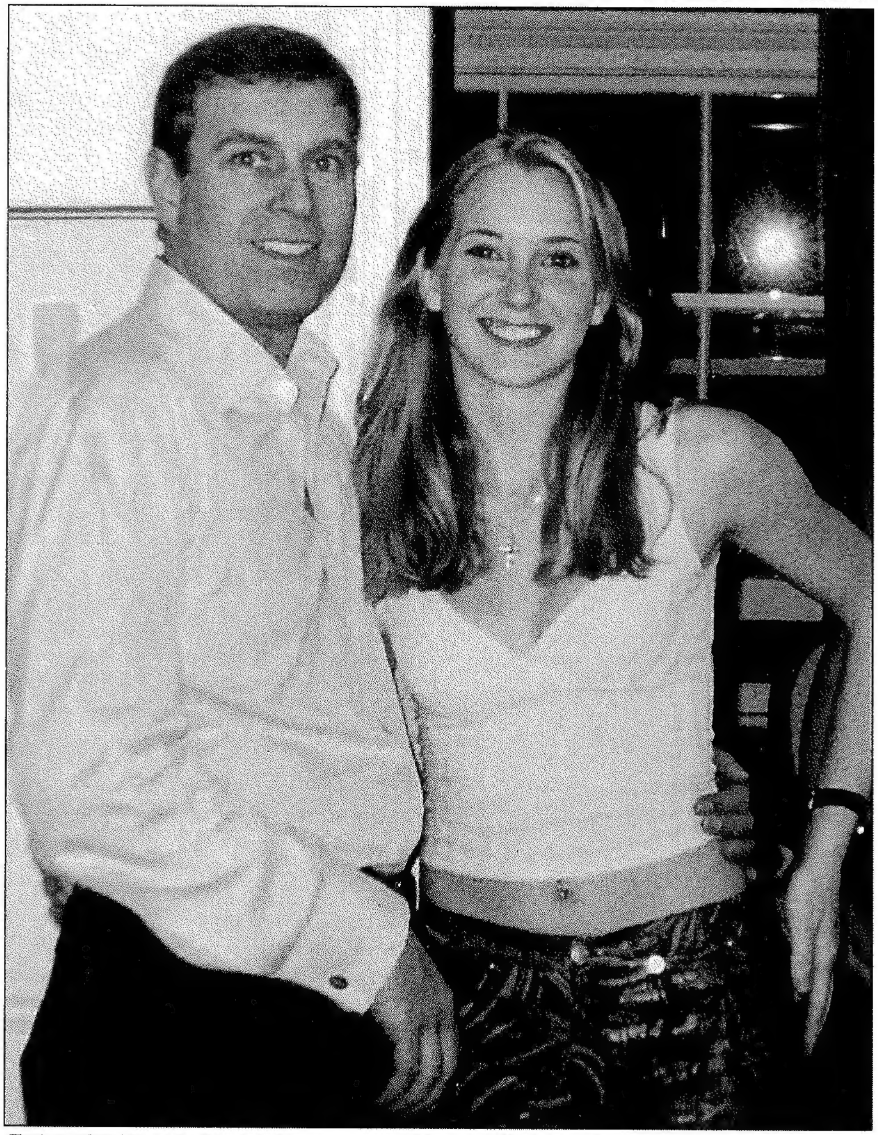


First meeting: Prince Andrew puts his arms around 17-year-old Virginia, centre

On one of those occasions Virginia Roberts was subsequently paid $15,000 (£9,400). Her shocking account of her four years as Epstein's personal masseuse is supported by court documents, an eyewitness, photographs and flight details of Epstein's private jets.

One picture, said to have been taken by Epstein during Andrew's first encounter with the girl in March 2001 and published today by The Mail on Sunday, shows the Prince with his arm around her waist.

This is not the first time the Duke of York's judgment and choice of associates have been questioned. He appears to relish the company of super-rich oil billionaires from the Middle East, North Africa and the former Soviet Union.

The peculiar sale of his former marital home to a Kazakh businessman for £15 million after it had languished unsold for five years at £12 million has never been satisfactorily explained.

In the recent leak of American diplomatic cables it was revealed that he had criticised an official corruption investigation into the huge Al-Yamamah arms deal between Britain and Saudi Arabia, while he is also said to be close to Saif Al-Islam Gaddafi, son of the beleaguered Libyan president, and may have had a role in the early release of Lockerbie bomber Abdelbaset Al Megrahi.

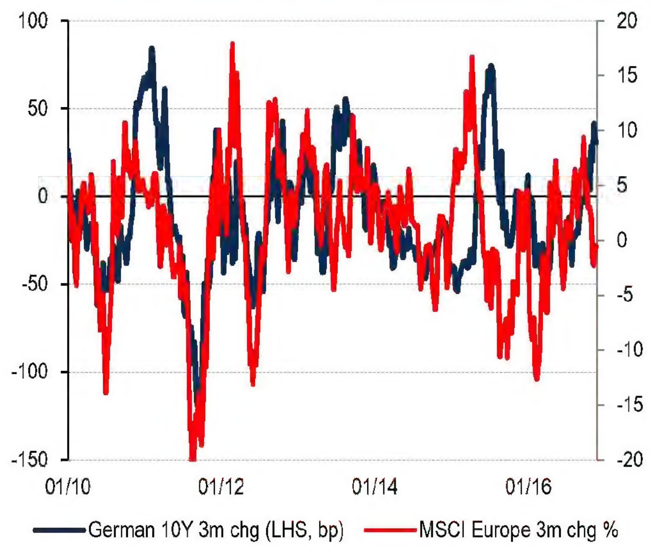
But it is Andrew's friendship with Epstein, whom he has known since at least 2000, and with Epstein's confidante Ghislaine Maxwell, daughter of the late disgraced newspaper baron Robert Maxwell, that gives most concern.

While on the streets, I slept with men for money. I was a paedophile's dream

He was first seen with the pair on holiday in Thailand, and was pictured cavorting with Ghislaine at a Halloween fetishthemed party in

+1.0% after 3 months and +3.7% after 6 months. Subsequent returns were positive in six of the eleven episodes and negative in the other five. Those stats are a little worse than the comparable numbers for the full sample but don't indicate that a bond yield spike is definitively negative for equities.

Chart 40: Rolling 3-month change in bond yields and equities



Source: BofA Merrill Lynch Global Research, Bloomberg

Table 3: Track record mixed for stocks following bond yield spike

Subsequent equity market returns following spike in bond yields (3m change >2.5SD)

3m change in bund yields hits peaks >2.5SD	Next 3m %	Next 6m %	Prior 3m %
10/06/1983	4.4	9.2	7.9
08/03/1985	5.3	10.2	11.1
02/03/1990	5.9	-6.9	-0.4
25/03/1994	-7.5	-4.7	-3.4
15/03/1996	4.7	7.0	4.9
09/07/1999	-3.6	9.8	3.7
22/08/2003	1.0	10.4	12.1
15/06/2007	-7.1	-6.1	11.1
13/06/2008	-8.1	-32.1	1.6
26/11/2010	6.0	3.7	7.2
08/05/2015	-1.2	-5.6	5.9
Median return	1.0	3.7	5.9
% positive	55%	55%	82%

Source: BofA Merrill Lynch Global Research, Bloomberg

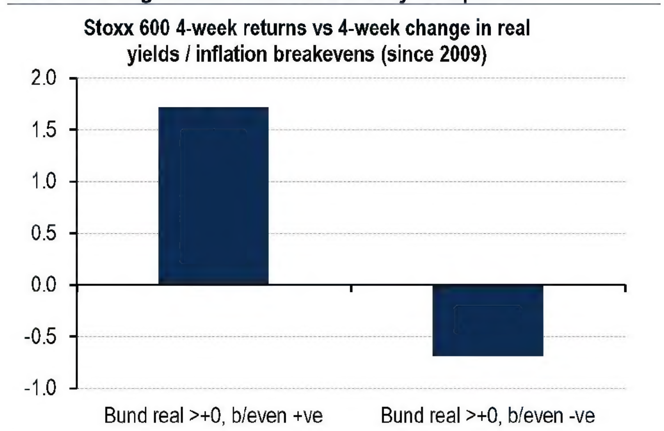
It matters why yields are rising – higher inflation breakevens key for stocks.

Digging a little deeper shows that the underlying dynamics in the bond market matter. Essentially rising inflation breakevens is the key driver for equities. Even when real yields are rising it is the change in implied inflation that has correlated most strongly with equity returns in recent years. Looking at 4-week rolling returns since 2009, in the periods that real yields rose Stoxx 600 returns were a median +1.7% if breakevens were also higher at the same time. In contrast a combination of higher real yields and lower inflation breakevens led to a median -0.7% return.

Chart 41: Inflation breakevens on the rise in recent bond market move

Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 42: Rising inflation breakevens the key for equities

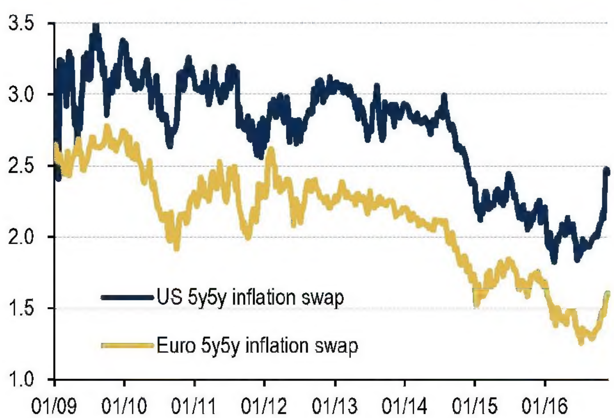


Source: BofA Merrill Lynch Global Research, Bloomberg

What then is the prospect for inflation expectations from here? Breakevens have moved significantly already in the context of the Euro area inflation outlook. 5-year, 5-year forward inflation swaps have recovered all the ground they lost earlier in 2016 in Europe and are back to end 2014 levels in the US. At 1.6% in Europe and 2.44% in US there is arguably more limited upside. A return to the range for inflation expectations that prevailed in 2013/14 before the oil price collapse would imply another 30-50bp from here. However, at least in the case of Europe our economists see the outlook for inflation remaining very subdued. Overall we would conclude that equities can see upside from here if bond yields rise towards our fixed income team's targets as long as inflation expectations are stable to rising at the same time.

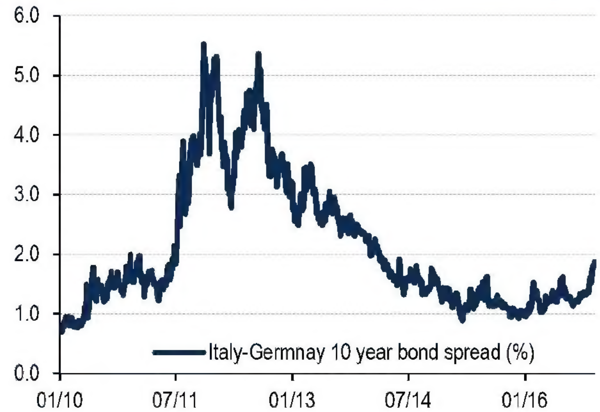
Rising bond yields pushing Italian spreads wider a risk for equities. Although rising core rates are not necessarily problematic for stocks, an important caveat is the fall out in other parts of the bond markets – particularly in the periphery. The equity market in Europe is sensitive to rising Italian bond spreads – exhibiting a negative correlation in recent years. This is an important risk at the current juncture given the upcoming referendum in Italy and ECB decision on QE extension. Should Italian bond spreads widen significantly from here it would likely weigh on equity valuations, keeping the risk premium high in Europe and in turn offset or outweigh the benefit from rising nominal growth expectations globally. This is perhaps the biggest potential problem for equities in the scenario that bond yields rise further from here. The ECB decision on QE extension is an important risk event in that context. As our economists have discussed in a recent note the risks of an ECB delay in the short term are increasing but their base case remains a QE extension with some tweaks of the capital key – a relatively benign outcome for peripheral sovereigns.

Chart 43: Inflation breakevens – room to normalize further?



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 44: Wider Italian bond spreads correlate negatively with equities



Source: BofA Merrill Lynch Global Research, Bloomberg

Sector Strategy

Markets due a period of consolidation in the short term. The reflation trade has run hard and we've taken some chips off the table in recent weeks by cutting our overweight positions in Banks and Basic Resources to neutral and reducing the size of our underweights in some Defensive sectors. In the short term we look for markets to consolidate. Near term risk reward is also a little poorer in light of event risks around the Italian referendum, OPEC's decision on a potential cut in oil production quotas and the ECB's decision on QE extension.

Look for another leg to the reflation trade in the coming months. We would look for another leg to the cyclical and reflation rotation in the next 1-2 quarters as evidence of stronger global growth and rising inflation materializes. We will look to re-enter sector positions that benefit from global rotation when short term risk reward improves. However, we would look for the pace of the rotation to moderate and become less binary from here. The upside from here for bond yields is more limited. With that in mind we are likely to be more selective in reflation vs bond proxy positions.

Politics likely remains an overhang through 1H 2017. Another reason to run a less binary portfolio over the coming months is the potential for political uncertainty to weigh on European markets. Attention near-term will focus on Italy but the French Presidential elections loom in April / May and the tail risk of a Marine Le Pen victory will act as an overhang for Europe in the coming months. It suggests 22017 may well be a year similar to 2016, in which the major indices in Europe have traded in ranges for large parts of the year.

Value in some Defensive bond proxies. Valuation looks quite compelling already in some of the bond proxy sectors. Utilities and Healthcare are both trading at the low end of relative valuation ranges and have decent fundamentals in the view of our analyst team. However, rising government bond yields remains the major potential headwind in coming months. We are overweight both sectors.

Financials – neutral following the strong recent rally. Banks have re-rated aggressively, taking PE-relative back to average levels. However, the sector continues to have uncertain prospects for EPS recovery given continued ultra-low policy rates in Europe and ongoing tail risks from periphery are an overhang on the sector. Continued long only positioning remains a potential support for the sector should rates and yield curves renew their widening moves. A Risk reward may be better in Insurance – the sector still offers the second highest DY in the market (and relative DY is still at 90th percentile of the range since 2004).

Global quality Cyclicals – waiting for an entry point. Many cyclicals have performed less strongly in the recent rally than Resources and re-rated less aggressively than Financials. With relative PE valuations in-line with or below 17-year averages for the likes of Industrials, Chemicals and Technology we will look for opportunities to build positions in cyclical areas in the coming months. Overowned positioning has been something of a negative for several of these areas (notably Tech) and any signs of a correction could be a catalyst to re-enter an overweight in the sector.

Media – raise to overweight. With the outlook for markets set to become less binary we will look to add exposure to quality cyclical areas. One such sector that has lagged this year is Media, making this an interesting entry point. The sector is something of hybrid combining defensive and cyclical components and high and low quality. Media in particular has come back a long way following a six-month period of sustained underperformance.

Overweight Oil position dependent on OPEC. As we go to press, the OPEC decision on a deal to cut oil supplies is pending. Our commodity strategists' base case has been for some kind of deal, with upside into the mid $50s for a deal to cut 1 million barrels per day. However, in the case OPEC fails to agree any deal they see WTI dipping back below $40. In other words, the outcome is highly binary in the short term for crude and related equities. We flag to investors that we would consider reducing our weighting in the event of no deal.

Assuming OPEC does cut production and oil prices recover up to the high $50s per barrel, as per our commodity strategists views, earnings and cash flows can recover significantly in the coming 12-18 months. Our Oil analysts model between 8 and 17% upside to operating cash flows in 2017 for European integrated stocks if assumed crude prices are increased $10 from $50 to $60. That makes the highest DY in market at ~6% more sustainable out of FCF coverage.

Cautious UK domestic (underweight Retail, Travel & Leisure). We are cautious on domestic UK exposure and underweight Retail and Travel & Leisure. To our mind, these companies face a lose-lose trade-off of maintaining margins by passing on higher costs at the expense of volumes, or face margin pressure by absorbing these costs in order to sustain current volumes. Building inflationary pressures point to a post-Christmas consumer squeeze. This could be further compounded OPEC cuts and oil prices rise. The Retail sector is also facing structural margin pressures and unattractive valuations. In Travel & Leisure (two thirds UK listed), profitability is declining from peak levels. Note our analysts also see structural pressures on airlines from overcapacity and competition. See below for more details.

Table 4: European Sector Allocation

Sector	Ticker	Index Weight %	Stance	Delta (bp)	Portfolio Weight %	Portfolio / Benchmark %
Oil&Gas	SXEP	4.6	o/w	+150	6.1	132%
HealthCare	SXDP	12.5	o/w	+150	14.0	112%
Media	SXMP	2.6	o/w	+100	3.6	138%
Utilities	SX6P	3.9	o/w	+100	4.9	125%
Trav&Leisr	SXTP	1.8	u/w	-150	0.3	15%
Food&Bevrg	SX3P	5.9	u/w	-150	4.4	75%
Retail	SXRP	3.1	u/w	-200	1.1	36%
		100.0		+0	100.0	0%

Sector	Ticker	Index Weight %	Stance	Delta (bp)	Portfolio Weight %	Portfolio / Benchmark %
Autos&Parts	SXAP	3.2	n	0	3.2	100%
Banks	SX7P	12.4	n	0	12.4	100%
BasicResou	SXPP	3.0	n	0	3.0	100%
Chemicals	SX4P	5.0	n	0	5.0	100%
Constr&Mtr	SXOP	3.0	n	0	3.0	100%
FinServ	SXFP	1.9	n	0	1.9	100%
InduGd&Ser	SXNP	11.9	n	0	11.9	100%
Insurance	SXIP	6.4	n	0	6.4	100%
Per&HouGds	SXQP	8.8	n	0	8.8	100%
Real Estate	SX86P	1.9	n	0	1.9	100%
Technology	SX8P	3.8	n	0	3.8	100%
Telecomm	SXKP	4.1	n	0	4.1	100%

Source: BofA Merrill Lynch Global Research, Bloomberg

Reflation rotation – tactically got very stretched

Over the last two weeks we cut our weightings in Basic Resources and Banks to neutral. That was in response to the signals from our technical models all flashing warning signs that the rotation out of bond proxies into reflation beneficiaries had got very stretched tactically. Our Composite Technical Indicators (CTIs) for sector relative performance hit +100 at the recent high in the case of Basic Resources and +94 for Banks and Insurance. These models combine a range of technical indicators including RSIs, MACDs, Bollinger bands and others and +100 represents maximum overbought. Basic Resources relative price has also reached +2.7SD above the 52-week average, the highest reading for the sector since 2010. Financials hit +1SD while other cyclicals have also peaked at +1.5-2SD in recent weeks.

By contrast bonds and equity bond proxies screen as very oversold on these models. All Defensives troughed at -92 or below at some point over the last 4 weeks. On Bollinger scores, relative prices hit between -2.4SD and -3.8SD for the Defensives and also Real Estate. In the case of Utilities (-3.8SD) that is close to a record low. Similarly our CTI readings for macro variables like 10-year Treasury yields, gold and $/yen also hit oversold levels. The models are useful in isolation for highlighting any anomalies in recent price action for individual assets. However, the fact that we have had multiple signals across a range of sectors and macro prices is typically a warning that markets have moved too far too fast in a more general sense.

The last comparable episode was in early July in the wake of the Brexit sell-off. At that point Defensives were hitting record over bought signals with Financials and Cyclicals seeing the opposite. Against the backdrop of heightened uncertainty over the effects of Brexit the models provided a great signal to fade the violent rotation.

With these signals in mind we look for a period of consolidation in the rotation trade. The models are short term in nature and are not intended to identify strategic turning points – although like in the case of Brexit they do tend to emphasize when a crescendo is reached. While we would look for another potential leg in some of the reflation trades over the coming months we would prefer to wait for a pull back. The Basic Resources sector provides a useful example in how to use the models tactically. Three times this year prior to the current instance the sector has hit overbought levels on its relative CTI indicator. Previous pullbacks lasted 4-8 weeks and averaged -11% in relative performance terms.

Table 5: Composite Technical Indicators for sector relative returns
(+100 max overbought; -100 max oversold)

Sector	Latest	Since Oct 27 MIN	MAX
Healthcare	-5	-98	-1
Personal & Household Goods	0	-94	0
Food & Beverages	-31	-93	0
Telecom	-25	-92	0
Utilities	-8	-92	3
Technology	0	-88	26
Media	-1	-87	7
Industrial Goods & Services	0	-73	35
Oil & Gas	1	-45	4
Autos	0	-12	8
Chemicals	0	-8	0
Travel & Leisure	0	-27	37
Financial Services	-1	-3	43
Construction & Materials	0	-17	45
Retail	0	-42	90
Insurance	36	0	94
Banks	16	8	94
Basic Resources	9	7	100

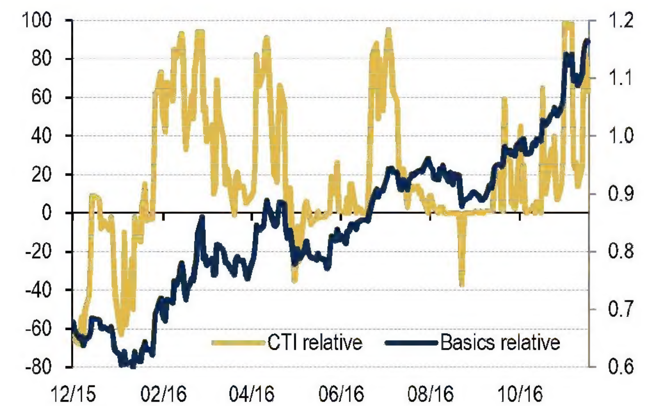
Source: BofA Merrill Lynch Global Research, Bloomberg

Table 6: Bollinger scores –bond proxies 2.5-3.5SD oversold

	52-week Z-Score Recent 1m extreme	Latest
Utility	-3.8	-2.6
Real Estate	-3.4	-2.1
Media	-2.9	-1.8
Food & Bev	-2.6	-2.2
HealthCare	-2.5	-1.8
Telcos	-2.4	-2.2
Travel & Leis	-2.1	-0.7
Retail	-1.5	-0.4
Prs & HH Gds	-1.2	-0.6
Autos	0.8	0.5
Insurance	0.9	0.8
Technology	1.0	0.6
Banks	1.0	0.6
FinServ	1.0	0.6
Industrials	1.5	1.4
Oils	1.6	0.9
Chemicals	1.9	0.8
Construction	2.0	1.2
Basics	2.7	2.2

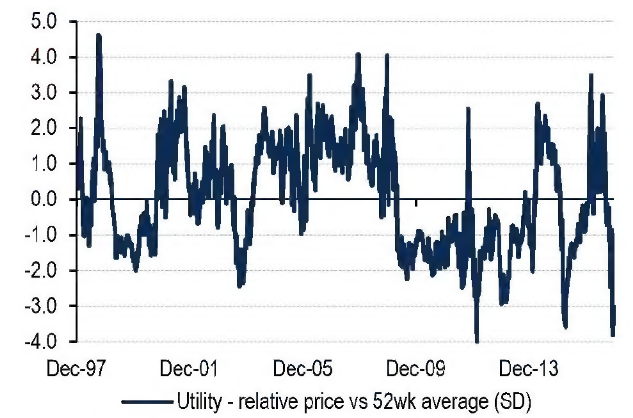
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 45: Basic Resources 4th overbought signal this year – previous pullbacks last 4-8 weeks and averaged -11% relative



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 46: Utilities near a record -4SD oversold vs 52-week average



Source: BofA Merrill Lynch Global Research, Bloomberg

Rotation trade – valuations have moved a long way

While technical metrics suggest a pause is due in the reflation rotation, we have also seen a significant amount of ground covered from a valuation perspective in the market moves to date.

The scatter chart below compares the PE relative change since 8th July (the post Brexit valuation high / low for many sectors) against where PE relative ranks now compared to history. Essentially sectors in the top right have enjoyed a relative multiple re-rating and current relative PE levels are above the median since 1999. Those in the bottom left have seen relative PE multiples de-rate while their current relative PE is below the median since 1999. We make the following observations:

- **Financials have had the biggest re-rating.** Financials re-rated most since Brexit and are now trading around median relative valuation levels. Given the tight link between relative valuations and bond yields in recent years the PE-relatives for Banks and Insurance have also recovered much more than would seem justified by the move in the German 10-year yield. The sectors do screen cheaper versus history on PBV reflecting relatively depressed ROEs especially for Banks. Hence, we think PE multiple expansion from here would need to be driven by improving EPS prospects in the sector – something our analysts are sceptical about.

- **Global Cyclicals trading near or below average relative PE's.** Many global cyclicals have had fairly modest re-ratings since early July and trade on close to median or below valuations. Sectors such as Industrials, Chemicals, Autos, Tech have relative PE multiples 5-10% higher than post Brexit. Relative PE for Chemicals and Industrials are close to post 1999 averages. Construction PE relative does screen as elevated – at the 92nd percentile. Autos, Tech and Travel & Leisure all have PE relatives in the bottom quartile of their post 1999 range. Relative PE valuations look very reasonable on this basis for Tech, Chemicals and even industrials. In part this may reflect higher than historical average ROE – relative PBV is less flattering for Industrials for example.

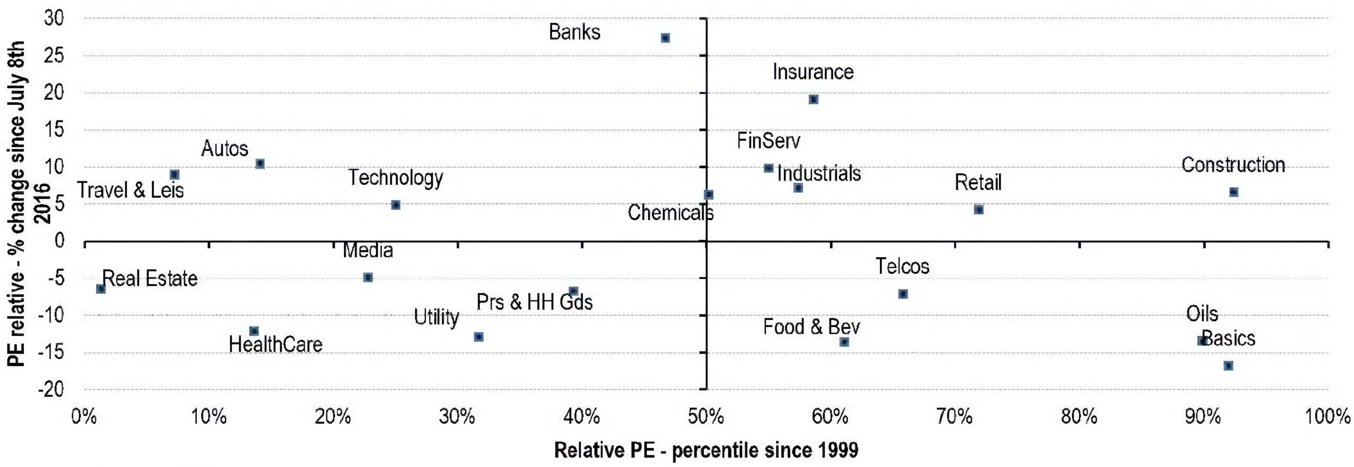
- **Resources sectors – de-rating as EPS recovers.** Oil and Basic Resources PE relative has declined more than in any other sector. Although both sectors have seen strong price performance this year, PE multiples are declining from very elevated levels earlier this year as earnings bounce back from depressed levels. Since the end of June Basics 12m forward EPS is up +65%, while the sector index price has risen +33%. For Basics and Oil, performance from here is likely to remain a function of EPS momentum rather than valuations.

- **Defensives have all de-rated with Telecoms suffering least.** Defensive sectors have all seen relative valuations decline over the past four months. Healthcare and Utilities are the two sectors with multiples at lower end of the historical range – notably Healthcare at the 14th percentile. Utilities relative PE is also close to the prior low hit in 2013. Telecoms screens as somewhat less depressed form a valuation perspective – notwithstanding the poor sector performance in 2016. PE relative remains well above the median levels since 1999.

- **Staples approaching 2010/14 lows on PE-relative.** Staples have also de-rated severely – in fact Food & Beverage relative PE fell somewhat more than the other Defensives. However, current levels are still somewhat higher versus the historical range (since 1999) than for Healthcare or Utilities. That being said, the PE-relative rose structurally through the 2000s. Over a shorter time frame since 2010 Food & Beverage is also now trading near the bottom quartile. PE-relative is 6-10% above the lows seen in 2010 and 2014 – but those would still allow for healthy 25-30% valuation premiums to the market .

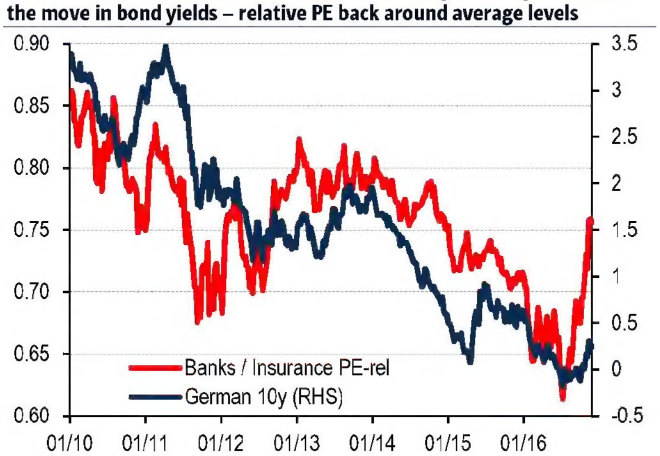
Overall, we find it hard to argue that sectors haven't moved a long way already from a valuation perspective, even against the context of potentially important inflection points in bond yields and earnings. From here we suspect investors may need to more selective in how they play the rotation theme and consider other variables such as earnings momentum, yield, technicals and positioning when allocating across sectors.

Chart 47: Relative PE – recent re / (de) rating compared to percentile ranking of latest relative multiple



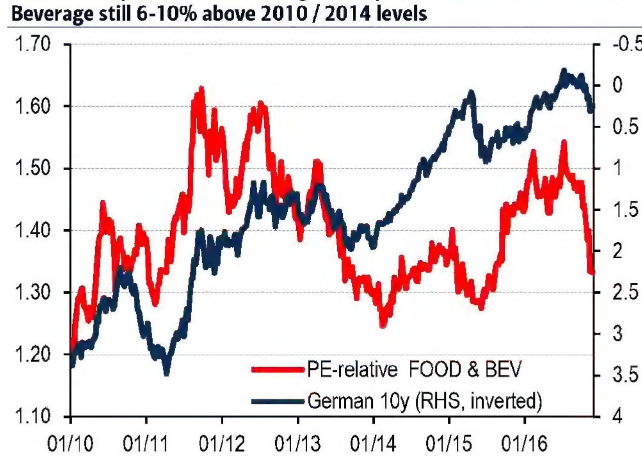
Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 48: Financials valuations have recovered significantly relative to the move in bond yields – relative PE back around average levels



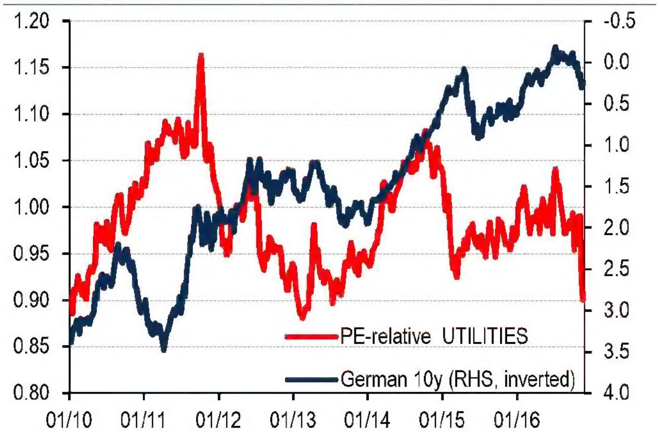
Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 49: Rapid relative de-rating for Staples – relative PE for Food & Beverage still 6-10% above 2010 / 2014 levels



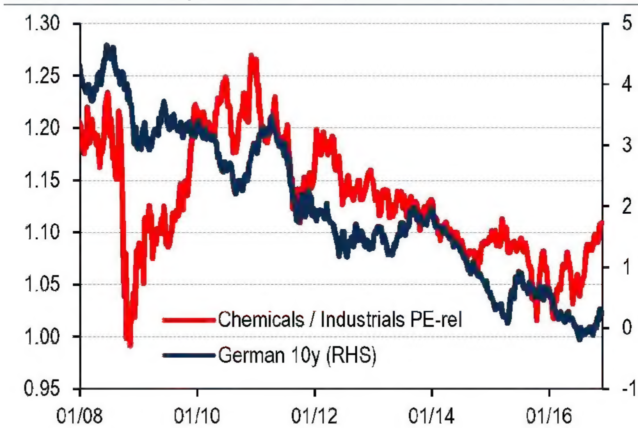
Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 50: Utilities relative PE close to the 2013 low



Source: BofA Merrill Lynch Global Research, Datastream, IBES

Chart 51: Chemicals / Industrials – re-rated but PE-rel not excessive



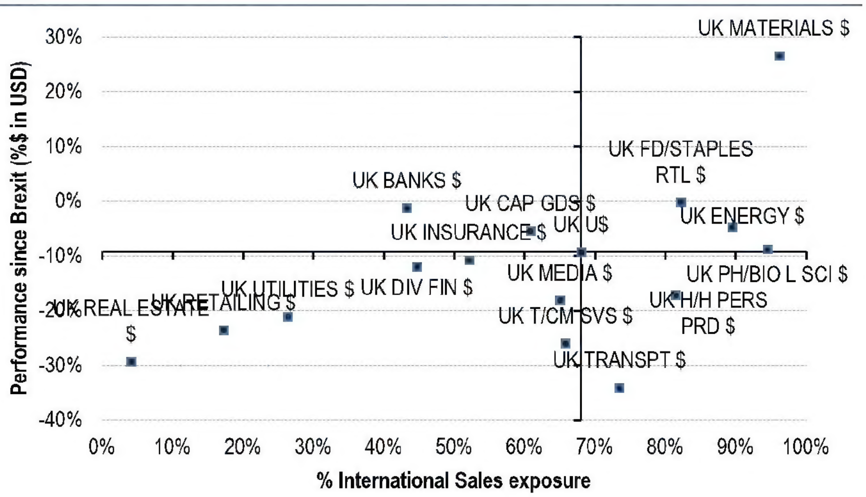
Source: BofA Merrill Lynch Global Research, Datastream, IBES

UK – Waiting for Brexit

It's useful to think about where the UK is today in terms of the four risk factors we identified in our February 2016 Brexit preview: 1) weaker GBP; 2) weaker UK growth; 3) Higher UK risk premia & gilt yields; 4) increased regulatory, political and market uncertainty.

Although we saw a severe risk-off move immediately following the Brexit vote, the only truly significant post-Brexit delta has been a weaker GBP. GBP is down 16% vs USD and 11% on a trade weighted basis. In fact, a simple post-Brexit strategy of going equal weighted long UK-listed sectors with above market international sales exposure vs sectors with below market sales exposure would have delivered ~110% returns in USD.

Chart 52: GBP and sales exposure have been the key determinants for post-Brexit UK equity returns

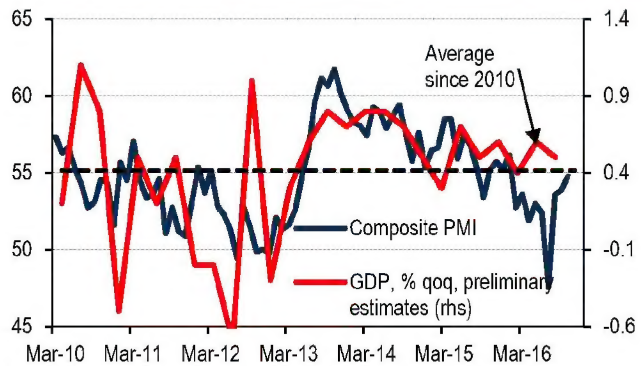


Source: BofA Merrill Lynch Global Research, Bloomberg, Factset. Performance in USD from 23-June-2016 close to 25-Nov-2016 close.

The currency move contrasts with the other risk factors. To date, UK growth which has held up better than many expected; policy uncertainty has fallen following a sharp spike; gilts are only 2bp higher than June 23rd (although this masks a 85bp rally then 87bp sell-off); and the UK cost of equity is now down ytd. What Brexit, you could ask.

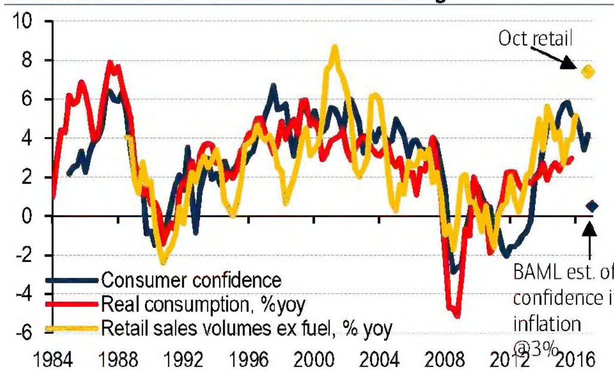
As we outline below, we think it is just a matter of timing. The political certainty created by the swift election of Theresa May plus the Bank of England's interventions have delayed, rather than resolved, the underlying uncertainties caused by the vote.

Chart 53: UK PMIs tanked post-Brexit but have recovered



Source: BofA Merrill Lynch Global Research, Markit, ONS.

Chart 54: While retail sales have remained strong



Retail sales volumes. Source: BofA Merrill Lynch Global Research, GfK, ONS.

2017: Falling growth, negotiations and a consumer squeeze

We think there are clear warning signs that conditions are deteriorating, uncertainty is set to return and a consumer squeeze is coming for the UK.

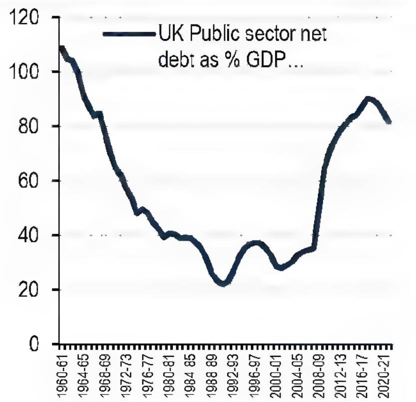
Falling growth to compound deficit problems

Real gdp is only expected to fall 0.1% in 2016 vs the March forecast. But the UK Office of Budgetary Responsibility expects growth to slip by 0.8% next year (2.2% to 1.4%) and 0.4% on 2018 (2.1% to 1.7%) vs March. A notable slice of this is can be attributed to the OBR's estimate that Brexit added £59bn to UK borrowing to 2022, or nearly £200mn a week. These numbers include Phillip Hammond's sensible but small measures. Our UK economist is more pessimistic forecasting 0.9% in 2017 and 0.7% in 2018. Even if we split the two, that represents a 50% decline in expected 2017 gdp and 40% decline in 2018. The OBR also expects public sector net debt to hit its highest level since 1964-65 in 2017-18 at a time when the UK already relies on "the kindness of strangers" to finance its growing twin deficit.

Chart 55: OBR / BofAML UK GDP forecasts materially lower in 2017

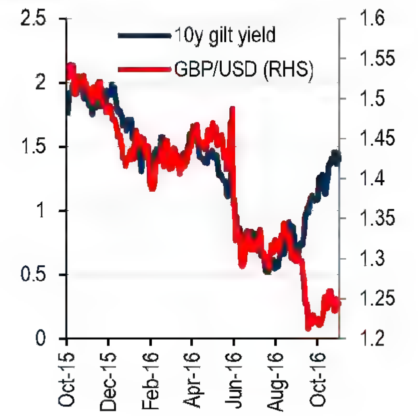
Source: BofA Merrill Lynch Global Research, Office of Budgetary Responsibility

Chart 56: UK Public sector net debt is expected to return to 1960s levels



Source: Office of Budgetary Responsibility

Chart 57: The weaker econ outlook has helped decouple GBP and gilts since late Sept'16



Source: Bloomberg

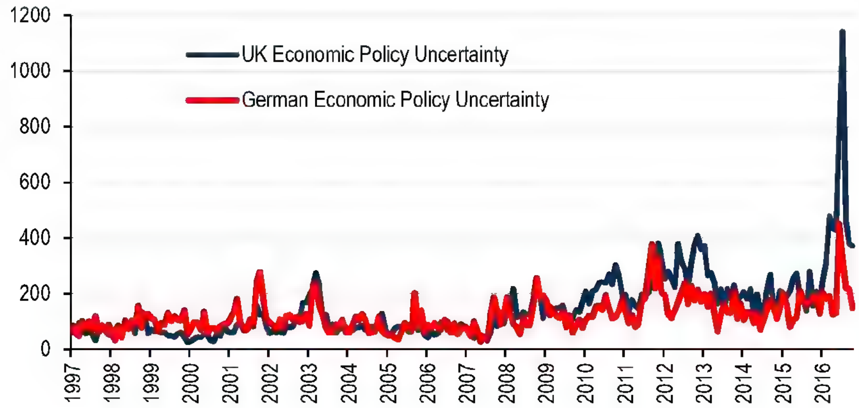
Certainty that Brexit negotiations will start, but uncertainty on the details

Against this debt and growth backdrop, investors are likely to want clarity and visibility on policymaking in order to continue funding the UK's deficit in our view. We think they could be disappointed.

Firstly, the Government has committed to triggering Article 50 by the end of March 2017. We think this is likely irrespective of the outcome of the Judicial Review on where the legislative power lies for making that decision. Second, the Government's formal position is not to announce its negotiating strategy in public. A lack of insight into the UK's future trading relationship with its biggest export market for goods and services is a difficult backdrop upon which to continue investing in the UK, even if a few companies have taken that decision already. Third, we think there will have to be a resolution to the trade-off between the Government's desire to control immigration and reach a beneficial economic settlement. The problem, as is often repeated by EU leaders, is that curbing migration puts the UK on a collision course with the EU's four freedoms and therefore at odds with access to the single market. That's why our base case remains a so called "hard Brexit", but even now our colleagues in FX strategy think investors are not positioned for this. Hence their GBP/USD forecast of 1.15 for Q1/Q2 2017.

Finally, a major concern for investors and especially business investment would be if the UK faces a "cliff edge" for trade terms in 2019 (on the assumption article 50 is triggered). While a transition deal would be a potential positive development next year, the absence of such a deal before or soon after article 50 is triggered could be another reason for policy uncertainty to spike higher again.

Chart 58: The dip in UK policy risk is likely to be short lived if the Govt keeps to its commitment to trigger A50 in Q1 without providing clarity on its negotiating position

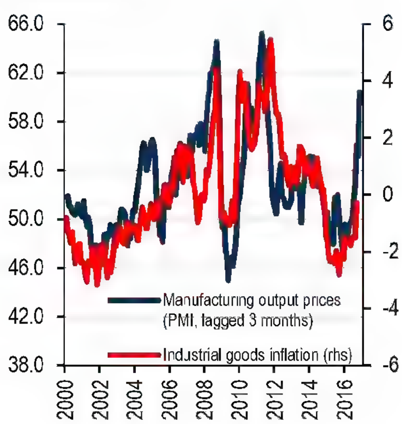


Source: Bloomberg

Building inflationary pressures point to post-Christmas consumer squeeze

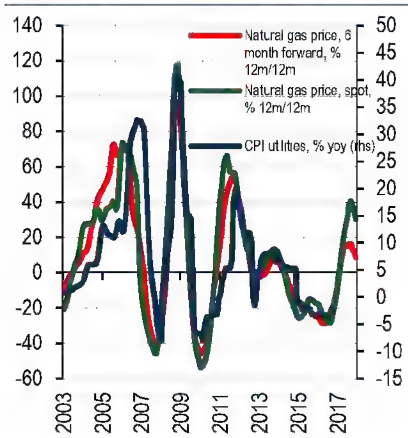
The third act in waiting for Brexit is cost-push inflation from the fall in GBP. So far, consumer spending has held up far better than most expected, especially retail spending by the over 50s. But there is evidence the inflationary canary is starting to sing. The charts below show that the move in CPI has lagged sharp rises in manufacturing output prices, utility prices and food prices in the past two months.

Chart 59: Firms report sharp increases in output prices



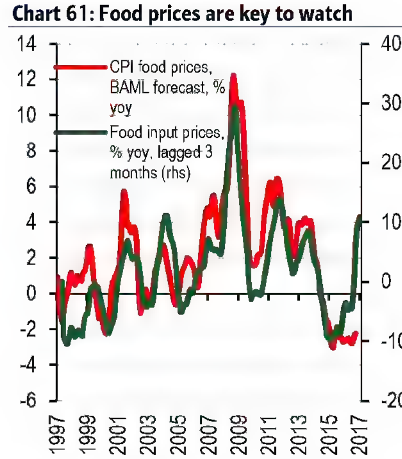
Source: BofA Merrill Lynch Global Research, Markit, ONS.

Chart 60: Chunky utility price increases on the horizon



Source: BofA Merrill Lynch Global Research, ONS, Bloomberg

Chart 61: Food prices are key to watch

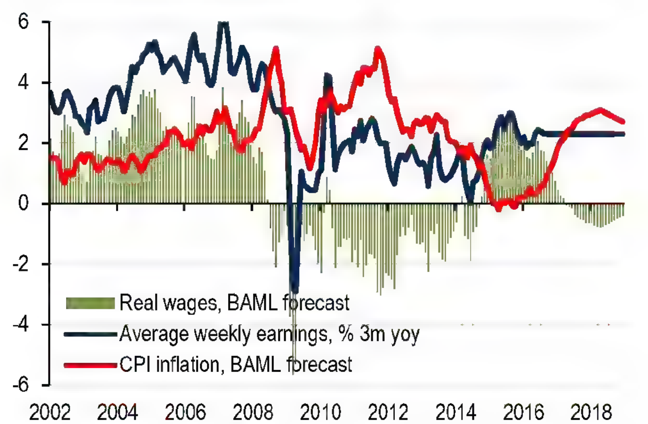


Food input prices calculated as an average of domestically produced and imported food. BofA Merrill Lynch Global Research, ONS.

To understand this delay it is worth remembering "Marmitegate" and the pressure put on companies not to raise the prices of household brands. The incident also illustrates the margin pressure building up in the system and challenges posed to producers, vendors and consumers as to who will absorb the higher costs. According to the Chairman of the UK Food and Drink Federation many companies may be waiting until post-Christmas to change prices, which Ian Wright estimates could rise as much as 8%. If that happens at the same time as power prices hit seasonal highs, the consumer could start to feel the pinch.

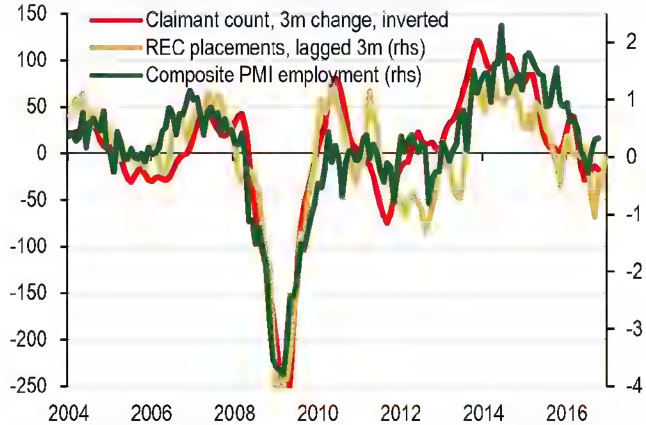
To avoid this leading to a contraction in demand, workers we would need to see strong nominal wage growth. However, the Institute of Fiscal Studies does not expect real wages to return to 2008 levels until 2021. The tightness of the UK labour market could also cushion any blow, but we note jobless claims have started to rise again and businesses may be less likely to hire if uncertainty, for reasons outlined above, picks up again.

Chart 62: Real wages likely to fall



Real wages calculated as average weekly earnings minus CPI inflationSource: BofA Merrill Lynch Global Research, ONS

Chart 63: REC and PMI point to higher unemployment



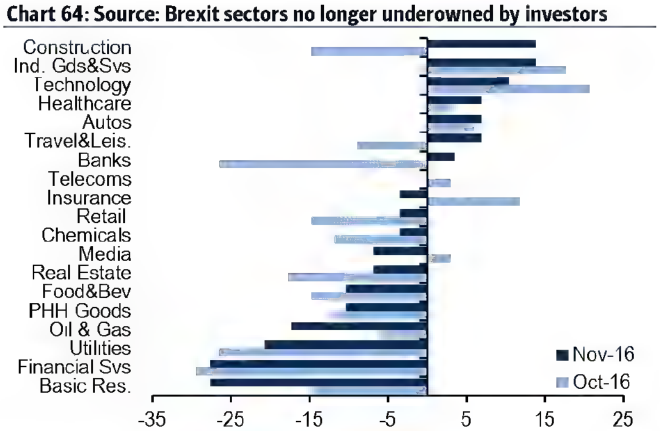
REC placements is an average of permanent and temporary placements. REC and PMI shown as standard deviations from average. Source: BofA Merrill Lynch Global Research, Markit

Given all of the above, we reiterate our preference for avoiding sectors with a high proportion of domestic UK companies. To our mind, these companies face a lose-lose trade-off of maintaining margins by passing on higher costs at the expense of volumes, or face margin pressure by absorbing these costs in order to sustain current volumes in our view. This could be further compounded if our Oil Strategists' forecasts are right and Brent averages ~$60/bb following an OPEC cut.

But how much is in the price?

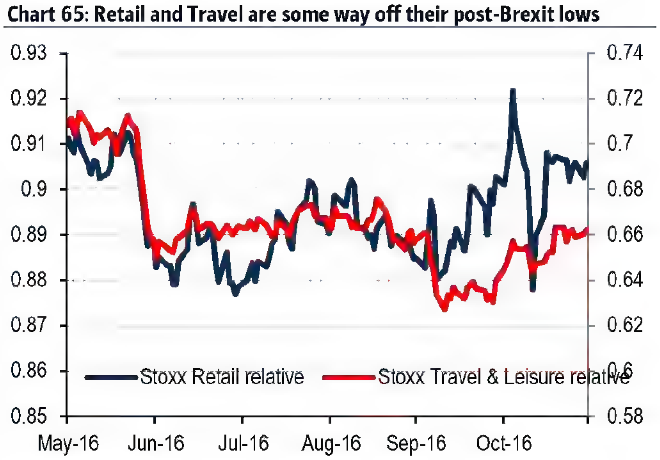
The pushback to our view is that the forecasted deterioration in growth hasn't really materialised and investors are already pricing it in a lot of bad news. For instance, Easyjet is down nearly 35% and investors are still underweight the UK in the FMS. While this is the case for certain stocks, at a sector level investors appear to have squared off their underweights in Retail/ Travel according to the FMS. Both sectors also back near pre-Brexit levels relative to the market (albeit Travel reflects the recent oil price weakness).

Chart 64: Source: Brexit sectors no longer underowned by investors



Source: BofA Merrill Lynch Global Research

Chart 65: Retail and Travel are some way off their post-Brexit lows



Source: Bloomberg

Sector Trades

Table 7: European Sectors – Summary of investment case and risks

Sector (Ticker)	Index Weight %	Stance	Delta (bp)	Summary of view
HealthCare (SXDP Index)	**12.5**	**O/W**	**+150**	Laggard despite Republican clean sweep reducing legislative risks, valuations close to 2010-12 lows at trough of patent cliff but sector team expect 11% EPS CAGR 2018 2021 supporting 17/18x PE (currently on 13x 2018), catalysts from new products set to be announced in 2017 **Risks: rising bond yields continues, pipelines fail to realise, strong growth leads to risk-on rally led by value/ rotation out of quality.**
Oil & Gas (SXEP Index)	**4.6**	**O/W**	**-150**	Forecast Brent to average ~$61/bbl in 2017 on supportive demand backdrop (EM), OPEC reduction, supply destruction causing rebalance Oil team modeling 8%-17% upside from crude rally meaning FCF covers ~6% DY and EPS to improve (revisions 2nd best in market) **Risks: OPEC fails to cut supply pushing rebalancing out, strong dollar and protectionism curtail global demand and EM growth.**
Media (SXMP Index)	**2.6**	**O/W**	**+100**	Market laggard and de-rated presenting favourable entry points, optionality to improving EU consumer confidence even if UK consumer set to be squeezed next year, historically outperforms when dollar/ PMIs/ inflation rising, positioning now underweight in FMS **Risks: UK growth/ EU consumer confidence drop quickly, investors prefer cheaper cyclicals if we see another leg to risk-on rally.**
Utilities (SX6P Index)	**3.9**	**O/W**	**+100**	Big underperformer in reflation rotation given defensive yield characteristics now oversold, consistent underweight in FMS but fundamental outlook positive with cyclical/ earnings improvement from higher power prices/ CSPP/ changing sector composition **Risks: lack of differentiation from investors in rising yields continues, commodity prices roll, regulatory risk increases.**
Autos & Parts (SXAP Index)	**3.2**	**M/W**	**0**	Bull case Margins supported by strong EU/ China sales, lease growth in US, valuations at multi-year lows, positioning neutral, cyclical beta Bear case. Future car raises questions over terminal value, US/UK markets peaked, Truck market has turned, China tax cut to end
Banks (SX7P Index)	12.4	M/W	0	Bull case global yields and inflation continue to rise as global growth pushes higher, Italian banks successfully recap and earnings improve. Bear case LT profitability challenges persists (ECB monetary policy), UK large caps underperform, rates move unwinds
Basic Resources (SXPP Index)	3	M/W	0	Bull case Investors still u/w, Trump delivers on fiscal not trade, DXY capped so EM recovery / China cycle continues, higher metals lifts FCF. Bear case: Protectionism rises, China cycle slows, hawkish Fed hurts EM rally, metals prices fail to sustain recovery.
Chemicals (SX4P Index)	5	M/W	0	Bull case Cheap on relative PE/ DY, M&A pick-up, cyclically geared to improving EM growth, higher quality characteristics vs other cyclicals Bear case OPEC deal fails hurting oil, industrial cycle potentially at risk from protectionism, margins unsustainable given at highest since 2004
Const & Mats (SXOP Index)	3	M/W	0	Bull case geared to expected increase in fiscal spending (esp US), EU mfg and construction PMIs solid, US ISM / housing market strong Bear case Most expensive sector on relative basis, re-rated on fiscal expectations but EPS hasn't followed, exposure to softening UK market
Fin Srvs (SXFP Index)	1.9	M/W	0	Bull case High proportion of dollar earnings/ sterling reporters, geared to pick up stronger markets, potential M&A targets Bear case less attractive valuations and not as levered into better growth/ rising bond yields than other financials (e.g Banks)
Ind Gd&Svs (SXNP Index)	11.9	M/W	0	Bull case US mfg ISM strong, EU OECD lead indicator improving, expect fiscal spending in US, high RoE and consistent earnings Bear case valuations stretched on PBV, big outperformance driven by re-rating more than eps growth, Q3 earnings season has been weak
Insurance (SXIP Index)	6.4	M/W	0	Bull case beneficiary of rising yields, strong balance sheets, cheap on PBV/ PE and attractive, growing and covered DY. Positioning still light. Bear case lower beta and longer cycle than Banks, vulnerable to any rally in bond prices from Italy risks, higher DY in more cyclical sectors
Persnl & HHG (SXQP Index)	8.8	M/W	0	Bull case luxury stocks delivering growth, tobacco structural outperformer, has de-rated following Brexit rally but earnings outlook decent Bear case margins at 10y peak, stiff competition from digital innovation, EM consumer demand volatile, vulnerable to rising rates
Real Estate (SX86P Index)	1.9	M/W	0	Bull case oversold on CTI, at 10y lows on relative PE and bottom quintile on PBV, UK market held up post-Brexit, yield attractive if bonds rally Bear case. positioning o/w vs history, REITs vulnerable to rising yields backdrop, rental yields under pressure fall if UK/ EU growth slumps.
Telecomm (SXKP Index)	3.8	M/W	0	Bull case strong FCFY and improving balance sheets, valuations not expensive, positioning has unwound, beneficiary of CSPP, major laggard Bear case structural challenges to monetising data, consolidation not set to play out, vulnerable to further outflows in rising yield environment
Technology (SX8P Index)	4.1	M/W	0	Bull case valuations less stretched, semis cycle proving resilient, higher "quality" cyclical, positioning neutral, structural growth Bear case vulnerable to rotation into value sectors in a risk-on market, margins close to peak, structural challenges for Nokia/ Ericsson.
Food & Bev (SX3P Index)	**5.9**	**U/W**	**-150**	Highest correlation to rising yields/ bond proxy, valuations still not cheap on a range of metrics (esp vs Healthcare), falling earnings revisions **Risks: Oversold vs history in rotation move, sector has de-rated enough if bond yields capped/ CB don't hike/ growth disappoints.**
Travel & Leisr (SXTP Index)	**1.8**	**U/W**	**-150**	Airlines in structural decline, negatively correlated to higher oil, vulnerable to weaker UK and returns at peaks levels, valuations not cheap **Risks: Oil rally takes longer to materialise if OPEC fails to cut, European/ global growth picks up and UK gdp surprises to upside.**
Retail (SXRP Index)	**3.1**	**U/W**	**-200**	Most vulnerable to consumer squeeze in UK, margins in structural decline, supermarkets have had their relief rally, expensive on PE/ PBV/DY **Risks: modest inflation provides pricing power, Eurozone growth boosts consumer demand, positioning light, strong x-mas season.**

Source: BofA Merrill Lynch Global Research

Underweight Retail

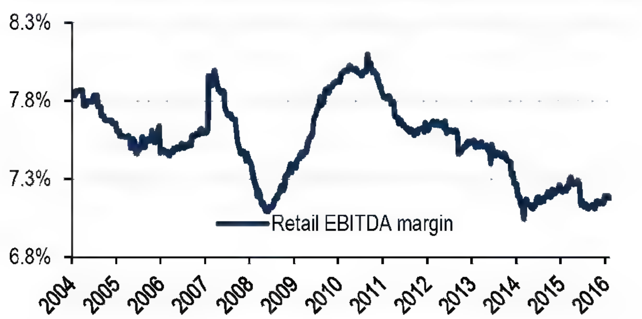
In addition to Brexit concerns, we also see a number of fundamental reasons to reiterate out underperform on Retail.

- **Structural margin pressures:** Aside from Brexit, retailers face declining returns as online disruptors and discounters drive up competition. EBITDA margins have fallen from 8% in 2010 to close to 7% in 2016 and RoE has declined by nearly 3% since 2004. We think this structural trend has further to run.

- **Valuations are also unattractive.** Retail remains on a significant premium to the market on absolute terms (17.3x 2017 PE vs 14.2x) and is expensive versus its own history at 20% above its 10y relative average on PE and 92%ile on PBV, while it has the second lowest dividend in the market (2.9%). Even if you strip H&M and Inditex the sector is towards the higher range of its post-GFC range.

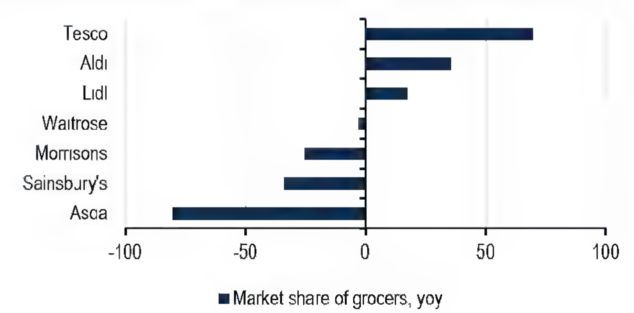
- **UK supermarkets have had their relief rally.** Despite challenges facing UK food retailers, Tesco has rallied 25% and Morrison's 15% since Brexit as retail spending has held up and the short base grew massively immediately following the UK-EU vote. Yet as Xavier Le Mene notes, this has largely been because they have gained market share from Asda and investors have bought into their new management plans. However, Xavier see limited upside potential for either next year and there is a risk that Asda starts to recoup lost ground under its new management too.

Chart 66: Stiff competition means retail margins are structural declining



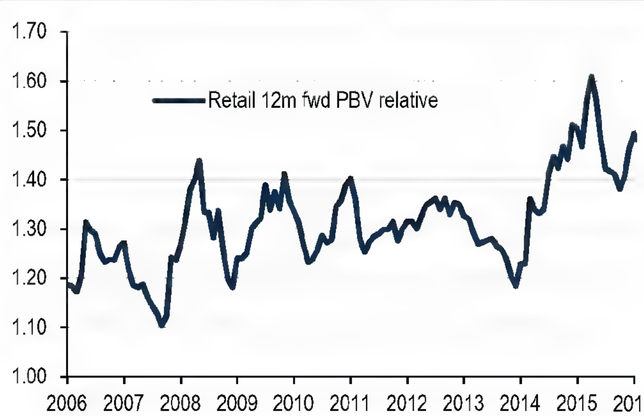
Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream, IBES

Chart 67: Market share gains have largely been at Asda's expense



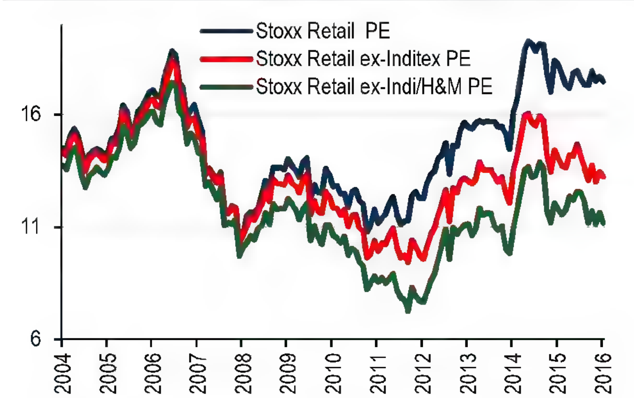
Source: Kantar Worldpane

Chart 68: Retail is expensive on a range of metrics



Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream, IBES

Chart 69: Not cheap even if you strip out the two biggest ex-UK names



Source: BofA Merrill Lynch Global Research, Datastream

Underweight Travel & Leisure

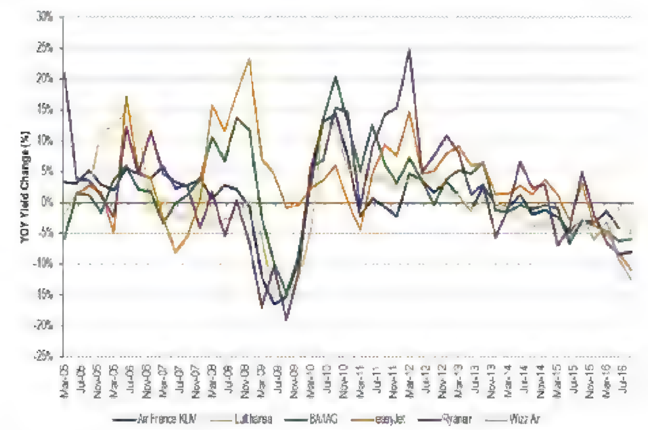
- **Airlines in structural decline:** our European Airlines analyst thinks overcapacity (networks set to grow 7% yoy to 2020) and competition from low cost/ ME carriers is driving prices and passenger yields lower across the board.

- **Negatively correlated to Oil:** the sector is negatively correlated to the Oil price and despite recent weakness, our Commodity Strategist expects OPEC to cut by 500k b/d or 1 million b/d. Should OPEC cut with firm quotas and a tight control mechanism, they see WTI prices averaging $59/bbl.

- **Watch UK consumer confidence closely:** the combined effect of the challenges we identified earlier starting to mount for the UK consumer and the drop in the value of the pound could reduce demand for and expenditure on overseas holidays. This would weigh on the travel operator part of the sector. If the bulk of sterling move is over the boost for dollar earnings like Compass will also likely fade.

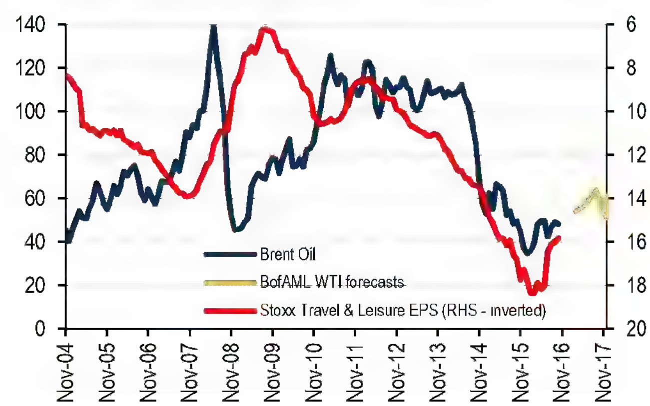
- **Peak returns:** unlike Retail, T&L margins (98%ile since 2004) and RoEs (85%ile) are close to all-time highs. We think returns may well have peaked therefore given the backdrop of rising oil, weakening consumer confidence in the UK and structural overcapacity in airlines. This is reflected in the fact that PBV are on 2.8x for the sector, which is top quintile for the sector since 2004.

Chart 70: Competition & overcapacity pushing airline yields down



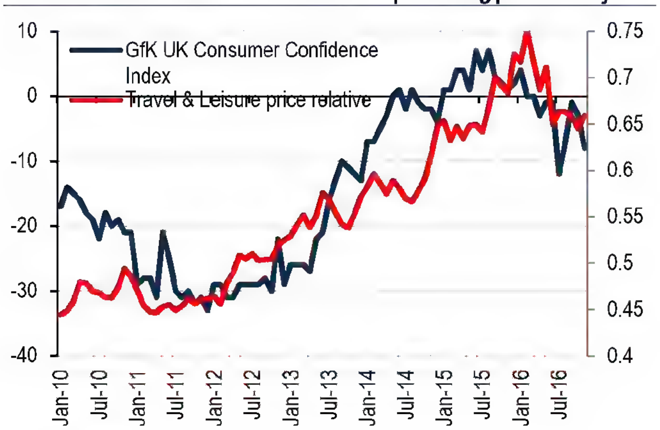
Source: Company data

Chart 71: Rising oil would weigh on Travel earnings



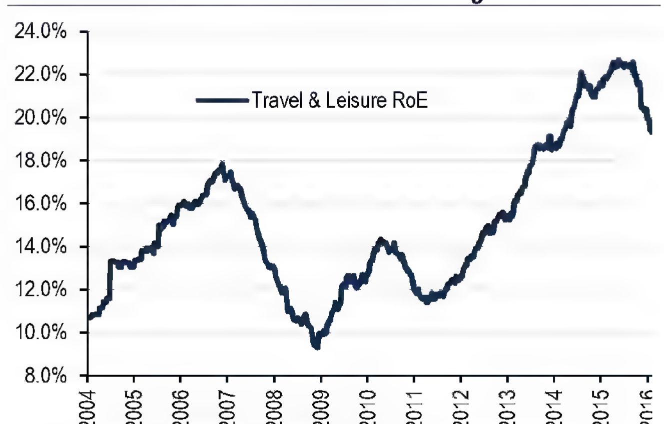
Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream, IBES

Chart 72: The UK consumer will have lower purchasing power next year



Source: Bloomberg

Chart 73: Yet sector RoEs remain close to all-time highs



Source: BofA Merrill Lynch Global Research, Datastream IBES

Bank of America Merrill Lynch

Media – raise to overweight

Favourable entry point

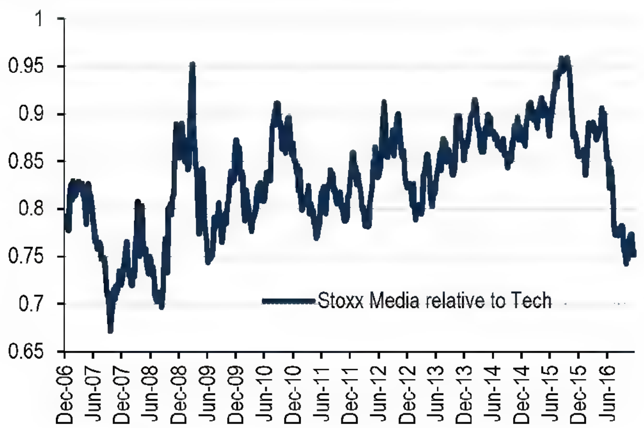
Media has been is a big laggard following a six-month period of sustained underperformance and hit very oversold levels on our CTIs in mid-November. Although Media is a bit more domestic than Tech both are "quality" cyclicals and typically trade fairly in line with one another. However, the relative is now back at 2009 lows.

Optionality on European consumer

We are bearish on the outlook for the UK consumer but consumer confidence has been steadily rising in the Eurozone since 2012 and the sector has tracked this measure very closely. We note however that the two have disconnected recently. We think Media is more likely to catch up then confidence fall given economists' fairly positive view on Eurozone growth next year, and the potential for upside surprises to US growth.

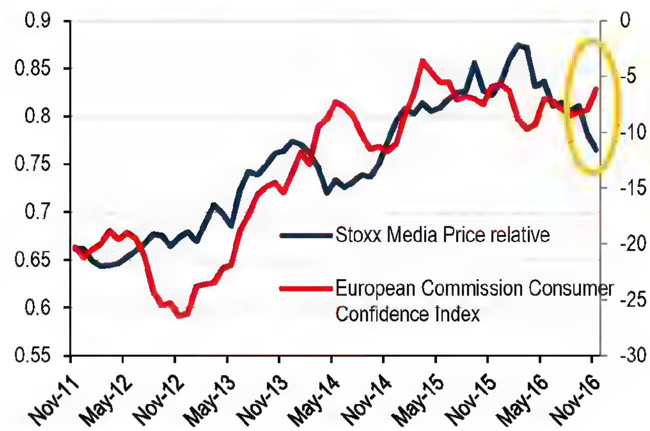
Chart 74: Favourable entry point for Media

Media and Tech are both "quality" cyclicals but the relative is at a 7y low



Source Bloomberg

Chart 75: The pick-up in EU Consumer Confidence should boost Media



Source Bloomberg

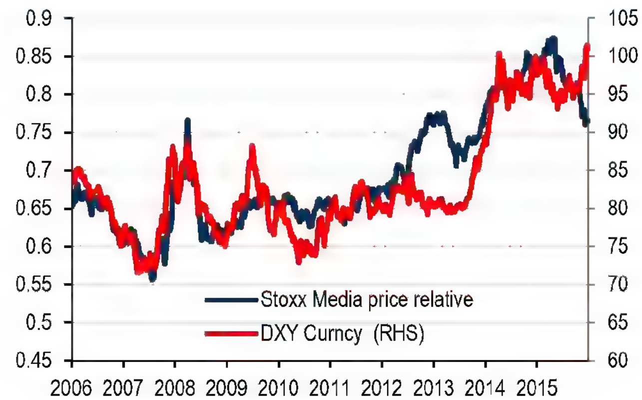
Media historically outperforms when PMIs and inflation rising

The average return for Media when PMIs and inflation are both rising is 0.6% relative but the sector has underperformed by 2% month to date. A stronger dollar is also a positive historically for Media given that many large caps within the sector, notably agencies, are large dollar earners. But again, the two have disconnected recently.

Valuations now at a small discount to the market

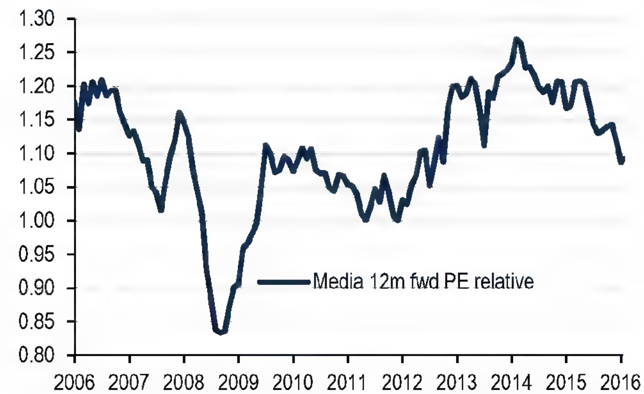
Media has de-rated by nearly four PE points (from 19.7 to 16) since the April 2015 highs and the sector now trades on a 5% discount to its average vs the market. We think the improving global growth backdrop will support earnings and should mean the sector can re-rate.

Chart 76: A stronger dollar benefits agencies with global exposure



Source: Bloomberg

Chart 77: Media now at a small discount to its 10y average vs market



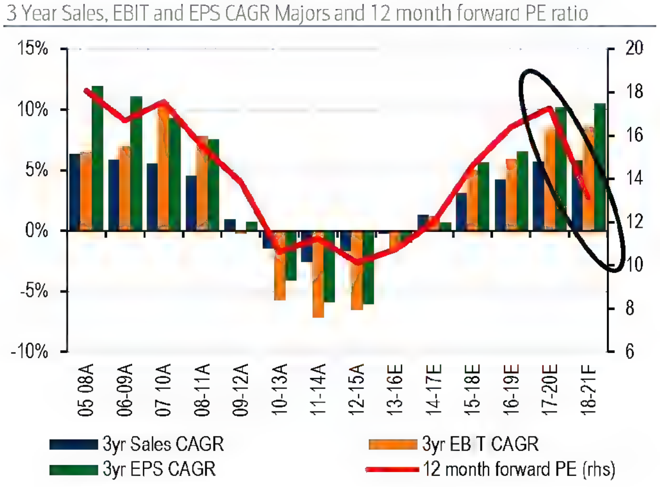
Source: BofA Merrill Lynch Global Research, Bloomberg, Datastream, IBES

Overweight Healthcare

Healthcare looks very attractively valued and we see compelling risk reward in the sector on an outright basis at current levels. The fundamental bull case for Health rests on the strong pipeline of new products for the big cap pharma universe. Our sector analysts forecast EU Pharma to deliver a 2018-21E EPS CAGR of 11%, up from mid-single digit levels in recent years. Historically that would justify a PE re-rating and a multiple for the pharma sub-sector nearer 17-18x than the current 13x 2018 PE.

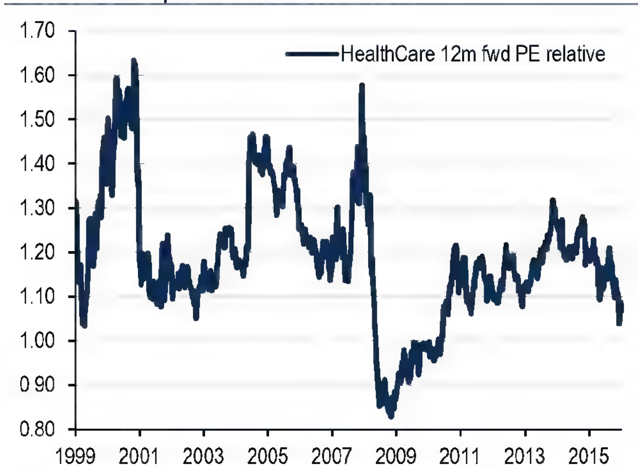
We believe the Republican clean sweep in the US elections represents a positive catalyst as it significantly decreases the potential for legislative initiatives to aggressively control drug pricing in the US. The catalyst for the sector to re-rate will come progressively from newsflow around new products. The next 12 months should see progress on this front with several of the European large caps expected to announce key data on important drugs in 2017.

Chart 78: Pharma's improving growth outlook not reflected in PE
3 Year Sales, EBIT and EPS CAGR Majors and 12 month forward PE ratio



Source: BofA Merrill Lynch Global Research

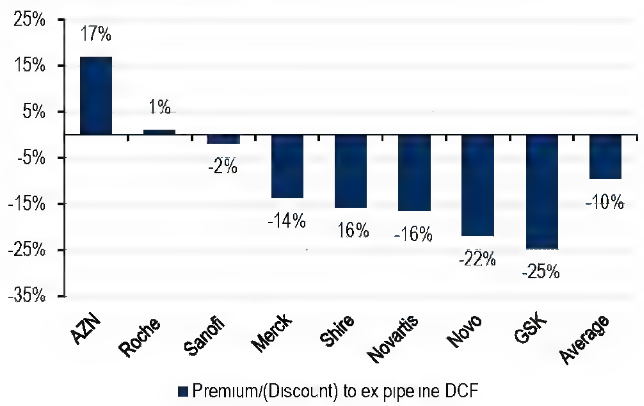
Chart 79: Healthcare PE relative back near market multiple and lowest since 2011 when patent cliff was at its worst



Source: BofA Merrill Lynch Global Research, Datastream IBES, Bloomberg

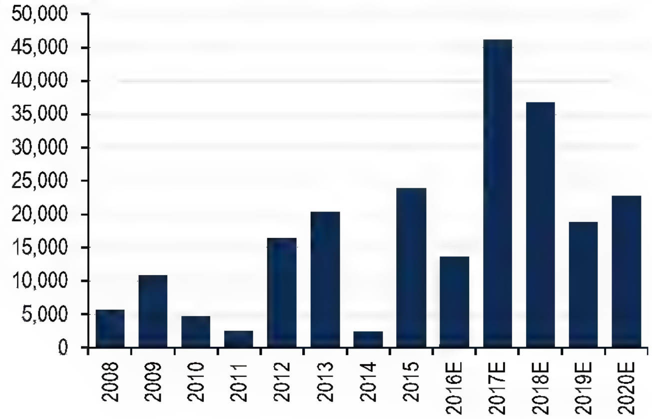
Healthcare's forward PE is now down to just a 7% premium relative to the market and nearing the valuation lows recorded in 2010-12 when the patent cliff was at its worst and pipelines were very weak. Today pipelines are twice the size they were in 2011 and innovation is the key to growth in the sector - pricing power remains strong in drug categories with differentiated products. The new product launches expected between 2015 and 2018 add up to potential sales of $133 billion.

Chart 80: Stocks mostly trade above ex-pipeline value
Pipelines are free for most stocks



Source: BofA Merrill Lynch Global Research

Chart 81: Growth from new products - $138bn launching 16-20E Peak unrisk-adjusted sales potential (USDm) of product launchs by year



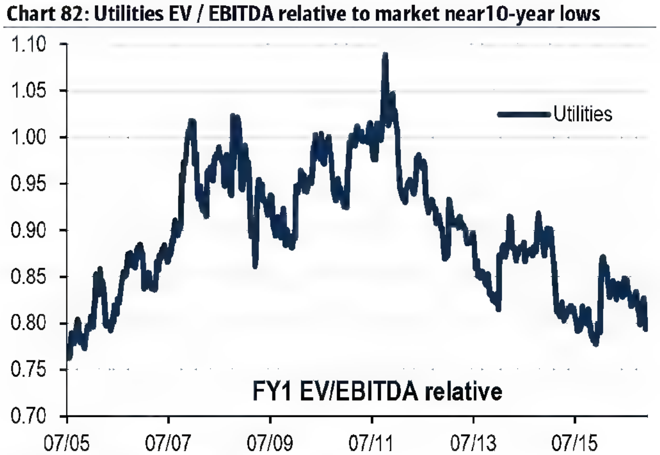
Source BofA Merrill Lynch Global Research

Overweight Utilities

The Utilities sector has suffered badly from the back up in bond yields. However, fundamentals for the sector are actually improving relative to recent history. The sector is the biggest direct beneficiary of corporate QE in the UK and Euro are (more than half of the sector are eligible for the ECB's Corporate Sector Purchase Program) meaning it can gain more than most other sectors from potential refinancing savings. This cushions any effect on debt costs from higher bond yields as corporate bond yields are still very low.

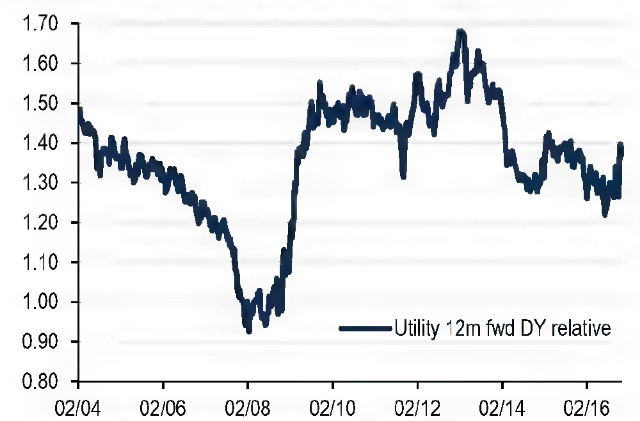
Earnings and cash flow are improving. The bottoming out of the commodity cycle has supported a turn to the upside for power prices. This has helped earning to trough and analyst revisions have been positive throughout the last few months of underperformance. Balance sheets and dividends in most cases now also look sustainable. Valuation multiples for the Utilities sector are attractive relative to history and compared to other Defensives. EV/EBITDA for the sector sits at 7.3x on Bloomberg estimates. That is a 20% discount to the market and is near 10-year lows on a relative basis. With dividends more secure the relative DY becomes more attractive at 2-year highs.

Chart 82: Utilities EV / EBITDA relative to market near10-year lows



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 83: DPS more secure now but the relative yield is at 2yr highs



Source BofA Merrill Lynch Global Research, Datastream IBES

Analyst Certification

I, Ronan Carr, CFA, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Disclosures

Important Disclosures

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. *VOLATILITY RISK RATINGS*, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. *INVESTMENT RATINGS* reflect the analyst's assessment of a stock's: (i) absolute total return potential and (ii) attractiveness for investment relative to other stocks within its *Coverage Cluster* (defined below). There are three investment ratings: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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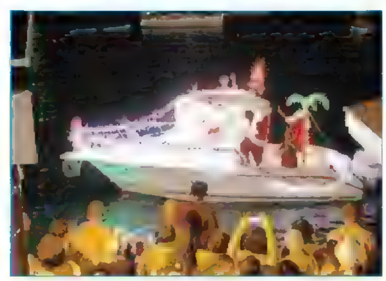

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V.I. businesses face higher unemployment taxes as territory struggles to pay down $69 million debt

By BRIAN O'CONNOR
Daily News Staff

Territory business owners will pay four times the normal federal unemployment tax rate this year because of an unpaid government debt, documents show.

The federal unemployment insurance tax rate is traditionally 6 percent on the first $7,000 an employee makes. However, the federal government usually offers a credit of 5.4 percent, meaning most employers actually pay about 0.6 percent, according to the IRS.

States — and territories — with unemployment insurance programs meeting federal standards are required to meet their unemployment obligations. When a state can't meet its unemployment obligations, it's entitled to take loans from the Federal Unemployment Insurance Trust Fund.

Federal documents show only one state and one jurisdiction — California and the U.S. Virgin Islands — are currently in that position.

The territory owes $69,138,266.61 in loans, according to the U.S. Department of Treasury website.

In fiscal year 2017, which began Oct. 1, the loans have accrued $294,349.15 in interest payments alone.

The V.I. Labor Department is in charge of administering unemployment insurance. Labor Commissioner Catherine Hendry did not return a number of phone calls seeking comment.

Government House spokeswoman Cherie Munchez would not comment, saying that Hendry would issue a prepared statement about the debt by Wednesday.

Provisions of the Federal Unemployment Tax Act stipulate that in states or territories with outstanding balances in the fund, businesses are subject to a credit reduction, which is collected and directed toward the unpaid balance, according to Robert Pavosevich, Supervisor of the Actuarial Team in the Office of Unemployment Insurance's Division of Fiscal and Actuarial Services in the Department of Labor.

Virgin Islands business owners will pay the original 0.6 percent, plus an additional 1.8 percent caused by the unpaid balance, for a total of 2.4 percent, Pavosevich said.

At the fully discounted rate, an employer would pay $42 for each employee earning $7,000. At the Virgin Islands rate, employers will have to pay $168.

After two years with an unpaid balance, the discount decreases by 0.3 percent each year until the total discount disappears, Pavosevich said.

"It's capped at 6 percent," Pavosevich said.

At the full 6 percent, employers will have to pay $420 for each new employee earning $7,000 that comes on board. By law, that money can't come out of the wages themselves and is paid out of the profits or losses that employers face, said Charles Engeman, an attorney who served on the Unemployment Insurance Advisory Council under the administration of Gov. John deJongh Jr.

Without payment on the loan — or waivers or relief, which has happened three times since 2013 — the rate is scheduled to max out by 2028. That's barring the imposition of step increases, which can happen if the state has an outstanding balance for a certain number of years, or if — as was the case in the tax year 2012 — step increases are piled on by other provisions of the law, which could move the unemployment tax rate up faster.

"It looks like they're not making much headway," Pavosevich said, referring to the territory's debt.

The territory wasn't alone in 2011, the first year the rate went up. In all, 20 states and the Virgin Islands received a 0.3 percent credit reduction that year, federal documents show.

That's in part because of the lingering effects of the Great Recession, said Bennett Chan, a lawyer who represents several businesses and has worked with the St. Thomas-St. John Chamber of Commerce in the past.

"

I don't think there's enough political willpower to do the kinds of thing necessary to fix the system.

— Charles Engeman,
an attorney who served on the Unemployment Insurance Advisory Council under the administration of Gov. John deJongh Jr.

"

The business owners always bear the brunt of whatever deficiencies we have. We have to, at some point, find other sources of revenue for the government. Any time there's any sort of additional tax burden, fee burden, licensing burden, it's always a point of concern.

— Kimberly McCollum,
president of the St. Croix Chamber of Commerce

In general terms, states collected more money than they paid out during the years leading up to the 2008 market collapse, creating large surpluses. Sometimes those surpluses were subject to financial raids. Other times — as was the case in the territory — the surpluses were used as a cause to reduce the amounts collected for unemployment insurance. When large-scale unemployment hit as a result of the recession, surpluses turned into deficits, Chan said.

"A lot of states were blindsided by the Great Recession," Chan said. "They also had big surpluses and never foresaw that there would be this sudden inflow in unemployment claims."

Territorial officials were late in reacting to bring the rate back up to address the issue, Chan said.

"If we had done it earlier, we probably would have collected enough," he said. "Now they want to make it up when times are hard."

In many cases, the government can't say what each employer owes or has paid in surplus, Engeman said.

The system originally was set up so that employers faced a roller coaster, Engeman said.

Each employer had a rate based on a three-year average. If an employer's account paid out more in benefits than they contributed, the rate would go up to 5.4 percent. After three years, the employer's rate would drop down to 0.1 percent, because at 5.4 percent, the rate exceeded likely contributions.

At 0.1 percent, if anyone were laid off, it immediately moved the employer back to the 5.4 percent rate. Employers would oscillate between the 5.4 percent rate and the 0.1 percent rate.

"It was 5.4 for many employers, and that's what an average employer would pay out over the course of 17 years for one employee," Engeman said.

As a result, the unemployment insurance fund accumulated large surpluses. To reduce the surpluses, the V.I. Labor Department dropped the automatic increase based on a negative account, and lowered the minimum rate to 0. Less money came in, even as unemployment rates remained high and benefits remained expensive.

A few steps could help move the system back to sound footing, Engeman said. For example, better record-keeping would help reduce delinquencies. Reducing unemployment insurance benefits and reducing the amount of time the unemployed are eligible for unemployment would both help. Verifying that those collecting unemployment are seeking employment, and generally reducing fraud also would help, Engeman said.

"I don't think there's enough political willpower to do the kinds of thing necessary to fix the system," he said.

Chamber of Commerce officials on both islands decried any increase in taxes or fees for businesses.

"Despite what the governor and the senators think, the economy of the Virgin Islands is not doing that well," said Tom Brunt III, a member of the St. Thomas-St. John Chamber of Commerce Board of Directors.

Kimberly McCollum, president of the St. Croix Chamber of Commerce, said any increases to fees or taxes was worrying.

"The business owners always bear the brunt of whatever deficiencies we have," she said. "We have to, at some point, find other sources of revenue for the government. Any time there's any sort of additional tax burden, fee burden, licensing burden, it's always a point of concern."

The folly of the situation is compounded by the fact that business owners themselves aren't allowed to file for unemployment if they lose their jobs, McCollum said.

"You're still paying unemployment taxes on what you're paid, but you are not allowed to request compensation should you find yourself in a position to file for unemployment," she said.

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Work stoppage threat gets Waste Management to table

By JONATHAN AUSTIN
Daily News Staff

A Waste Management Authority contractor had planned a work stoppage this week because the Virgin Islands Waste Management Authority owes vendors a lot of money and they can't keep working for nothing.

However, discussions with administrators at Waste Management led Peter Caproni, owner of Your Environmental Services Inc., to say he's holding off on urging garbage collection vendors to stop work on Wednesday.

"I'm not intent on messing up our communities," said Caproni, whose company picks up the bin sites on St. John.

"We've created a dialogue. I am a fair person," Caproni said. "I want to listen to what they have to say. It seems as though they're going to put together an offer."

Caproni had told The Daily News on Monday he was announcing a work stoppage beginning Wednesday. He said he and other haulers were going to stop emptying scores of bins across St. Thomas and St. John because Waste Management had failed to pay them for weeks or months.

Caproni said he has worked 26 years in trash removal and roll on/roll off services in the territory. He said his company empties "all the rear load bins on St. John," and does emergency Waste Management Authority work on St. Thomas.

Contacted by The Daily News, Waste Management Authority executives were unaware Caproni and possibly two other haulers were walking off the job.

Roger Merritt Jr., the newly hired executive director of the agency, said Monday evening he wants to meet with all the contracted haulers to see what they are owed and come up with a plan to get them paid.

"I understand that the haulers need to get paid," Merritt said. "We need to ensure we are able to make timely payments."

Caproni said he is willing to listen, but the answer has to be that the Waste Management Authority comes up with payment for services already rendered.

"The solution is, you pay your bills on time," he said.

Patrick Charles, one of the vendors Caproni mentioned, said Monday that he has "reasons to be on board" with a work stoppage, though he couldn't make such a decision alone.

"I realize that he is upset," Charles said, referring to Caproni. "It is time for anybody to get upset. I'm in agreement with him."

> "
> **The solution is, you pay your bills on time.**
> — Peter Caproni, owner of Your Environmental Services Inc.

Charles said his firm empties bins on St. Thomas and hauls trash from Waste Management Authority collection sites in a number of government housing communities.

Regarding how much Waste Management owes him, Charles replied: "It depends on what you call a lot. They're two months behind, now."

Caproni wouldn't say how much Waste Management owes him in total.

"It's a big amount of money," he said. "I'm fed up with the whole thing."

Caproni said he estimated that Waste Management owes various vendors millions of dollars.

The Waste Management Authority's inability to pay vendors has been a topic during Senate testimony over the years.

Steve Aubin, who was interim executive director of the Waste Management Authority for most of 2016, told the Senate Finance Committee in July that the contractors needed to be paid.

"It is clear that the contractors are bearing the brunt while trying to provide critical services in hopes of payment by the authority as soon as possible," he said.

Aubin ran the agency after the retirement of May Adams Cornwall until Merritt was hired last month.

"The financial condition of the Virgin Islands Waste Management Authority is dire and requires immediate attention and relief," Aubin told senators in July. "The authority's available cash to pay its contractors/vendors timely is critically limited, resulting in delayed payments to its contractors/vendors; growing accounts payable, which is currently on the order of $10 million for its major contractors/vendors; and non-compliance at the Anguilla and Bovoni landfills with court ordered mandates."

An example of the outstanding obligations owed by Waste Management has been highlighted for the last two years in Senate testimony during the budget process. For Fiscal Year 2016, the agency noted it owed vendor Gem's Construction $200,000 from fiscal year 2012 to pay for garbage collection services on the island of St. Thomas.

The Waste Management Authority noted that it was "unable to identify a revenue source" to pay Gem's for the years-old debt.

During testimony on the Fiscal Year 2017 budget, Waste Management again listed $200,000 owed to Gem's Construction for garbage collection on St. Thomas. However, Waste Management officials said the $200,000 was owed from the 2011 fiscal year.

No one from Gem's Construction was available for comment Monday afternoon.

Merritt said he believes the Waste Management Authority can address the overdue debt owed to the vendors.

"I think we can. We've got to get a plan in hand and get them paid. If they provide a service, they should get paid," he said.

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Police: Ex-employee filing 'frivolous' complaints against top cops

By BRIAN O'CONNOR
Daily News Staff

Police officials dismissed this week multiple complaints filed by a former employee against high-ranking members of the V.I. Police Department.

The complaints are all filed by Lynne Harrison, the former director of the Police Training Bureau.

In one such complaint, Harrison alleges Deputy Commissioner Curtis Griffin Jr. was "receiving compensation when absence from employment without proper leave documentation," and "payroll fraud/embezzlement — falsifying timekeeping records, or when employees are not working while on the job."

In a letter attached to the claim, Harrison says that from August 2016 to the present, Griffin received compensation while not reporting for duty at the department.

"In addition, he has not left forwarding contact information to those under his supervision and often was not available during contact attempts occurring during normal working hours," Harrison wrote. "Griffin was available only via VIPD email which was delayed or not deliverable, thus leaving him ineffective and not suitable to be classified as working telecommuting."

Griffin dismissed the complaints against him, and said he welcomed an investigation.

"I want them to investigate because I'm hoping — when all is done — I'm hoping that maybe I can sue her for slander," he said. "I have nothing to hide."

Harrison's letter calls for Griffin to be investigated.

"While his explanation of absence has been reported as a long term medical procedure, due to the extraordinary length of absence, previous absences, and non-contact information, a full investigation is warranted to insure the people of the Virgin Islands have not been deprived of its funds due to improper payroll deductions or notifications," she wrote.

The complaint was one of 10 filed after Harrison lost her job as director of the police department's Training Bureau, according to copies furnished by Harrison.

She filed a citizen's complaint after her termination alleging that Police Commissioner Delroy Richards Sr. had violated department policy and that he had ignored requests for the correction of a violation.

Harrison also filed a complaint alleging Griffin's administrative assistant, Le-Reeda Lake, was absent on sick leave for four weeks without prior notice; that special assistant to the commissioner Capt. Mary Duggan had potentially disclosed confidential department information to a third-party vendor for personal gain, and had used threatening behavior to create a hostile work environment, and that she had obstructed Harrison's performance of her duties.

Harrison further alleged that Lt. Maria Colon-Jones had disrupted a training presentation, and she said her termination was retaliatory for asking for sick leave to be treated for Zika.

Harrison said that she eventually fled the Virgin Islands in fear of her life and that the police department still owes her $5,000 in back pay, Harrison said.

Harrison said Monday she's submitted her complaints to Gov. Kenneth Mapp.

"I was the director of training and was fired without cause," she said. "I had filed several complaints."

Harrison said she requested 10 days of medical treatment off-island to combat a Zika infection on Oct. 18.

"Two hours later, I was terminated," she said.

Documents provided by Harrison show she was suspended without pay on Oct. 18, and terminated on Oct. 28.

Griffin said that while he was undergoing cardio rehab in Florida, he started hearing about issues involving Harrison. Ultimately, Richards made the decision to terminate Harrison, Griffin said.

"Subsequent to her termination, she started sending complaints," he said. "She said she heard that while I was away I was practicing law and not really sick."

Harrison wasn't his supervisor, and wasn't aware of how the accumulated sick time was being used, Griffin said.

"She submitted so many complaints against so many people," he said. "It's obvious that it's frivolous."

The complaints have not yet resulted in an internal investigation, Richards said.

"I found she was too much of a distraction for us to move forward with the actions as required of us by the mandates of our consent decree," Richards said about his decision to terminate Harrison.

Harrison had failed to submit to a department background check in a timely manner, Richards said.

"The department brought her in on an interim basis initially, and then she was asked to comply with the package that we provided in order to conduct a background investigation," he said. "She offered resistance. She believed she could complete her own timeline."

Harrison said she had asked for 10 days to secure her college transcripts.

"My email specifically says I am not saying I don't want a background check," she said.

Richards said he ultimately directed Harrison's complaints to the legal department, but he said Harrison continued to send letters and emails.

A response from the department's legal counsel provided by Harrison says simply that Harrison couldn't use the citizen's complaint process to complain about things that happened while she was the director of the Training Bureau, and that each complaint will be closed as it is received.

"In some of her letters and emails, she appeared very threatening," Richards said. "In one of her emails she wrote 'You are sicker than a tree branch that's going to be cut down very soon.' It's one ignorance after another."

Harrison disputes that characterization.

"I'm very professional," she said.

Griffin was on legitimate sick leave when he was in Florida, Richards said.

"He was being treated and he entered into a program in Florida," he said. "The woman is on a witch hunt all over."

— Contact Brian O'Connor at 340-714-9130 or email boconnor@dailynews.vi.

Police say woman tried to smuggle pot into prison

By BRIAN O'CONNOR
Daily News Staff

A Mon Bijou woman tried to sneak two bags of marijuana into Golden Grove, police said.

Sherifa Petersen, 27, faces a single charge of introducing contraband into prison, and was free on $10,000 bail about six hours later, according to her arrest record.

V.I. police arrested Petersen on Friday afternoon about 1:47 p.m., after corrections officers discovered the marijuana hidden in the personal belongings of inmate Omari Gordon, according to Petersen's arrest log.

Rick Mullgrav, Director of the Bureau of Corrections, said corrections officers discovered the marijuana during a routine search.

Petersen "was bringing a package for her companion, and I will say her companion, because I'm not sure what the relationship was there," Mullgrav said. "She was coming to visit, and she brought some drugs."

Corrections officers told police they had smelled marijuana in a pair of black Jordan sneakers Petersen was bringing to Gordon, according to a VIPD press release. When corrections officers pulled apart the sneakers, they discovered two small plastic bags of marijuana, according to the press release.

Any material that ends up in the hands of prisoners is thoroughly searched as a matter of routine, Mullgrav said.

"We search any item that goes to the inmates," he said. "Generally speaking, it's pretty thorough."

Gordon, 32, has been in jail since police charged him with first-degree attempted murder and first-degree assault following a Nov. 29 shooting on St. Croix, authorities have said.

Gordon's name also matches that of a man charged in 2010 with the murder of 19-year-old Kendal Wood. Gordon's trial languished in the Superior Court on St. Croix for almost three years, and he was most recently granted a continuance in 2013.

The disposition of the murder case involving Gordon couldn't be immediately ascertained Monday evening.

Gordon had been released on electronic monitoring and house arrest pending trial in 2013, according to court documents at the time.

He was being held on $500,000 bail in his most recent arrest, police said.

— Contact Brian O'Connor at 340-714-9130 or email boconnor@dailynews.vi.

Federal judges from Philadelphia in the Virgin Islands to hear cases

By BRIAN O'CONNOR
Daily News Staff

The 3rd U.S. Circuit Court of Appeals will sit this week in the federal courthouse on St. Thomas.

Judges Kent Jordan, Michael Chagares and Thomas Hardiman will hear a range of appellate cases, ranging from a local prisoner challenging his detention as unconstitutional to an estate battle over an inheritance in which two separate federal cases were merged into one.

The judges fly in from Philadelphia to hear argument on issues they decide at a later date.

Appellate court argument is based around rapid-fire questions from the empaneled judges, unlike civil or criminal court, which frequently is dominated by long exchanges between attorneys and witnesses.

The appellant attorney gets four minutes to make a case, followed by four minutes from the appellee, followed by four minutes of rebuttal from the appellant attorney, though judges' questions can sometimes turn four minutes into eight.

For example, Ronald Gillette, incarcerated in 2008 on multiple counts of aggravated rape and unlawful sexual contact against two children, is seeking an appeal on a motion denying his release from custody.

Gillette's attorney, Joseph DiRuzzo III, began on Monday by making his case that the motion, ordered by Chief District Court Judge Wilma Lewis, constituted a final judgement and thus was worthy of an appeal. DiRuzzo sought a three-judge panel to overturn Lewis's order.

It didn't take long for Jordan to ask a question.

"How can it be a final order if there are still claims in the case, if you're still seeking relief, which you are?" he said.

DiRuzzo had a response.

"The denial of a three-judge panel effectively throws Mr. Gillette out of court," he said. He started to add to this, but Jordan cut him off.

"There are claims for relief, they still exist," he said. "I'm struggling to see how this is a final judgement."

Orders relating to the change in the reduction of a prison population essentially rely on three-judge panels to be valid, DiRuzzo said. Prison orders issued by a single judge are subject to challenge on appeal, DiRuzzo said.

"I would submit that three-judge courts are desirable in confrontations between state and federal power," he said.

Kimberly Salisbury was the Assistant Attorney General arguing for the appellee. Her job on Monday was to tell three federal judges that it wasn't their job to decide Gillette's case.

"This particular order is just simply not final," she said, at one point.

However, Hardiman had a question.

If there was an order short of Gillette's release that could make the prison resolve the Eighth Amendment violations that put the prison under a federal consent decree for decades to resolve, Lewis or another judge could still make the determination. The prison has completed only 14 percent of the new consent decree ordered in 2013 according to testimony.

"What would that order look like?" Hardiman asked.

Salisbury struggled with an answer.

Jordan tried to steer the argument back to the facts of the case.

"Does the fact that a 2013 consent decree superseded and replaced the original, does it mean the three decades of prior noncompliance is to be ignored?" he said. "You're not even a fifth of the way completed. At what point is enough enough?"

Complying with the consent decree will take time, Salisbury said.

"According to the Bureau of Corrections, we're not there yet," she said.

Chagares jumped in, and compared Golden Grove Adult Correctional Facility to a luxury cruise liner.

"It's like your big cruise ships out in the bay," he said. "It takes a long time to turn around. But this is a really long time."

Hearings will continue today before the Third Circuit at the DeLugo Federal Building on St. Thomas at 9 a.m. Another session is set for Thursday starting at 10:30 a.m.

— Contact Brian O'Connor at 340-714-9130 or email boconnor@dailynews.vi.

Caribbean Lottery

Pick 3 (Dec. 12)		Pick 4 (Dec. 12)		Mega Millions
Morning		**Morning**		(Dec. 9) Next draw: Tonight
1st prize	5 5 4	1st prize	4 3 6 2	19 27 47 67 68
Midday		**Midday**		**Mega Ball:** 1
1st prize	8 7 0	1st prize	2 3 0 4	**Powerball**
Sunset		**Sunset**		(Dec. 10) Next draw: Wednesday
1st prize	3 9 8	1st prize	8 0 9 6	12 21 32 44 66
Evening		**Evening**		**Powerball:** 15
1st prize	0 3 7	1st prize	7 5 8 0	

Mapp turns to new taxes in accepting court ruling on 8% government pay cut

By JONATHAN AUSTIN
Daily News Staff

Gov. Kenneth Mapp said Monday he believes the territory must accept a federal court ruling that found a 2011 government employee pay cut unconstitutional.

"After reviewing the case with the attorney general and reviewing the case with our financial team, I really am of the mind that the government of the Virgin Islands should make good on this claim," Mapp said.

He said he wants the Legislature to sign on to a plan to pay the claim and address other issues by approving increased sin taxes, taxes on time-share occupants, and changes that set a minimum tax for property owners who claim tax credits.

He said the lawsuit judgement is valued at $65 million.

"We will include all workers affected by the cut. In unions, all unions, and out of unions," Mapp said.

The territory had asked the full 3rd U.S. Circuit Court of Appeals to reconsider the judgement, which was penned by three of the court's judges.

The court rejected that request Monday.

The governor made his comments during a press conference Monday morning on St. Croix.

The conference originally had been scheduled for Friday on St. Thomas, but was delayed for no stated reason.

Mapp also announced he has invoked public exigency authority to fast track road repairs in the territory.

He described public exigency as "sort of a public emergency" declaration that should allow the government to more quickly award repair contracts for roadways that have deteriorated following extensive rainfall.

Mapp said he has consulted with federal authorities and hopes to access existing highway project funds "to use them to get the primary road system and secondary road system repaired."

He said the work will be done under existing federal road requirements, meaning they include proper drainage, sidewalks, striping and other elements, "all compliant with federal highway and DOT standards."

Regarding the 3rd Circuit ruling on the 8 percent cuts enacted through the V.I. Economic Stability Act of 2011, Mapp said the territory could pay off the amounts due to employees in two years if plaintiffs in the case give the government time to make good.

He said the payments can be satisfied if new tax collections from what he called the Virgin Islands Enhancement and Economic Recovery Act, which must be approved by the Senate, total at least $80 million.

He said alcohol and tobacco in the Virgin Islands is sorely undertaxed, and 40 million bottles of beer are sold each year in the territory.

Additional tax also would be charged on distilled alcohol and wine.

"In addition, we are seeking at least $12 per carton tax on cigarette and tobacco products in the territory," as well as "a sugar tax on carbonated sweet beverages," Mapp said.

Mapp suggested most of the millions of beers are consumed by tourists, so the tax would target visitors who enjoy the territory and should contribute to maintaining its infrastructure.

"If you felt that was too expensive, then stop drinking beer. That's healthy. That's a benefit," Mapp said, referring to locals who drink alcohol.

Mapp is also seeking a tax on time-share occupants, and wants to require that any resident claiming credits on property taxes pay a minimum annual property tax of $360.

He said the additional tax revenue could also provide $18 million to pay worker's compensation debts to medical providers, hospitals and injured workers in the territory.

Mapp said Monday that "as of today," he was not prepared to call the Legislature back into session to address his proposal.

Senate Majority Leader Sammuel Sanes said Monday he hopes more revenue could be generated through the reopening of the St. Croix oil refinery to pay some of what Mapp wants.

"We shouldn't rely so much on taxation. Right now, people of the Virgin Islands are facing a financial burden. Now we want to tax them more. That is not appealing to me at all," he said.

"There are some good points" to the governor's suggestions, Sanes said. "I see his point. I can understand where he is coming from," he said.

Lame duck Sen. Clifford Graham said Monday that the promise to repay government workers back for the pay cut won't be enough to convince legislators to support Mapp's proposal.

"The governor has sent us his version of the deficit reduction strategy," Graham said. There are parts that senators will support, and "some we definitely would not be in favor of," he said.

Graham said paying back the government employees should be a priority.

"Are they Number 1 on the priority list? I think there are more critical issues now," Graham said.

Graham said he is not sure whether the 31st Legislature will consider Mapp's approvals before it stands down this month.

"I am willing and able to work until my last day," he said. "I am not sure the calendar will afford us the time to do so."

— Contact Jonathan Austin at 340-714-9104 or email jaustin@dailynews.vi.

Senate Agenda

Today

The Homeland Security, Justice and Public Safety Committee will meet at 9 a.m. in the Lawaetz Conference Room on St. Croix to get an update on the V.I. Police Department, the V.I. Corrections Bureau and the V.I. Health Department.

Wednesday

The Finance Committee will meet at 9 a.m. in the Ottley Legislative Hall on St. Thomas to consider a bill relating to the International Banking Center Regulatory Act and a bill re-appropriating $2 million of Luis Hospital appropriations for the use of the HVAC project.

Thursday

The Rules and Judiciary Committee will meet at 9 a.m. in Ottley Legislative Hall on St. Thomas to consider bills that include a bill to increase the Emergency Services Surcharge from $1 to $2; a bill providing for the disposition of proceeds from the rental or sale of housing units acquired in the Limetree Bay Terminals operating agreement to a bill regarding the establishment of credit unions and their oversight; and a bill creating the V.I. Risk-Based Capital for Insurers Act.

Friday

No meetings.

Governor's Agenda

Today

No appearances scheduled.

Government House did not provide Gov. Kenneth Mapp's agenda.

Oswald Harris Court raid yields 2 marijuana arrests

By SUZANNE CARLSON
Daily News Staff

ST. THOMAS — A massive operation involving more than a dozen armed local and federal officers — while a helicopter circled overhead — at Oswald Harris Court on Friday evening yielded two marijuana arrests.

Jose Squiabro, 42, and Yasim Ross, 31, both of Oswald Harris Court, were arrested as a result of the operation, according to court documents. Both were charged with possession of marijuana with intent to distribute and released Monday after posting $10,000 bond each. Arraignment for the two men is scheduled for Jan. 5.

Friday's operation shut down the housing community and caused alarm for residents around Estate Thomas, Long Bay and Centerline Road.

More than a dozen armed officers secured the intersection around Building 9 in the housing community as a U.S. Customs and Border Protection helicopter flew overhead. None of the officers would say what they were doing, but they were dressed in tactical gear, some armed with long guns that appeared to be semi-automatic rifles, and officers wore body armor labeled as being from the Drug Enforcement Administration or police.

Probable cause affidavits filed Monday against Squiabro and Ross shed light on the operation, known as "December Reign."

The operation is a joint effort by officers from Homeland Security Investigations, U.S. Customs and Border Patrol, the Bureau of Alcohol, Tobacco, Firearms and Explosives, the Drug Enforcement Agency, the Justice Department, and the V.I. Police Department. It is meant to patrol St. Thomas housing communities, "due to the recent increase in gun violence in those areas," according to the affidavit for Ross.

At 4:45 p.m. Friday, officers approached a group of men around Building 20 and noticed Squiabro drop a partially smoked joint, according to the affidavit.

Officers recovered the joint and 105 bags containing marijuana, according to the affidavit. The affidavit does not note how large the bags were or the total weight of marijuana recovered.

Daily News file photo

A U.S. Customs and Border Protection helicopter circles Estate Thomas on Friday evening as police on the ground secured the intersection around Building 9 at Oswald Harris Court housing community on St. Thomas.

Officers also recovered $1,045 in cash and a Samsung cell phone from Ross, both of which were returned to him, according to the affidavit.

Squiabro's criminal history includes a 1993 arrest for second-degree burglary, which was dismissed in 1997; a 1996 arrest for possession of stolen property, for which he was sentenced to a $500 fine, one year in jail suspended after six months, and two years' probation; and a 2001 arrest for possession of an unlicensed firearm, for which there was "no known disposition" listed in court documents.

Similar to Squiabro's arrest, at about 5:50 p.m. Friday, officers approached Ross and other men near the 1st Stop Gas Station in Estate Thomas, which is located south of Oswald Harris Court. When asked whether he had any illegal substances, Ross said, "yeah I have a little weed in my back pocket," according to the affidavit.

Officers found a total of 2.2 ounces of marijuana packaged in various plastic bags in Ross' possession and arrested him, according to the affidavit.

Ross's criminal history includes a 2003 arrest for third-degree burglary; a June 2009 arrest for delaying and obstructing; a Sept. 2009 arrest for first-degree robbery, possession of a dangerous weapon, and unauthorized use of a vehicle; and he was arrested in January and charged with destruction of government property.

Court documents list "no known disposition" for each of Ross's prior arrests.

— Contact Suzanne Carlson at 340-714-9122 or email scarlson@dailynews.vi.

Crack dealer arrested in Red Hook

By SUZANNE CARLSON
Daily News Staff

ST. THOMAS — Federal agents arrested a crack cocaine dealer in Red Hook on Saturday as part of an ongoing investigation targeting armed drug trafficking, according to court documents.

Tolomah Foy was arrested and charged with possession of crack cocaine with intent to distribute, according to an affidavit filed Monday by a special agent with the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives, also known as the ATF.

The arrest came as a result of operation "Total Recall," an ATF initiative on St. Thomas that began in August and is ongoing, according to the affidavit.

"This investigation focuses on the armed drug trafficking fueling violence which has resulted in over 48 homicides to date," according to the affidavit.

Agents focused on armed drug traffickers operating in Red Hook, a commercial bar and restaurant district frequented by a large number of tourists, and have created cases against 10 subjects for federal firearm and narcotics violations so far, according to the affidavit.

On Nov. 11, an undercover agent made a cold contact with Foy, also known as "T," who led the agent behind Tap and Still and sold him approximately 3 grams of crack cocaine, according to the affidavit.

The agent exchanged phone numbers with Foy and called him on Nov. 14 to arrange another transaction outside the Fresh Mart Grocery store.

Foy asked the agent to instead meet him behind Tap and Still, where he sold him approximately 6 grams of crack cocaine for $200, according to the affidavit. On Nov. 17, Foy sold the agent 9 grams of crack cocaine for $600 at the same location.

On Friday, the agent exchanged text messages with Foy and arranged for another transaction, and on Saturday, agents recorded a phone call with Foy in which he agreed to sell approximately $1,500 worth of crack cocaine, according to the affidavit.

The agent met with Foy at approximately 6:15 p.m. Saturday in the rear parking lot of Tap and Still, "consequently the ATF cover teams descended on scene and arrested Foy," according to the affidavit.

Agents retrieved 15 grams of crack cocaine from Foy on Saturday, and seized approximately a total of 32 grams of crack cocaine from Foy during the investigation, according to the affidavit.

— Contact Suzanne Carlson at 340-714-9122 or email scarlson@dailynews.vi.

Man arrested in Arizona for armed jewelry store robbery

By SUZANNE CARLSON
Daily News Staff

Police have extradited a man from Arizona and charged him in connection with the 2013 armed robbery of Gems and Gold Corner, according to V.I. Police spokeswoman Sakeeda Freeman.

Ron Kuntz, 42, was arrested at 11:55 p.m. Saturday and charged with first-degree robbery, second-degree robbery, grand larceny, first-degree assault, third-degree assault, destruction of property, and aiding and abetting. Bail was set at $150,000.

Kuntz and others were identified as being responsible for the armed robbery in Drake's Passage on Sept. 16, 2013, Freeman said.

The robbery occurred just before 10 a.m. when a man entered the store and pulled a handgun from his waist, police said at the time. The robber told the owner, who was the only person in the store at the time, to get down and then broke out some of the glass cases in the store.

Police did not say what the value of the goods taken was.

Kuntz was apprehended and detained in Tempe, Ariz., after a routine traffic stop, and Arizona police discovered there was an outstanding warrant for Kuntz from the U.S. Virgin Islands, Freeman said.

Kuntz waived extradition and was returned to St. Thomas to face charges, Freeman said.

Freeman said Kuntz lives in Estate Tutu, but the V.I. Police arrest log listed his address as East Baseline Road in Phoenix, Ariz.

Anyone with information about crime in the territory can contact the V.I. Police Department at **340-774-2211**, the Criminal Investigation Bureau at **340-714-9801**, the anonymous tip service Crime Stoppers USVI at **1-800-222-8477**, or **911**.

— Contact Suzanne Carlson at 340-714-9122 or email scarlson@dailynews.vi.

Police blotter

The police blotter is the V.I. Territorial Emergency Management Agency's list of calls to 911 Emergency operators and the time they were reported.

St. Croix

Charged: Assault

George Christopher, 62, of Mon Bijou was arrested at 10:30 a.m. Friday and charged with second-degree assault-domestic violence. Police said he choked a woman. No bail was set per the domestic violence statute.

Charged: Fugitive from justice

Everick Phillip, 31, of Mount Pleasant was arrested at 6:20 p.m. Sunday and charged with being a fugitive from justice. Police said he was wanted on a warrant out of Orange County, Fla. No bail was set.

• • •

Incidents in the police blotter included:

Assault — 10:54 p.m. Sunday, Golden Grove; 3:16 p.m. Monday, Kingshill.

Destruction of property — 12:32 a.m. Monday, Salt River; 11:51 a.m. Monday, Strawberry Hill; 12:09 p.m. Monday, Salt River; 6:30 p.m. Monday, La Reine.

Larceny — 11:17 a.m. Monday, Mutual Homes; 3:15 p.m. Monday, Richmond.

Vehicle tampering — 8:59 a.m. Monday, Hannah's Rest; 12:28 p.m. Monday, La Reine.

St. Thomas

Charged: Assault

Anthony Picot, 31, of Smith Bay was arrested at 2:40 p.m. Saturday and charged with second-degree assault and disturbance of the peace-domestic violence. No bail was set per the domestic violence statute.

Charged: Assault

Kimberley Williams, 27, of Bovoni, was arrested at 5:50 a.m. Monday and charged with third-degree assault-domestic violence. No bail was set per the domestic violence statute.

Charged: Assault

A 17-year-old boy was arrested at 12:10 p.m. Monday in the area of the Lucinda Millin Home and charged with third-degree assault. He was released to the custody of his parents.

• • •

Incidents in the police blotter included:

Assault — 4:32 a.m. Monday, Oswald Harris Court; 4:38 a.m. Monday, Bovoni; 11:50 a.m. Monday, Savan.

Attempted burglary — 6:03 p.m. Monday, Mariendal.

Destruction of property — 3:56 p.m. Monday, Port Authority.

Larceny — 11:42 a.m. Monday, Mahogany Estate.

Unlawful entry — 11:34 p.m. Sunday, Anna's Retreat.

Vehicle tampering — 11:34 a.m. Monday, Port Authority; 7:37 p.m. Monday, Zone C; 7:52 p.m. Monday, Zone C.

St. John

Incidents in the police blotter included:

Larceny — 12:28 p.m. Monday, Zone D.

Outside fire — 11:05 a.m. Monday, Zootenvaal.

Vehicle fire — 2 a.m. Monday, Gerder Marsh Road; 2:43 a.m. Monday, Gerder Marsh Road.

Cruise Ships

Today, Dec. 13		
Norwegian Escape (5,400)	8 a.m. to 6 p.m.	Havensight
Carnival Glory (2,974)	11 a.m. to 7 p.m.	Havensight
Carnival Magic (4,675)	Noon to 8 p.m.	Havensight
Harmony of the Seas (6,780)	11 a.m. to 8 p.m.	Crown Bay
Wednesday, Dec. 14		
Norwegian Epic (4,100)	7 a.m. to 2 p.m.	Havensight
Norwegian Gem (2,394)	8 a.m. to 5 p.m.	Havensight
Regal Princess (3,560)	10 a.m. to 10 p.m.	Havensight
Grandeur of the Seas (2,446)	9 a.m. to 6 p.m.	Inner harbor
Eclipse (2,582)	8 a.m. to 5 p.m.	Crown Bay
Oasis of the Seas (6,296)	noon to 8 p.m.	Crown Bay

Ivan A. Frazer Muhammed

Ivan A. Frazer Muhammed, also known as BKA Kitchel or Rock City, 80, of St. Thomas, died Tuesday, Dec. 6, 2016, at Schneider Regional Medical Center. He was born Oct. 6, 1936.

Ivan A. Frazer Muhammed

His children and their children; daughter – Denise Frazer; Kneka Dewindt, Rick Lewis and Caprisha Richards; daughter – Cheryl Frazer Jackson; Kevin Jackson Jr. and Chynelle Munnilal; daughter – Elise Frazer; Jaymel Leonard, Jalima Francis, Tiba Francis, Gyasi Francis, Jahmela Maduro, Jamari Maduro and Jarise Maduro; daughter – Rehenia Frazer-Phillip (Akiemba); Rehema (Alika) Jackson, Saitah Aubain, Sencelia Renolds, Quamid (Presidente) Asani and Shaeed Gumbs; daughter – Venise Frazer; daughter – Shenika Muhammed; Jason And Jahni Pemberton; son – Tyrone Frazer; Bajani Frazer, Taj Mahal Frazer, Tamar Frazer, Sohi Frazer, Jahti Frazer, Iibea Frazer; son Keith Frazer; Jarell Frazer; son Albert Frazer; son – Ivan Frazer Jr.; his siblings/sister – Rehenia Joshua and Blanche Frazer; and brother – Victor Frazer.

Relatives and friends are respectfully invited to attend the viewing at Christ Church Methodist on Friday, Dec. 16, 2016, at 9 a.m., followed by the service at 10 a.m. Interment is at Western Cemetery No. 3.

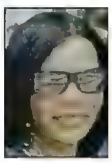
Arrangements are under the care of Hurley Funeral Home and Cremation Center of St. Thomas, St. John, St. Croix, and Tortola.

For directions and online condolences, please visit us at www.hurleydavis.com.

Diana S. Richardson

Services will be held Saturday for Diana S. Richardson, 38, of St. Thomas, who died Saturday, Nov. 26, 2016, at Schneider Hospital.

The first viewing will be from 5 to 7 p.m. Friday at the Celestial Chapel of Hurley Funeral Home.



Diana S. Richardson

The second viewing will be from 9 to 10 a.m. Saturday at Church of God of Prophecy in Estate Hoffman. The service will follow at 10 a.m.

Interment will be in Western Cemetery No. 2.

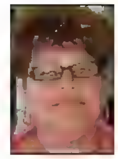
She is survived by her mother, Sonia Richardson; father, Romeo Richardson; siblings, Romeo, Nancy, Sharon, Louise, Karen and Lydia; nephews and nieces, Ly'Dale, Jayziah, Kerrisa, Mokesha, Aaliyah and Kayla; great aunts, Isalene Clomel Shelford, Irene and Frances Hughes, Rita Joseph and Olivia Rievere; aunts, Verna Rollins, Claudette Prince, Janetta Gumbs, Juliette, Ena, Christibell and Violet Imogen Richardson; great-uncle, Melvyn Shelford; uncles, Egbert Hood, Aubrey, David and Elroy Prince, David, Wycliffe, McIntosh, Elkin and Sanford Richardson; cousins, Albert, Yves, Egbert Jr. and Tisha Hood, Kim Rollins, Patrick and Patricia Farrel, Toya Rollins, Latrema Simon, Jermaine, Aubrey Jr., David Jr. and Lanna Prince, Diana Williams, Janice, Jewel, and Joslyn Gumbs, Joanna Haley, Nigel, Davida, Daniella, David, Radoykah, Radimiroh, Radiquah, Rohan, Jan, Devaunie, Daeja, Moyagaye, Udlyn, Simone, Leonardo, Ashael, Elson, Elvin, Saniqua and Casey Richardson; the Shelford, Rollins, Nibbs, Maduro and Smith families; and many other extended family and friends too numerous to mention.

Arrangements are by Hurley Funeral Home and Cremation Center of St. Thomas, St. John, St. Croix, and Tortola.

For online condolences visit www.hurleydavisfuneralhome.com.

Germain Petersen

Services will be held Thursday for Germain Petersen, who died on December 6, 2016, at her residence. She was 61.



Germain Petersen

The viewing will be from 8 to 9 a.m. in the Celestial Chapel at Hurley Funeral Home.

The funeral Mass will follow at 10 a.m. at Our Lady of Perpetual Help.

She will be cremated.

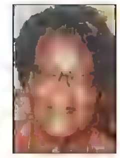
She is survived by her husband, Donald Petersen; children, Donald, David and Gina Petersen; daughter-in law, Dawn Petersen; grandchildren, Delano and Destini; brothers, Edward, Edmund and Edville Bryan; sisters, Jeanette Querrard, Joycelyn Harris and June Aubain; sister-in-law, Eleanor Chote; brothers-in-law, Daniel Petersen, Eddie Aubain and Alpha Harris; special family friends, Camille DeCosta and Gilbert Laban Jr.; and many more family and friends

Arrangements are by Hurley Funeral Home and Cremation Center of St. Thomas and St. John. For online condolences visit www.hurleydavisfuneralhome.com.

Catherine Ann Elizabeth Felix

Services will be held Monday for Catherine Ann Elizabeth Felix, 93, who died on Dec. 5, 2016, at her residence.

The first viewing will be from 3 to 5 p.m. Sunday at Hurley Funeral Home.



Catherine Ann Elizabeth Felix

The second viewing will be from 9 to 10 a.m. Monday at Saint Andrews Episcopal Church followed by the funeral service at 10 a.m.

Interment will be in Eastern Cemetery.

She is survived by her brother, William Fergus; sisters, Grace Duberry, Catherine Lizzie White, and Mary Allen; children, Noelise Noel, Glendor Christine Fagan, Catherine Matthew, Emeline Clauretta Felix, Nilda Hector, Elsie Weeks, Joseph Fergus and Winsley Felix Sr.; sons-in-Law, Patrick Hector and Thomas Noel; Grandchildren, Bernard and Robert Attidore; Derrick, Jadine, and Carolyn Allen, Jacqueline and Alicia Fagan; Neuvena Cuffy and Tashina Rogers; Tamika De La Cruz, Kyle and Nathan Felix; Wakima, Yakim, and George Baptiste III, Phillip, Kristal and Keanna Hector; Damali, Shanika, and Kareem Smith, and Geneiva Weeks; Joe-Ann, Joseph Jr., J. Daly, Ja'Den Fergus; Carl and Winsley Felix, Jr.; and many more great grandchildren, relatives and friends.

Arrangements are by Hurley Funeral Home and Cremation Center of St. Thomas, St. John, St. Croix and Tortola.

For directions and online condolences visit www.hurleydavisfuneralhome.com.

Prosecutors: white powder letters contained hoodoo curse

By SUZANNE CARLSON
Daily News Staff

A woman facing federal criminal charges for mailing letters containing white powder was attempting to place a hoodoo curse on her enemies, according to court documents filed by prosecutors in the case.

Eugenia Winston, who is facing 32 counts of mailing threatening communications, placed "hotfoot" powder into envelopes containing subpoenas that she mailed to witnesses set to testify against her in a civil lawsuit against her former employer, Scotiabank, according to court documents.

Hoodoo, also known as "rootwork," is a traditional African American folk spirituality that developed from a number of West African spiritual traditions and beliefs.

The detail came in prosecutors' opposition to Winston's motion to suppress all of her statements to authorities, which was filed Monday.

Winston has been free on unsecured bond since Sept. 1, and her civil lawsuit against Scotiabank alleging employment discrimination and harassment has been placed on hold until the criminal case against her is resolved.

At a detention hearing on Sept. 1, Federal prosecutor Chris Fisanick said Winston's actions were a clear threat intended to terrorize the recipients of the letters, and made reference to the 2001 anthrax attacks.

Postal Inspector Eric Oram said at the hearing that the substance was determined to be nontoxic and was likely baby powder, cornstarch, or a similar substance.

Winston's attorney, Assistant Federal Public Defender Gabriel Villegas, argued that Winston is the victim of an unfortunate misunderstanding, and she accidentally spilled body powder over and into the envelopes.

However, Monday's filing by federal prosecutors paints a slightly different picture of Winston's actions.

Hoodoo, also known as "rootwork," is a traditional African American folk spirituality that developed from a number of West African spiritual traditions and beliefs.

"Winston mailed over 30 envelopes that contained 'hotfoot' powder and subpoenas to various individuals in the Virgin Islands. Hotfoot powder is a hoodoo curse designed to prevent witnesses from appearing in court to testify," according to the filing.

"Hotfoot" powder is a hoodoo practice of mixing various ingredients — often some combination of cayenne pepper, Sulphur, copper sulphate, cornstarch and other elements — which is believed to drive away enemies. Commercial versions of the powder also are available for sale online.

Recipients of Winston's letters were mainly witnesses who might testify against Winston in her lawsuit against Scotiabank, and also included U.S. Magistrate Judge Ruth Miller, the legal counsel for Scotiabank and Winston's former counsel in her suit against Scotiabank, according to prosecutors.

Because the envelopes had a return address of the U.S. Courthouse on St. Thomas, "despite the fact that Winston was serving these subpoenas herself," some of the envelopes that could not be delivered were returned to the courthouse and opened by staff there, according to prosecutors.

"Believing the powder to be anthrax or some other deadly biological toxin, the United States Courthouse was evacuated and closed; the employees in the courthouse who were exposed to the powder were quarantined for hours," according to the filing.

The incident caused significant disruption at the courthouse and at the private law office of attorney Bennett Chan near the West Indian Co. cruise ship dock.

"The purpose of lacing these envelopes with hotfoot powder was to instill fear and intimidation in the witnesses to prevent their testifying against Winston," according to prosecutors' filing.

The filing does not indicate how authorities determined the substance in the envelopes was hotfoot powder or what ingredients were in the powder.

Winston admitted to FBI investigators shortly after the envelopes were received that she was the sender. But Villegas has filed a motion to suppress all of her statements to law enforcement, saying she was not properly advised of her right to avoid self-incrimination.

But prosecutors shot back in Monday's filing, saying there is no evidence in a video-recorded interview with Winston that authorities did not properly advise her of her rights or attempt to intimidate her to give a statement in any way.

Villegas wrote in his motion that "the videotaped interview speaks for itself."

However, prosecutors wrote that "the most cursory view of Winston's video recorded interview with law enforcement agents establishes beyond cavil that Winston was never coerced, was properly and repeatedly advised of her rights, and consciously waived those rights," according to Monday's filing. "The first thirty seconds of the interview wholly defeats Winston's meritless motion."

Winston is scheduled to go to trial on Jan. 11 before U.S. District Judge Juan Sanchez.

— Contact Suzanne Carlson at 340-714-9122 or email scarlson@dailynews.vi.

Centennial Scene

Archaeology in the Virgin Islands

The Cuban Scientific Expedition to the Virgin Islands in 1951 was documented by archaeologists Oswaldo I. Morales Patiño, above, and Fernando Royo Guardia, and subsequently translated and annotated many years later for the Virgin Islands Archaeological Society in its Journal number 5 (1978) by Alfredo E. Figueredo. Morales Patiño was president of the National Board of Archaeology and Ethnology within the Ministry of Culture and Education from 1951-1955. During that same period, Royo Guardia served first as secretary and then treasurer. The visiting Cuban scientists were part of a commission formed, among other objectives, to study and identify possible routes through which prehistoric cultures may have reached Cuba, to seek evidence of the presence of common Cuban influences in Jamaica, Puerto Rico and the Virgin Islands, and to ascertain the spread of Carib influence and identify the culture found by Columbus on St. Croix. Welcomed in the Virgin Islands by Gov. Morris de Castro, they visited and examined four sites. On St. Thomas, they judged the Magens Bay site to be Arawakan culture with a few Igneri specimens. Administrator Harry E. Taylor accompanied the visitors on St. Croix, where they viewed three more sites: Christiansted environs where they examined and collected a number of rimsherds and shell samples; the Salt River midden, with its French fort earthworks foundation, where they were able to excavate pottery, stone, shell and shell bead specimens; and Estate Richmond, where they viewed artifacts, including some Igneri pottery, obtained by the owners from Salt River and from an Indian site on the estate. According to Figueredo, the "importance of this work (by the Cubans) is not due solely to its reports of archaeological remains, however; it is also a historical document, offering us interesting information on the state of affairs, beliefs, and personalities of its time. The Cubans came during one of our minor dark ages — when archaeological work had come to a near standstill, and the history and historiography of the (Virgin Islands) ... were in abject abandon."

Virgin Islands laborers excavate pre-historic deposits at Magens Bay, St. Thomas.

Photo courtesy of THE VIRGIN ISLANDS, OUR NEW POSSESSIONS

Katheryne Brooks Kay-Willock, archaeologist with the Conservation and Cultural Affairs Department, studies the remains of what is believed to be 1,000-year-old skeleton located at Hull Bay beach in 1974 in St. Thomas, at a proposed condominium project.

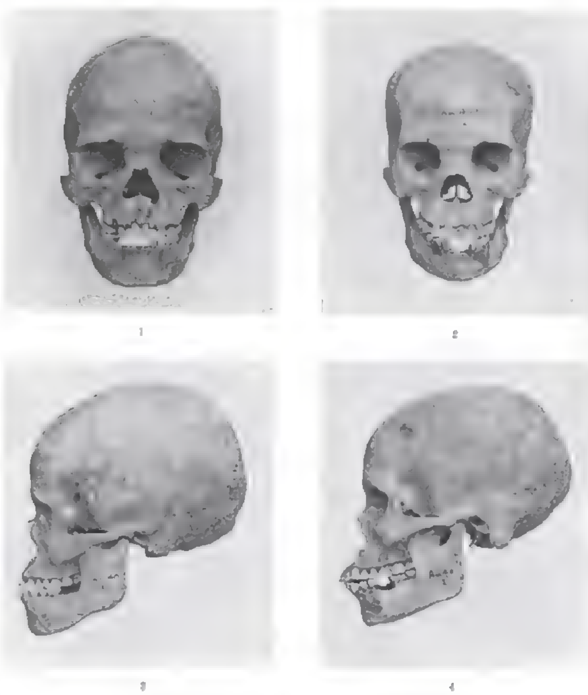
The "ribbon-sealed" bottle, a P.F. Heering Company "Heering's Cherry Cordial" bottle produced in the period 1835-1850, was recovered from the harbor in St. Thomas, where many such items have been discarded over the centuries. The Schenectady (New York) Gazette of Jan. 7, 1981, reported an upcoming lecture presentation to the National Bottle Museum Society in Ballston Spa, N.Y., on the "Buried Treasures of St. Thomas." The newspaper reported that lecturer Gary T. Stephenson "recently returned from the Virgin Islands where he provided consulting services to an individual who has unearthed over 3,000 bottles from an old community dump. The collection dates back to 1700. 'I have never seen so many bottles come out of one dig,' said Stephenson, vice president of the museum society. Bottles in the collection come from Paris, London, Martinique, Canada, Germany and the U.S.A. They graphically illustrate the history of St. Thomas, showing evidence of worldwide trade and commerce. The St. Thomas collection is considered to be the fifth largest collection in the U.S."

Photo courtesy of VAGN PETERSEN'S DANISH BOTTLES

CENTENNIAL SCENE

Fort Salé (formerly Fort Flamand) at the entrance to Salt River in St. Croix is the oldest intact colonial earthwork fort under United States authority. It is also believed to be the only extant earthwork fort in the entire Caribbean. Begun circa 1640 by the English, it was occupied in turn by the Dutch, then the French. The fortifications lie directly adjacent to the Columbus landing site and an ancient Taino ceremonial ball court and plaza. All these features are part of the National Park System's Salt River Bay National Historic Park and Ecological Preserve, co-owned by and managed under an agreement with the government of the Virgin Islands.

The Daily News of May 13, 1938, reported the 1934 discovery by Alvarez Julien of skeletal remains and pottery sherds on Water Island. Based upon the direct association of shells, stone implements and pottery in the area, Julien suspected the remains to be Carib Indian in origin. In 1936 he brought news of his find to the attention of J.C. Trevor, who was conducting field work on the Negroes of the Eastern Caribbean under his fellowship in anthropology at Northwestern University. The skeletal remains had been re-interred and while all could not be relocated, those that could were donated by Julien to Oxford University for further identification and study. Provisionally they were classified as pre-Columbian with further characteristics to be defined and confirmed. The images above and others appeared in the article "Skeletal Remains from the Virgin Islands" in the April 1938 issue of "Man, A Monthly Record of Anthropological Science," published by the Royal Anthropological Institute of Great Britain and Ireland (Vol. XXXVIII, 47-65). According to The Daily News, Virgin Islands "Governor Lawrence Cramer gave permission for the material to be excavated and sent to England."



TWO SKULLS FROM THE VIRGIN ISLANDS.

1–3 male : 2–4 female : about one-third natural size.

An old scale found on St. John and donated to Cruz Bay Museum on July 8, 1974, by Russel Dennem.

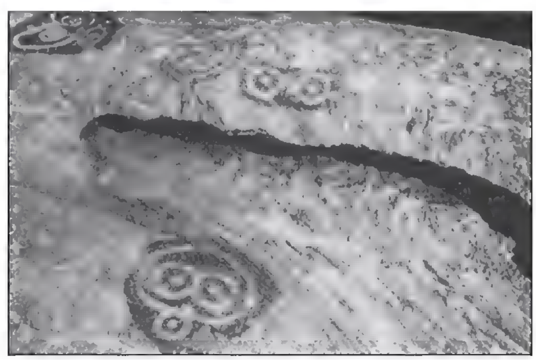


Photo courtesy of ARCHAEOLOGICAL RECONNAISSANCE OF THE ISLAND OF ST. JOHN, UNITED STATES VIRGIN ISLANDS, PLATE VII

Petroglyphs at Congo Cay, north of Cruz Bay off St. John.

About the Images: Images provided by the Territorial Archives of the Government of the Virgin Islands, a unit of the Division of Libraries, Archives and Museums of the Department of Planning and Natural Resources. Additional images sourced as otherwise noted. For more information on the holdings of the Territorial Archives, contact Territorial Archivist Susan Lugo at **340-774-0630**, or email susan.lugo@dpnr.vi.gov.

The Virgin Islands
DAILY 86 YEARS NEWS
A Pulitzer Prize-Winning Newspaper
ST. CROIX ST. JOHN ST. THOMAS TORTOLA

Founded Aug. 1, 1930, by J. Antonio Jarvis and Ariel Melchior Sr.
Published by Daily News Publishing Co., Inc.
Archie Nahigian, President

What's the speed limit on Magens Bay Road? Is it how fast you can run?

Lori Emery

What do the new Magen Bay signs mean?

Public Works installed four of these signs on Magens Bay Road in November in response to the speeding problem.

According to the Merriam-Webster dictionary the abbreviation of miles per hour is "mph" and there should be a number in front of mph designating the speed. On these signs, the number is omitted, so drivers have no idea what the speed limit is.

St. Thomas is an international destination, and we have contemporary street signs that use symbols for walkers, joggers, bicycles etc. I know we can do better in the signage department on Magens Bay Road.

— *Lori Emery, St. Thomas*

◆ See Your Views In Print ◆

The Daily News is always interested in publishing local views on topics of general interest, and we especially welcome commentary on issues affecting the Virgin Islands and its people, culture, businesses and government.

Send Letters, Essays, Halos and Pitchforks, Cartoons or other original material about local issues of general interest to

letters@dailynews.vi

The Daily News' opinions are expressed only in its editorials. The opinions expressed in columns, letters, cartoons and guest editorials are those of the particular author or artist.

Where will Trump venture for his first state visit?

Markos Kounalakis

Barbara Streisand and Lena Dunham may be some of the higher profile Trumpfugees leaving the country and heading to Justin Trudeau's Canada. What is less certain is if a President Donald Trump will make Ottawa his first foreign port of call — a longstanding presidential and foreign policy tradition.

Post-election, Trudeau quickly called to congratulate PEOTUS Trump on his victory and the Canadian tweeted, "(W)e agreed to meet soon to keep building the Canada-US relationship."

Trump may want to use the high-visibility first trip to do something other than affirm tradition and reflect the importance and strength of U.S.-Canadian ties. He may want to make a grand strategy statement, letting the world know that he is going to shake-up the global status quo.

Calls to Taiwan, support for the Philippines President Rodrigo Duterte and meeting with Japan's Shinzo Abe have already shaken up the foreign policy establishment's rules for protocol, as well as approaches to human rights and global power relations. All this well-before Trump has even been sworn-in.

Once in office, Ronald Reagan began the tradition of new U.S. presidents making Canada the first foreign presidential visit. George W. Bush notably broke from this tradition, making his first stop Mexico, a country he knew well. He also hoped his trip and Cinco de Mayo parties on the White House lawn would attract Latino voters to the Republican Party.

Trump has already been to Mexico, met with President Pena Nieto, gotten a great presidential photo-op and made his talking points. It is unlikely he will be heading south of the border first.

Making a splash abroad will likely require a large rally — similar or bigger than candidate Barack Obama's visit to Berlin in the summer of 2008 — and may be chosen based on the right mix of pomp, circumstance, strategy and significance.

If two big border nations are knocked out of the running for the primary reception of America's new head of state, where might he go first?

There are any number of early supporters in other countries who could be rewarded and elevated by a presidential visit. The scramble to send invitations to Trump Tower has already begun.

U.K. Prime Minister Theresa May is considering an invitation on behalf of Queen Elizabeth II. Trump's friendship with and preference for Brexit leader Nigel Farage as Britain's next diplomatic envoy will require Trump to balance Buckingham Palace pageantry, the "special relationship," Brexit forces and a potentially restive urban populace before deciding to touch down in London Town.

Numerous foreign leaders supported Trump's candidacy early on, mostly opposition politicians. A few, however, are running countries. They include Hungary's Viktor Orban, North Korea's Kim Jong Un, Zimbabwe's Robert Mugabe and, of course, Russia's Vladimir Putin. Rewarding them with an American inaugural visit would be revolutionary and could set in motion dramatic changes in how America's global relations, alliances and power balancing is perceived and conducted.

Big, bold, groundbreaking unprecedented moves were the hallmark of Trump's campaign: Is there a reason to believe he would take a different approach to governing? Trump's brand of politics is proudly unconventional — from his brand management business to his Fifth Avenue transition tower to his tweet-centric campaign.

Where will he go? Japan, Russia, China, Italy, Germany, France — maybe even India, Australia or Argentina? Tipping favor toward any of the G8 member countries other than Canada for a "first visit" would create both new foreign policy opportunities and challenges.

To avoid granting any nation the favor of a first foray, however, he may decide never to leave the country at all, requiring all foreign leaders visit him at Trump Tower, Mar-a-Lago, the Trump National Golf Club Bedminster … or maybe even the White House.

— *Markos Kounalakis is a senior fellow at Central European University and visiting fellow at the Hoover Institution. Contact him at markos@stanford.edu*

Employers should not impose religious views on employees

Richard Carroll

In my opinion, Philadelphia Archbishop Charles Chaput is wrong in his view that religious liberty in the United States is under attack (Philadelphia Inquirer and Philly.com, Dec. 8, 2016).

Religious institutions are free to believe and preach whatever they want. I think that what they are not free to do is impose those beliefs on their employees.

For example, a Catholic-affiliated organization may believe that contraception is immoral, but I don't think that organization should be allowed to block its female employees, who may or may not be Catholic, from access to contraception through its medical insurance plans.

I worked for a Catholic organization (the Knights of Columbus) for 30 years. Its 600 employees — most of whom were non-Catholic women — had access to contraceptive coverage through the employer-provided health plan.

Freedom of religion means freedom not to have your employer's religious views imposed on you.

— *Richard Carroll, a part-time St. Thomas resident, is the former Associate General Counsel of the Knights of Columbus*

Island Life

Lighted Boat Parade

Boats festooned for Christmas wow spectators during the Lighted Boat Parade on Saturday along the Christiansted boardwalk on St. Croix. Above, the crew on Time Out waves to the crowd. Left, Santa makes an appearance. Top left, Live the Dash delivers a message of peace.

Winning entries were: Sail Boats, first place, Time Out; Power Catamarans, first place, Adventure, second place, Gemini/Century; Power Boats Under 25 Feet, first place, Saorise, second, Checkmate; Power Boats 26-32 Feet, first place, Firefly; Power Boats 33-39 Feet, first place, Benita, second place, Golden Eagle; Power Boats 40 Feet, first place, Irie Feelin, second place, Milemark/Rotary; Power Boats 41+ Feet, first place, Reliance (SCUBA), second place, Renewed Interest; Best Lights, a tie between Living the Dream and the U.S. Coast Guard; Best Decorations, La Vie En Rose; Best Animation, Cat Chi; Best Music, Turn & Burn; Best Creativity, Live the Dash; and Best Boat Overall, Heineken Barge.

Daily News photos by ROB JONES

Send us your Island Life news, events and photos

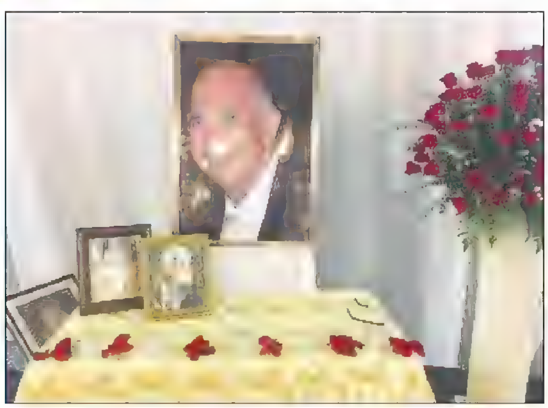
The Daily News is expanding its Island Life section.

Do you have an event, a celebration, or a milestone, including a birth, graduation, wedding, retirement, award, honor or military accomplishment you'd like to share?

Maybe you have a photo from around our islands you think our readers would like to see, whether it's a beautiful sunset, a big catch or people just having fun in the sun.

Help us celebrate our community by sending us your contributions to island-life@dailynews.vi.

The possibilities are endless.



Tribute to a V.I. leader

The community paid tribute to the late Mulo Alwani on Friday with a memorial service gathering at the Mark C. Marin Center at Antilles School on St. Thomas. Alwani, the president of the India Association of the Virgin Islands and a longtime community leader, died on Nov. 19 in Miami after a bout with cancer. He was 79.

Alwani, the former owner of Artistic Jewelers in Charlotte Amalie, had served on the Schneider Medical Center governing board and was a leader in the Rotary and the Masonic Lodge. He was remembered as the "godfather of the Indian community" as well as a friend and a mentor to many.

Ulla F. Muller students attend a pep rally to roll out the school's Positive Behavior Support and Interventions initiative on Nov. 30 on St. Thomas.

Ulla F. Muller students pledge good behavior

Ulla F. Muller Elementary School rolled out its Panther PRIDE Positive Behavior Support and Interventions (PBIS) initiative at a pep rally at the school on Nov. 30. The fun, high-energy event laid the groundwork to teach students the behaviors that make up a positive school environment.

Administrators taught the students the core values of the school through PRIDE: P — positive behaviors, R – respect, I – individual responsibility, D – determination and E – excellence. Students held signs depicting the values while Muller cheerleaders and the Boys & Girls Club performed to rally around the cause.

St. Thomas-St. John PBIS district coach Darian Torrice-Hairston, who is assigned to Ulla F. Muller Elementary, praised the event. "As the PBIS district coach for Ulla F. Muller Elementary School, I have certainly caught the Panther PRIDE! It was evident that the administration, staff and students exhibited their Positive Behavior, Respect, Individual Responsibility, Determination and Excellence. PBIS and its strategies are a priority at Muller and they are working hard to implement the program as it fits their school," she said

Following the rally, teachers will continue to instill the Panther PRIDE principles in students on a daily basis as well as demonstrate what Panther PRIDE looks in each area of the school. School staff will integrate the Panther PRIDE language into daily routines to encourage students to strive for excellence.

The PBIS initiative is rooted in evidence-based practices meant to increase behavioral and academic outcomes by improving school climate, preventing problematic behavior, increasing learning time and promoting positive social skills. Up to five members from each school were selected to attend training facilitated by PBIS coaches from the state and district. School representatives were tasked with producing positive behavior values unique to their institutions and introduce them to teachers and students. The goal of the PBIS initiative is to focus on what the students do right, rather than on what they do wrong to help encourage the repetition of good behavior.

As Muller Elementary continues to support its students through PBIS, additional phases of the initiative will be introduced, such as a positive reward system as well as ceremonies to celebrate student and staff success. With the help of the district coach, Muller's in-house PBIS task force will guide the PBIS initiative to support the school.

Central High School students that participated in this year's "Close Up Washington" trip to Washington, D.C., include Ethaliah Henry, Jenna Malcomb, Nathan McGregor, Destiny Stout, Martisha Charles, Pellis Leonard, Franche Rodriguez, Jayla Norman, Khaiel James and N'Quelle Golden. History teacher Ericka Hansen is the Close Up adviser.

Students get 'close up' with democracy

Students enrolled in the St. Croix Central High School Close Up organization recently returned from the nation's capital where they attended the Close Up Washington flagship program. The group of 11 traveled Nov. 13-19 and joined with other Close Up high school chapters from across the country to learn about the American democratic process.

Central High School history teacher and Close Up advisor Ericka Hansen took 10 students on the annual trip, which gives high school students and educators an inside look at their democracy in action. Using the nation's capital as their living classroom, program participants get a "close up" view of government processes and places that make the district unique and functional.

Students visited the Washington Monument, Martin Luther King Memorial, the Smithsonian, U.S. Capitol, Arlington National Cemetery, the White House and more. Students also participated in political discussions and met with members of Congress. The program provided social activities for the students in the evening.

Founded in 1971, the Close Up organization has provided more than 825,000 students with educational tours about government and the political processes.

Club gets facelift

Crowley Caribbean Services went to the Oswald Harris Court neighborhood on St. Thomas recently on behalf of the Crowley Cares Foundation and spent time sprucing up the Boys and Girls Club. Crowley personnel from St. Thomas, St. Croix, and the states helped to clean up and paint the facility and donated furniture for the children to use for their arts and craft programs. The Crowley Cares Foundation allows employees to make monthly contributions, which the company matches, to nonprofit groups in the communities Crowley serves as a cargo carrier. Crowley also delivered a check to help the club purchase a laptop computer. In addition to the contributions, employees donate their time to community groups like the Boys and Girls Club.

Magazine reprint celebrates centennial

To celebrate the centennial of the transfer of government from Denmark to the U.S., the St. Thomas-St. John Friends of Denmark Society announces the facsimile publication of a commemorative magazine printed by the society in 1967. The title is "50 Years: St. Thomas Friends of Denmark Society."

The chairperson of the magazine committee was Eldra L.M. Shulterbrandt. Articles by Omar Brown, Fred Gjessing, Bill LaMotta, Francesca Greve, Gertrude Dudley, Rabbi Sasso and Enid Baa are featured in the magazine. Eldra Schulterbrandt wrote "Quo Vadis" and Gov. Ralph Paiewonsky's stirring "What is Virgin Islander," is printed in full. The editor was Carlos Dowling, with design and layout by Ira Smith. Even the advertisements provide a peek at the islands' past.

The restoration of the initial magazine, including the mixed coloring of the pages, was made possible through digitalization by Bill and Frannie Newbold of Island Business Graphics. It's an accurate reproduction of the original.

The magazines are $25 and are available at the V.I. Children's Museum, Frenchtown Museum and My Brother's Workshop Bakery on Back Street downtown and in Red Hook at Chelsea Drug Store and Sandra's Secretarial Service — Lock and Blade. Additional sites will be announced. Members of the society will also have copies to sell.

Students' cultural calendar also marks V.I. centennial

The students of the St. Croix Educational Complex are working on a collaborative project to celebrate the upcoming centennial anniversary of the U.S. Virgin Islands.

Called the Virgin Islands Cultural Contributors Calendar Creation and Theatrical Performance, the project consists of a 12-month calendar featuring 12 V.I. cultural contributors, accompanied by live interviews.

Visual arts, drama and speech teachers Danica David and Sayceda Carter are the directors of the project and are using students from their classes and the school's Art Club to bring the vision to life.

Art Club students will use photographs of selected participants to create mixed media portraits for the calendar. Simultaneously, Carter's drama and speech students will conduct interviews with the participants that will be used to create brief write-ups to go along with the graphics.

The cultural contributors were selected based on being natives of the Virgin Islands or residents for at least 15 years and also active contributors to the development of Virgin Islands' culture through fine arts, education, literature, and history.

The students will formally present the finished project at a reception that will feature an art exhibition and theatrical performances embracing V.I. culture and honoring the contributors. The event will take place at St. Croix Educational Complex in January. Calendars are available at the school in December for $12 each.

The Virgin Islands Cultural Contributors 2017 calendar is available at St. Croix Educational Complex for $12.

The educator duo, David and Carter, developed the project so Virgin Islands students could learn about the individuals in their community that aid in the advancement of local culture. The calendar is expected to be produced annually.

The project is sponsored by Rotary Club of St. Croix, Mid Isle and the Community Foundation of the Virgin Islands.

Holiday Happenings

St. Croix

Arthur A. Richards Jr. High School Music Department presents **Christmas Concert 2016** at 6:30 p.m. Wednesday in the school's auditorium, featuring the Concert Band, Choir, Steel Band and cheerleaders. The Youth Band Dance Ensemble of St. Patrick's School will make a special guest appearance.

•••

John H. Woodson Junior High School invites parents, guardians, and the St. Croix community to its **2016 Christmas Concert**, featuring the Concert Band and the Touch of Love Chorale in the school's auditorium on Thursday at 7 p.m. The December PTA meeting will precede the concert at 5:30 p.m.

•••

The second annual **Holiday Fest** will take place on Friday from 3 p.m. to midnight at Buddhoe Park, bandstand and Strand Street in Frederiksted. Come shop and make it a picture-perfect day with Santa Claus. Vendors are welcome. Contact **340-778-1012**, ext. **6200** or **6206** for more information.

•••

The **Tourism Department,** in collaboration with the **Frederiksted Economic Development Association**, presents a **Community Holiday Giveback with Sunset Jazz** at Buddhoe Park on Friday from 5 to 8 p.m. For more information, go to visitusvi.com.

St. Thomas

Pistarckle Theater presents **"The Nutcracker"** at 7 p.m. Friday and Saturday and at 2 p.m. on Sunday. For tickets visit www.pistarckletheater.com or call **340-775-7877**.

•••

Miracle on Main Street celebrates its 24th year on Friday in downtown Charlotte Amalie, featuring musicians, culinary delights and shopping. For more information, or to become a sponsor, contact the St. Thomas-St. John Chamber of Commerce at **340-776-0100** or email chamber.vi@gmail.com.

•••

Sea View Nursing Home will host its annual **Christmas Gala** on Dec. 22 at the facility on St. Thomas. Cocktails begin at 6 p.m. and presentations will follow at 6:30 p.m. For more information, please contact Simone Edwards at **340-777-3303**.

Briefs

Torah scribe at synagogue

The Hebrew Congregation of St. Thomas welcomes Sofer Rabbi Druin from 5 to 7 p.m. this evening. Druin is in St. Thomas to help the synagogue maintain its historic Torahs and invites you to come learn and ask about the work of the Torah scribe, a 300-year-old craft. For information email info@synagogue.vi or call **340-774-4312.**

AARP meets on Saturday

AARP St. Thomas Chapter 3138 has rescheduled its regular meeting from Dec. 24 to Saturday at 1:30 p.m. in the sun room at Schneider Hospital. The newly elected executive officers and board members will be installed.

Beer & Bacon Bacchanal

Worldwide West and Island Vibes Summer Camp invite you to a Beer & Bacon Bacchanal at The Shops at Yacht Haven Grande pool on Saturday from noon to 6 p.m. For more information on how to participate, volunteer or become a sponsor, call **340-626-3729**, visit www.facebook.com/USVIcamp or email islandvibessummercamp@gmail.com.

The St. John Singers will perform two holiday concerts with guest soprano Laura Strickling on Dec. 21 at Nazareth Lutheran Church in Cruz Bay and on Dec. 23 at Emmaus Moravian Church in Coral Bay

St. John Singers welcome guest soprano for holiday concerts

The St. John Singers are celebrating their 35th anniversary with a special guest at two holiday concerts during the week preceding Christmas.

Soprano Laura Strickling, who has a home on St. Thomas, will be performing with the choir at their annual concerts in Cruz Bay and Coral Bay on St. John.

Strickling has been described as possessing "a flexible voice, crystalline diction, and warm presence" by a reviewer in the New York Times. She has received numerous awards for her performances of opera, classical and contemporary music.

"We were very lucky to get her," said Janice Ballard, who has directed the St. John Singers for the last five years. "She was on St. Thomas and had only a four-day window between other engagements to sing with us."

The singers' selections will include carols from around the world, and in keeping with the tradition, the audience will be invited to sing along with the choir on a medley of holiday songs.

This year the choir will be accompanied on piano by Arboris de Jesus, a talented young musician who was born in Puerto Rico and raised on St. Thomas. She now studies music at Lawrence University.

The St. John Singers concerts will be held on Dec. 21 at Nazareth Lutheran Church in Cruz Bay, and on Dec. 23 at Emmaus Moravian Church in Coral Bay. Both concerts will begin at 7:30 p.m. Tickets, which are available at the door, are $20. Children are admitted for free.

Ravens-Patriots in AFC showdown Page 34 | Alabama, Ohio State lead All-America team Page 33

The Virgin Islands Daily News
Sports
Tuesday, December 13, 2016

STX Educational Complex takes win over P.R.'s Juncos Broncos

By **DAVID EDOLE**
Special to the Daily News

ST. CROIX — The St. Croix Educational Complex High School's tackle football exacted some revenge for the Virgin Islands, roughing up Puerto Rico's Juncos Broncos, 20-8, on Saturday night.

Scott Cofiell

The Barracudas, behind the duo of Vernon Clarke and Cristian Perez, ran out to a 14-0 halftime lead.

Clarke, Complex's quarterback, called his own number in scoring on an 18-yard run. He then handed off to Perez, the Barricudas' tailback, who scampered for a 12-yard score.

The extra points were good by Roland Richards both rushing, but were awarded one point each.

"We didn't know that the National Federation of High Schools changed the rules on extra points," said Educational Complex head coach Scott Cofiell. "The new rule is one point for a rushing and two for passing."

Complex poured it on in the second half when defensive end Antonio

See **BARRICUDAS**, page 35

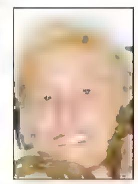
Photo courtesy SCOTT COFIELL

St. Croix Educational Complex High School quarterback Vernon Clarke, center, hands off to ta lback Cristian Perez during Saturday's game against the Juncos Broncos at Pista Atletica Municipal de Juncos in Puerto Rico. The Barr cudas went on to take a 20-8 victory over the Broncos.

V.I. swimmers take gold at P.R. Nationals

By **BILL KISER**
Daily News Sports Editor

Swimmers from two Virgin Islands swim teams brought home a combined 49 medals from the Puerto Rico Short Course National Championships, held Dec. 2-4 at the San Juan Natatorium.



Webster Bozzo

The St. Thomas Swim Association (STSA) team finished eighth overall in the combined team scoring, while the St. Croix Dolphins (SCD) came in 12th. Puerto Rico's Bayamon Swimming Team won the overall team title.

St. Thomas swimmers won 13 events, finished second in seven events and third in five others. St. Croix swimmers won in eight events, and finished second in eight others and third in eight events.

St. Croix's Webster Bozzo led all the Virgin Islands swimmers with five gold medals, posting the top times in the boys 15-16 division in the 100- and 200-meter backstroke, 100- and 200-meter freestyle, and the 200-meter individual medley. He also finished second in the 100-meter

See **SWIM,** page 35

BARRICUDAS

CONTINUED FROM PAGE 36

Polanco picked up a fumble and returned it for score to push the Barricudas' lead to 20-0.

"Our defense played very well," Cofiell said. "Aderemi Flores had an interception and had a couple of returns of 40 yards. Lejoni Williams was all over the field and led us in tackles."

The Broncos added a late touchdown from Diego Luna and two-point conversion from Hernan Velez for the final score.

"I was playing all my guys at that point," Cofiell said. "I wanted to give everyone the experience of playing in Puerto Rico."

After the game, the Broncos set up a meet-and-greet between both team and an innovative idea came out of it.

"They took care of us all weekend," Cofiell said. "They gave us a place to stay and ground transportation. They even took us sightseeing of old San Juan before being dropped at the airport.

"We invited them to come to St. Croix and play us during the Virgin Islands-Puerto Rico Friendship weekend; hopefully it could be a yearly thing. Either they come one year or we go, this was a positive experience for us."

"This was an amazing event," Juncos head coach Manuel Santiago said. "We were very happy to host them and we enjoyed them, too. This was an excellent opportunity to open our relationship and we are working on coming to St. Croix in October."

St. Thomas schools Charlotte Amalie and Eudora Kean, the 2016 St. Thomas-St. John IAA champs, played teams from Puerto Rico last month, losing to the Dorado Spartans and University Garden Dolphins, respectively, in games played at Lionel Roberts Stadium.

"I think we should have a combined league with Puerto Rico," Cofiell said. "We play one home and one away every year. Look, our ticket cost $150, that's not much more than flying to St. Thomas. It could be done. But before we approach Puerto Rico, we would need a unified league between St. Thomas and St. Croix agreeing on stuff to make it happen. Then we could move on to Puerto Rico, They are not that far away.

"They are more Puerto Rican teams than Virgin Islands teams. A mixed schedule will have to be created with a Caribbean champion between the winners of each league. People are really interested in playing in football. If we're going to grow, we need to play good teams to get better and Puerto Rico has been playing a while."

The Puerto Rico High School Football League is presently comprised of seven teams — Antilles High School, Baldrich Comets, Parque Central Bluewaves, Parkville Steelers, Juncos Broncos, Dorado Spartans and the University Gardens Dolphins.

Photo courtesy SCOTT COFIELL

The players and coaches from the St. Croix Educational Complex and Juncos Broncos football teams gather at midfield for a postgame photo after the Barricudas' 20-8 win over the Broncos on Saturday at Pista Atletica Municipal de Juncos in Puerto Rico.

SWIM

CONTINUED FROM PAGE 36

individual medley and 50-meter backstroke.

Mary Killman led St. Thomas with four gold medals, winning in the girls 19-under division in the 50-, 100- and 200-meter backstroke, and the 200-meter individual medley. She also finished third in the 50-meter freestyle.

Killman also set meet records in two events, with her time of 30.09 seconds in the 50 backstroke shattering the old record by 1.24 seconds, and her time of 1 minute, 5.08 seconds in the 100 backstroke breaking a 14-year-old record by 1.14 seconds.

St. Thomas' Audrey Moore and Ky Odlum, and St. Croix's Matthew Mays won three events each.

Moore took gold in the girls 11-12 division's 50- and 100-meter freestyle events, and teamed with Carter Maltby, Casey Vanderwall and Ana Pia Brunt to take the 200-meter freestyle relay. She also took seconds in the 200-meter freestyle and 200-meter individual medley, and teamed with Vanderwall, Maltby and Brunt to take second in the 200-meter medley relay. Moore also finished third in both the 400-meter freestyle and 100-meter individual medley.

Odlum won in the boys 13-14 division in the 50-meter freestyle, 50-meter backstroke and 100-meter butterfly. He also finished second in the 50-meter butterfly, and third in the 100-meter individual medley.

Mays won in the boys 17-18 division in the 100-meter individual medley, 200-meter backstroke and 200-meter individual medley. He also finished second in the 200-meter freestyle and 200-meter butterfly, and third in the 100-meter freestyle.

Other gold medalists were St. Thomas' Max Wilson (boys 11-12 200-meter backstroke), and STSA's girls 9-10 200-meter freestyle and 200-meter medley relay teams, both composed of Gabriela Brunt, Fairley Maltby, Alex Otwell and Lindsay Barr.

From: Richard Kahn [redacted]
Sent: 12/15/2016 5:40:04 PM
To: jeffrey E. [jeevacation@gmail.com]
Subject: Fwd: 2016 Election: Tax Changes Expected
Attachments: image001.png; Untitled attachment 417590.htm; Tax Alert 2016-5.pdf; Untitled attachment 417593.htm

Importance: High

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Begin forwarded message:

From: "Ens, Amanda" <[redacted]>
Subject: 2016 Election: Tax Changes Expected
Date: December 15, 2016 at 9:51:37 AM EST
To: Richard Kahn <[redacted]>

Rich, following up on your question from a while back about this topic. Please find a white paper attached.

Regards,
Amanda

The election of Donald Trump as President is expected to lead to significant tax law changes. The tax changes may come in two parts: from the repeal of the Affordable Care Act (ObamaCare) and its related taxes and from comprehensive tax reform. Since Republicans will also have majorities in both the House and Senate, such changes could be undertaken without bipartisan support. Although it is not yet known exactly what the changes will be or when they would be effective, we are issuing this Tax Alert to inform you of changes that are anticipated, based on proposals made during the campaign by both President-elect Trump and the House Republicans. We also discuss how these changes may impact your planning, both currently and in the future.

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[redacted]

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The 2016 Election: Tax Changes Expected

INTRODUCTION

The election of Donald Trump as President is expected to lead to significant tax law changes. The tax changes may come in two parts: (1) from the repeal of the Affordable Care Act (ObamaCare) and its related taxes and (2) from comprehensive tax reform. Since Republicans will also have majorities[1] in both the House and Senate, it is anticipated that such changes could be undertaken without the need for bipartisan support. It is likely that the Affordable Care Act, and its taxes, could be repealed in early 2017 and result in an immediate tax cut for dividends, capital gains and high-income earners. It is more time consuming to enact comprehensive tax reform and such efforts may not result in a tax bill until mid-summer or the fall, which could push the effective date of broad-based tax changes into 2018. Although it is not yet known exactly what the changes will be or when they would be effective, we are issuing this Tax Alert to inform you of changes that are anticipated, based on proposals made during the campaign by both President-elect Trump and the House Republicans. We also discuss how these changes may impact your planning, both currently and in the future. When we have more specifics, we expect to issue another Tax Alert.

	Current Law*	Trump Plan	House GOP Plan
Individual Tax Rates	10, 15, 25, 28, 33, 35, 39.6%	12, 25, 33%	12, 25, 33%
Top Capital Gains/Dividend Tax Rate	20% (plus 3.8% surtax)	20%	16.5%
Itemized Deductions	3% of itemized deductions are lost when adj. gross income exceeds $313,800 ($261,500 if single)	Limited to $200,000 (couples); $100,000 (singles)	Eliminates except for charitable and (likely capped and modified) mortgage interest
AMT	Parallel tax calculation	Eliminates	Eliminates
Investment Surtax	3.8%	Eliminates	Eliminates
Estate Tax	40% rate, $5,490,000 exemption	Eliminates (capital gain at death subject to $10 million exemption)	Eliminates

*Inflation adjusted amounts for 2017

INCOME TAX

Current law. Ordinary income can be subject to rates as high as 39.6%, and capital gain can be subject to rates as high as 20%. In both cases, an additional 3.8% surtax might apply. Certain itemized deductions are "phased out" under the so-called "Pease limitation" when adjusted gross income reaches certain thresholds. The Alternative Minimum Tax can result in additional tax liability. The income from so-called "carried interests" is taxed as capital gain.

[1] In the House of Representatives, a simple majority is sufficient to pass legislation. It is more complicated in the Senate, where 60 votes (a super majority) are required to avoid a filibuster. Republicans have a simple majority, but not a super majority, in the Senate. However, there is a budget procedure known as Reconciliation, which allows certain legislation to be passed without filibuster. Accordingly, it would appear that Republicans could pass tax legislation in the Senate with just a simple majority.

Proposals. Both President-elect Trump and the House Republicans would lower the top tax rate for ordinary income to 33%. President-elect Trump would maintain the top rate on capital gains at 20%, though it might be applicable at a lower threshold than current law. House Republicans would lower the top rate on capital gains to one-half of the highest rate imposed on ordinary income, or 16.5%. Both President-elect Trump and the House Republicans have proposed repealing (and replacing) the Affordable Care Act, which is the source of the current 3.8% surtax. The Affordable Care Act is also the source of the extra 0.9% surtax on high-income earners (wages exceeding $250,000 for couples; $200,000 for singles) and other indirect tax increases such as the reduced cap on flexible spending accounts and tighter rules for deducting medical expenses. A repeal of the Affordable Care Act could lead to an immediate tax cut. President-elect Trump would impose a $100,000 cap on itemized deductions ($200,000 for joint filers); the House Republicans would eliminate itemized deductions other than charitable gifts and mortgage interest. Both President-elect Trump and the House Republicans would eliminate the Alternative Minimum Tax. President-elect Trump's proposal would tax the income from "carried interests" as ordinary income.

Planning. At its most basic, income tax planning is (i) timing income so it is recognized in a lower-tax year, and (ii) timing deductions so they are deducted in a higher-tax year. However, the proposals listed above contain both "good news" and "bad news" for 2017, so we cannot offer a universal rule as to whether income or deductions are better recognized in 2016, 2017 or even 2018. Each taxpayer needs to make an educated prediction. If there is not a clear answer, sometimes it can make sense to recognize some income (or deductions) in one year and some the next. That approach has the benefit of making sure you don't completely pick the worse year.

The following are some general planning considerations.

- **Installment sale.** If a sale is made in return for an installment note, the resulting gain can be reported on the installment method, meaning gain can be deferred into the year in which payment is received. Not all assets can be sold via the installment method, and there are several special rules. For example, marketable securities cannot be sold and reported using the installment method. We have a separate Wealth Strategy Report: *Installment Sales.*

  If a sale is made for an installment note, you can also elect to be taxed in the year of sale rather than deferring the gain. This election must be made by the due date (including extensions) of the return for the year in which the sale occurred. Thus, an installment sale in 2016 could allow you to wait until as late as October 2017 to decide whether to use the installment method or report all the gain in 2016. This could allow a decision to be made with 20/20 hindsight, at least as of October.

- **Equity-based income**. Certain types of compensation are tied to the value of an underlying stock. As one example, a nonqualified compensatory stock option's value will vary with the changing value of the underlying stock. As another example, a grant of restricted stock will be taxed when it vests, unless a so-called "83(b) election" is made to be taxed at the time of grant. In either case, the amount of compensation that is taxable will depend on the value of the stock at the appropriate time. When deciding the most favorable tax year to recognize these types of equity-based compensation, in addition to the usual considerations of the applicable tax rate, it is important to account for the expected investment performance of the underlying stock. As a simple example, deferring a stock option exercise to the next year might produce a better result not because of a better tax rate but because of the expected growth in the stock's value.

- **Roth conversions**. It is generally better to convert traditional retirement funds to a Roth IRA in a lower tax rate environment rather than a higher rate environment. For taxpayers who converted a traditional IRA to a Roth IRA in 2016, the normal rules will provide a chance to review whether 2016 or 2017 would be the better year for a conversion. Generally, a 2016 conversion can be unwound ("recharacterized") as late as October 16, 2017. Following a recharacterization, the IRA could again be converted to a Roth IRA 30 days later (assuming the original conversion occurred in 2016). Thus, you could wait until October 2017 to determine whether 2016 or 2017 would be the better year for conversion based on the relative tax rates, changes in the market value of the retirement funds and other relevant considerations. If 2016, then you could let the 2016 conversion remain. If 2017, you could "recharacterize" in October of 2017 and re-convert 30 days later.

ESTATE AND GIFT TAX

Current law. Under current law, the federal exemption for estate and gift tax is $5 million, subject to an inflation adjustment each year. For 2016, the exemption is $5,450,000, and for 2017, it is $5,490,000. For gifts or estates above the exemption, the federal tax rate is 40%. If an appreciated asset is includible in the estate, it generally receives a step-up in basis for income tax purposes equal to the fair market value at death. Accordingly, there would be little or no capital gains tax for appreciated assets sold soon after death.

Proposals. President-elect Trump has proposed to repeal the estate tax. The House Republicans' Tax Proposal also proposes federal estate tax repeal. It would appear that such repeal would be temporary, unless the tax changes proposed can be enacted on a revenue neutral basis.[2] It is not clear whether the federal gift tax would also be repealed. The federal gift tax may be viewed as serving two purposes. First, it serves to support the estate tax, because without it you could make unlimited gifts during your life and thereby avoid federal estate tax at death. From that perspective, repealing the estate tax would suggest that the gift tax would also be repealed. However, the gift tax also serves to support the federal income tax. Without a gift tax, income-producing property could be given to family members or others in a lower tax bracket (or residing in a state without an income tax), and subsequently given back. From that perspective, repealing the estate tax would not suggest that the gift tax also be repealed. Neither President-elect Trump's proposal nor the House Republicans' Tax Proposal includes a repeal of the gift tax.

As noted, appreciated assets includible in the estate generally receive a step-up in basis. President-elect Trump has proposed to change this, however specific details have not been offered. The proposal sets forth a $10 million exemption for gains at death. It is not clear whether this exemption is for each decedent, or if that is the combined exemption for a married couple. It is also not clear whether any gains above the exemption would be subject to capital gains tax at death (in effect a deemed sale at fair market value), or only subsequently when the asset is actually sold. It is also uncertain whether any unused exemption could be transferred to a surviving spouse.

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[2] In order to comply with the Reconciliation procedure, the repeal needs to "sunset," resulting in reinstatement of the estate tax after approximately 10 years. Under the 2001 Tax Act, there was a temporary repeal of the estate tax (and other taxes) for this reason. Reconciliation rules will likely also add pressure to produce a revenue-neutral tax bill in order to avoid such a "sunset." That could cause Congress to abandon repealing the estate tax.

Valuation discounts. On August 2, 2016, the IRS released proposed regulations, which may limit valuation discounts for transfers of interests in family-controlled entities.[3] These regulations contain many ambiguities, and the IRS requested comments and held a public hearing on December 1, 2016. The regulations are controversial, many comments were sent and only a few clarifying changes were provided at the hearing. As a result of the election, we believe it is likely the IRS will not proceed with these regulations. For now, there has been no official word from the IRS.

Planning. The proposal to repeal the federal estate tax appears straightforward, but will be complicated if it is temporary. The possibility of reinstatement of the estate tax may be a reason for traditional estate planning techniques, such as gifts and sales, to continue to be utilized. There is also significant uncertainty as to the related federal gift tax and basis step-up proposals. This makes current planning difficult because you may be comparing the consequences of taking action currently (such as making a gift), with the uncertain future consequences of not taking such action. Nevertheless, there are some general guidelines to consider.

- It does not appear advisable to make a current gift that requires the payment of gift tax. Although the gift tax may be less costly than the estate tax, that would not be true if the estate tax is repealed.
- There are many types of "free" gifts that do not require the payment of gift tax, such as annual exclusion gifts, tuition and medical gifts, gifts utilizing the lifetime gift exemption, and zeroed-out GRATs.
    - If such gifts are being considered only to save estate tax, it does not appear necessary to make these gifts, unless there is an applicable state estate tax[4]. However, if repeal is temporary and the estate tax will be reinstated, then such gifts may continue to be advisable.
    - If such gifts are being considered for other non-tax reasons (such as benefitting the recipient or asset protection), such gifts may still be beneficial. Even if the gift tax were repealed, you would still have made the gift for free.
    - If a gift will be made currently, it may be advisable to include flexible provisions, such as a trust which allows for discretionary distributions to the donor's spouse. This could allow the gift to be "undone" in the future by distributions to such spouse, if that becomes desirable.

As to future planning, it will obviously depend on what changes are enacted. If the estate tax is repealed, or if other significant changes are made, all wills, trusts and estate planning documents should be reviewed to determine if any revisions are desirable. Since most wills have dispositive provisions, such as credit shelter trusts and QTIP trusts, based on the estate tax, it will require a re-thinking of estate planning and what dispositions and trusts would be appropriate. Non-tax considerations, such as trust provisions, asset protection and fiduciary selection, will play an enhanced role. If federal estate tax repeal is only temporary, it will presumably be necessary to include alternate dispositive provisions, in case the tax is reinstated.

CONCLUSION

The results of the 2016 election are expected to lead to significant income and transfer tax changes, some through the potential repeal of the Affordable Care Act and others through a push for comprehensive tax reform. In this Tax Alert, we have highlighted some of the tax proposals, and the possible impact these changes may have on

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[3] We have a separate *Tax Alert 2016-3, Proposed Regulations May Limit/Eliminate Valuation Discounts for Family Controlled Entities*.

[4] Certain states impose their own estate tax, independent of whether the federal estate tax is repealed.

planning. It is our view that due to fiscal and political pressure to keep future budget deficits in check and the narrow corridor which could result in the passage of a major tax bill (Reconciliation), we expect the tax bill to be closer to the House Republicans' Plan than the Trump Plan and perhaps narrower in scope. When more information is available, we expect to issue a more detailed Tax Alert.

— **National Wealth Planning Strategies**

From: Richard Kahn [redacted]
Sent: 12/15/2016 5:46:20 PM
To: jeffrey E. [jeevacation@gmail.com]
Subject: Fwd: US Healthcare Year Ahead...Buy ACAD, AGN, ANTM, CELG, CVS, DHR, EW, EVHC, RARE, REGN, WBA
Attachments: image001jpg01D256A2F263C080.jpg; image001gif01D256C23AC52B10.gif

Importance: High

attached are equity healthcare ideas

Richard Kahn
HBRK Associates Inc.
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tel [redacted]
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Begin forwarded message:

From: "Ens, Amanda" [redacted]
Subject: US Healthcare Year Ahead...Buy ACAD, AGN, ANTM, CELG, CVS, DHR, EW, EVHC, RARE, REGN, WBA
Date: December 15, 2016 at 10:59:39 AM EST
To: "Rich Kahn" [redacted]
Reply-To: "Ens, Amanda" [redacted]

The US team is out with their 2017 Year Ahead this morning (link) running through ALL sub-sectors with each analysts top pick into the new year.

Top Picks – ACAD, AGN, ANTM, CELG, CVS, DHR, EW, EVHC, RARE, REGN, WBA

Washington DC Backdrop
Given the clean sweep by the GOP & uncertainty around the ACA, key attention is paid by Andy Bressler to a review of the various scenarios that could play out early next year. With a repeal likely to happen well before a replace (essentially via the Budget Reconciliation process in Jan/Feb), Andy notes this is likely to include a repeal of both health insurance exchange subsidies & a phase-down of Medicaid expansion funding (albeit with a two or three year transition period).

He also expects a repeal of many of the larger HC related taxes in the ACA, including the HIX ($14.3bn in 2018), Medtech Tax (2.3%), pharma industry tax ($4.1bn in 2018) & Cadillac tax (effective 2020).

As for the views by analysts…
Biotech (+) – believe sector will outperform largely as pricing risk has diminished (although will remain in pockets) but pipelines/growth remains. Ying's top picks are **CELG** & **REGN**; Tazeen's top picks are **ACAD** & **RARE**.

Spec Pharma (-) – headwinds remain w/ Sumant's top pick **AGN** given lower risk to reimbursement pressures & an underappreciated pipeline. Leverage & CF remain the key focus for investors.

Tools/Animal Health (=) – Derik notes more "headline" than "real" risks from policy which will create opportunities for a group growing MSD, although valuations remain above peers. **DHR** (US 1 name) top pick, also **A**, **ZTS** in Animal Health, **BDX** in Diagnostics & **CTLT** in Services.

Medtech (=) – Hopkins' expects a mixed bag in 2017 w/ stocks trading close to 5yr valuation lows; **EW** top pick given best growth / purest innovation story.

Facilities (-) – Fischbeck notes that uncertainty will remain an overhang for hospitals as repeal/replace a negative for the group (est losing 2-3mm Medicaid lives & 2-3mm exchange lives would be a 1-2% EBITDA hit on avg). Focus on company-specific stories like **EVHC**.

MCOs (+) – Fischbeck generally +ve under Trump (especially around MA given historical support from GOP) w/ tailwinds from corporate tax & rising rates. **ANTM** top pick in given valuation & tailwinds.

Distribution/Tech (=) – Valiquette prefers pharmacies **CVS/WBA** given benefits from decelerating generic prices (which will remain an overhang for Distributors). HHS appointment a –ve for HCIT.

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Bank of America Merrill Lynch

From: Morris, Paul V [redacted]
Sent: 1/5/2017 3:31:54 PM
To: Morris, Paul V [redacted]
CC: Lehane, Sean T [redacted]
Subject: The Year Ahead: A World of Change (Short Version Below For Convenience)
Attachments: image001.jpg; image003.jpg; image004.jpg; image005.png; image006.jpg

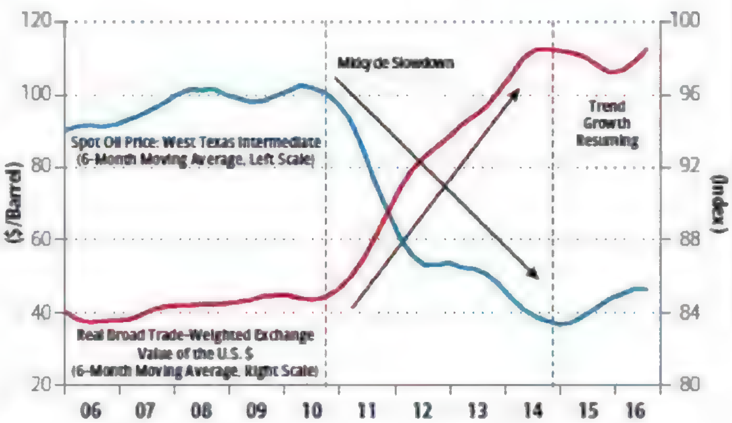
The Year Ahead: A World of Change

A continued rise in equities. Renewed investor confidence. Bond markets under pressure. Our Chief Investment Office explores the risks and opportunities of these and other trends shaping the year ahead.

AS WE LOOK BACK ON 2016, one could characterize it as The Year of The Unlikely. It began with deep worries regarding China's growth path, a second wave of collapsing oil prices, a Federal Reserve (Fed) hiking into deflationary headwinds, the impact of negative interest rates in Europe and Japan, concerns over a potential U.S. recession, lower-quality corporate high yield problems, and U.S. consumers who might never spend their savings at the pump. All these worries hit at once in January and February, prompting the S&P 500 to fall over 10% from its 2015 closing level of 2043. The year, at that point, appeared bleak.

Our view was to maintain a balanced and diversified position throughout the downturn, particularly for the long haul, due to our belief that the major concerns, although understandable, were simply not going to fully develop and asset prices would begin to track fundamentals more effectively through the remainder of the year. The potential for risk assets to climb higher was there but a catalyst was needed. [For our full view on the year ahead, please read our December 2016 Monthly Letter.]

Exhibit 1: Mid-Cycle Slowdown Ended in Early 2016, When Oil and Dollar Stabilized)



Source: EIA/CME; FRB/Haver Analytics. Data as of December 5, 2016

Past performance is no guarantee of future results.

Our core belief was centered on healthy consumers who would indeed pick up their spending from savings at the pump and become more confident as job growth continued and real incomes increased. We also believed U.S. financial conditions and the economic backdrop would improve in the second half of the year as the pressure from the strong dollar subsided and the deflationary effects of the collapse in oil prices began to fade. In other words, we were witnessing evidence that the mid-cycle slowdown that had hurt economic growth and corporate earnings was ending. [See Exhibit 1] Based on this core belief, the "grind it out" year for risk assets would be back on track, the business cycle would extend into 2017, bond yields would slowly shift higher, and equity markets had the potential to head toward previous highs.

A series of unexpected outcomes

At this point, we did not characterize 2016 as The Year of the Unlikely. However, if you consider specific events throughout the year in finance and sports, it is easy to see that now. We already mentioned the second plunge in oil prices to the mid-$20s per barrel to start the year, and bond markets in some areas of the world actually had negative yields—meaning the lender paid the entity issuing the bonds to take their money! This was unlikely. How about Brexit vote in Great Britain? Unlikely. In sports, Villanova University winning the national championship in men's college basketball (Nova's first championship since 1985), Leicester—the English football club—

winning the Premier League (before this season began, British bookmakers listed them as a 5,000-to-1 shot to emerge as the champion), the Cleveland Cavaliers' first ever National Basketball Association championship and, of course, the Chicago Cubs winning the World Series for the first time since 1908! All unlikely. But they happened.

Last but not least, in our own political backyard, we witnessed Donald Trump's victory in the U.S. presidential election last month. Also unlikely. We all know markets do not like uncertainty. However, sentiment can shift quickly if fundamentals are not negatively affected, and what was previously determined to be "unlikely" turns to enthusiasm as to what could be.

"We expect business, consumer and investor confidence to continue to head higher well into 2017, with most of the newly expected growth to come in 2018, which should underpin equities for most of the year."

CHRISTOPHER HYZY
CHIEF INVESTMENT OFFICER, BANK OF AMERICA GLOBAL WEALTH AND INVESTMENT MANAGEMENT

Why this expansion can continue

Business cycles typically last between five and seven years before fundamentals deteriorate, usually due to a policy error of some sort. This can produce a recession and/or a bear market, which tend to correct the excesses that have been built up and kick-start a new cycle. Bull markets and cycles do not die of old age—there needs to be a fundamental catalyst that emerges and pushes the trends back the other way.

We are entering our ninth year in the current business cycle, despite all of the complexities and concerns that have come and gone since the financial crisis.. In fact, this cycle could have extended another few years along the same path, given the secular stagnation that prevailed. This era needed ultra-accommodative central bank monetary policy just to keep things stable and plodding along this far into the cycle. It also needed corporations willing to manage their earnings to the penny in a below trend growth world that offered little pricing power. And finally, this cycle needed U.S. and emerging market consumers to continue to switch from deleveraging to spending as their balance sheets and incomes improved.

A return of "animal spirits"

This dynamic could have continued for a bit, but monetary policy has become tired. Negative interest rates have become a headwind, not a tailwind, in our view. And, just like sports fans, investors need a catalyst to break from the past. Visible positive catalysts tend to turn into improved sentiment and confidence. Through the years, economists have called this "animal spirits."

Animal spirits begin as hope, turn into enthusiasm, and ultimately need visible action to keep the spirited momentum going. After all, economics is a behavioral science. It is our view that we are breaking from the era of secular stagnation and heading into fiscal reflation. This new era is likely to have its fits and starts and will not be in a straight line. It should also include different stages and speeds from various economic regions globally. Furthermore, it should contain some "unlikely" outcomes. With any cycle, we will have to take the good (higher nominal growth) with the potential bad (higher volatility) and investors will have to reposition portfolios, rebalancing when necessary, in order to take advantage of the new era.

Prior to the U.S. presidential election, and even dating back to the summer months when bond yields bottomed, the economy was already beginning to improve. Corporate earnings were picking up, the consumer was spending at a healthy clip, there were some subtle signs of positive surprises in European economic activity, and the downturn in emerging markets (and negative earnings revisions) ceased. We were certainly not waving the celebratory flag on growth, but the economy was getting up off the ground, which is what risk assets, including equities, need sometimes. However, the S&P 500—a major benchmark for U.S. stocks--had lost momentum heading into the election, as investors worried that the secular stagnation era would continue and that monetary policy had lost its effectiveness.

Market sentiment changed dramatically during the early morning hours on November 9. The surprise victory by Donald Trump caught many investors off-guard. The potential for fiscal stimulus measures, reduced regulation, corporate tax reform and other potential pro-growth initiatives increased. Animal spirits perked up. Investor positioning was heavily skewed toward long-duration fixed income, low-volatility equities and high-dividend-paying companies. These areas significantly outperformed in the first half of the year but started to lose momentum once rates bottomed mid-year. However, investor positioning did not change materially at first. Portfolios were still generally overexposed to higher- quality, rate-sensitive investments—otherwise known as "bond proxies."

In our Hills Have Eyes strategy report, published on November 16, we outlined the need to rebalance portfolios given our belief that we were already transitioning toward the late-cycle expansion phase and that the new enthusiasm for pro-growth policies would begin to accelerate investor flows toward more cyclical investments. Given the high degree of underexposure to late-cycle investments by investors, we believed such a rotation would cause a "melt-up" in equities toward new highs over time.

Diversification and rebalancing will be key

So, how are we going to manage portfolios in a world undergoing a major market regime shift, one that is transitioning from the era of secular stagnation to fiscal reflation, and one that still has a considerable amount of uncertainty? We are going to become more prescriptive, remain diversified and balanced, but with more exposure to pro-growth, pro-cyclical areas. We will also likely rebalance more often throughout the year as investor rotation gathers momentum during 2017 and into 2018; and we look to periods of volatility as opportunities to add to areas we favor.

"Fixed income still represents an important portfolio diversifier—and a volatility dampener in unforeseen worst-case scenarios."

CHRISTOPHER HYZY
CHIEF INVESTMENT OFFICER, BANK OF AMERICA GLOBAL WEALTH AND INVESTMENT MANAGEMENT

We expect business, consumer and investor confidence to continue to head higher well into 2017, with most of the newly expected growth to come in 2018, which should underpin equities for most of the year. Higher nominal growth, an improved picture for corporate profits and continued positive sentiment are the foundation for continued gains in the equity markets and an investor rotation from overexposure to long-dated fixed income into under owned equities.

This rotation will need a few periods of confirmation, given the still uncertain broader global macro outlook, but we expect price-to-earnings multiples to remain elevated, despite higher rates, throughout the year. S&P 500 earnings have a wide range of forecasts due to the potential for sizable tax cuts in 2017. Based on this, the S&P 500 could add extra earnings on top of normalized growth, which is expected to be around 9%. At present, a reasonable range, albeit a wide one, is considered to be between $129 and $138 with the potential for further upside. In this scenario, where we get pro-growth policies filtering into a higher earnings number, an S&P 500 bull case level of 2700 at the high end is possible.

Improving profits and growth should take equities higher

For now, a base case utilizing the five factor framework from BofA Merrill Lynch Global Research, which combines sentiment, valuation and technical, equates to 2300 for the S&P 500 at year end. The two components that include long-term valuation and 12-month price momentum are indicating that S&P 500 levels between the base and bull case are increasing in probability. Of course, there are a number of scenarios that could unfold that would indicate a wide range of outcomes depending on the multiple or earnings number that ultimately develops. In the end, it all comes down to the path of corporate profits and the visibility on growth, both of which are improving.

Highlights

We have moved from a "get paid to wait" core portfolio theme to a more cyclical- and value-oriented theme in multi-asset portfolios

- Equities remain attractive versus fixed income on a relative basis.
- Within equities, we favor U.S. large caps, U.S. small caps and emerging markets.
- Within equities, we favor value over growth and more cyclical assets versus defensives.
- Within fixed income, we prefer credit to Treasuries. We would also consider an allocation to Treasury inflation protected securities (TIPS) where appropriate.

Portfolio repositioning is likely to continue well into 2017, as developments unfold and the pro-cyclical environment gathers momentum. With growth already heading higher from Q3 2016 onward and earnings turning positive, investors have begun increasing cyclicality and exposure to value in portfolios at the expense of more defensive sectors and higher-dividend areas within equities. In addition, we expect a larger shift in emphasis toward small capitalization, which has already started, and more domestic-oriented equities due to a slightly stronger dollar, more pro-growth policies and the desire for a hedge against potential retaliatory trade policies from main trading partners. This portfolio shift in positioning is happening but, in our view, is in its early stages.

We have moved from a "get paid to wait" core portfolio theme to a more cyclical and value-oriented theme in multi-asset and all-equity portfolios primarily due to increased business and consumer confidence, which should lead to higher earnings than originally expected.

- Therefore, we have raised our exposure to equities versus fixed income to a moderate overweight and our new tactical asset allocation view is overweight equities versus its strategic benchmark.
- We are now further underweight fixed income versus equities, underweight versus its strategic benchmark rather than neutral, and have lowered cash to neutral from overweight.

Within the asset classes, we have made a number of changes consistent with our view from earlier this year and one that has accelerated post-election.

- We are now moderately overweight U.S. small capitalization equities and neutral non-U.S. developed markets.
- We maintain our preference for U.S. high-quality large caps and continue to overweight emerging markets.
- We continue to favor value over growth and more cyclical areas (such as financials and consumer discretionary) versus defensives (such as utilities and consumer staples).

In fixed income, we have moved from a balanced view to a larger underweight versus the strategic benchmark.

- However, fixed income still represents an important portfolio diversifier—and a volatility dampener in unforeseen worst-case scenarios—and should be viewed primarily as a cash flow producer versus a total return asset, given the expectations for higher yields.
- In addition, we have lowered Treasuries to a further underweight but maintain our neutral rating on high yield and underweight on international fixed income.
- Municipal bonds have corrected to levels that are becoming attractive again, and we are still favorable on investment grade corporate credit.
- We maintain our neutral rating on real estate and commodities, but we prefer metals and oil to gold.

In addition, the pro-cyclical improvement has started to break down the elevated correlation among and within asset classes since earlier in 2016. We expect this adjustment to continue in 2017 as economic volatility picks up and asset class volatility follows suit. Transitions to late-cycle phases tend to invite a higher level of volatility as inflation rises and central bank policies shift to nudging short rates higher.

In this environment, alternative investments, namely hedge funds, should outperform industry benchmarks, in contrast to recent underperformance. For investors able to withstand a higher allocation of illiquid assets in their portfolio, we prefer timberland for its long term-growth prospects and low correlation to financial assets.

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Outlook

Investment Management Division

Half Full

"Everything we hear is an opinion, not a fact. Everything we see is a perspective..."
Attributed to Marcus Aurelius

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Dear Clients,

Readers of our previous *Outlook* publications may recall that this page typically summarizes the key themes of our economic and financial market prospects for the coming year. However, for 2017 we decided that a brief overview would not suffice, given the current environment of high market valuations, great policy uncertainty, significant geopolitical tensions and, in all likelihood, an unconventional US presidency.

Since the trough of the global financial crisis, we have consistently emphasized US preeminence and maintained a strategic overweight to US equities relative to global market capitalization-weighted benchmarks. Tactically, we have had an overweight allocation to US equities and US high yield bonds from as early as mid-2008. Even when US equities became more expensive, we continued to recommend that clients stay fully invested at their strategic allocations. Indeed, we have reiterated that recommendation in our past *Outlook* publications, client calls and *Sunday Night Insight* reports as many as 59 times since January 2010.

But now we have crossed into the 10th decile of valuations: US equities have been more expensive than current levels only 10% of the time in the post-WWII period. Yet we continue to recommend staying the course. We are duly aware that this recommendation is long in the tooth, particularly given such high valuations and the unusually high level of policy uncertainty.

Policy uncertainty, both economic and political, abounds globally: uncertainty with respect to Brexit (the how and when), upcoming elections in Germany and France (the who), transitional government in Italy (the how long followed by what) and new appointments to the Standing Committee in China and their significance (the who and what of any reform agenda), to name a few.

We are also facing rising geopolitical tensions that could trigger significant market volatility. Tensions in the Middle East will not abate. Greater Russian involvement in that region is stabilizing in some respects and destabilizing in others. Further Russian incursions into Eastern Europe may elicit a more robust reaction from the West. Terrorism could spread in the US and Europe as ISIL (Islamic State of Iraq and the Levant) loses territory in Iraq and Syria and foreign fighters return home. North

Korea's nuclear program and missile launches go unchecked. There is rising risk of military incidents—or accidents—in the South China Sea and across the Taiwan Strait.

China is the most likely source of global economic shocks over the next two to three years. The country's leadership continues to prioritize imbalanced economic growth over structural reforms, thereby increasing debt at an unsustainable pace. Such increases will eventually prove to be destabilizing.

In Donald Trump, the US has elected an unconventional president in many respects, including his more US-centric approach to China. If China responds to, say, imposition of US tariffs on imports of Chinese products by sharply devaluing the renminbi, significant downside volatility and tighter global financial conditions will follow.

Given already high US equity valuations, uncertain economic and political policy prospects and heightened geopolitical risks, readers may well ask why we continue to recommend staying fully invested in US equities. Among the reasons:

- Our eight-year US preeminence theme is intact and continues into its ninth year. As Professor Jeremy Siegel of the University of Pennsylvania wrote 23 years ago in *Stocks for the Long Run*[1] and recently repeated in a *Wall Street Journal* interview,[2] "Stocks are the best long-run asset." We refine that view by saying US equities are the best long-run asset.
- We think that the policy backdrop in the US will be particularly favorable for the economy, with looser fiscal policy, relatively easy monetary policy and a less stringent regulatory environment. We expect US growth to continue through 2017.
- We expect global growth to improve modestly, from 2.5% in 2016 to 2.9% in 2017, with looser fiscal policy and still easy monetary policy in key countries.
- And last but not least, we expect that while President-elect Trump's initial policy measures with respect to tariffs and trade agreements risk jolting financial markets, as a self-described "deal maker" he will likely adjust and change course as necessary to achieve his desired results.

We may have a bumpy ride, but the US economy will not be derailed.

Over the years, we have viewed the glass as half-full—if not full—when it comes to the US economy. Many others have seen the glass as half-empty, pointing out that productivity growth has decreased, US labor demographics are less favorable and government policies have been ineffective. While it is correct that productivity growth has decreased and labor demographics are less favorable, it does not follow that the US economy is in stagnation. Quite the reverse.

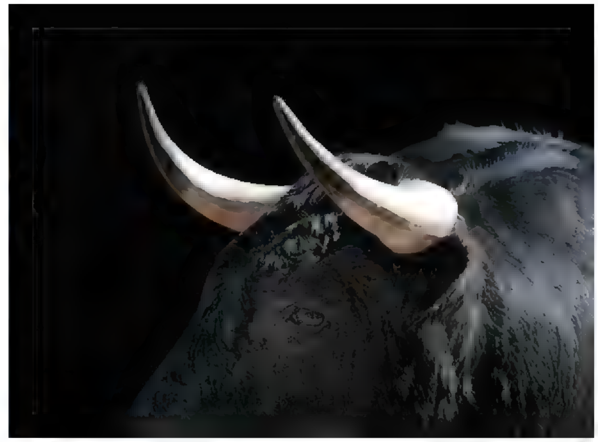
We should note that our conviction in US preeminence and US economic growth in 2017 is greater than our conviction in the direction of the equity markets. Just as we were appropriately humble about how much further equity markets could fall when we published our 2009 *Outlook*, we are equally humble today about our financial market outlook given the significant uncertainties ahead.

Here, we are reminded of Voltaire's famous words: "Doubt is not an agreeable condition, but certainty is an absurd one." A client with a well-diversified portfolio that is fully invested at its US equity allocation is generally well positioned for these uncertain and probably volatile times.

We hope our 2017 *Outlook* is helpful as you evaluate your portfolio allocations. We also wish you a healthy, happy and productive 2017.

The Investment Strategy Group

Contents



Half Full

Since the trough of the global financial crisis in March 2009, US equities have returned nearly 300%, producing one of the longest bull markets in the post-WWII period and outperforming all other major developed and emerging market country equities. US equities have also exceeded their pre-crisis peaks of October 2007 and March 2000 by 75% and 103%, respectively, on a total return basis. This bull market has exceeded all other bull markets but one in length and exceeded all but three in magnitude.

US economic growth has also exceeded that of most other recoveries in length. This recovery is the fourth-longest recovery in the post-WWII period[3] and if, as we expect, the US economy avoids a recession in the first half of 2017, this recovery will become the third-longest. While many critics correctly point out that it is the slowest recovery since WWII, it has actually created more economic growth than some of the stronger recoveries that lasted for shorter periods. On a cumulative basis, this recovery ranks sixth out of the last 10 recoveries with respect to GDP growth. What this recovery has lacked in strength, it has partially made up for in length.

The slow but steady growth has also exceeded that of all other major developed economies, and US GDP per capita has increased more than the GDP per capita of any major developed or emerging market country.

This recovery has created over 15 million jobs. The unemployment rate decreased from a peak of 10.0% in October 2009 to 4.6% in November 2016 and is now below its long-term average of 5.8%. Even the broader U6 measure, which adds the underemployed (such as part-time and discouraged workers) to the number of unemployed, has fallen from a peak of 17.1% to 9.3%, and stands below its long-term average of 10.6%. Unemployment claims are not only lower than they were during pre-crisis troughs but also at their lowest since 1973; they are also the lowest on record as a percentage of the labor force (see Exhibit 1).

As a result of more robust employment, wages have increased as well. Wage growth, as measured by the Atlanta Federal Reserve Bank Wage Growth Tracker (which, in our opinion, is a better gauge of the employment backdrop than average hourly earnings, since it is not affected by the changing composition of the labor force as new entrants are hired at lower wages), has picked up from a low of 1.6% year-over-year growth in May 2010 to a high of 3.9% in November 2016—just below the 4.4% peak of September 2007. More robust employment and better wage growth have, in turn, led to a steady increase in consumer confidence, reaching levels last seen in August 2001, as measured by the

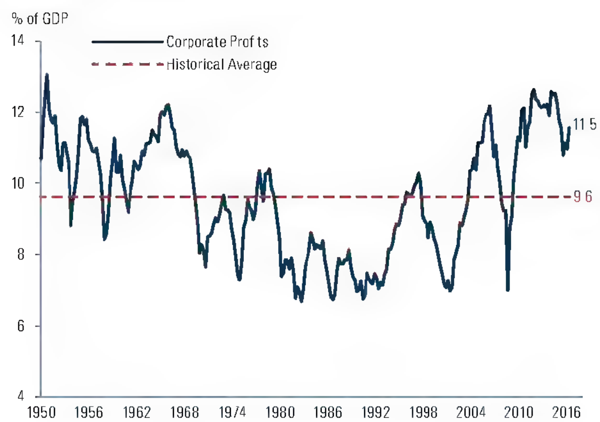
Exhibit 1: US Initial Unemployment Claims as a Share of the Labor Force

Claims as a share of the labor force are at record lows.

Data through December 2016
Source: Investment Strategy Group, Datastream

Exhibit 2: Corporate Profits as a Share of US GDP

Profits have been higher than current levels only 17% of the time since 1950.



Data through Q3 2016
Note: Showing US corporate profits with inventory valuation adjustment and capital consumption adjustment
Source: Investment Strategy Group, Datastream

The Declinists at Work

March 1979
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July 2016
Source: *Financial Times.* Martin Wolf/James Ferguson, 2016. "Global elites must heed the warning of populist rage." *Financial Times* / FT.com, 20 July. Used under licence from the *Financial Times.* All Rights Reserved.

Conference Board. Even median household income, as measured by the US Census Bureau, rose in 2015 at the fastest rate on record.

In the corporate sector, total profits of domestic corporations as a percentage of GDP, as measured by the national income and product accounts (NIPA), are close to all-time highs. At 11.5% of GDP, profits not only are well above the historical average of 9.6%, but have been higher than current levels only 17% of the time since 1950, as shown in Exhibit 2.

Despite these "glass half-full" facts, the announcements of US decline that pervaded the airwaves in the depths of the global financial crisis have persisted. We continue to be inundated with analysis of "America's relative decline,"[4] "America's slow-growth tailspin" and "sclerotic growth,"[5] "an economic in-tray full of problems"[6] and, of course, "secular stagnation."[7] Two books published in 2016 that have received extensive coverage epitomize the sentiment: Robert Gordon's *The Rise and Fall of American Growth*[8] and Marc Levinson's *An Extraordinary Time: The End of the Postwar Boom and the Return of the Ordinary Economy.*[9]

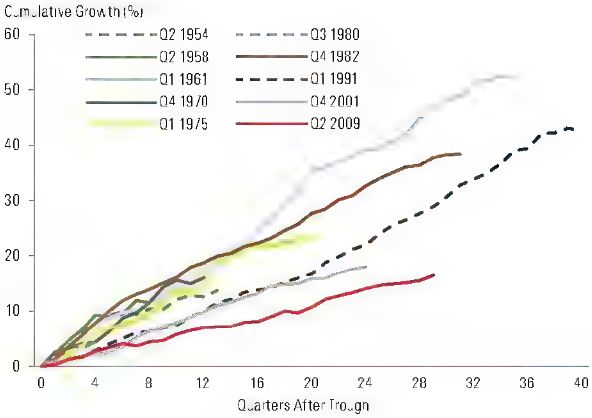
Some of the images are equally telling. We were struck by a recent image of the Statue of Liberty on its side that resembles a *BusinessWeek* cover of March 1979 with a tear trickling down Lady Liberty's face. Since WWII, the waning of US preeminence has been a topic of recurrent hand-wringing. Whether prompted by the flexing of Soviet muscle, most spectacularly with the launch of Sputnik in the 1950s; the civil rights upheavals and growing fallout from the Vietnam War in the 1960s, the Arab oil embargo and the Watergate scandal of the 1970s, the rise of Japan in the 1980s or the rise of China in the 2000s, the declinists have foretold the ebbing of American preeminence. Typical of the genre is a 2009 book provocatively titled *When China Rules the World*[10] by British columnist Martin Jacques.

Yet, as we wrote in our 2011 *Outlook: Stay the Course*, neither the global financial crisis nor the rise of China will hinder what we described as "America's structural resilience, fortitude and ingenuity" and remove the US from its preeminent perch.

What explains our difference of opinion, which has consistently underpinned our investment recommendation for a greater allocation to US assets and for remaining invested at such high valuations? Why do we believe that the US is on a more solid footing both absolutely and relative to all other major countries in the world? Is it a matter of perspective, analytical rigor, bias, review of longer economic history, or reliance on a big cadre of external experts in specialized fields?

Exhibit 3: Growth in US Real GDP Across Post-WWII Expansions

In this recovery, GDP has grown at half the average pace of prior expansions.

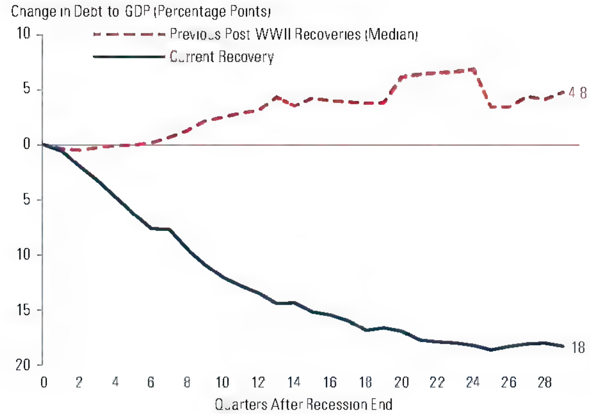


Data as of Q3 2016

Source: Investment Strategy Group, Datastream, National Bureau of Economic Research.

Exhibit 4: Change in US Household Leverage Following Recessions

A large reduction in household debt served as a drag on the pace of this recovery.



Data through Q3 2016

Source: Investment Strategy Group, National Bureau of Economic Research, Federal Reserve Economic Data

We believe that no one factor explains the difference in opinion. Instead, we rely on a comprehensive framework of investigation that blends all of these elements, combining rigorous fundamental, quantitative and technical analysis, as well as the insights of an extensive network of external experts. At the same time, we continually endeavor to overcome the behavioral biases Nobel Laureate Daniel Kahneman and his collaborator Amos Tverksy have shown to affect economic decision-making and tolerance for risk. These key characteristics of our investment process not only underpin our continued view of US preeminence, but also allow us to form a holistic view across global economies and asset classes. Of equal importance, our framework provides us with a consistent process by which to assess investment opportunities. While we believe our approach is robust, we acknowledge that nothing can ensure we will avoid the next downdraft.

We begin our *Outlook* with a brief review of this recovery and place it in the context of past recoveries showing that the glass is indeed half-full. We address some of the key concerns regarding demographics and declining productivity growth. We show that US labor force demographics have deteriorated and will continue to do so, especially in the absence of policy changes. Nonetheless, we demonstrate why there is room for optimism about productivity growth. The analysis leads us to a view of slightly above-trend growth for 2017 with some upside potential from higher productivity and fiscal stimulus from a Trump administration.

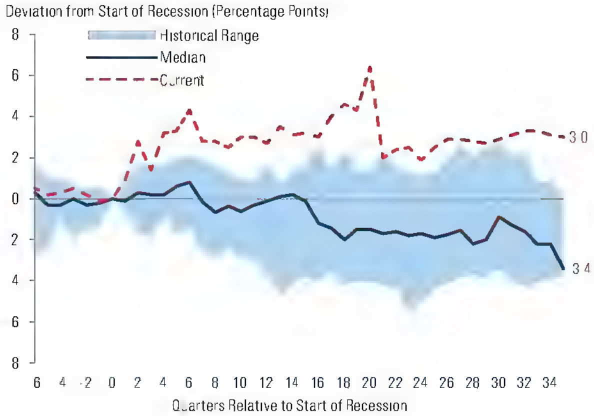
We then turn to our one- and five-year expected returns, which are driven by our view of a solid economic foundation, a well-balanced economy and a positive growth trajectory in the US. We conclude our introductory section with the risks to our view, both upside and downside, including a low probability of recession in 2017, high policy uncertainty under a Trump administration, possible global shocks from economic and currency policies in China, and the risks of geopolitical mishaps in Europe, the Middle East and the Far East.

This Recovery in Context—An Update

This recovery has been the slowest of the 10 recovery cycles since WWII, as shown in Exhibit 3. Since the trough, US GDP has grown at an annualized rate of 2.1% through the third quarter of 2016, which is half the pace of the median and average growth rates of all other recoveries. The slow GDP growth rate stands in stark contrast to the recovery in the labor market and, most recently, in wages and household income. Impressively, the decline in the unemployment rate has been the second-largest of all post-WWII recoveries.

Exhibit 5: Change in US Personal Savings Rate Surrounding Historical Recessions

The increase in the personal savings rate in this recovery has been unusually large.



Data through Q3 2016

Note: Quarter 0 marks the start of each recession since 1950, defined as the NBER recession cycle start. The cycle is measured from the start of each recession until the beginning of the next recession.

Source: Investment Strategy Group, Datastream, National Bureau of Economic Research.

Exhibit 6: Ratio of US Household Net Worth to Disposable Income

Real estate price and financial asset gains have boosted the ratio to near pre-crisis highs.

Data through Q3 2016

Source: Investment Strategy Group, Datastream.

The anemic (but steady) pace of this recovery has fueled a debate about its causes. The theories fall into six categories:

- A "hangover" from the global financial crisis[11]
- "Secular stagnation" due to unfavorable demographics
- "Secular stagnation" due to declining productivity growth
- Mismeasurement of GDP statistics
- Poor policies in Washington
- A steady onslaught of external shocks

We briefly examine each of these six theories below—some of which we have touched upon in our prior *Outlook* publications. While there has been further research on the topic over the past year, the debate has not yet been resolved and likely never will be to everyone's satisfaction. One star-studded group of experts believes that most contributing factors other than weaker demographics have dissipated or will dissipate, and the US economy will remain structurally vibrant. Another star-studded group believes that the best days of the US are behind it, contending that even radical policy changes will not reverse this decline and that the 2016 election results are a testament to this "secular stagnation."

A Hangover from a Crisis

Proponents of the "hangover" theory suggest that recoveries after a major financial crisis generally have been slower. In their book, *This Time Is Different: Eight Centuries of Financial Folly*,[12] Carmen Reinhart and Kenneth Rogoff use historical data from 66 countries between 1810 and 2010 to demonstrate that, historically, recoveries following a major financial crisis have been markedly slower than other recoveries.

Fundamentally, one can argue that households deleverage for a long time to increase precautionary savings, and corporations limit capital expenditures to build up precautionary cash, out of fear that another major financial crisis is looming. As shown in Exhibit 4, the pace at which households deleveraged in this most recent crisis was faster than in any other recovery in the post-WWII period; commensurately, the increase in the personal savings rate since the start of the recession is unusually large relative to previous cycles (see Exhibit 5).

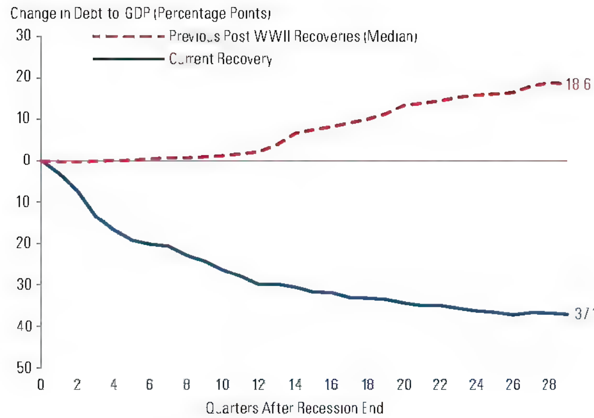
Along with higher savings, the increase in home prices to levels matching the February 2007 peak (as measured by the S&P/Case-Shiller US National Home Price Index on a seasonally adjusted basis) and the appreciation in financial assets have boosted the ratio of household net worth to disposable income to near pre-crisis levels, as shown in Exhibit 6. This improvement in net worth will enable households to lower their savings rates going forward and support consumption. Therefore, even if the “hangover” hypothesis was partly valid earlier in the recovery, it should have less impact in the future.

During the current recovery, the financial sector also deleveraged substantially, partly due to the unusually high levels of leverage that existed as the crisis began and partly due to greater financial regulation resulting from the Dodd-Frank Wall Street Reform and Consumer Protection Act signed into federal law by President Barack Obama on July 21, 2010. As shown in Exhibit 7, the financial sector began to deleverage even before Dodd-Frank and has continued to do so through 2016.

However, more recently, the pace of deleveraging has abated, as shown in Exhibits 4 and 7. Furthermore, such deleveraging may well be bottoming and soon reverse as households and the financial sector face a more favorable fiscal and regulatory policy environment under President-elect Trump. For all practical purposes, the “hangover” may now be over.

Exhibit 7: Change in US Financial Sector Leverage Following Recessions

A decrease in financial sector indebtedness has contributed to a slower-than-usual recovery.



Data through Q3 2016

Source: Investment Strategy Group, National Bureau of Economic Research, Federal Reserve Economic Data

Secular Stagnation: Unfavorable Demographics

As we discussed in our 2016 *Outlook: The Last Innings*, the term “secular stagnation” was first coined by economist and Harvard professor Alvin Hansen in 1934[13] and fully described in his presidential address to the American Economic Association in 1938.[14] He predicted that poor demographics, limited innovation and few trading and investment opportunities would slow US growth.

The term was more recently popularized by Lawrence Summers, professor at Harvard University and former secretary of the Treasury, when he referred to secular stagnation in a 2013 speech at the International Monetary Fund.[15]

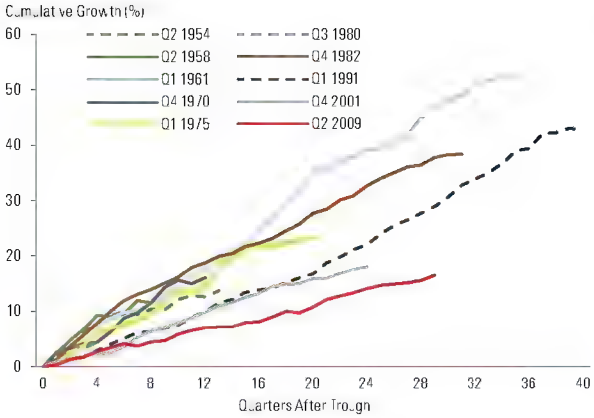
Hansen’s dire predictions never came to pass, and the US experienced close to record levels of productivity growth in the post-WWII period up to 1973, along with strong growth in the labor force. This current cycle, in contrast to the decades immediately following Hansen’s predictions, has been hampered by weak demographics and a decline in the growth rate of the labor force. In a September 2016 study, aptly called “How Should We Think About This Recovery?,” Jay Shambaugh, a member of the Council of Economic Advisers, shows that when one compares this recovery with the average of past recoveries, the growth gap narrows significantly if one accounts for the number of people in the labor force.[16] Instead of this recovery growing at about half the pace of the average of past recoveries, the gap narrows to 83% of the average: GDP per number of people in the labor force has grown at an annualized rate of 1.9%, compared with an average of 2.3% in past recoveries. A recovery that appears to be at half the pace of other recoveries is actually in line with other recoveries after adjusting for the size of the labor force, as shown by comparing the red lines in Exhibits 8 and 9.

There are two components to the unfavorable demographics story. The first is simply the decline in the growth rate of the US working-age population, which is driven by aging, the retirement of the baby boom generation and slower immigration.

This trend cannot be easily reversed; however, the pace of decline can potentially be slowed. For example, the commonly accepted retirement age of 65 can be extended. In fact, there is some evidence that baby boomers are working longer than historical norms.[17] When life expectancy was about 62 years in 1935, the retirement age for Social Security was 65. Today, life expectancy in the US is about 79 years, and the retirement age for Social Security has been extended to 67 for those born in 1960 or later. Of course, more broadly, the retirement age is still regarded as 65. A 65-year-

Exhibit 8: Growth in US Real GDP Across Post-WWII Expansions

In this recovery, GDP has grown at half the average pace of prior expansions.

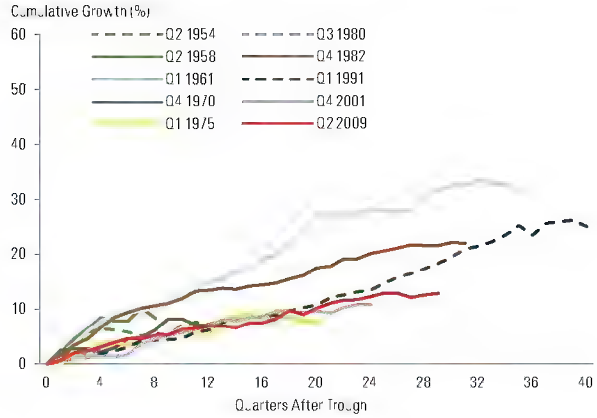


Data as of Q3 2016

Source: Investment Strategy Group, Datastream, National Bureau of Economic Research

Exhibit 9: Growth in US Real GDP per Person in the Labor Force Across Post-WWII Expansions

But when adjusted for labor force trends, this recovery has actually been in line with the average of past expansions.



Data through Q3 2016

Source: Investment Strategy Group, Datastream, National Bureau of Economic Research.

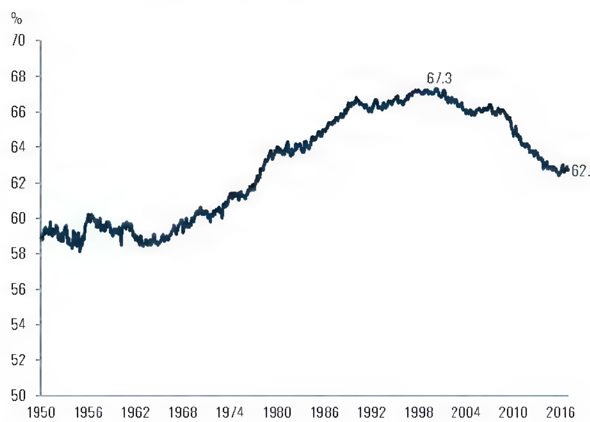
old today, however, is much healthier and more vibrant than a 65-year-old in 1935 and has many more years of active life that can reduce the decline in the growth rate of the working-age population. Furthermore, this cohort is quite productive relative to new entrants into the labor force. Similarly, immigration reform can help offset the decline in working-age population growth. Both factors depend on policy changes, and we do not have any definitive reason to be either optimistic or pessimistic at this time.

The second component of the unfavorable demographics perspective has been the drop in labor force participation, particularly among males. Exhibit 10 shows the rapid growth in labor force participation that occurred as the baby boom generation reached working age and as women joined the labor force in growing numbers after 1950. The labor force participation rate, however, peaked in 2000 and declined by 0.3% a year until it troughed at 62.4% in September 2015. Most of the drop was driven by three factors: significant decline in male labor force participation, retirement of baby boomers and the cyclical decline in demand for labor as a result of the global financial crisis. Some of the cyclical decline reversed as the economic recovery entered its eighth year: the participation rate has risen to 62.7% as of November 2016.

The male labor force participation, however, has been declining, coincidentally also by 0.3%

Exhibit 10: US Labor Force Participation Rate

Both cyclical and structural factors have contributed to a decline in the participation rate from the 2000 peak.



Data through November 2016

Source: Investment Strategy Group, Datastream.

per year—but since 1952. The trend has occurred across all age cohorts. An important driver of this decline has been reduced demand for lower-skilled and less-educated males. The US ranks 32 out of 34 OECD countries in participation of prime-age (between the ages of 24 and 54) males in the labor force, ahead of only Italy and Israel.[18] A Council of Economic Advisers report in June 2016 attributed that low ranking to the fact that the US spends less than other OECD countries on job search assistance and job training, and to the fact that the US has a high rate of incarceration that especially affects lower-skilled men.[19] According to the report, several policy measures can boost prime-age male labor force participation, including

- Increased investment in infrastructure
- Systemic reforms in the criminal justice system and in immigration policies
- Tax reforms
- Investment in education and training

This demographic aspect of secular stagnation is undeniable. In fact, an October 2016 paper by a team at the Federal Reserve Board, "Understanding the New Normal: The Role of Demographics,"[20] shows that the slow pace of economic growth since 1980 and the more pronounced decline in the last decade could be predicted by a model looking at "fertility, labor supply, life expectancy, family composition, and international migration."

Thus, a glass half-full or half-empty perspective does not change the facts on the ground. There is little cause for near-term optimism with respect to the slower growth rate of the labor force. The general consensus is that the US labor force will grow at an average of 0.6% per year in the next several decades, compared with 1.6% from 1950 to 2000.[21]

In the shorter term, infrastructure investment and other policies highlighted above may boost the growth rate in the labor force, but it is hard to imagine growth rates reaching levels that would support President-elect Trump's GDP growth targets of 3–4% on a sustainable basis.[22]

Secular Stagnation: Declining Productivity Growth

Of all the theories put forth to explain the slow pace of this recovery, the one that has garnered the most attention is declining productivity growth.

Of all the theories put forth to explain the slow pace of this recovery, the one that has garnered the most attention is declining productivity growth.

It is also the most important issue in terms of its impact on future trend growth in the US, which in turn has the greatest impact on the long-term rate of earnings growth and equity market returns.

As reviewed in last year's *Outlook*, the techno-optimists and the techno-pessimists are on opposite sides of the debate on declining productivity growth. Both camps have garnered new members; even Federal Reserve Chair Janet Yellen and Vice Chair Stanley Fischer have joined the fray.[23] Most recently, in September 2016, the Brookings Institution hosted a conference with leading experts from both camps to debate the issue.

We should note that debates on productivity are nothing new. They have surfaced during past periods of slow growth, as was the case in the early 1990s. Even some of the players are the same: Robert Gordon was a techno-pessimist in the early 1990s and remains so in the 2010s.[24]

Part of the productivity debate is philosophical. For example, one question pertains to the increased use of free digital services such as Facebook, Google Maps, Waze and Khan Academy. These services yield "consumer surplus," defined as the benefits consumers derive from various activities over and above the price they pay. Should they be included in GDP if they are deemed "non-market" services—those that are provided free of charge or at a fee that is well below 50% of production costs? While social media such as Facebook may (or may not, depending on your perspective) provide a service greater than the advertisement revenues associated with the use of that service, some will argue that if such services do not have an associated market price, they are not part of GDP and therefore should not impact the calculation of productivity levels. As the volume and the impact of these non-market services increase, we believe that the methodology for measuring GDP will evolve to better reflect the value of these services.

Such improvements in measuring GDP are not uncommon. The Bureau of Economic Analysis (BEA) conducts comprehensive revisions of the national income and product accounts every five years, with the goal of reflecting methodological and statistical improvements. Most recently, in 2013, the BEA expanded its definition of fixed investment to include expenditures on research and development and expenditures on artistic originals (e.g., books, music, television

Exhibit 11: Pillars of the Investment Strategy Group's Investment Philosophy

series, movies). Combined with some smaller improvements, these changes added $560 billion to the level of 2012 GDP, a 3.6% increase relative to the prior estimate.[25]

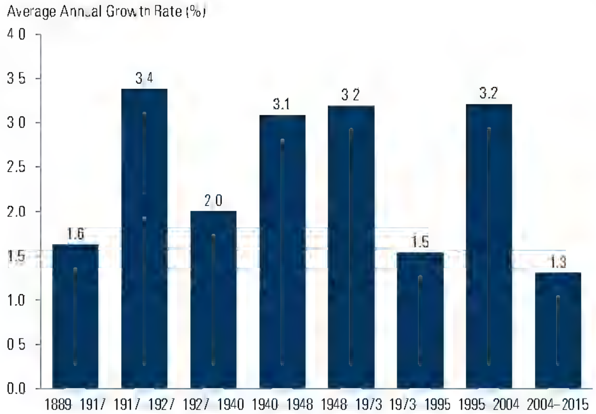
The more immediate—and important—question is whether we have entered a new phase in productivity growth trends that will keep productivity growth at the low levels seen since 2004. We believe that the answer is unknowable with any degree of certainty; historically, productivity forecasts have been notoriously wrong. In *The Age of Diminished Expectations*,[26] first published in 1990, Paul Krugman, Nobel laureate in economics and professor at City University of New York, wrote that the lower pace of productivity growth experienced since the early 1970s would most likely persist in the future. In 1995, however, productivity growth rates increased and were more than double the rate of the prior 12-year period.

Similarly, in 1997, the Congressional Budget Office estimated that the long-run average annual growth rate of labor productivity would be 1.1%. Between 1995 and 2004, the actual average annual growth rate of labor productivity was 3.2%.[27]

As many of our clients know, one of the pillars of our investment philosophy is that history is a useful guide (see Exhibit 11). And history tells us that labor productivity has moved in cycles, with periods of low productivity growth followed by periods of high productivity growth. In a forthcoming and comprehensive paper titled "Seven Reasons to Be Optimistic About Productivity,"[28] Professors Lee Branstetter of Carnegie Mellon University and Daniel Sichel of Wellesley College show that periods of low productivity growth have been followed by periods of high productivity growth since 1889, as seen in Exhibit 12. There is no reason to believe that "this time is different"; as many of you also know, we believe that those words are among the most dangerous and misused words in our industry.

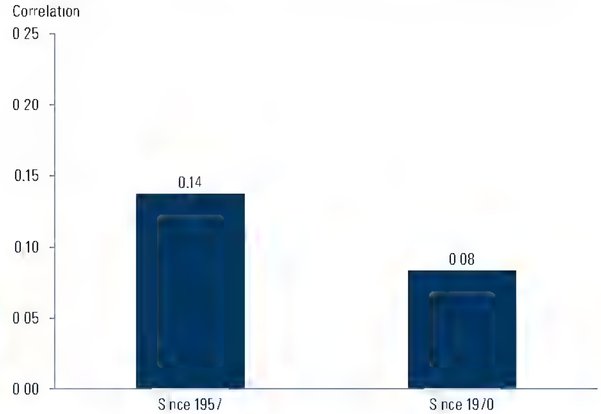
Olivier Blanchard, senior fellow at the Peterson Institute for International Economics and former chief economist at the IMF, has also shown that the current period of low productivity growth does not tell us much about future productivity trends. He states that the correlation of "successive pairs of five-year averages of total factor productivity growth is only 0.20" since the mid-1970s.[29]

Exhibit 12: US Labor Productivity Growth
Periods of slow productivity growth have been followed by periods of stronger productivity gains.



Data through 2015.
Source: Investment Strategy Group, Lee Branstetter and Daniel Sichel, "Seven Reasons to Be Optimistic About Productivity," forthcoming Peterson Institute for International Economics Policy Brief

Exhibit 13: Correlation of 5-Year US Productivity Growth Rates With Following 5 Years' Productivity Growth Rates
Recent productivity trends tell us little about the future.



Data through Q3 2016
Source: Investment Strategy Group, Haver Analytics, Olivier Blanchard, "Three Remarks About the US Treasury Yield Curve," Peterson Institute for International Economics, June 22, 2016

We have examined labor productivity growth rates and, as shown in Exhibit 13, find even lower correlations.

There are two issues to consider. First, if the reported productivity growth rates are accurate, then the exceptionally low rates of the last 10 years account for part of the slow pace of this recovery. However, the current low productivity growth rates do not portend low growth rates going forward. Just as Hansen was proven wrong on his secular stagnation theory and Krugman was proven wrong on his diminished expectations for the US economy (and they were both influenced by their pessimistic view on productivity), those who extrapolate stagnation from the current productivity trends may be proven wrong as well.

Second, as we discuss below, there is also a high probability that real GDP may be mismeasured. If real GDP is mismeasured, it follows that productivity is also mismeasured, thereby invalidating the whole theory of secular stagnation and the decline of the US economy.

Mismeasurement of GDP Statistics

In addition to the productivity debate, there is a debate as to whether we are measuring GDP correctly in the first place. The key argument being made is that while we correctly measure the value of *nominal* GDP based on the value of goods and services, we mismeasure the value of *real* GDP when we convert nominal GDP to real GDP using various price indices, and this therefore understates the pace of this recovery. This debate garnered considerable attention in 2016.

The mismeasurement argument states that the official price indices do not adequately reflect significant improvements in many products, especially in information and communication technology, due to the methodology used by the Bureau of Labor Statistics (BLS) and the BEA. If the price indices do not adequately reflect the greater capacity of an improved product such as a smartphone or a microprocessor, then the price index used to convert nominal GDP to real GDP is too high. And if the price index is too high, then real GDP is understated.

If real GDP is mismeasured, it follows that productivity is also mismeasured, thereby invalidating the whole theory of secular stagnation and the decline of the US economy.

It follows that if real GDP is understated, then what appears to be a slow recovery is not as slow as reported and what appears to be a period of low productivity growth is not as low as reported.

We believe that the evidence favors the mismeasurement argument. At a September 2016 Brookings Institution conference on productivity, Martin Feldstein, Harvard professor and president emeritus of the National Bureau of Economic Research, also concluded that "the official statistics substantially underestimate the real growth of output" after studying the methods used to measure price indices.[30]

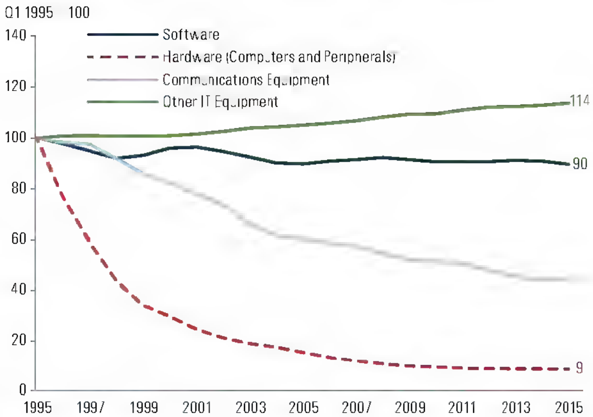
We point to three examples to illustrate the mismeasurement argument. First, our colleagues in Goldman Sachs' Global Investment Research (GIR) have pointed out that the official price indices for information and communication technology show an implausible gap between the price deflation in computers and that in communications equipment, software and other IT equipment (see Exhibit 14). They question how "a given dollar outlay now buys about 10 times as much computer in real terms as 20 years ago, but it only buys about 10% more software."[31]

Our colleagues' conclusion that the official price indices for the information and communication technology sector are overstated matches that of a 2015 study of microprocessor pricing by David Byrne of the Federal Reserve Board, Professor Stephen Oliner of UCLA, and Sichel.[32] The trio created an index showing that prices for microprocessor units used in desktop personal computers declined by an average annual rate of 43% between 2008 and 2013, while the official Producer Price Index (PPI) for these units declined by an average annual rate of 8%—substantially mismeasuring the real value created by this sector of information technology equipment. They point out that because microprocessor units represent about half of US shipments of semiconductors, the rate of innovation in this sector is inevitably mismeasured.

A second example of mismeasurement that we can all readily appreciate involves the quality and product improvements in smartphones. Hal Varian, chief economist at Google and emeritus professor at the University of California at Berkeley, has estimated that globally, people took over 1.6 trillion photos in 2015 using their smartphones, compared with 80 billion in 2000 using cameras and film. The price of each photo taken has gone from 50 cents to zero for smartphone users; 1.6 trillion photos that would have contributed $800 billion to GDP have no impact on GDP in the current framework. GDP has declined since camera and film sales have fallen without a commensurate quality adjustment for smartphones. Of course, fewer photos would have been taken had the smartphone not been developed, but the point still stands.[33]

Exhibit 14: US Technology Price Indices

The implausible gap with hardware suggests IT and communication price indices are likely overstated.



Data through 2015

Note: Other IT Equipment represents medical and non medical equipment and instruments.

Source: Investment Strategy Group, Goldman Sachs Global Investment Research, Bureau of Economic Analysis

Similarly, Varian shows that with the onset of the commercial application of GPS technology, productivity growth in trucking was twice the aggregate US productivity growth, yet when GPS functionality was added to smartphones basically at no additional charge, GDP declined because sales of stand-alone GPS systems fell.[34]

Finally, a third example, also provided by Varian, shows that, because GDP does not fully count the export of intangibles such as software and design, GDP is understated. He shows how an iPhone manufactured by Foxconn in China using parts from 28 countries and exported to France has no direct impact on US GDP. Varian concludes that in a global supply chain, US design and software that is replicated outside the US through offshore manufacturing and exported to a third country never impacts US GDP measures directly, particularly if the profits are not repatriated and redeployed in the US.[35]

Our colleagues in GIR continue to estimate that such mismeasurements lower reported annual real

We believe that productivity in health care is underestimated. Consider IBM's Watson Health, an artificial intelligence system that can read 200 million pages of text in 3 seconds. As of 2015, Watson had amassed 315 billion data points representing health records, lab results, genomic tests and clinical studies. The system processes patients' cases against its ever-growing database and recommends customized treatment options. With such developments, we expect continued improvement in growth of productivity in health care.

"If productivity growth were better measured, particularly in health and other services, the growth rate would look better than is currently reported."

Martin Neil Baily and Nicholas Montalbano, "Why Is U.S. Productivity Growth So Slow? Possible Explanations and Policy Responses," Brookings Institution, September 2016.

GDP growth by about 0.7 percentage point, similar to their estimate reported in our *Outlook* last year.

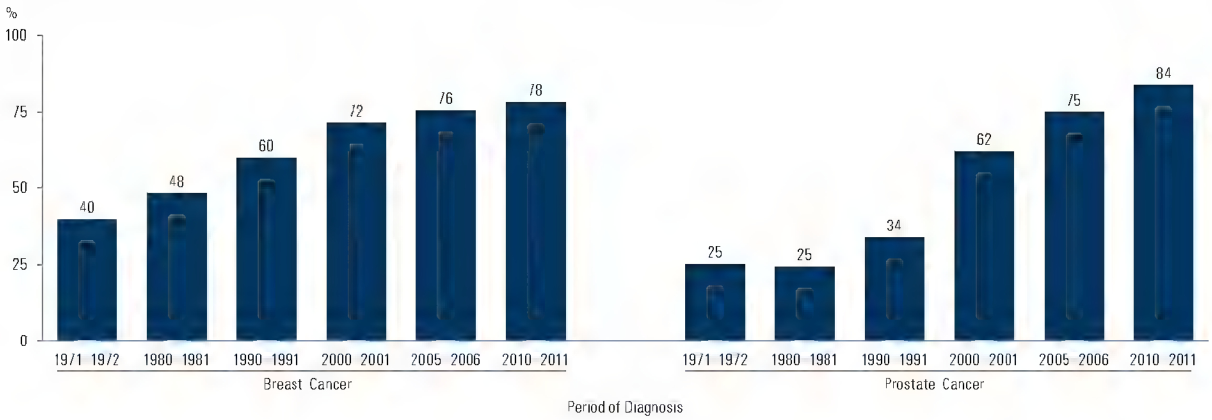
Of course, not all experts believe that there is a mismeasurement problem. Notable among them is Chad Syverson of the University of Chicago, who raises four points in making this case.[36] First, he states that the productivity slowdown has been global in nature and unrelated to countries' consumption or production intensities of information and communication technology. Second, he states that estimates of consumer surplus are too small relative to his estimates of lost GDP due to slower productivity growth. Third, he argues that if such mismeasurement existed, the growth rate in the information and communication technology sector would be a multiple of its stated growth rate. Finally, while he acknowledges that gross domestic income has been higher than GDP since 2004 and the gap might reflect the higher wages of workers who are producing non-market digital services, he does not believe that this difference is evidence of mismeasured GDP because the trend started earlier than the slowdown in productivity growth.

A somewhat similar line of reasoning has been presented by Byrne, John Fernald of the Federal Reserve Bank of San Francisco and Marshall Reinsdorf of the IMF in a paper titled "Does the United States Have a Productivity Slowdown or a Measurement Problem?"[37] While they agree that productivity growth has been mismeasured in the past, they argue that the mismeasurement has been negligible in the 2004–15 period partly because computer hardware, for which mismeasurement was once a factor, now makes up a smaller part of GDP. Therefore, the impact is less in the 2004–15 period than it was in the 1995–2004 period when productivity growth was much higher. They also state that free digital products not only are non-market and should not be counted in GDP, but also are not sizable enough to account for the level of decline in productivity growth rates.

Experts' opinions on mismeasurement continue to evolve. In fact, in a subsequent publication co-authored with Carol Corrado of the Conference Board, Byrne found a significantly higher level of software price mismeasurement than assumed in his prior paper.[38] He has also co-authored a study on prices and depreciation for computer tablets such as iPads, proving that quality-adjusted price indices for tablets have fallen much faster than the broader price indices for computers and peripheral equipment.[39]

Exhibit 15: 10-Year Net Survival Rate of Breast and Prostate Cancer Patients

Improved cancer survival rates reflect significant gains in science and technology.



Data as of November 2014

Note: Based on cancer statistics for the UK. Ten year survival for 2005 2006 and 2010 2011 is predicted using an excess hazard statistical model

Source: Investment Strategy Group, Cancer Research UK.

We conclude that there is undoubtedly some degree of mismeasurement. We know that information and communication technology has evolved significantly and innovation is occurring at a rapid pace. We know that the BEA reviews its statistical methodologies every five years and revises them as needed, recognizing that measurement methodologies have to evolve with the evolution of the US economy. We also know that we as consumers carry incredibly powerful digital equipment in the palms of our hands and pay less for it than we paid for equipment with lesser functionalities not so long ago. Common sense supplemented by extensive research by the experts on productivity and mismeasurement reinforces our view of a glass half-full when it comes to innovation and productivity in the US.

We realize this debate will be resolved only with the benefit of hindsight, in the same way that realized productivity growth exceeded the prognostications of Hansen in the late 1930s and Krugman in the early 1990s. Our clients will be inundated with conflicting views from headlines in the media and books with captivating titles. Separating fact from fiction remains challenging. Recently, an article in the *Wall Street Journal* highlighted "dwindling gains in science, technology and medicine."[40] The article suggested that improvements in breast cancer mortality have slowed since 1985. Exhibit 15 shows the 10-year net survival rate for breast cancer and prostate cancer since 1971. Maybe it is only a matter of perspective, but, to us, a 78% 10-year survival rate for breast cancer and an 84% 10-year survival rate for prostate cancer represent significant improvements over the rates of the early 1980s, 48% and 25%, respectively, and are even more significant for those whose lives have been saved.

We realize this debate will be resolved only with the benefit of hindsight, in the same way that realized productivity growth exceeded the prognostications of Hansen in the late 1930s and Krugman in the early 1990s.

Probably one of the more amusing instances of conflicting perspectives can be seen in the 2016 publication of two books with diametrically opposed messages: *Progress: Ten Reasons to Look Forward to the Future*[41] and *The Innovation Illusion: How So Little Is Created by So Many Working So Hard*,[42] both written by authors born in Sweden in the early 1970s. Our views, of course, are more aligned with the first book. The second book, however, raises important concerns about excessive regulation and how such regulation is "killing frontier innovation." Indeed, some have put forth the prevalence of poor government policies as one of the theories to explain the slow pace of this recovery.

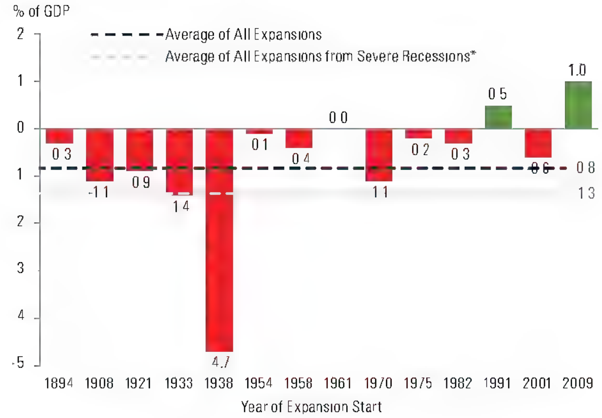
Poor Policies in Washington

One of the theories that has been getting more traction recently attributes the slower recovery to poor policies enacted in Washington. In a June 2016 article about the US economy, Gregory Mankiw, professor at Harvard University and former chair of the Council of Economic Advisers for President George W. Bush, highlighted "policy missteps,"[43] including misguided fiscal policy, as a possible contributor to the slow pace of growth since the global financial crisis.

One unusual feature of this recovery has, in fact, been a contractionary fiscal policy. We have derived an approximate historical measure of fiscal policy changes by estimating changes in the cyclically adjusted federal budget as a percentage of GDP. We note that, by this measure, as far back as 1890, fiscal policy has been expansionary in all but three recoveries following a recession—with the fiscal policy in the current recovery being the most contractionary, as shown in Exhibit 16. In this recovery, the budget deficit as a share of GDP was reduced by 1.0% a year, compared to an average widening of the budget deficit by 1.3% a year in all other recoveries after severe recessions. The average increase in the size of the budget deficit for all recoveries, including less severe ones, is -0.8%. A swing of 1.8 percentage points would have had a material impact on the pace of this recovery.

Exhibit 16: Change in US Budget Balance Following Recessions

Fiscal policy has been an unusually large headwind to growth in this recovery.



Data through 2015

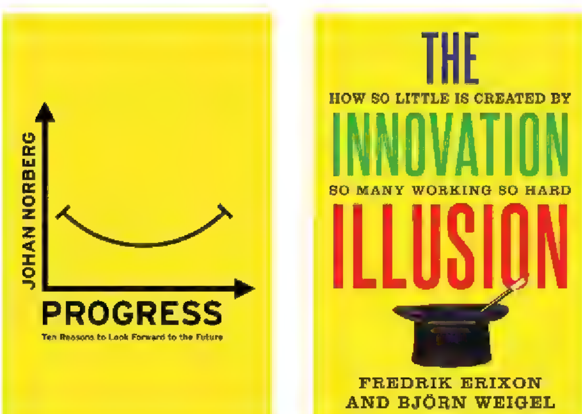
Note: Shows the change in the cyclically adjusted budget balance as a % of GDP for each episode

Source: Investment Strategy Group, Datastream, Global Financial Data

* We define "severe" recessions according to those identified by Carmen Reinhart and Kenneth Rogoff in "Recovery from Financial Crises: Evidence from 100 Episodes" (2014), as well as the 1937 recession (a continuation of the 1929 recession) and the two most severe post WWII recessions (excluding the 2007 recession)

Professor Alan Blinder of Princeton University and former vice chair at the Federal Reserve echoed the sentiment by stating that partisan politics have prevented progress in dealing with important economic issues.[44] Shambaugh has outlined various measures, such as infrastructure spending proposed by President Obama in his fiscal year 2017 budget, that would positively impact productivity and labor force participation.[45] The budget was not approved. Summers has similarly called for expansionary fiscal policy through infrastructure spending, but such policies have not been pursued.[46]

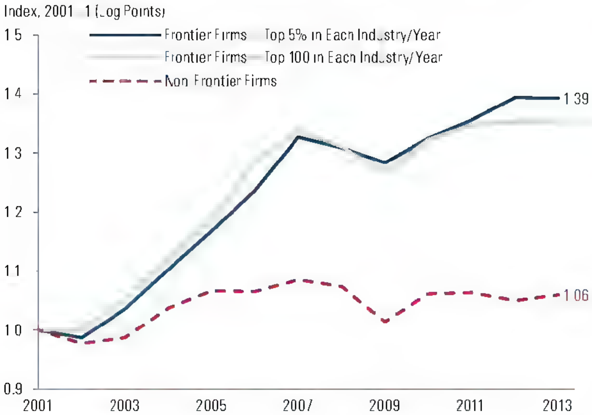
Increased regulation has also been blamed for some of the slow pace of this recovery. A September 2016 working paper by Martin Neil Baily and Nicholas Montalbano of the Brookings Institution on the slow growth of US productivity shows that while productivity in the most productive firms is growing rapidly, their best practices are not spreading to the rest of the players in a given industry.[47] Exhibit 17 shows the widening gap between the productivity growth rates of firms at the frontier of innovation and



Two books published in 2016 and written by Swedes born in the early 1970s highlight the conflicting perspectives on productivity.
Johan Norberg's *Progress* cover used with permission of Johan Norberg and Oneworld Publications. All rights reserved.
Fredrik Erixon and Bjorn Weigel's *The Innovation Illusion: How So Little Is Created by So Many Working So Hard* cover used with permission of Fredrik Erixon, Bjorn Weigel and Yale University Press. All rights reserved.

Exhibit 17: Labor Productivity Growth for Different Groups of Firms

Rapid productivity growth of firms at the frontier of innovation is not spreading to the rest of the industry.



Data through 2013

Note: Average across 24 OECD countries and 22 manufacturing and 27 market services industries.

Source: Investment Strategy Group, OECD preliminary results based on Dan Andrews, Chiara Criscuolo and Peter N. Gal, "Mind the Gap: Productivity Divergence Between the Global Frontier and Laggard Firms," OECD Productivity Working Papers, forthcoming.

Exhibit 18: US Financial Conditions Index

Conditions tightened significantly due to global shocks emanating from the Eurozone, oil prices and China.

Data through year-end 2016

Source: Investment Strategy Group, Goldman Sachs Global Investment Research.

the rest of the industry. Baily and Montalbano suggest that increased regulation after the crisis may be partially responsible for the widening gap between frontier firms and the rest of the industry, which lowers overall productivity growth rates across the economy and hence lowers the pace of economic growth.

Our colleagues in GIR think that lower capital investment accounts for the lack of diffusion of new technologies from more productive firms to less productive firms.[48] Here, again, it is likely that a more favorable business environment could have boosted capital expenditures and increased overall productivity levels.

We conclude that it is reasonable to assign some of the weakness in this recovery to less effective fiscal and regulatory policies out of Washington rather than to structural shortcomings in the US economy.

A Steady Onslaught of External Shocks

A sixth theory posits that numerous external shocks explain the slow pace of this recovery. Just as the US economy was recovering from the trough of 2009, the Eurozone sovereign debt crisis jolted global financial markets. The Eurozone was a source of uncertainty and financial market volatility beyond the initial shock in 2010 as the crisis spread from Greece to Spain and Italy.

The Eurozone crisis was followed by a series of what the Brookings Institution has called the "fiscal fights of the Obama administration."[49] The first fiscal fight resulted in the Standard and Poor's (S&P) downgrade of US Treasury debt in August 2011. The equity markets, as measured by the S&P 500 Index, dropped about 19% between April and October of 2011.

Taken together, the Eurozone sovereign debt crisis and the first of the fiscal fights tightened US financial conditions[50] by 142 basis points (see Exhibit 18). GIR estimates that a 100 basis point tightening of financial conditions is equivalent to a federal funds hike of 150 basis points and a drag on GDP growth of about one percentage point.

The drop in oil prices from a post-crisis high of $107 per barrel for West Texas Intermediate in June 2014 to a trough of $26 per barrel in February 2016 also provided a shock to the economy. Employment and capital expenditures in the oil and gas sector dropped by 29% and 67%, respectively, from peak levels seen in 2014. The sector's par-weighted default rate excluding distressed exchanges reached 14.6% and including such exchanges 19.8%, in October 2016.[51]

Broad-based fear of policy mistakes in China and unexpected depreciation of the renminbi were

Exhibit 19: US Equity Volatility

Spikes in equity volatility have corresponded with major global shocks.

Data through December 31, 2016.
Note: The red arrows show the S&P 500's (SPX's) peak to trough declines around each episode
Source: Investment Strategy Group, Bloomberg

another shock to the financial markets, resulting in the tightening of financial conditions in the US in mid-2015 and early 2016, with US equities dropping by more than 10% in both periods.

Exhibit 19 provides a time line of shocks, which, in all likelihood, dampened the pace of the US recovery.

In Summary

As we review the six theories that could account for the notably slow pace of this recovery, we believe that all have some merit. Recovering from the hangover from the deepest recession since the Great Depression took a little longer. Demographics have not been favorable. Productivity growth appears lower, but that fact does not portend weak productivity growth in the future. Productivity growth is also probably not as weak as it appears, given some mismeasurement of GDP. Fiscal and regulatory policies hampered the economic recovery. And the global backdrop provided a steady source of shocks that slowed growth in the US.

That said, we feel confident that the US continues to progress on a solid footing, that the recovery is intact and, as we argued in our 2016 *Outlook: The Last Innings*, that this recovery and bull market have another inning or two left to run. The glass is still half-full.

We now turn to our expected returns for the next one and five years.

One- and Five-Year Expected Total Returns

The Investment Strategy Group began producing one- and five-year annualized expected total returns for major asset classes in our 2013 *Outlook*. Since then, our key message has been to stay invested in US equities despite the low returns we have expected for the asset class. Our recommendation has been driven by a low probability of recession, a reasonable probability of upside for equities, zero expected returns for cash and negative expected returns for bonds.

We have presented these one- and five-year annualized expected returns to: a) provide more context for our investment recommendations; b) encourage our clients to have a longer investment horizon; and c) increase the odds that our clients have greater staying power to withstand market downdrafts.

Fulfilling these three priorities is even more imperative moving forward. Our return expectations are lower than in prior years after several years of outsized returns in equities and high yield, and, at the same time, we are confronted with tremendous economic policy and geopolitical uncertainty. We have been faced with such uncertainty in the past, but today (in contrast with periods such as 2008), we no longer have the wind at our back with the benefit of cheap equity and high yield valuations. In 2008, we believed that attractive valuations would eventually lead to high prospective returns in US equities and high yield, notwithstanding short-term uncertainty. At the dawn of 2017, we face uncertainty, but US equities and high yield are expensive, and valuations no longer provide much margin of safety and protection from the downside. Similarly, other asset classes such as fixed income provide negligible returns but come with downside risk, e.g., if the incoming Trump administration's fiscal policy is more stimulative than we expect or if the Federal Reserve raises interest rates at a more rapid pace than we expect.

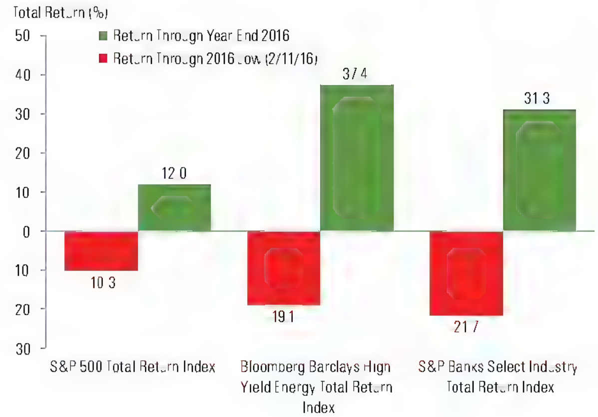
As we prepared our one- and five-year annualized expected returns for this *Outlook* and finalized our investment recommendations for 2017, we were struck by two observations.

First, the general recommendations and volatility warnings in our *Outlook* publications over the last several years have been similar, have been directionally correct and have generally added value to our clients' portfolios. We have continuously recommended that clients stay invested in their strategic US equity allocation. We have also recommended maintaining some tactical tilts such as an allocation to high yield. Yet we have warned clients to be prepared for bouts of volatility. Last year, our exact message to clients with respect to volatility was that "markets will be volatile, so an asset class that performs well in the first half of the year may perform particularly poorly in the latter part of the year; however, investors—unlike traders—should not try to time such short-term moves."[52] It is very important that clients heed this warning—not just for 2017 but for their entire investing lives.

Exhibit 20 illustrates the point. We have compared the performance of some of the best-performing asset classes and sectors for the year with the performance of those assets at their worst

Exhibit 20: Returns in 2016

Some of the best-performing assets in 2016 experienced significant declines before recovering.



Data through December 31, 2016

Source: Investment Strategy Group, Bloomberg

point of the year. Energy high yield provides an excellent example. On February 11, 2016, the US energy high yield sector (as measured by the Bloomberg Barclays High Yield Energy Total Return Index) was down 19.1% year to date—one of the worst-performing sub-asset classes at that time. Similarly, the US bank sector (as measured by the S&P Banks Select Industry Total Return Index) was down 21.7% over the same period. We had in place tactical tilts in both sectors. As oil prices recovered, high yield energy securities rallied, with the benchmark index ending the year up 37.4%—a wild swing of 56 percentage points from low to high. US banks also rallied initially in response to prospects of higher interest rates and later in anticipation of less regulation under a Trump administration. The bank sector index rallied to end the year 31.3% higher than at the start—an equally wild swing of 53 percentage points from low to high.

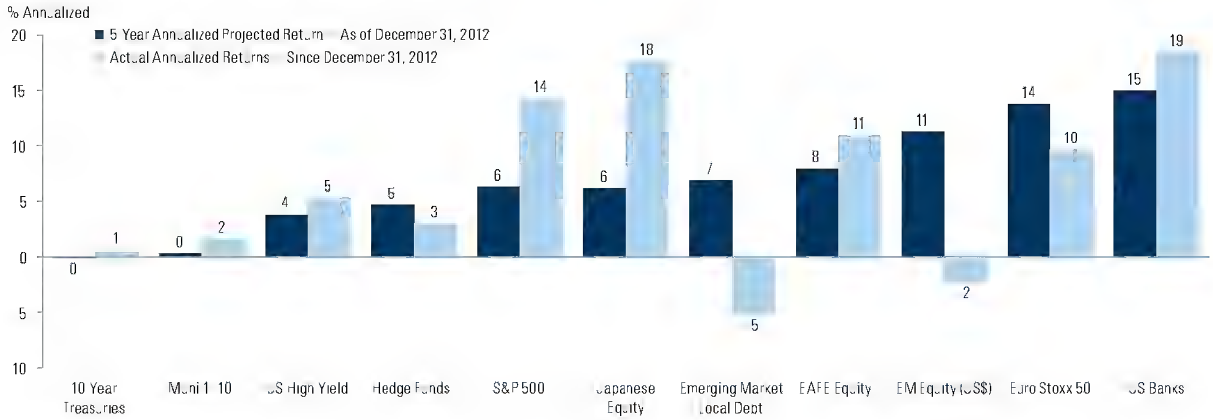
We have to be realistic: we cannot anticipate such market swings on a consistent basis. Therefore, it is imperative that clients maintain a long investment horizon, be tactical when investment opportunities present themselves—usually at times of extreme stress in the financial markets—and otherwise stay invested in the appropriate strategic asset allocation.

Our second observation was that our five-year annualized return forecasts

The general recommendations and volatility warnings in our *Outlook* publications over the last several years have been similar, have been directionally correct and have generally added value to our clients' portfolios.

Exhibit 21: Historical Total Returns vs. ISG's 2013 *Outlook* 5-Year Prospective Total Returns

Our 5-year return forecasts have so far been relatively accurate for the bulk of assets in our diversified model portfolio, but we have not been right across the board.



Data through December 31, 2016

Note: Rounded to the nearest whole integer

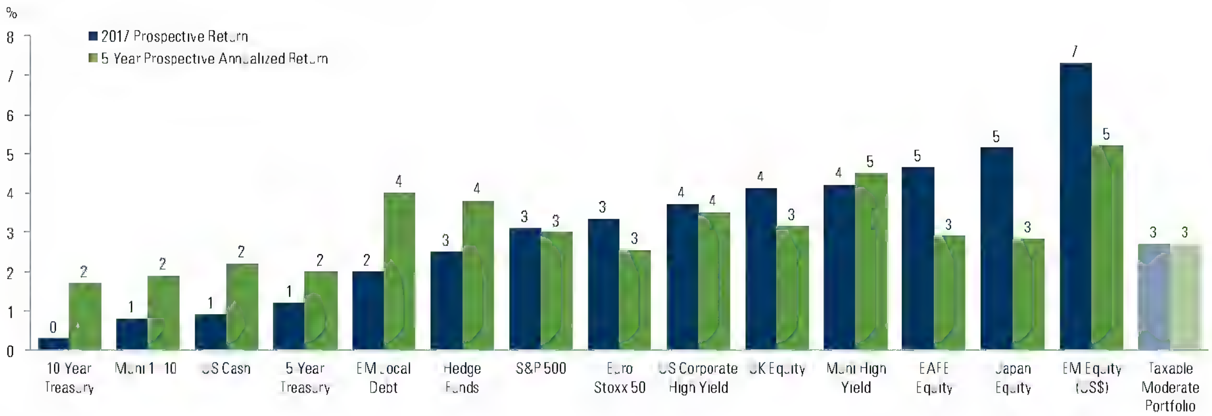
Source: Investment Strategy Group, Datastream

have also been relatively accurate for the bulk of assets in our diversified model portfolio. In Exhibit 21, we compare the five-year annualized expected total returns published in our 2013 *Outlook* to what transpired over the last four years. Our forecasts for 1) fixed income returns including both investment grade and high yield, 2) hedge fund returns, and 3) EAFE equity returns were close to the mark. Directionally, we were also right about US equity returns but off in terms of magnitude. We were also struck by how close our US bank sector return forecasts were to the realized returns—approximately a quarter of which were realized after the November election. This observation has reinforced our belief in one of the pillars of our investment philosophy: having the appropriate horizon for various strategies is critical to long-term success.

Not surprisingly, we have not been right across the board. We underestimated Japanese equity returns by 11.4 percentage points on an annualized basis and we overestimated emerging market equity and emerging market local debt returns, by sizable 13.5 and 12.1 percentage points, respectively, on an annualized basis. Japanese equities realized an annualized 18% return and EM equity and local debt realized negative returns, at -2% and -5% annualized, respectively. While our forecasts were off the mark, our emerging market investment recommendations were on the mark. In mid-2013, we recommended clients reduce their strategic allocation to emerging market assets. Even though we had forecast expected returns that were nearly double those of US equities, we became

Exhibit 22: ISG Prospective Total Returns

Expected returns over the next one and five years are below historical realized averages.



Data as of December 31, 2016

Note: For informational purposes only. There can be no assurance the forecasts will be achieved.

Source: Investment Strategy Group. See endnote 53 for list of indices used.

increasingly concerned about the structural fault lines of emerging market countries. These fault lines were discussed in detail in our December 2013 *Insight, Emerging Markets: As the Tide Goes Out.*

We continue to recommend a zero allocation to emerging market debt (dollar-denominated and local currency debt) and a 2% allocation to emerging market equities in a moderate-risk diversified portfolio. We highlight emerging market assets because, yet again, our base case returns, especially for emerging market equities, appear compelling, but we are not recommending a tactical allocation to this asset class. As we discuss below in our review of the risks to our economic and financial market outlook, China is our biggest source of concern in 2017 and for the next few years. Emerging markets are the countries that would be most negatively impacted by any shocks emanating from China.

China is our biggest source of concern in 2017 and for the next few years. Emerging markets are the countries that would be most negatively impacted by any shocks emanating from China.

Our 2017 expected returns, shown in Exhibit 22, are the lowest returns we have published since the global financial crisis. Not a single broad asset class is expected to have double-digit returns. Cash has an expected return of 1%. Expected returns for intermediate investment grade fixed income securities range between 0% and 1% depending on maturities, an expectation driven by our view of rising rates as the Federal Reserve hikes the federal funds rate two or three times in 2017. US equities, which are the most expensive of global equities, have an expected return of about 3%, and we expect slightly higher returns in other developed market equities. Hedge funds, an asset class for which we have had modest single-digit return expectations since our 2013 *Outlook* (as shown in Exhibit 21), should continue to have modest returns; we expect a 3% return before taxes, compared to a 5% annualized return expectation in 2013 and an annualized return of 3% over the last four years.

In aggregate, a moderate-risk diversified portfolio for taxable clients is expected to have a return of about 3%. We must note that our return expectations are not meant to promote a specific investment, and that their basis on current capital market assumptions implies they will likely change over the course of the year.

At this point, our clients may well be asking why they should remain invested in a diversified portfolio with such paltry return expectations, given all the economic policy and geopolitical uncertainty mentioned earlier. We believe there are three compelling arguments.

First, there is potential for upside surprises in 2017:

- Saudi Arabia and the rest of the oil producers may stick to the announced oil production cuts, thereby boosting energy sector earnings.
- A Trump administration fiscal stimulus could boost growth by more than we expect.
- Corporate tax cuts could increase corporate sector profitability.
- A possible tax holiday could encourage US multinational corporations to repatriate some of their earnings and deploy them for stock buybacks.

We assign a 25% probability of such upside surprises relative to a 60% probability of our base case scenario and a 15% downside probability. (Please see Section III, 2017 Financial Markets Outlook, for a more detailed discussion.)

Second, we recommend staying invested because we believe that the probability of a recession in the US is about 15% over the next year. There is an 85% chance that the economy will grow at a rate of about 2% or higher. Absent a recession, equities are more likely to generate positive returns. Obviously, the probability of a recession is substantially higher over the next five years, and our five-year annualized expected returns incorporate a 70–80% probability of a recession.

Third, and most importantly, we do not see better investment alternatives. Cash will provide negligible returns with no upside, and we expect investment grade bonds to have equally negligible returns with little upside, if any. We also expect hedge funds, in aggregate, to lag equities on an after-tax basis.

We expect similarly modest returns from our tactical tilts.

As equities, high yield and the dollar have rallied over the course of the year, we have continued to reduce the overall risk level of our tactical tilts.

Our Tactical Tilts

As equities, high yield and the dollar have rallied over the course of the year, we have continued to reduce the overall risk level of our tactical tilts. At the beginning of 2016, we had already reduced our exposures by 50% relative to peak levels in 2015, as measured by value at risk. By the end of 2016, we had reduced exposures further, based on our investment discipline of averaging in and out of our tactical tilts.

Underweight Fixed Income: We continue to recommend underweighting US fixed income assets as the Federal Reserve slowly but steadily raises the federal funds rate. We expect the 10-year Treasury bond yield to range between 2.5% and 3.0%. As a result, we forecast a 1% return across short- and intermediate-maturity fixed income assets and a near zero return for the 10-year Treasury. Longer maturities are expected to have negative returns. We also recommend underweighting fixed income assets to fund tactical tilts given their higher expected returns.

Overweight to High Yield: While we reduced our tactical allocation to high yield assets by half throughout 2016, we continue to recommend an allocation to general high yield bonds, high yield energy bonds and high yield bank loans. The incremental yield in such securities, adjusted for defaults, is still compelling, with expected returns of about 4% for high yield bonds and high yield energy bonds and about 5% for bank loans. We forecast that crude oil prices will stay in the $45–65 range, partly owing to some production discipline by Saudi Arabia as the largest swing producer. Our bank loan tilt is further supported by a rising rate environment; the coupon rate on bank loans will be reset higher as LIBOR rises.[54]

Modest Overweight to US Banks: We maintain a modest overweight to US banks despite their 31% return in 2016. Banks will benefit from rising rates, especially if the increase is greater in the short end of the yield curve. About 60% of changes in the net interest margin of banks is typically driven by changes in short rates since they are used for setting the banks' prime lending rate. Banks will also likely benefit from a more favorable regulatory environment under a Trump administration. We forecast a return of about 7%.

Overweight US Energy Infrastructure Master Limited Partnerships (MLPs): We initiated a direct allocation to energy MLPs in late January 2016 and have maintained that tilt. Given our assumptions about oil prices, we believe that the cash distributions from MLPs are generally secure and provide a yield to investors of just over 7%. In the absence of any valuation changes, the yield translates into a high single-digit tax-advantaged return. Any growth in cash flow distribution or improvements in valuation relative to the S&P 500 would provide some upside.

Overweight Spanish Equities: We maintain an overweight to Spanish equities on a currency-hedged basis. This tactical tilt was introduced in August 2013, and we have adjusted the size of the overweight about a dozen times since. Spanish equities offer some of the cheapest valuations across the developed markets, attractive dividend yields, expected earnings growth of 4.6%, aided by healthy domestic growth, and a particularly well-capitalized[55] banking sector that has a lower nonperforming loan ratio than the Eurozone bank average. Furthermore, Spain is unlikely to face the same political uncertainty as Germany, France and Italy in 2017. We expect high single-digit returns for Spanish equities.

Short Five-Year German Bunds: We recommend a short position in five-year German bunds as the ECB embarks upon the process of shifting its monetary policy. After the December 2016 meeting, the ECB announced that it would reduce its monthly purchases of bonds from €80 billion to €60 billion starting in March 2017 and continuing through December 2017. We expect the ECB to end all purchases sometime in 2018, barring any shocks. As a result, we think interest rates for Eurozone sovereign debt will rise gradually over the course of the year, which in the case of German bunds means they will become less negative. We expect a modest 2% return from this tilt.

Short Chinese Renminbi: We have increased our bearish position on the Chinese renminbi over the course of 2016. China is under pressure from multiple sides: the need for loose monetary policy to achieve the leadership's 6.5% target GDP growth rate, 32 months of capital outflows that have accelerated in late 2016, a strong dollar and an incoming Trump administration that will likely pursue a US-centric policy toward China. Risks are exacerbated by the leadership's lack of experience in handling financial market volatility, as evidenced by China's policy response to its equity market collapse in June 2015 and its approach to shifting the currency regime to a more flexible one in August 2015 and January 2016. We expect the currency to depreciate about 7% in 2017; since 4% is already priced in the forward markets, we expect a return of about 3%. There is considerable scope for further upside from this tilt if China abandons its current control of the currency, a move that could lead to depreciation in the renminbi of about 20%.

Our tactical tilts are based on above-trend growth of 2.3% in the US, global growth of 2.9%, generally favorable monetary policy and more stimulative fiscal policy across developed and emerging market countries. We expect returns to be muted across asset classes, resulting in modest returns in a diversified portfolio with a modest enhancement from tactical tilts. Of course, our views are not without risks. As we discuss below, some are low-probability risks with the potential for high impact while others are high-probability risks with low impact potential.

The Risks to Our Outlook

When we think about the risks to our economic and financial market outlook, we are reminded of the words of French writer Jean-Baptiste Alphonse Karr: *Plus ça change, plus c'est la même chose*—the more things change, the more they stay the same. This year's list of risks overlaps with those of the last several years. As far back as 2011, investors have worried about a hard landing in China. From the inception of the European sovereign debt crisis in 2010 through the Brexit vote in 2016, the potential breakup of the Eurozone has been a source of concern. As soon as the Federal Reserve raised the federal funds rate in December 2015, investors worried about tightening policy causing a recession. Cybersecurity and terrorism are constant threats. And geopolitical risks have grown over time. This year, we are adding trade policy uncertainty and US-China geopolitical relations as new risks.

As we said in our 2013 *Outlook*, there is no shortage of concerns as markets climb a wall of worry. In our view, there are eight risks that

We do not believe this tightening cycle will lead to a US recession in 2017.

could derail the last innings of this recovery and bull market. The first three are low-probability risks in our view, the next three risks have a high probability of occurring but their impact is uncertain and the last two are high-probability and high-impact risks beginning as early as 2017.

Low-Probability but High-Impact Risks:

- The pace of Federal Reserve tightening is disruptive and financial markets react negatively.
- The economy slips into recession.
- Populist parties in the Eurozone gain greater influence.

High-Probability but Uncertain-Impact Risks:

- Geopolitical hot spots get hotter.
- Terrorism escalates.
- Cyberattacks continue.

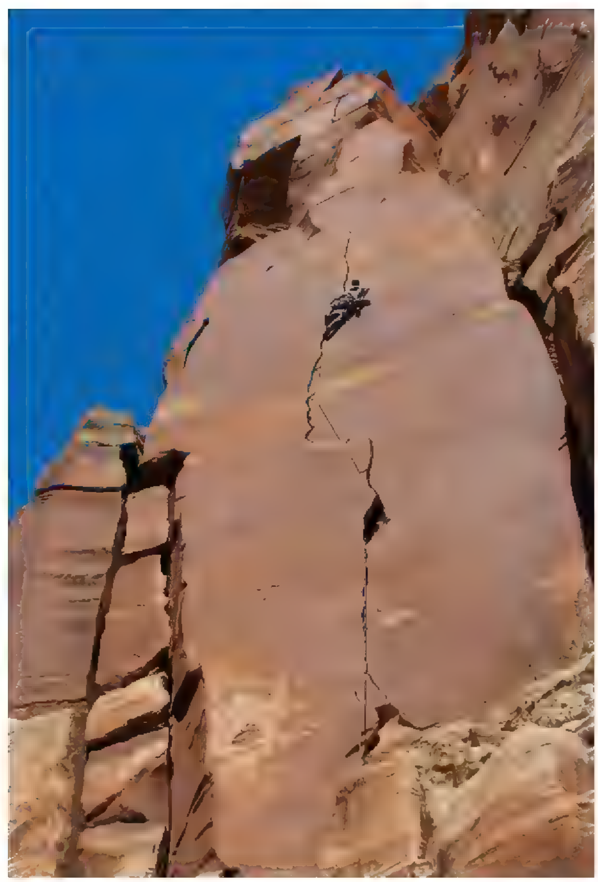
High-Probability and High-Impact Risks:

- China submerges under its debt burden and capital outflows.
- US-China relations deteriorate under the Trump administration.

Pace of Federal Reserve Tightening

Unlike the December 2015 interest rate hike that prompted a vocal response from naysayers but had limited impact on the bond market, the December 2016 hike has elicited a muted response from market commentators but has had a larger impact on the bond market. The underlying strength of the labor market and the steady improvement in the economy have led to a change of sentiment toward more interest rate hikes, which are clearly in the offing. Interest rates have increased from a low of 1.3% for the 10-year Treasury in July 2016 to 2.4% by year-end. While this increase in interest rates would ordinarily tighten financial conditions, it has been partially offset by stronger equity markets and tighter corporate bond spreads. In fact, financial conditions were looser at the end of the year than they were at the beginning of 2016 despite expectations of a slow but steady increase in the federal funds rate.

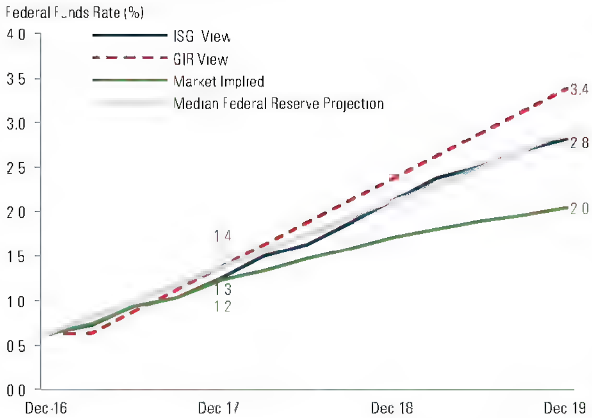
We share the market view that the pace of monetary policy tightening will accelerate but remain benign. As shown in Exhibit 23, the difference between the Federal Reserve dots, the view implied by the bond market, the forecast by our colleagues in GIR and our view is negligible. The bond market has priced two hikes, the Federal Reserve and GIR expect three hikes, and we think two or three hikes are equally likely in 2017. We assume that the Federal Reserve will slow down the pace of interest



There is no shortage of concerns as markets climb a wall of worry.

Exhibit 23: Policy Rate Path Projections

We expect the pace of monetary policy tightening to accelerate but remain benign.



Data as of December 31, 2016

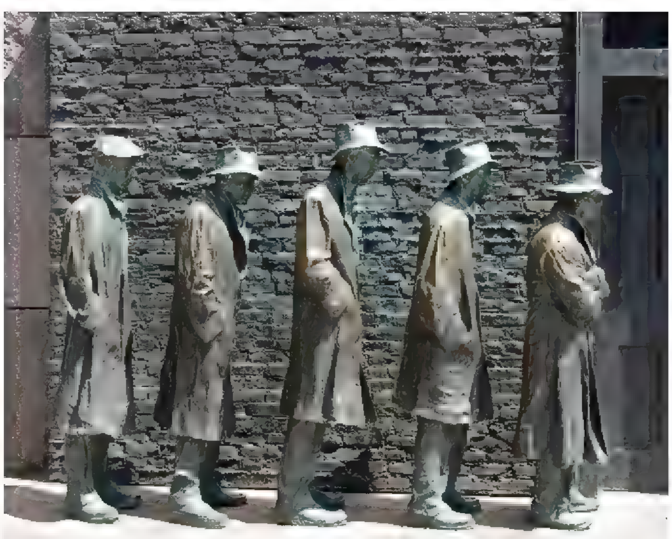
Note: For informational purposes only. There can be no assurance that the forecasts will be achieved.

Source: Investment Strategy Group, Bloomberg, Goldman Sachs Global Investment Research, Federal Reserve

rate hikes should the economy weaken, and will pick up the pace later in 2017 or 2018 if the fiscal package under the Trump administration is bigger than we expect (see Section II, 2017 Global Economic Outlook, for a more detailed discussion).

Irrespective of the realized pace, this tightening cycle will not result in a US recession in 2017, in our view.

Recession Is Highly Unlikely



"Depression Bread Line," Bronze, 1991, George Segal at the Franklin D. Roosevelt Memorial. Art © The George and Helen Segal Foundation/Licensed by VAGA, New York, NY.

Low Expectations of a US Recession

Recessions in the US have been triggered by Federal Reserve tightening of monetary policy; by economic imbalances such as the bursting of the dot-com and housing bubbles in 2000 and 2008, respectively; or by external shocks such as the Arab oil embargo in 1973. The first two triggers are unlikely to occur in 2017, and the third, a shock, is not something that we can typically anticipate. However, we do think that China will be a source of downside risk sometime over the next three years.

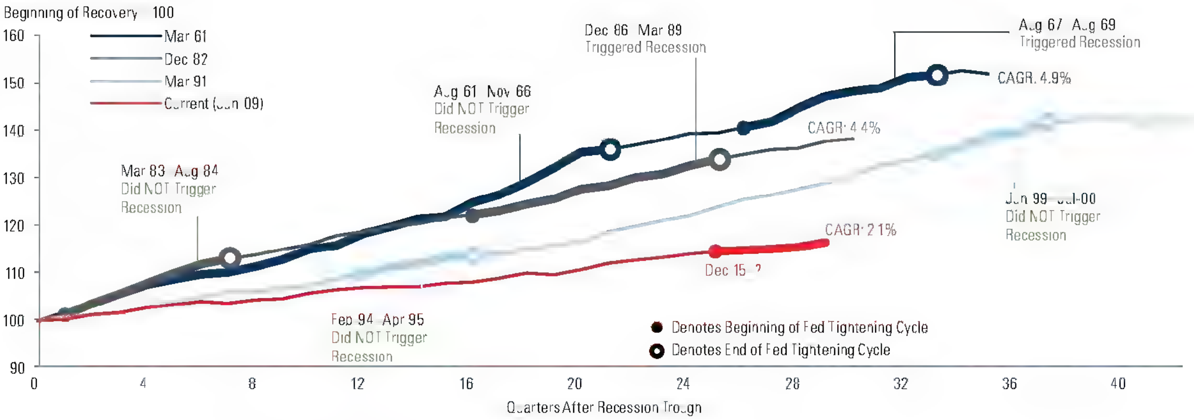
First, as we mentioned in last year's *Outlook*, there have been five tightening cycles in the post-WWII period that have not triggered a recession. Four of those cycles occurred during the three longest recoveries, as shown in Exhibit 24. Those cycles have been characterized by an early start to the tightening cycle, a slow pace relative to historical averages (220 basis points per year for nonrecessionary tightening and 330 basis points per year in recessionary cycles), low core inflation and slack in the labor market. This cycle shares those characteristics: the tightening cycle started in 2015, the pace has been 25 basis points per year, the core personal consumption expenditures (PCE) index—the Federal Reserve's preferred benchmark for inflation—is at 1.6% year over year as of November 2016, and our colleagues in GIR estimate that the labor market still has about 0.3% slack.

Second, the US economy does not suffer from any imbalances in which one sector of the economy has become the sole driver of growth or equity market returns. Before the global financial crisis, residential investment as a percentage of GDP had peaked at 6.7% in 2005, compared to a long-term average of 4.7%, and the credit-to-GDP gap as a measure of nonfinancial sector leverage had peaked at 12.4% in 2007 compared to a long-term average of -1%, leading to meaningful imbalances. Similarly, in 2000, technology and telecommunication sector valuations were more than three standard deviations higher than the average of other sectors. Such imbalances do not exist in the US at this time.

Third, while we cannot anticipate an external shock—otherwise it would not be a shock—we do not see imbalances in other large economies except in China.

Exhibit 24: US Real GDP During the Longest Post-WWII Recoveries

Four of the five tightening cycles that did not trigger a recession occurred during the three longest recoveries in the post-WWII period.



Data as of December 2016

Source: Investment Strategy Group, Bloomberg, National Bureau of Economic Research.

In our 2016 *Outlook* and our 2016 *Insight* report, *Walled In: China's Great Dilemma*, we stated that China was unlikely to have a hard landing over the next two years (i.e., 2016 and 2017). We believe the view still holds. We do not expect a hard landing in China that would destabilize the US economy in 2017, but the risks grow significantly in 2018 and 2019. As we discuss below, China may nevertheless represent a geopolitical risk in 2017.

Historically, since WWII, the odds of a recession occurring over a 12-month period have been 18%. Our composite recession model, incorporating end-of-year financial and economic data, estimates the probability of a recession in 2017 at 23%. Once we incorporate the likely passage of a fiscal stimulus package of tax cuts and infrastructure investments in the latter half of 2017, the probability of a recession this year declines to about 15%.

Rising Influence of Populist Parties in the Eurozone

Since the election of Prime Minister Alexis Tsipras and the Syriza Party in Greece in January 2015, populism has been gaining momentum across Europe. The support for populist parties has increased to varying degrees in Spain, Greece, Italy, France, the Netherlands, Germany and Austria. The common themes among populists have been anti-immigration and anti-European Union. Outside the Eurozone, the 2016 Brexit vote in Great Britain has been interpreted as a populist vote against immigration from Eastern Europe, the Middle East and North Africa, as well as against the bureaucracy of the European Union.

The increasing enthusiasm for populist parties in Europe raises two questions. First, will any of the more extremist parties win enough support to break away from the European Union? In France, for example, upcoming elections in May 2017 are likely to pit François Fillon of Les Républicains against Marine Le Pen of the far right Front National. Le Pen has promised a referendum on whether France should stay in the European Union, and, should she win, questions about the viability of the Eurozone will surface immediately.[56] While polls show Fillon well ahead of Le Pen, polls have been wrong on the UK and Italian referenda and the US election. The Eurasia Group, for one, assigns a 30% probability to a Le Pen victory.[57]

Second, to what extent will the rise of populism influence policies in the Eurozone? Here, Germany will probably provide a litmus test. Chancellor Angela Merkel and her coalition government are likely to respond to recent terrorist attacks there by proposing a stronger police and military presence, according to the Eurasia Group. Security checks will probably be increased as well, since at least 800,000 asylum-seekers entered Germany with minimal security checks and terrorist suspects have already been arrested among them.[58] With German elections scheduled for September 2017, it remains to be seen whether Chancellor Merkel will adjust her immigration policy.

While populism is on the rise and the support for such parties has increased, we do not think that these movements will threaten the viability of the Eurozone in 2017. In fact, in response to Brexit, we believe that Eurozone policymakers will take a hard line with Britain to make sure other countries do not think it realistic to manage an exit that retains all the benefits while shouldering none of the costs.

Geopolitical Hot Spots Get Hotter

We rely on the insights of external experts to formulate our geopolitical views. They include members of prominent research groups, think tanks and universities as well as former government officials, both in the US and abroad. So informed, we highlight activity in North Korea, Russia and the Middle East among our group of risks with high probability but uncertain impact.

North Korean Belligerence Continues: North Korea's unpredictable and belligerent military activities have continued unabated. In early 2016, North Korea announced that it had tested its first hydrogen bomb.[59] By the end of 2016, North Korea had conducted nine other military actions, including the launch of a ballistic missile from a submarine,[60] launches of long-range ballistic missiles toward Japan[61] and additional nuclear tests.[62]

We can only expect further tests in 2017, given the estimates by a Council on Foreign Relations task force chaired by retired Admiral Michael Mullen that North Korea may have between 13 and 21 nuclear weapons as of June 2016.[63]

Even more troubling is a pattern highlighted by David Gordon, adjunct senior fellow at the Center for a New American Security. Gordon points out that North Korea makes a habit of testing new presidents, as it did in May 2009, early in President Obama's first term, and again in February 2013 after South Korean President Park Geun-hye was inaugurated.[64]

The *Wall Street Journal* reports that the "Obama administration considers North Korea to be the top national security priority for the incoming administration."[65] Nuclear weapons already in place, long-range ballistic missile capabilities in development, and an unpredictable and provocative leader are a deadly combination. North Korea will remain a serious risk for the foreseeable future.

Russian Adventurism Intensifies: While attention has been focused on Russia's adventurism in Syria, the frozen conflict in Ukraine remains intact, with increasing violations of the Minsk agreements of 2014 and 2015.[66] Since the first agreement in September 2014, nearly 10,000 people have been killed,[67] and most recently, Russian-backed separatists attempted to break through Ukrainian government lines.[68] In response to such lack of progress and concerns about further Russian aggression in the region, the heads of North Atlantic Treaty Organization (NATO) member countries agreed, at a summit in Warsaw in July 2016, to deploy as many as 4,000 troops to the Baltic States and Poland in early 2017 as a deterrent to further adventurism in Eastern Europe.[69] The risks of accidents and intentional skirmishes will inevitably rise.

Furthermore, the direction of foreign policy in the region under a Trump administration is uncertain given President-elect Trump's July 2016 statement that the US would not automatically defend the Baltic States.[70]

Russia is likely to stay involved in the Middle East as well. Russia has been a constructive force with respect to the fight against the Islamic State of Iraq and the Levant (ISIL) and a stabilizing force with respect to keeping Syrian President Bashar al-Assad in place in the absence of any attractive alternatives. Syria would not have made as much progress in pushing back ISIL and the rebels without Russian air power support. Russia has also hosted a meeting in Moscow with Iran and Turkey to work toward an accord to end the war in Syria[71]—a six-year war that has resulted in 400,000[72] to 470,000 fatalities[73] and an estimated economic cost of $250 billion to $275 billion.[74] Given the prospects of continued geopolitical turmoil in the region, Russian involvement in the Middle East will not be reduced anytime soon.

While populism is on the rise and the support for such parties has increased, we do not think that these movements will threaten the viability of the Eurozone in 2017.

Middle East Conflicts and Tensions Persist: The Middle East will remain a source of conflict for years to come. Many countries have weak or collapsing nation-state structures with varying degrees of civil war. As Zalmay Khalilzad, former ambassador to Afghanistan, Iraq and the United Nations, and president of Gryphon Partners, wrote recently, "the national borders devised by Western powers for Iraq and Syria, in particular, are not standing up well to the test of time … and Pakistan's policies have contributed to Afghanistan's precarious condition."[75] Iran and Saudi Arabia compete for influence in the region, and the Sunni-Shia divide that was not a geopolitical factor 40 years ago will continue to escalate tensions in the region.

Another potential risk in the region is the dismantling of the Iran nuclear deal by the Trump administration.[76] In the absence of a deal, Iran would return to building its nuclear capabilities, thereby increasing the risks of a military strike by Israel or the US.

We assign a low probability to such an event for two reasons. First, we point to comments made by secretary of defense nominee retired General James Mattis, which suggest a different approach in dealing with Iran.[77] In a speech in April 2016 at the Center for Strategic and International Studies, Mattis said "there is no going back" on the deal "absent a clear and present violation."[78] Second, other signatories to the deal, including Russia and China, would not support a unilateral dismantling of the deal by the new administration.[79] That is not to say that tensions between the US and Iran will not continue this year.

Turmoil in the region will continue into 2017 and beyond. While the direct impact of such conflicts on global growth and world equity markets is limited outside a war among major powers, the threat posed by terrorism is significant and growing.

Terrorism Escalates

Another high-probability but uncertain-impact risk is increased terrorism. The Middle East has been the main source of terrorism even before the September 11, 2001, attack on the World Trade Center. The majority of the 9/11 perpetrators, 15 out of 19, were from Saudi Arabia, with the rest from other Arab countries in the region.[80] Since then, the spread of ISIL, the Syrian civil war, extremism in Pakistan and Afghanistan, and the immigration of Arabs and North Africans to Europe and, to a lesser extent, the US, have increased the incidence of terrorism in the West.

In 2016, there were five key terrorist incidents in the US and 15 in Europe, including a December 19 attack when a truck rammed into a Christmas market in Berlin.[81] Some of the terrorists responsible were inspired by ISIL,[82] and some were lone-wolf Islamic extremists who had lived in their respective countries for years.[83] With a growing number of refugees in Europe, it is highly likely that this pace of terrorism will continue.

Terrorist attacks and geopolitical tensions in the Middle East take more than their immediate human toll. While consumer confidence in the US is now above the pre-global financial crisis peak of July 2007 (see Exhibit 25), Gallup Poll data shows that dissatisfaction remains at a very high level, similar to that at the beginning of the global financial crisis. As shown in Exhibit 26, the dissatisfaction rate increased steadily in the aftermath of the 9/11 terrorist attacks and the US wars in Afghanistan and Iraq. It had already reached current levels before the global financial crisis.

Former Federal Reserve Chairman Ben Bernanke has named traumatic national shocks such as 9/11 along with political polarization and "shrill" political debates as possible culprits of the contradictory signals between the high levels of consumer confidence as measured by the Conference Board and the high levels of dissatisfaction as measured by Gallup Polls.[84]

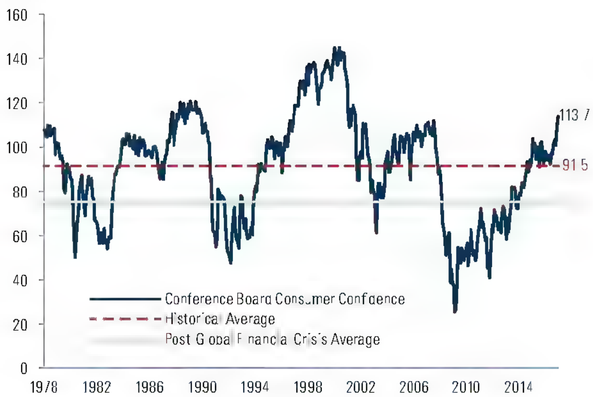
Risks of continued terrorism are very high, but the broader economic impact of the type of terrorist acts we witnessed in 2016 is limited. We can only hope that large attacks such as 9/11 do not occur again.

Cyberattacks Continue

High-profile cyberattacks or cyberattack announcements were a regular feature of 2016. The highest-profile attacks were those perpetrated by the Russian government on the Democratic National Committee computer network, according to a joint statement from the Department of Homeland Security and Office of the Director of National Intelligence on Election Security.[85] The US government expelled 35 Russian officials and imposed sanctions on four high-ranking members of the Russian military intelligence unit as a result.[86]

Exhibit 25: Conference Board Consumer Confidence Index

The labor market recovery has led to a steady increase in consumer confidence.



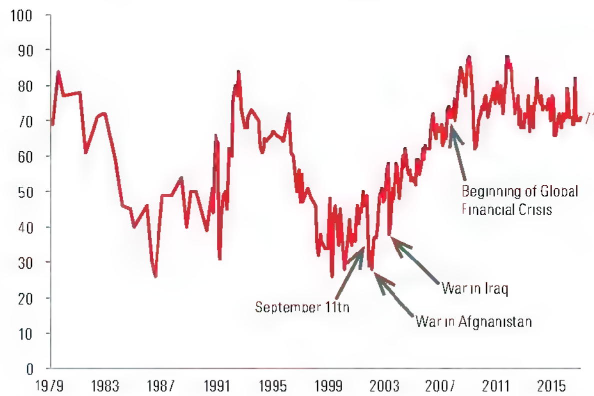
Data through December 2016.

Note: Series starts in January 1978. Post GFC average begins in July 2009.

Source: Investment Strategy Group, Datastream.

Exhibit 26: Gallup Poll on Satisfaction With the Direction of the US

Dissatisfaction remains at a very high level, similar to that at the beginning of the global financial crisis.



Data through December 2016.

Note: The poll asks, "In general, are you satisfied or dissatisfied with the way things are going in the United States at this time?"

Source: Investment Strategy Group, Gallup.

Other high-profile cyberattacks included

- The announced theft of the account information of 1 billion Yahoo users in 2013 and 500 million Yahoo users in 2014[87]
- The theft of information from as many as 700,000 accounts at the Internal Revenue Service[88]
- A suspected Chinese military hack into the Federal Deposit Insurance Corporation[89]
- The theft of 117 million LinkedIn passwords (stolen in 2012 but announced in 2016)[90]

The risks of cyberattacks continue to increase.

The risks of cyberattacks continue to increase. To date, the attacks have had limited detrimental impact on the broad US economy, but the impact could be far-reaching if foreign governments such as Russia or China, criminal entities, or lone actors attack critical infrastructure in the US or any other major country.

China Submerges Under Its Debt Burden and Capital Outflows

At $11.4 trillion, China is the second-largest economy in the world, with a 13.8% share of global exports and a 9.7% share of global imports. It accounts for nearly half of global demand for zinc, tin, steel, copper and nickel, and more than half for thermal coal, aluminum and iron ore. Any major slowdown or volatility across bond, currency and equity markets in China, including Hong Kong, would have major ramifications for the rest of the world.

While the US has limited direct economic exposure to China—only 0.6% of exports as a share of GDP, 0.6% of bank assets and 0.7% of corporate profits—any shocks in China will reverberate through US financial markets. As shown earlier in Exhibit 18 on page 19, US financial conditions tightened by 118 basis points in the summer of 2015 when China's leadership intervened in the local equity markets and adjusted the trading band around the renminbi, and by 104 basis points in late 2015 and early 2016 when the leadership changed the reference currency from the dollar to a basket of 13 currencies. If US financial conditions had stayed at those levels for over a year, US GDP growth would have slowed by about one percentage point, all else being equal. Financial conditions are the mechanism by which shocks from China would have the most immediate impact on key developed economies such as the US.

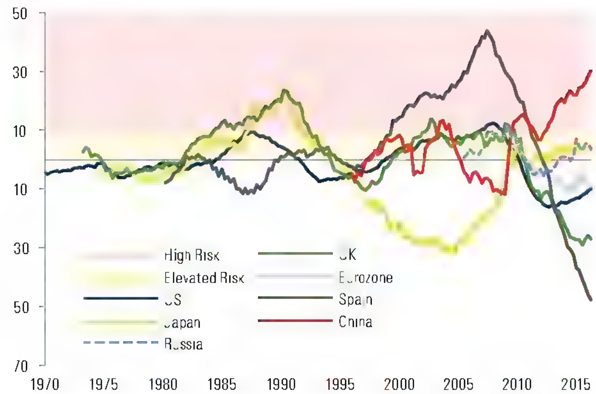
As mentioned above, one of the triggers of US recessions has been economic imbalances. While we do not see such imbalances in the US, or in other major developed economies, at this time, we see significant imbalances in China. Such imbalances have led to crises in other countries, and there is no reason to believe that they will not lead to a financial crisis in China. In our view, it is not a question of if—it is only a question of when.

The biggest imbalance in China is the high level of debt relative to GDP. The Bank for International Settlements (BIS) has a series of early warning indicators. One of the more widely followed and reliable measures is the credit-to-GDP gap, measured as the total credit extended to the private nonfinancial sector as a percentage of GDP compared with its long-term trend. As shown in Exhibit 27, China breached the high-risk threshold in June 2012, when its credit-to-GDP gap rose above the 10% level. At 30.1% as of March 2016 (latest data available) and rising, China's gap exceeds the 10% threshold by 20 percentage points, levels previously seen in Spain before the European sovereign debt crisis. Major developed and emerging market countries have experienced a financial crisis within three years of their credit-to-GDP gap exceeding 10%.

In our 2016 *Outlook* and our 2016 *Insight* report, *Walled In: China's Great Dilemma*, we stated that we did not expect a hard landing in China over the next two years—2016 and 2017. We continue to assign a low probability to a hard landing in China in 2017. However, it is unlikely that China can avoid a financial crisis over the next three years. In prior years, we have pointed to China's high savings rate and government control of many aspects of the economy as reasons for its ability to avert a hard landing. However, the country's debt levels have risen rapidly, the pace of capital outflows has picked up, and net foreign direct investment has reversed and is now negative. In our view, neither China's high savings rate nor its increasing government control of financial markets and capital flows will be sufficient to avert a hard landing over the next several years. Keep in mind that even the US was not able to avert a financial crisis after its credit-to-GDP gap briefly breached the 10% high-risk threshold in December 2006 and peaked at 12.4% in December 2007.

Exhibit 27: Credit-to-GDP Gap Across Economies

China's gap reached the high-risk threshold in June 2012 and has continued to rise.



Data through Q1 2016

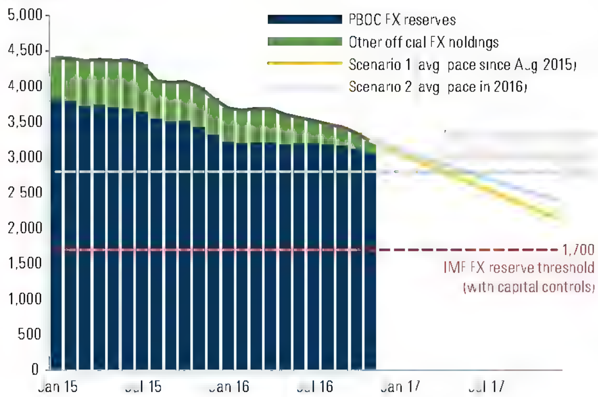
Note: Estimates based on series of total credit to the private nonfinancial sector. Credit to GDP gap is defined as the difference between the credit to GDP ratio and its long term trend in percentage points. Long term trend is calculated using an HP filter.

Source: Investment Strategy Group, Bank for International Settlements

The US has the highest GDP per capita of any major country in the world. The large countries that come closest to the US on this score have GDP per capita levels that stand at about 70% of US levels on a nominal basis and slightly higher on a purchasing power parity (PPP) basis. The US dollar is also *the* unquestioned reserve currency of the world; its reserve-currency status has only been fortified after the Eurozone sovereign debt crisis and the British referendum for Brexit. Thus, the US is able to access the excess savings of the entire world. The US also receives the largest share of world foreign direct investment flows, capturing 14% of global flows between 2011 and 2015. The US now accounts for 20% of the stock of all foreign direct investment. Yet, despite all these major advantages, it did not avert a financial crisis in 2008. It defies logic to assume that China will be the one major country that avoids a financial crisis and a hard landing when it does not enjoy such advantages. As we often say, stating that "this

Exhibit 28: Total Foreign Currency Holdings of China's Official Sector

If the recent pace of decline continues, China's reserves could soon fall below the IMF's adequacy threshold.



Data through November 2016.

Source: Investment Strategy Group, CEIC, Bloomberg, IMF

time is different" is extremely dangerous for the investment well-being of our clients' portfolios.

China, in fact, faces greater risk of a financial crisis because of growing capital outflows. An astounding $1.3 trillion of capital has flowed out of China since August 2015, when it broadened the trading range for its currency against the US dollar. The outflows averaged $64 billion per month in 2016. At that pace, China's total official foreign currency holdings could drop below the IMF's reserve threshold of $2.8 trillion by mid-2017, as shown in Exhibit 28.

Of course, China's leadership has not stood on the sidelines. Since September 2015, the People's Bank of China and the State Administration of Foreign Exchange have introduced a series of measures to limit capital outflows. These measures have included orders to financial institutions to carefully check and strengthen controls on all foreign exchange transactions[91] and strict oversight of Chinese companies' outward investment in overseas property, hotels, cinemas and the entertainment and sports industries.[92] According to reports, leadership has also ordered increased oversight of trade activities to make sure companies are not over-invoicing the value of their imports or under-invoicing the value of their exports as a means of circumventing capital controls.[93] Exports and imports are 20% and 15%, respectively, of China's GDP. It is virtually impossible for China to halt capital flows in such a porous economy without slowing GDP growth rates. Thus, China will not be able to completely stem outflows despite all its measures to slow the pace as much as possible.

Irrespective of the success of such capital controls, China's growing debt problem poses significant risks to China's growth trajectory. We estimate that the risk of a hard landing is only about 25% in 2017 but will increase rapidly to about 50% in 2018 and be closer to 75% in 2019. Therefore, while China is not a near-term risk, there is a high probability of an intermediate-term crisis that will reverberate through financial markets. We also know that we cannot anticipate the exact timing of such crises, especially given the uncertainty of how US-China relations will unfold under a Trump administration.

According to the Center for Strategic and International Studies, China has installed anti-aircraft guns and other weapons systems on seven man-made islands in the South China Sea, including the Johnson Reef, shown above.
Map data: Google, DigitalGlobe

US-China Relations Deteriorate Under the Trump Administration

There is no doubt that US strategy toward China will shift; the only question is when and how. There are two channels by which the Trump administration could affect US-China relations: trade and foreign policy.

We may see some fireworks in US-China relations during the Trump administration.

With respect to trade, President-elect Trump can use any one of six US statutes, including the Trading with the Enemy Act of 1917 and the International Emergency Economic Powers Act of 1977, to shift trade policy. The latter two statutes give him latitude to change foreign commerce without interference from Congress or the courts.

President-elect Trump has advocated imposing tariffs and labeling China a "currency manipulator." While he has continued to threaten tariffs of 45% on imports from China, there is considerable uncertainty as to what his administration will actually impose. If the US and China engage in a full trade war, the Peterson Institute for International Economics has estimated a notable drag on US GDP growth over three years.[94]

Any of these actions by the Trump administration may provoke a strong reaction from China, including a sizable depreciation of the renminbi. Such depreciation would certainly be disruptive to financial markets.

With respect to foreign policy, many policy experts have been calling for a change in strategy toward China. In April 2015, the Council on Foreign Relations published a special report on China, suggesting that Washington needed "a new grand strategy toward China that centers on balancing the rise of Chinese power rather than continuing to assist its ascendancy."[95] The militarization of the seven artificial islands in the South China Sea (see image on page 33), according to the Asia Maritime Transparency Initiative at the Center for Strategic and International Studies,[96] will only expedite such a shift in strategy.

If President-elect Trump's actions to date, such as the telephone conversation with Taiwan President Tsai Ing-wen[97] and his response to the recent Chinese seizure of a US Navy drone,[98] are any indication, we may see some fireworks in US-China relations during the Trump administration.

Key Takeaways

As we mentioned in last year's *Outlook*, forecasting is difficult under the best of circumstances but particularly so in the last innings of an eight-year-long economic expansion and bull market. This year brings the additional challenge of a new president whose policies are likely to follow an unconventional script.

Nevertheless, there are seven key takeaways from our 2017 *Outlook*:

- Improving growth: We expect global economic activity to accelerate this year, with modestly higher GDP growth rates in the US, Eurozone, Japan and many emerging market economies. We expect a small slowdown in China.
- Low recession risk: Favorable monetary and fiscal policies substantially reduce the probability of a recession in key developed and emerging market countries.
- Still accommodative monetary policy: US monetary conditions will still be relatively easy because of the slow and steady pace of tightening of the federal funds rate by the Federal Reserve. At the same time, other developed central banks are still expanding their balance sheets.
- Remain vigilant: Despite a favorable economic and policy backdrop, there is no shortage of global risks, including rising populism in Europe, growing geopolitical tensions, the spread of terrorism and the proliferation of serious cyberattacks.
- China concerns: China is the biggest source of uncertainty given its growing debt burden, accelerating capital outflows and potential for a notable deterioration in the US-China relationship driven by changing US trade and foreign policy toward China.
- Stay invested: The collective impact of these various risks is not yet sizable enough to undermine our core view: that we are in a longer-than-normal US recovery that supports equity returns, which are likely to exceed those of cash and bonds. Thus, we recommend staying invested in US equities with some tactical tilts to US high yield bonds and European equities.
- Modest returns: While we recommend clients remain invested, we have modest return expectations. We expect that a moderate-risk well-diversified taxable portfolio will have a return of about 3% in 2017.

2017 Global Economic Outlook: Winds of Change

FOR MOST OF THE LAST EIGHT YEARS, GLOBAL POLICY MAKERS have been buffeted by the gale force headwinds generated by the financial crisis. In response, central banks around the world have expanded their balance sheets by a staggering $12.5 trillion,[99] while fiscal austerity measures in the G-7 economies have reduced the general government budget deficit from 10% of GDP to just 3.6% today.

Although this mix of policies may have helped avoid a second Great Depression, it has fallen short of fostering a robust economic recovery. According to the IMF, the nominal GDP of advanced economies has grown at just a 1.6% annualized pace in US dollar terms since its 2009 trough, making it among the slowest expansions on record. The overt reliance on monetary policy has also had unintended consequences. Persistently low interest rates have crippled bank profitability and penalized savers. Moreover, the boost that low rates provide to stock prices primarily benefited a narrow segment of the income distribution, exacerbating inequality concerns. Not surprisingly, populism has been on the rise globally.

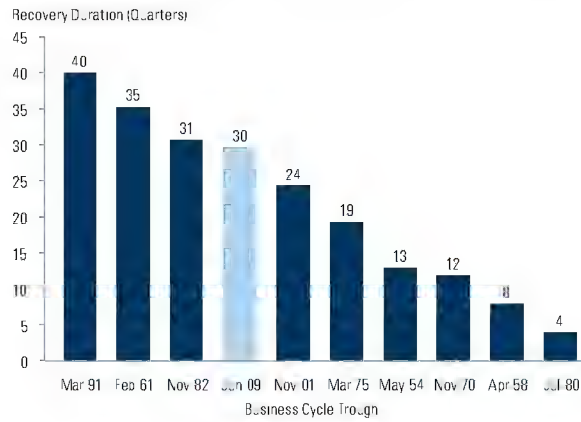
Last year witnessed a growing repudiation of this status quo, evident in the surprise outcome of the UK and Italian referenda, as well as US presidential election. As we begin 2017, these winds of change are gaining force. Central banks are acknowledging the often counterproductive impact of ultra-easy monetary policy and shifting attention to the eventual withdrawal of accommodation. At the same time, the recovery in commodity prices and recent firming in global growth is shifting the focus from deflation to reflation. The same could be said of the increasing focus on expansionary fiscal policy.

While this change brings hope, it also carries risk. In the US, fiscal stimulus arrives eight years into an economic expansion that is already near full employment, increasing the danger of the economy overheating. Although the Federal Reserve could respond by hastening the pace of rate hikes, it might overdo it. Similarly, an overzealous negotiating stance on existing trade relationships or imposition of protectionist policies by the incoming US administration could staunch the flow of trade—an outcome that would be particularly damaging to emerging markets. And in Europe, a victory of the far right in the French presidential election could unleash fears about France exiting the European Union and endanger the survival of the euro.

Still, we do not yet accord a high enough probability to these risks to alter our base case, which assumes these winds of change fill the sails of the ongoing global recovery, rather than capsize it (see Exhibit 29).

Exhibit 30: Duration of Post-WWII Expansions

This expansion is already the fourth-longest since WWII.



Data as of December 2016

Note: The recovery is measured from the business cycle trough.

Source: Investment Strategy Group, National Bureau of Economic Research.

United States: Age Is Just a Number

The US economic expansion is getting old by historical standards. At nearly eight years, it is already the fourth-longest in post-WWII history and poised to be among the top three by the middle of this year (see Exhibit 30). Concern that the economy's vigor is finally succumbing to its advanced age was only bolstered by anemic 1.6% real GDP growth in 2016, close to the weakest of any year during the recovery.

But as we have argued in the past and as Federal Reserve Chair Janet Yellen recently noted, "it's a myth that expansions die of old age."[100] Instead, business cycles are typically derailed by

Exhibit 29: ISG Outlook for Developed Economies

		United States		Eurozone		United Kingdom		Japan	
		2016	2017 Forecast	2016	2017 Forecast	2016	2017 Forecast	2016	2017 Forecast
Real GDP Growth*	Annual Average	1.60%	1.90–2.70%	1.60%	1.20–1.90%	2.10%	0.50–1.50%	1.00%	0.75–1.50%
Policy Rate**	End of Year	0.75%	1.25–1.50%	0.00%	(0.50)–(0.30)%	0.25%	0.00–0.50%	-0.10%	-0.10%
10-Year Bond Yield***	End of Year	2.44%	2.50–3.00%	0.21%	0.50–1.00%	1.24%	1.50–2.25%	0.05%	0.00%
Headline Inflation****	Annual Average	1.70%	1.80–2.60%	0.60%	0.80–1.60%	1.20%	2.00–3.00%	0.50%	–
Core Inflation****	Annual Average	2.10%	1.80–2.60%	0.80%	0.90–1.40%	1.40%	1.50–2.00%	-0.40%	0.25–1.0%

Data as of December 31, 2016

Note: The above forecasts have been generated by ISG for informational purposes as of the date of this publication. They are based on ISG's proprietary macroeconomic framework, and there can be no assurance the forecasts will be achieved.

Source: Investment Strategy Group, Goldman Sachs Global Investment Research, Bloomberg.

* 2016 real GDP is based on Goldman Sachs Global Investment Research estimates of year over year growth for the full year.

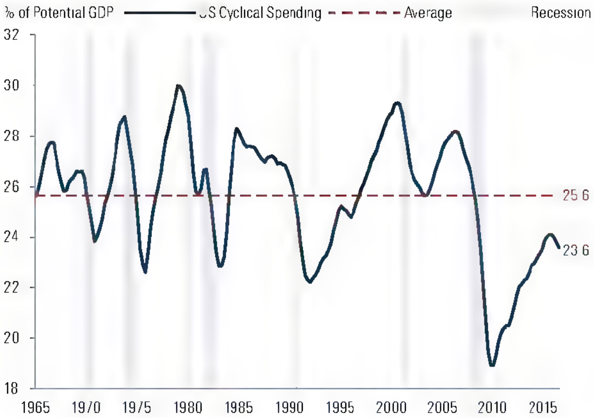
** The US policy rate refers to the top of the Federal Reserve's target range. The Japan policy rate refers to the BOJ deposit rate.

*** For Eurozone bond yield, we show the 10 year German bund yield.

**** For 2016 CPI readings, we show the latest year over year CPI inflation rate (November). Japan core inflation excludes fresh food, but includes energy.

Exhibit 31: US Cyclical Spending

There is scope for business and consumer spending to increase in the US economy.



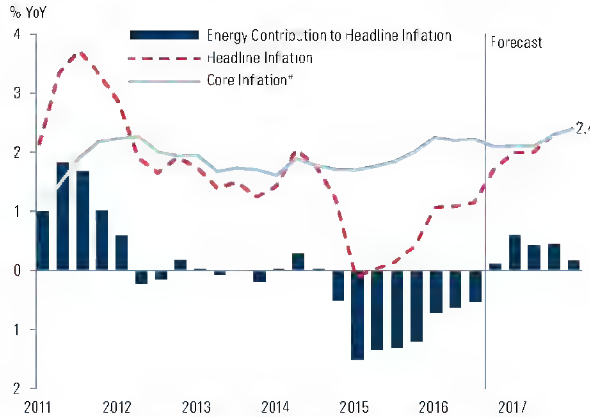
Data through Q3 2016

Note: 4 quarter average. Cyclical spending is business fixed investment plus consumer durables spending.

Source: Investment Strategy Group, Datastream.

Exhibit 32: US Inflation

Normalizing energy prices account for much of the inflation increase we expect.



Data as of Q3 2016

Note: ISG forecasts from Q4 2016. For informational purposes only. There can be no assurance the forecasts will be achieved.

Source: Investment Strategy Group, Datastream.

* Core inflation excludes food and energy.

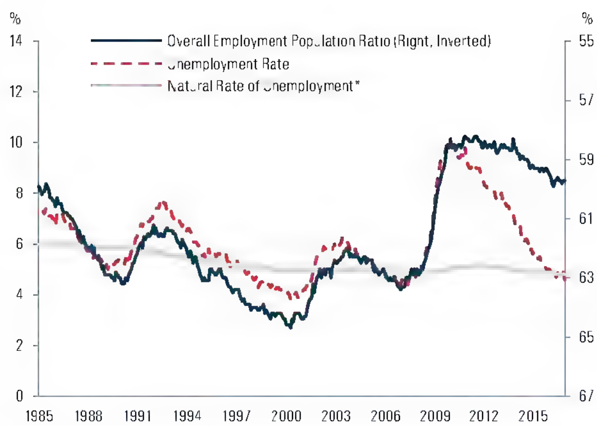
three culprits: economic imbalances, excessive Federal Reserve tightening and/or exogenous shocks (most commonly in the form of spiraling oil prices).

As we survey these risks today, none are particularly alarming. The depth of the financial crisis and the lackluster pace of the recovery have allowed the US to avoid the imbalances that would typically be evident this far into an expansion (see Section I of this year's *Outlook*). If anything, there is scope for spending in cyclical parts of the US economy relative to overall GDP to move toward its long-term average (see Exhibit 31).

There is also less risk of disruptive Federal Reserve tightening, given how few signs we see of economic overheating. Headline inflation remains below the Federal Reserve's 2.0% target, and though we expect it to move higher this year, normalizing energy prices are a key driver (see Exhibit 32). Further, while the November 2016 unemployment rate of 4.6% suggests the economy is near full employment, broader measures of labor slack, as well as today's depressed labor force participation rate, argue that the central bank is not "behind the curve" (see Exhibit 33). Lastly, our expectation for continued modest gains for the US dollar and a rebound in productivity growth from generational lows (see Exhibit 34) provides a natural offset to inflation pressures, even as wages continue to rise.

Exhibit 33: US Unemployment Indicators

There are still signs of slack in the labor market.



Data through November 2016

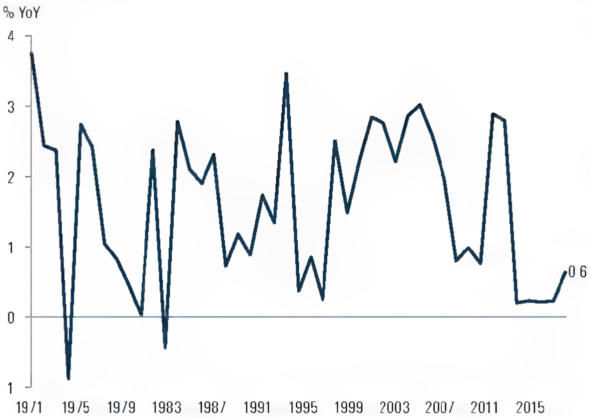
Source: Investment Strategy Group, Federal Reserve Economic Data, Datastream.

* Long term rate.

Of equal importance, the Federal Reserve is acutely aware of the risks that tighter monetary policy poses to the business cycle, which is apparent in both its willingness to step back from planned rate hikes last year as well as Chair Yellen's acknowledgment that an "abrupt tightening would risk disrupting financial markets and perhaps even inadvertently push the economy into recession."[101] With neutral real interest rates

Exhibit 34: US GDP per Hour Worked

We expect a rebound in productivity growth from generational lows.

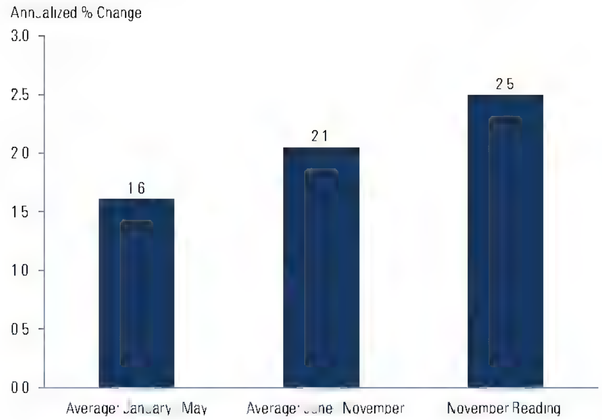


Data through 2015

Source: Investment Strategy Group, OECD

Exhibit 35: Goldman Sachs US Current Activity Indicator

Economic activity accelerated in the second half of 2016.



Data as of November 2016

Note: The current activity indicator is the first principal component of real activity indicators, expressed in GDP equivalent units. This is the growth signal in the main high frequency indicators for the US economy.

Source: Investment Strategy Group, Goldman Sachs Global Investment Research

near zero and inflation expectations still below levels compatible with its inflation target, the Federal Reserve is likely to hike rates two or three times in 2017, below the historical average pace. On this point, it is worth remembering that the Federal Reserve originally projected four hikes by the end of 2016, yet enacted only one in December. Thus, even if the Federal Reserve does raise rates three times this year, it will have delivered those four hikes over two years instead of just one.

Lastly, although a recession created by an external shock is always a risk, the probability we place on a hard landing in Europe and/or China or a destabilizing increase in oil prices is not currently high enough to alter our base-case view. Indeed, even with the recent cut in oil production coordinated between OPEC and non-OPEC members, the size of today's oil-supply glut and the historical tendency for producers to exceed their quotas greatly reduce the risk of a price spike (see Section III, Global Commodities). With none of the typical signs of economic contractions flashing red, we accord a 15% probability of a recession in 2017, roughly in line with historical average risk.

Against this backdrop, we expect US real GDP growth to accelerate from last year's moderate 1.6% pace, reaching 1.9–2.7% in 2017. There are three key drivers to this story: fading headwinds, a resilient US consumer and supportive policy. We discuss each below.

Fading Headwinds

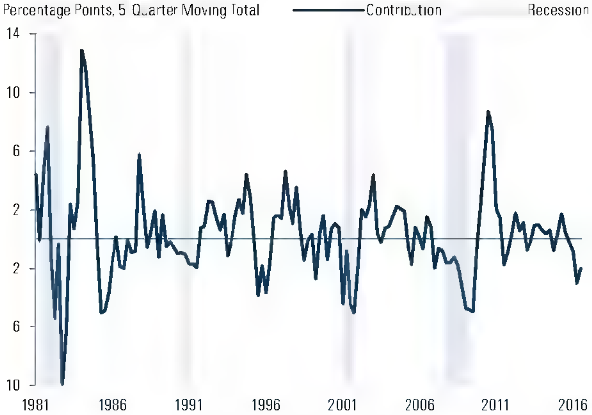
The combination of falling oil prices and a rising dollar that began in mid-2014 has been a meaningful drag on US growth, with energy-related capital spending falling by more than 60% over this period. In addition, exports have softened, the S&P 500 has suffered almost two years of contracting profits, and inventories throughout the supply chain have ballooned as activity has slowed. Such broad-based weakness has rarely occurred outside a recession.

With none of the typical signs of economic contractions flashing red, we accord a 15% probability of a recession in 2017.

The silver lining to last year's slowdown, however, is that growth is now poised to improve from depressed levels. A modest recovery in oil prices and stabilization of the dollar enabled US economic activity to accelerate notably in the second half of last year (see Exhibit 35). This boost will be aided

Exhibit 36: Contribution from Change in Inventories to US GDP Growth

Inventories should support growth after five quarters of subtracting from GDP.



Data through Q3 2016

Source: Investment Strategy Group, Haver Analytics

Exhibit 37: National Association of Home Builders US Housing Market Index

The post-crisis high in builder confidence bodes well for US residential investment.

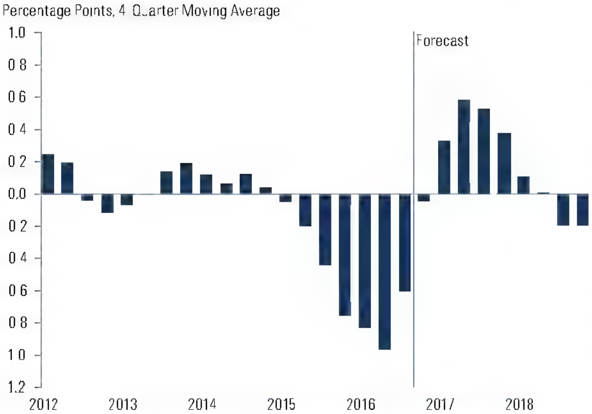
Data through December 2016

Note: Based on a monthly survey of NAHB members who rate market conditions for the sale of new homes, as well as the traffic of prospective buyers of new homes

Source: Investment Strategy Group, Datastream

Exhibit 38: US GDP Growth Impulse from Goldman Sachs Financial Conditions Index

The persistent drag from tight financial conditions over the last two years should reverse in 2017.



Data as of Q3 2016

Note: The financial conditions index is a weighted average of riskless interest rates, credit spreads, equities and FX, based on effects on 1 year forward US GDP growth. Historical estimates and forecasts by Goldman Sachs Global Investment Research. For informational purposes only. There can be no assurance the forecasts will be achieved

Source: Goldman Sachs Global Investment Research

by inventory restocking, which looks ready to help GDP growth again after five quarters of negative contributions (see Exhibit 36). Similarly, residential investment is set to contribute, reflected in the National Association of Home Builders (NAHB) housing market index reaching a post-crisis high in December of last year (see Exhibit 37). Overall, we expect this momentum to continue as the erstwhile easing in financial conditions provides a growth tailwind throughout 2017 (see Exhibit 38).

A Resilient US Consumer

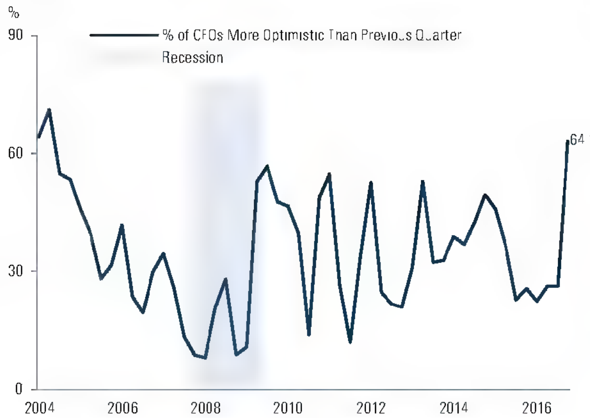
The stars are aligned for US consumers in 2017, as they enter the year with rising wages, higher net worth from asset price gains, historically low debt-servicing costs, ample savings and confidence at a 12-year high. They also stand to benefit directly from potentially lower tax rates and indirectly from higher fiscal spending, a topic we discuss in the next section. The above-mentioned factors should mitigate the headwind from higher inflation. Overall, we expect private consumption—a key driver of our GDP forecast—to expand at a pace of approximately 2.5%.

Supportive Policy

While government policy is always a source of uncertainty, it is even more so in 2017 given potential changes to tax, trade and immigration policies in the wake of last year's presidential election. Nonetheless, our base case is that policy ultimately supports growth this year, with some fiscal expansion and a measured pace of Federal Reserve rate hikes. Although the final contours of

Exhibit 39: CFO Optimism About the US Economy

Chief financial officers' confidence is at its highest level in a decade.



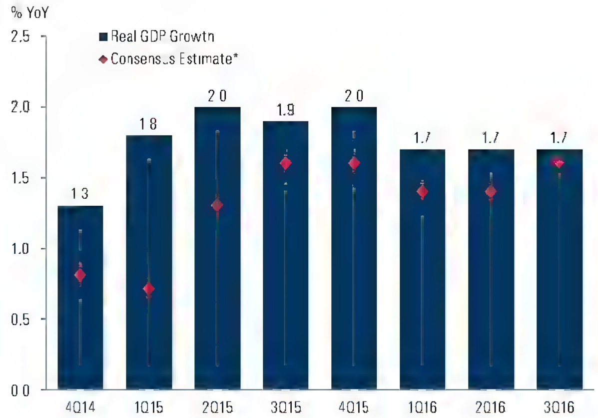
Data through December 2016

Note: The survey questionnaire is delivered online to senior financial executives and subscribers of *CFO Magazine* from both private and public companies

Source: Investment Strategy Group, Haver Analytics

Exhibit 40: Eurozone Real GDP Growth

Economic activity has been surprisingly resilient and higher than expected.



Data through Q3 2016

Source: Investment Strategy Group, Bloomberg

* One quarter prior to release

the new administration's policies remain uncertain, a moderate-sized stimulus package of around $200 billion per year seems likely.[102] While the *direct* impact of such a package is estimated to boost GDP growth by only 0.3 percentage point in 2017, the positive *indirect* impact of tax cuts and stronger anticipated GDP on household and business confidence is arguably more important. Indeed, both consumer and CFO confidence have recently hit their highest readings in over a decade (see Exhibit 39).

Our View on US Growth

As the expansion enters its eighth year, it is natural to question its durability. But far from showing its age, the US economy begins 2017 at an above-trend growth pace, with little evidence of cyclical imbalances or other excesses that typically portend the end of the business cycle. If anything, the slow pace of this recovery has elongated its life span, a dynamic that is likely to persist this year. Perhaps in macroeconomics, as in life, age is just a number.

Eurozone: Weathering the Storm

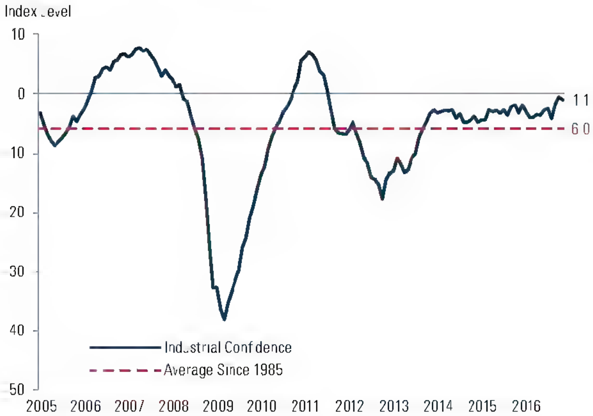
The Eurozone has faced its share of challenges in recent years. Not only did it relapse into recession in 2011, but it also endured a domestic sovereign bond and banking crisis at the same time. More recently, it has been buffeted by a spate of tragic terrorist attacks, an immigration crisis, the Brexit vote, a failed Italian constitutional referendum and renewed concerns about the solvency of its banking system.

Yet despite this onslaught of headwinds, the real economy has been remarkably stable in the last two years. That fact is evident in Exhibit 40, which shows real GDP growth has sustained an above-trend pace over this period, an outcome that clearly exceeded consensus forecasts. Business sentiment has remained equally steadfast over this period, suggesting that the rapidity of shocks may have effectively inured confidence to bad news (see Exhibit 41). Meanwhile, real household disposable income grew by 2.3% over the past year—the fastest pace since 2007.

We expect this stability to persist in 2017, with our forecast calling for 1.2–1.9% real GDP growth. Keep in mind that there is ample scope for above-trend growth to continue, as the level of Eurozone GDP still stands below its potential. On this point, the OECD, IMF and European Commission each currently estimate an output gap of around 2%, indicating slack in the economy. The Eurozone's still elevated 9.8% unemployment rate corroborates this point.

Exhibit 41: European Commission Industrial Confidence Survey

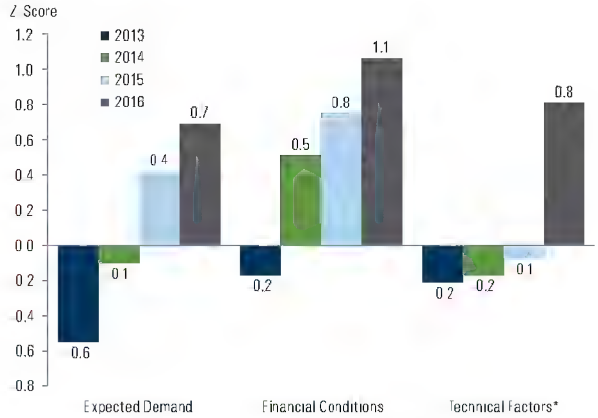
Eurozone business sentiment has remained steady despite recent shocks, including Brexit.



Data through November 2016.
Source: Investment Strategy Group, Datastream.

Exhibit 42: Drivers of Eurozone 2-Year Capital Spending Plans

Key factors that influence business investment stand at their highest levels in years.



Data through 2016.
Note: Based on the European Commission investment survey.
Source: Investment Strategy Group, Datastream.
* Technical factors include technological developments, the availability of labor and government incentives to invest.

As a result, Eurozone policy is likely to remain accommodative, keeping financial conditions supportive of growth. While we expect the European Central Bank (ECB) to gradually shift to a more neutral stance that is less punitive to bank profitability and acknowledges the uptrend in headline inflation, this shift does not imply the removal of accommodation. Indeed, the ECB has already announced an extension of quantitative easing through December 2017. Meanwhile, the European Commission has endorsed a moderate fiscal easing of 0.5% of GDP for the Eurozone. Given that fiscal policy is typically loosened ahead of major elections, this guidance could soon be embraced in France and Germany.

Of equal importance, both consumption and business investment are well positioned as we enter 2017. On the former, continued improvement in the labor market and ongoing GDP growth should encourage consumers to spend a bit from their precautionary savings, particularly given today's relatively high savings rate. At the same time, the fundamental justifications for increased business spending, such as higher demand and easy credit conditions, stand at their best levels in years (see Exhibit 42). Perhaps not surprisingly, a late 2016 survey of manufacturing firms revealed their investment intentions stood at all-time highs.[103]

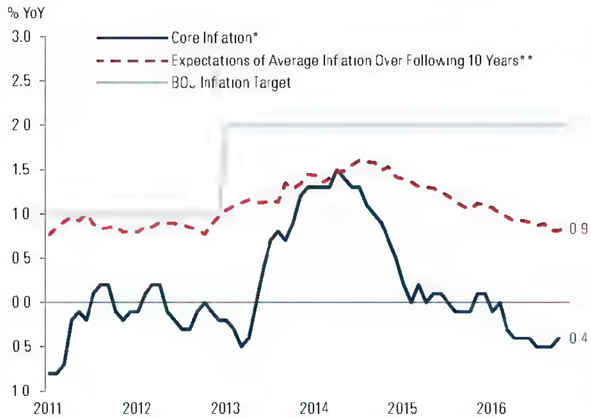
Of course, ongoing uncertainty regarding Brexit, the banking sector and upcoming elections remains a potential downside risk, particularly for an investment recovery. As a result, we acknowledge a greater-than-normal range of potential outcomes, both positive and negative. For example, the victory of the far right in the French presidential election could unleash fears about France exiting the European Union and endanger the survival of the euro, while the new government in Italy could speed up the long-overdue resolution of the banking sector's problems and change the electoral law to reduce political uncertainties.

Ongoing uncertainty regarding Brexit, the banking sector and upcoming elections remains a potential downside risk.

For now, our base case assumes that Italy will avoid a populist party in government and that a centrist candidate will win the French presidential election. Thus, we expect the Eurozone to again weather the storm in 2017.

Exhibit 43: Japan Consumer Prices

Core inflation and inflation expectations remain low.



Data through November 2016
Source: Investment Strategy Group, Datastream, QUICK Bond Investors Survey
* Core inflation excludes fresh food and VAT impact
** Based on the QUICK Bond Investors Survey

United Kingdom: A Fork in the Road

Much like the Eurozone, the UK economy is notable for its resilience, evident in 15 consecutive quarters of positive quarterly growth averaging 2.5% annualized. This streak is even more impressive considering last year's Brexit vote and the resulting consensus view that the UK was destined for recession. Although the 20% decline in the trade-weighted sterling and rapid easing by the Bank of England were no doubt pivotal in avoiding that fate, the immediate impact of the Brexit referendum has been far less destructive than feared.

But as we begin 2017, the UK is rapidly approaching a fork in the road. The government must choose which path Brexit will take once it triggers Article 50 of the Lisbon Treaty, which formally sets the process of the UK exit in motion. Here, the government's current objectives—limiting freedom of movement into the UK while retaining full access to the European Union's single market—seem mutually exclusive and likely to engender a politically charged negotiation process. This road is made all the more dangerous by the fact that UK authorities will have little room to cushion a downturn given today's large fiscal deficits and already highly accommodative central bank. Of course, a softer stance on the issues is also a possible path, one that could elongate the effective transitional period beyond two years and lead to a far more benign outcome for the UK.

The uncertainty around the government's ultimate choices significantly increases the range of GDP outcomes in the medium term. Our current base case assumes GDP will expand by 0.5–1.5% in 2017. This notable slowdown from last year's 2% pace reflects the likelihood that both hiring and investment activity will become more cautious once the Brexit negotiations start. Even worse, this slowdown arrives just as consumer price inflation is accelerating from past sterling depreciation, creating a lower growth/higher inflation backdrop that is set to erode real income growth. For these reasons, the risks to our central case are skewed to the downside.

That said, the fate of the UK economy is not preordained, even after the government chooses its path. As with any other negotiation, the result will ultimately reflect the reasonableness of the parties, the concessions of both parties and how the discussions evolve over time. Or in the words of golf legend Arnold Palmer: "The road to success is always under construction."[104]

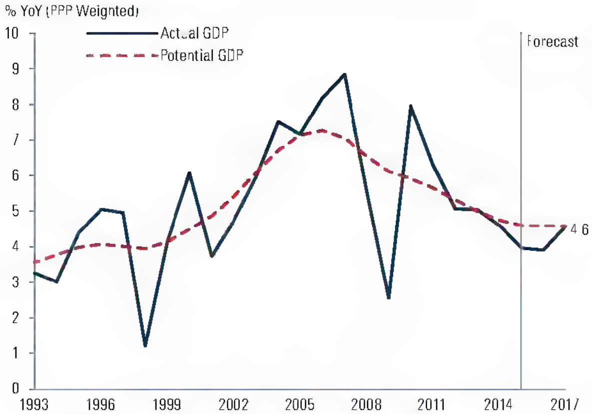
UK authorities will have little room to cushion a downturn given today's large fiscal deficits and already highly accommodative central bank.

Japan: Same Battle, Different Year

For Japan, the decades-long battle against deflation never seems to end. Despite two years of above-trend GDP growth, including last year's 1% gain, core inflation remains negative, having fallen 0.4% in 2016 (see Exhibit 43). This comes despite a tight labor market and record profits that should have encouraged companies to increase base wages. These already muted inflationary pressures were exacerbated by low energy prices and the appreciation of the yen, once again pushing the Bank of Japan's (BOJ's) 2% inflation target further into the future.

But far from waving the white flag, Japan's policymakers responded with a range of bold measures, including a

Exhibit 44: Emerging Market GDP Growth
We expect growth roughly in line with potential.



Data as of 2016
Note: ISG forecasts for 2016–17. For informational purposes only. There can be no assurance the forecasts will be achieved.
Source: Investment Strategy Group, IMF

large fiscal stimulus package last August and a shift by the BOJ away from ever-higher purchases of Japanese government bonds (JGBs). Instead, the BOJ will now use a "yield-curve control" framework, wherein it sets the short rate and targets a yield of about 0% on 10-year JGBs. This novel approach should afford the government low real interest rates with which to finance its fiscal expansion, while also providing Japanese financial institutions with a sufficiently steep yield curve to remain profitable. To augment these deflation-fighting measures, the government also implemented some modest structural reforms and called for a substantial increase in the minimum wage in order to support faster income growth.

Against this backdrop of supportive policies, we expect that GDP will grow by 0.75–1.5% in 2017. Our forecast is supported by three key drivers. First, the fiscal stimulus announced in August is poised to contribute 0.4 percentage point to 2017 GDP growth, and the government has indicated a willingness to do more if necessary. Second, the BOJ remains very accommodative, thereby providing easy financial conditions that should foster an uptick in business investment. While the central bank may consider a modest rate increase in late 2017, we expect it to maintain its negative interest rate policy (NIRP) for short rates and a 0% target for 10-year JGB yields in the interim. Lastly, the government is likely to push for further wage increases during the spring wage negotiations.

These pro-growth policies, coupled with less slack in the economy and a boost from higher energy prices and past yen appreciation, should enable core inflation (excluding fresh food) to reach our expected range of 0.25–1.0%. While Japan may have lost its battles against deflation over the years, it has not yet lost the war.

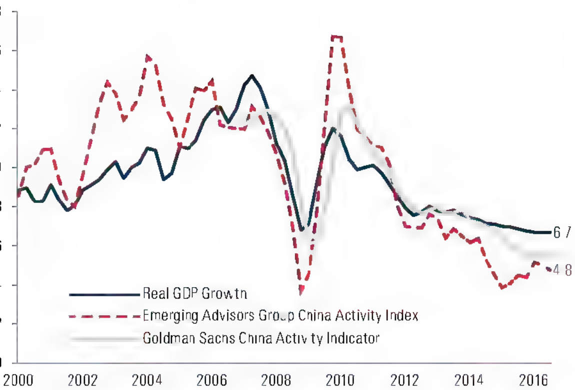
Emerging Markets: Competing Forces

Emerging market economies failed to live up to expectations once again in 2016, with GDP expanding by an estimated 3.9% versus original expectations closer to 5.0%. This marked the second-slowest growth rate in 15 years; only the 2.6% expansion at the depth of the global financial crisis in 2009 was slower. Yet this disappointing headline belies the economic recovery that unfolded over the course of 2016. Consider that growth actually troughed during a challenging first quarter, with economic activity gradually improving thereafter on the back of recovering commodity prices, the Federal Reserve's willingness to delay any further rate hikes and stable Chinese growth. These tailwinds were bolstered into the final quarter by early signs of recovery in Brazil and Russia, both of which had suffered deep recessions in 2015.

We expect this momentum to persist, with GDP increasing by 4.3–4.8% (purchasing power parity [PPP] weighted) this year, roughly in line with potential (see Exhibit 44). The pickup we expect is the product of two opposing forces. On the one hand, growth should benefit from the ongoing recoveries in Brazil and Russia, and somewhat stronger activity in developed economies should provide a small tailwind to emerging market exports. On the other hand, the further moderation in Chinese growth we expect is likely to weigh on activity across emerging markets, particularly if the US imposes tariffs.

Indeed, the policy agenda of the incoming US administration remains a critical unknown for emerging markets. Even if protectionist tariffs were directed only at China and Mexico—which account for 23% and 15% of US imports of manufactured goods, respectively—they would still negatively impact all emerging markets given the sensitivity of these countries to Chinese growth and fluctuations in the Chinese currency. This being the case, countries with substantial trade exposure to

Exhibit 45: China Economic Activity Measures
Actual growth is likely lower than official figures.



Data through Q3 2016
Source: Investment Strategy Group, Emerging Advisors Group, Goldman Sachs Global Investment Research

both China and the US, such as Korea, Taiwan and Malaysia, would be particularly vulnerable.

While the net effect of these competing forces is positive in our base case, the risks are tilted to the downside.

China

China continues to drive its economy with one foot on the gas pedal and the other on the brake. Consider that the government reached its official GDP growth target of 6.5–7% last year only by increasing public spending and allowing rampant credit growth. But these measures also exacerbated real estate bubble concerns and hastened capital outflows, forcing the government to apply the brakes through new restrictions within the property market and more stringent capital controls. This focus on dual-footed driving has also come at the expense of much-needed structural reforms. As a result, China continues to suffer from considerable excess capacity in industrial sectors, such as steel and coal, while its financial sector risks have increased.

Even so, we expect this approach to continue in 2017. Structural reforms are likely to stay on the back burner because China's leaders will not risk slower growth ahead of important leadership changes at the 19th Communist Party of China National Congress in the fall. In turn, the government is likely to use further fiscal easing and rapid credit expansion to target growth of around 6.5%. As a result, we expect official GDP to expand by 6.0–6.75% in 2017, although actual GDP growth will likely be lower (see Exhibit 45).

The risks to our outlook are skewed to the downside for two reasons. First, the new direction of US trade policy remains uncertain and could have a sizable impact. For instance, a 15% tariff would mechanically reduce China's GDP by 0.9%. China could respond by ramping up leverage, letting its currency depreciate faster and injecting more fiscal stimulus, but that could risk further imbalances in the economy while also disrupting global financial markets. Second, striking the right balance between stimulative and contractionary measures is a hazardous endeavor. On the road, as in government policy, accelerating and braking at the same time greatly increases the risk of an accident.

India

India's streak of strong growth continues. The economy expanded by an estimated 6.5% in 2016, making it the fourth consecutive year of GDP growth in excess of 6.0%, a rare feat that India's economy shares only with China's. Growth would likely have been even higher, were it not for the "demonetization" scheme the government introduced in November 2016. In a surprise move, the government announced that large-denomination bank notes, representing 86% of cash in circulation, would no longer be accepted as legal tender. The scheme—intended to root out illegal income stored in cash—had the unfortunate side effect of starving households of liquidity and thereby thwarting consumption, the main engine of growth. Although the severity of the consumption shock remains uncertain, it should be temporary.

The silver lining for 2017 is that India will probably benefit from a meaningful recovery in household spending. Moreover, fiscal policy will likely be eased ahead of the 15 state elections occurring in 2017 and 2018, while investment should receive a modest boost as the Reserve Bank of India lowers borrowing costs. Accordingly, we expect GDP growth of 6.5–7.5% in 2017.

China continues to suffer from considerable excess capacity in industrial sectors, such as steel and coal, while its financial sector risks have increased.

Brazil

Brazil has had its share of hard times in recent years. After being among the fastest-growing economies in the world in 2010, it has more recently suffered its worst recession in a century, evident in seven consecutive quarters of contraction. In turn, GDP fell an estimated 3.3% last year, leaving it on par with 2010 levels. Even worse, industrial production now stands where it did in 2004.

Fortunately, there are already tentative signs of a recovery. Inflation has peaked; the current account deficit has shrunk; and confidence indicators, while still weak, have stabilized. Of equal importance, the financial markets have welcomed a new government amid expectations that it will finally tackle Brazil's fiscal problems and steer the economy out of recession.

But despite these promising green shoots, our base case does not call for a robust recovery in 2017. While the new administration is off to a promising start, it is facing resistance to key structural reforms while also navigating ongoing corruption probes. Moreover, the recovery in household consumption and business investment is likely to be hamstrung by continuing high real interest rates, a function of falling inflation and a simultaneously easing central bank. Meanwhile, fiscal policy will continue to tighten given a new spending cap and proposed pension reform measures. Finally, the modest commodity price gains we expect are unlikely to foster a meaningful rise in exports for Brazil. Accordingly, we expect a tepid recovery, with GDP expanding just 0–1% in 2017.

Russia

Russia is also slowly recovering from a deep recession. Although the economy contracted for its second consecutive year in 2016, headwinds are now receding thanks to a recovery in real wages, rising oil prices and a related increase in oil production. The economy has also received support from both fiscal and monetary policy, with the central bank cutting the policy rate by 100 basis points last year as inflation moderated. Still, the economy has likely suffered some permanent damage from the combination of depressed oil prices and Western sanctions, which have pushed down Russia's long-run growth potential.

While the cyclical recovery should continue in 2017, it is apt to be measured. The government is planning to reduce the fiscal deficit by 1% of GDP this year, which will limit fiscal support. That said, elections in March 2018 could ultimately temper such fiscal prudence. Meanwhile, the central bank will likely deliver more rate cuts, but their size and pace will depend on the path of inflation, which could be stickier than anticipated.

Against this uncertain backdrop, we expect the Russian economy to return to modest growth in 2017, expanding 0.5–1.5%. While not our base case, growth could quicken if oil prices increase more than we expect or if sanctions are lifted.

SECTION III

2017 Financial Markets Outlook: The Horns of a Dilemma

INVESTORS HAVE HAD AN AMAZING BULL RUN. Including last year's 12% total return, the S&P 500 is nearly 3.5 times as high as its financial crisis trough. The advance has been equally long-lasting, second in length only to the almost-decade-long period that preceded the technology bubble in 2000. These impressive gains are not limited to just equities or US assets. US corporate high yield has gained 177% over the same time span, while the total return of the MSCI All Country World Index excluding the United States has been higher only 5% of the time over comparable eight-year periods since 1994.

But as we begin a new year, these gains have left investors on the horns of a dilemma. Put simply, they must now choose to either remain invested at high valuations and bear the associated risk of loss or exit the market and forgo the potential for upside surprises as well as returns that are attractive compared to the alternatives.

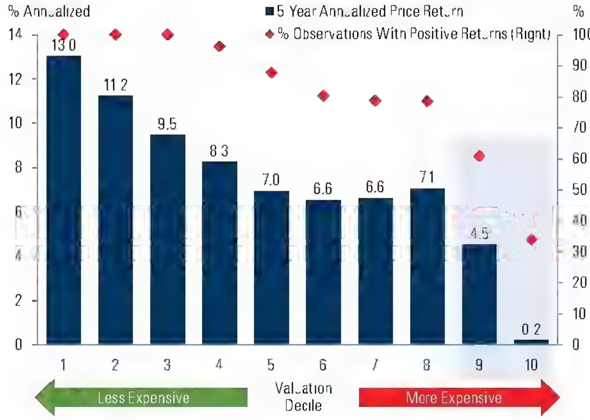
To be sure, there are good reasons to be cautious, as we discussed in Section I, The Risks to Our Outlook. Even worse, investors are exposed to these dangers at a time when most asset valuations are expensive by historical standards, providing them with a narrow margin of safety to absorb such adverse developments. This is particularly true in the US, where valuations have been cheaper at least 90% of the time historically.[105] Even in Europe, where valuations are more attractive, that fact is counterbalanced by greater geopolitical risks and deeper structural fault lines.

Still, as we highlighted in Section I of this *Outlook*, there are three reasons why remaining invested in risk assets is still warranted despite what are likely to be uninspiring returns. First, we see only a 15% probability of a US recession, which has historically been the key driver of losses in risk assets. Indeed, the S&P 500 has generated positive annual total returns 86% of the time during economic expansions in the post-WWII period. Second, the comparable returns of investment alternatives—such as cash and bonds—are unappealing, particularly in the rising interest rate environment that we expect. Third, risk assets can surprise us to the upside, as last year demonstrated. The potential for returns to exceed our expectations is especially true in the US, given the possibility of tax reforms, fiscal expansion and deregulation. The same could be said for our tactical positions across various asset classes, which we discussed in Section I, Our Tactical Tilts.

While we have suggested that the dilemma should be resolved in favor of remaining invested, we are not Pollyannaish. Investors have ridden this bull market for eight years, and while we don't expect the ride to end in 2017, we must stay vigilant to avoid the horns.

Exhibit 47: US Equity Price Returns from Each Valuation Decile

In the past, subsequent returns from high valuation levels have been muted.



Data as of December 31, 2016

Note: Based on 5 valuation metrics for the S&P 500, beginning in September 1945: Price/Trend Earnings, Price/Peak Earnings, Price/Trailing 12m Earnings, Shiller Cyclically Adjusted Price/Earnings Ratio (CAPE) and Price/10 Year Average Earnings. These metrics are ranked from least expensive to most expensive and divided into 10 valuation buckets ("deciles"). The subsequent realized, annualized 5 year price return is then calculated for each observation and averaged within each decile. Past performance is not indicative of future results.

Source: Investment Strategy Group, Bloomberg, Datastream, Robert Shiller.

US Equities: Life in the Fast Lane

US stocks have been driving in the fast lane since 2009. Over this nearly eight-year period, the S&P 500 has generated a stunning 16.5% annualized price return, a pace exceeded only 3% of the time since 1945. As a result, the 500 companies in the index are collectively worth $20 trillion today, about 3.5 times as high as they were at the trough of the financial crisis. Needless to say, investors have had a good ride.

Yet such a fast drive also raises the question of whether US equities are now running on empty.

Exhibit 46: ISG Global Equity Forecasts—Year-End 2017

	2016 YE	End 2017 Central Case Target Range	Implied Upside from Current Levels	Current Dividend Yield	Implied Total Return
S&P 500 (US)	2,239	2,225–2,300	-1–3%	2.1%	1–5%
Euro Stoxx 50 (Eurozone)	3,291	3,250–3,400	-1–3%	3.6%	2–7%
FTSE 100 (UK)	7,143	7,050–7,310	-1–2%	4.0%	3–6%
TOPIX (Japan)	1,519	1,530–1,590	1–5%	1.9%	3–7%
MSCI EM (Emerging Markets)	862	880–925	2–7%	2.6%	5–10%

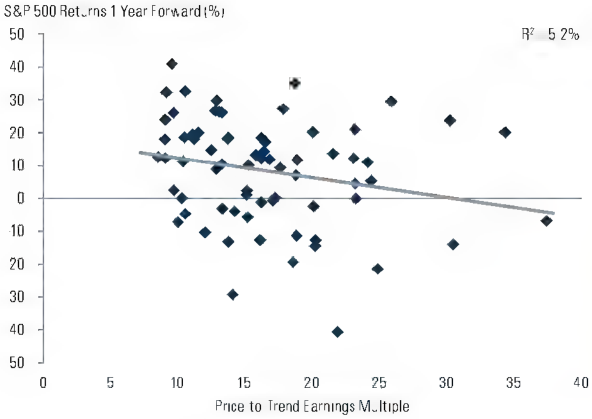
Data as of December 31, 2016

Note: Forecast for informational purposes only. There can be no assurance that the forecasts will be achieved. Please see additional disclosures at the end of this *Outlook*.

Source: Investment Strategy Group, Datastream, Bloomberg

Exhibit 48: S&P 500 Price-to-Trend Earnings vs. Subsequent Calendar-Year Price Return

Starting valuation multiples tell us little about equity returns over the following year.

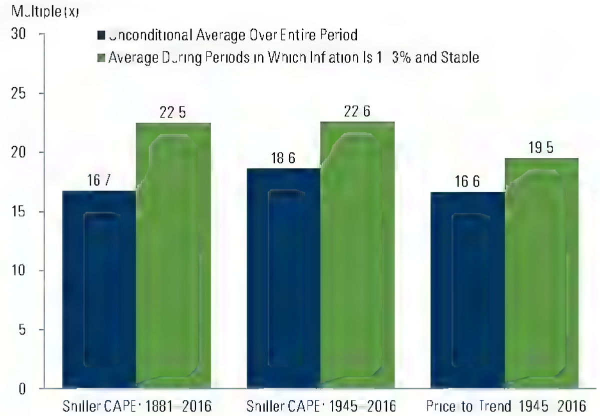


Data as of December 31, 2016

Source: Investment Strategy Group, Bloomberg, Datastream, Robert Shiller

Exhibit 49: S&P 500 Valuation Multiples by Inflation Environment

Periods of low and stable inflation have supported higher equity multiples.



Data as of December 31, 2016

Source: Investment Strategy Group, Bloomberg, Datastream, Robert Shiller

This bull market is already quite old by historical standards, second in length only to the almost 10-year period that preceded the technology bubble in 2000. Moreover, valuations now stand in their 10th decile, indicating they have been cheaper at least 90% of the time historically. In the past, starting from such a high base has led to muted equity returns over the subsequent five years, with only a third of those episodes generating a profit (see Exhibit 47).

Even so, high valuations should not be confused with certainty of loss, especially over short periods. As seen in Exhibit 48, today's equity multiples tell us very little about potential gains over the next year, explaining only 5% of their variation historically. Moreover, history teaches us that a strategy of selling equities based solely on expensive valuations has been a losing approach over time. As we noted in our 2014 *Outlook*, research conducted by three professors at the London Business School concluded that underweighting equities based exclusively on high valuations underperformed a strategy of remaining invested across every one of the 20 countries and three country aggregates they examined.[106] In short, valuations alone are a poor tactical timing signal. Indeed, the S&P 500 has returned more than 36% since first entering its 9th valuation decile in November 2013, a time when many were already suggesting that US equities were in a bubble.

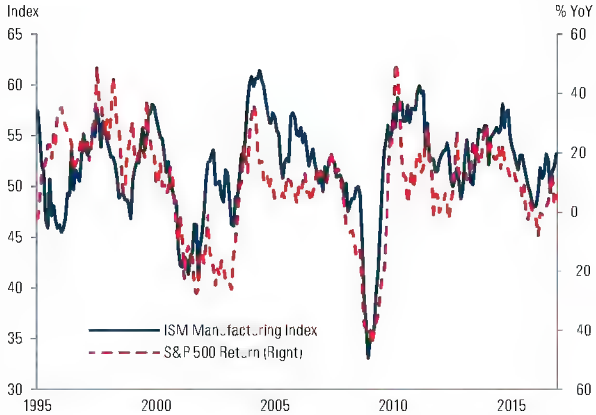
Valuations must also be considered in the context of the prevailing macroeconomic environment. Consider that periods of low and stable inflation, such as we expect for the year ahead, have supported higher valuations in the past (see Exhibit 49). The same could be said for lower taxes and deregulation—were they to materialize later this year—as both would boost real returns on invested capital and justify higher equity values. Similarly, today's structurally lower interest rates—reflecting slower population and productivity growth—reduce the rate at which all future cash flows are discounted, increasing their present value.

Investors have ridden this bull market for eight years, and while we don't expect the ride to end in 2017, we must stay vigilant to avoid the horns.

Here, it's helpful to remember that the S&P 500's long-term average P/E ratio—which many investors use to gauge fair value—was forged over a period when risk-free rates averaged 4.5%. In contrast, the risk-free rate now is just 0.5–0.75% and the Federal Reserve

Exhibit 51: ISM Manufacturing Index and S&P 500 Returns

Equity market performance is closely related to the business cycle.

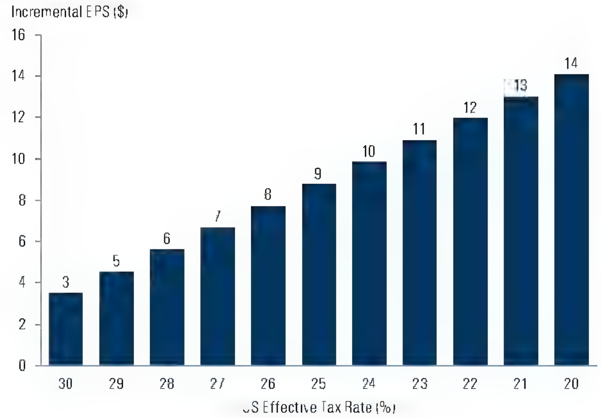


Data through November 30, 2016

Source: Investment Strategy Group, Bloomberg

Exhibit 52: Estimated Incremental S&P 500 Earnings per Share by Tax Rate

Proposals for lower corporate tax rates could lead to higher earnings.



Data as of December 31, 2016

Note: The current US effective tax rate for the S&P 500 companies is 33.3%.

Source: Investment Strategy Group, Standard & Poor's.

estimates its new long-run equilibrium level has fallen to 3%, a full 1.5 percentage points below the historical average.[107] Of equal importance, the Federal Reserve is not expected to reach that 3% target for six years based on current market pricing in Eurodollar futures.

A similar valuation tailwind emerges from the market's current sector composition. The combined technology and health-care sectors constitute about 40% of S&P 500 earnings today, almost three times as high as their 15% share in the late 1980s. Because these faster-growing, higher-margin sectors are generally accorded premium valuations, their higher representation in the index today justifies a higher S&P 500 P/E multiple.

Although current valuations may be fundamentally justified, that does not mean they are impervious to downward pressure. Our central-case equity view for 2017 acknowledges this, calling for some contraction in P/E multiples given the uncertainty associated with a new administration and continued Federal Reserve interest rate hikes. Even so, that headwind will be more than offset by the 6–10% earnings growth we forecast, resulting in a 1–5% total return for US equities this year (see Exhibit 50).

Investors might rightly ask whether it is worth bearing equity risk for such meager returns. Our read of the evidence suggests it is. The linchpin of this view is our expectation of a continued

Exhibit 50: ISG S&P 500 Forecast—Year-End 2017

2017 Year-End	Good Case (25%)	Central Case (60%)	Bad Case (15%)
End 2017 S&P 500 Earnings	Op. Earnings $140 Rep. Earnings $124 Trend Rep. Earnings $113	Op. Earnings $125–130 Rep. Earnings $113–117 Trend Rep. Earnings $113	Op. Earnings < $102 Rep. Earnings < $78 Trend Rep. Earnings < $113
S&P 500 Price-to-Trend Reported Earnings	21–23x	18–21x	15–16x
End 2017 S&P 500 Fundamental Valuation Range	2,375–2,600	2,040–2,375	1,700–1,810
End 2017 S&P 500 Price Target (based on a combination of trend and forward earnings estimate)	2,450	2,225–2,300	1,800

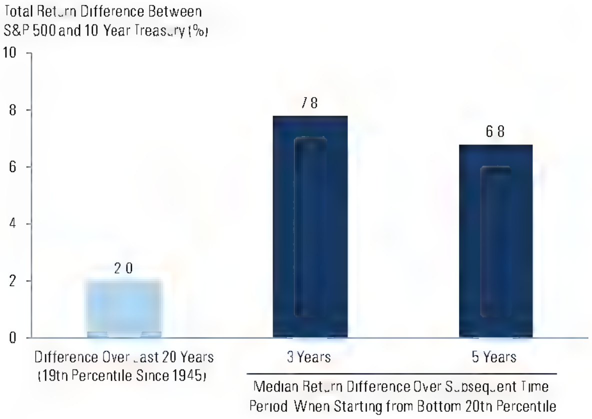
Data as of December 31, 2016

Note: Forecasts and any numbers shown for informational purposes only and are estimates. There can be no assurance the forecasts will be achieved and they are subject to change. Please see additional disclosures at the end of this *Outlook*.

Source: Investment Strategy Group

Exhibit 53: US Equity Performance Relative to Fixed Income

Stocks have outperformed bonds following periods of muted return differences.

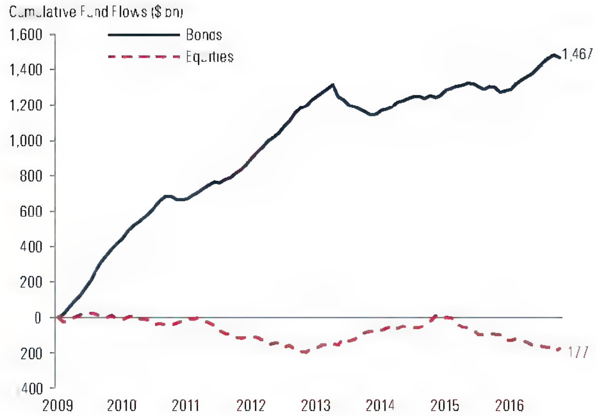


Data as of December 31, 2016.

Source: Investment Strategy Group, Bloomberg, Leuthold Group.

Exhibit 54: US Equity and Bond Fund Flows

Equities could benefit from rebalancing out of bonds given lopsided flows since 2009.



Data through November 30, 2016.

Note: Beginning in March 2009.

Source: Investment Strategy Group, Bloomberg, ICI.

expansion in the US economy (see Section II, United States). The state of the business cycle is a key driver of market performance, evident in the tight linkage between the S&P 500 and the ISM Manufacturing Index (see Exhibit 51). Notably, the S&P 500 has generated positive annual total returns 86% of the time during economic expansions in the post-WWII period, while suffering annual declines of greater than 10% just 4% of the time. During the same postwar period, nearly three-fourths of the bear markets—defined here as declines of 20% or more—occurred during US recessions.

With few signs of an economic contraction on the horizon, the high odds of positive returns and low odds of large losses raise the hurdle for underweighting equities significantly. This is particularly true because the risks are not one-sided: markets often surprise to the upside, too, even at high valuations. Last year was a case in point: the S&P 500's 12% return matched our good-case scenario, although at the start of 2016 we had attached only 20% odds to it occurring.

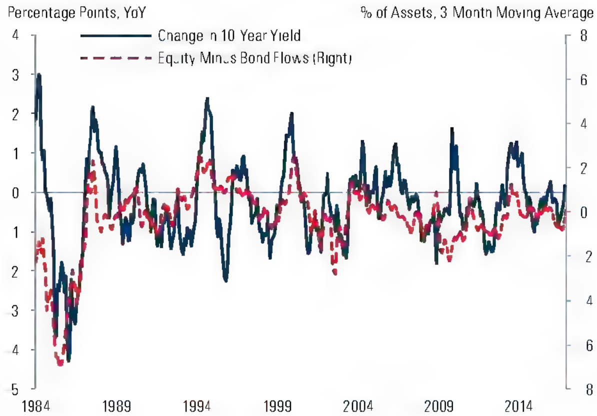
As we consider the potential for similar upside surprises in 2017, earnings growth tops the list for three reasons. First, we expect the sizable profit drag from energy earnings to reverse in 2017, with scope for a greater than $4–5 contribution to S&P 500 EPS if recently announced global oil production cuts are realized. Keep in mind that this contribution was closer to $15 prior to the collapse in oil prices. Second, a shift to a 25% corporate tax rate could add $9–10 to S&P 500 EPS in 2017 if enacted retroactively (see Exhibit 52). Finally, a tax holiday for the estimated $1 trillion of cash held overseas could lead to an additional $1–2 of EPS upside from repatriation-driven buybacks.

There are also other, less visible potential catalysts for equities. Over the last 20 years, the total return of stocks has exceeded that of 10-year Treasury bonds by only 2 percentage points, well below the historical average of 4.4 percentage points and a result that ranks in the bottom 20% of all post-WWII observations. But after similar periods of underperformance, stocks generated well above average relative returns over the next three and five years (see Exhibit 53). Said differently, history suggests stock returns will outpace those of bonds, even if expected equity returns are uninspiring.

A related source of upside stems from the lopsided investor flows evident in Exhibit 54. Here, even moderate rebalancing out of bonds by retail investors—who represent 80% of mutual fund owners—would represent a sizable tailwind to equities. Historically, a shift in flows from bonds into equities has been motivated by three factors: confidence in the durability of the economic recovery, unattractive prospects for bond returns and higher equity prices (see Exhibit 55). Our central case features all three factors, suggesting the

Exhibit 55: US Equity Fund Flows and Change in 10-Year Treasury Yield

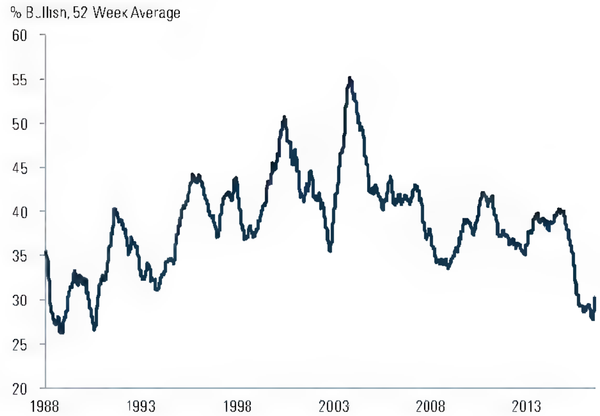
Bond returns can influence flows into equity funds.



Data through December 31, 2016
Source: Investment Strategy Group, Bloomberg, ICI

Exhibit 56: The AAII Bullish Investor Sentiment

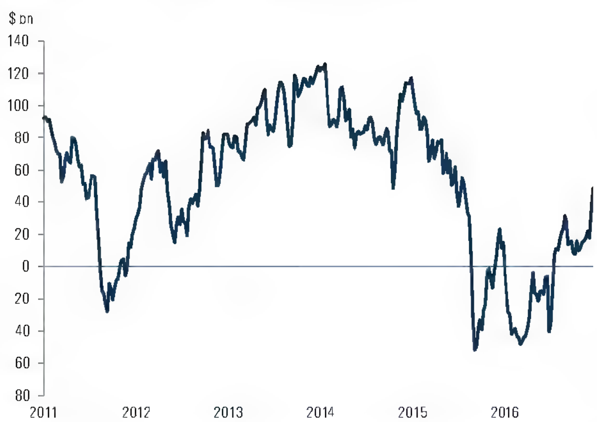
Lack of investor euphoria is a contrarian positive for stocks.



Data through December 31, 2016
Source: Investment Strategy Group, Bloomberg, American Association of Individual Investors

Exhibit 57: Non-Dealer US Equity Index Futures Positioning

There is scope for increased US equity positions.



Data through December 31, 2016
Source: Investment Strategy Group, CFTC, Goldman Sachs Securities Division Equity Strats Group.

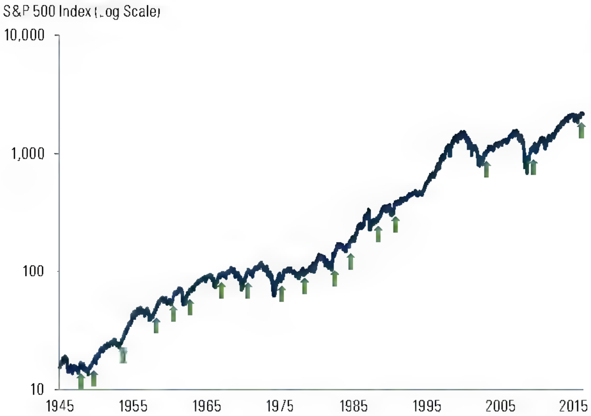
incipient uptick in bond outflows seen in late 2016 may persist, especially with "risk-free" Treasuries delivering a notable loss in the fourth quarter.

Today's visible lack of market euphoria represents another potential positive for stocks. Exhibit 56 shows the proportion of investors classifying themselves as "bullish" near its lowest level in decades. Meanwhile, non-dealer positions in US index futures stand well below the levels seen in 2013–14, providing scope for upside (see Exhibit 57). If bull markets "die on euphoria" as Sir John Templeton observed, then these measures argue we have not yet reached the apex.

A rare technical analysis signal corroborates that view. As shown in Exhibit 58, the Coppock curve—an intermediate-length momentum signal—has generated only 17 buy signals over the past 71 years, but collectively they have provided attractive low-risk entry points for long-term investors. If we took the median path of S&P 500 prices after past signals, it would imply the market gains 9% this year with 88% odds of a positive outcome. Of particular note, Coppock buy signals on the NYSE, Russell 2000 and FTSE All-World Index were also triggered in November, even before the post-election rally. For all the reasons discussed above, we accord a 25% probability to our good-case scenario of the S&P 500 reaching 2,450 by year-end.

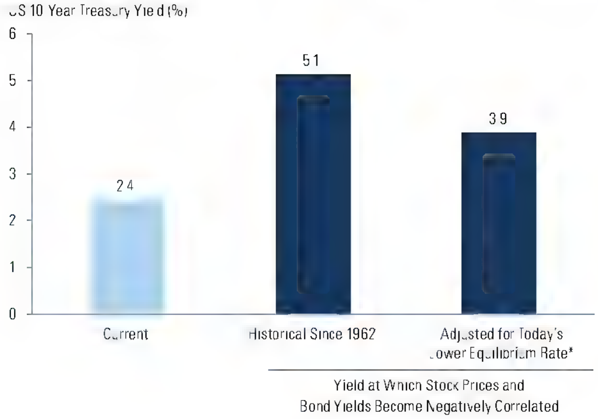
Of course, we are equally aware of the myriad downside risks investors face, including growing unease about a disorderly backup in bond yields. But here, our work suggests that rates have scope to increase further before becoming a headwind for stocks, even if adjusted for today's lower long-run equilibrium nominal rate (see Exhibit 59). Keep in mind that 88% of S&P 500 debt has a fixed interest rate and only about 10% matures each year. The impact of higher rates will be spread over many years as a consequence.

Exhibit 58: Coppock Curve S&P 500 Buy Signals
One of only 17 post-WWII buy signals was triggered in July 2016.



Data through December 31, 2016.
Source: Investment Strategy Group, Bloomberg

Exhibit 59: Inflection Point for Negative Correlation Between Bond Yields and Stock Prices
Typically stocks and interest rates move in the same direction until yields reach levels far above those seen today.



Data as of December 31, 2016
Source: Investment Strategy Group, Bloomberg, Federal Reserve.
* Adjusts for the reduction of 1.25 percentage points in the long run equilibrium nominal rate, in line with the shift in Federal Reserve projections since 2012

Some have taken a less sanguine view, arguing that the "taper tantrum" of 2013 suggests bond yields have already reached a troublesome level for stocks. However, the tantrum primarily reflected concerns that by tightening policy prematurely, the Federal Reserve was committing a mistake that would undermine growth—a fact evident in the episode's widening credit spreads and declining breakeven inflation rates. Despite a similarly rapid increase in rates this time around, we have seen the opposite market reaction, with credit spreads tightening and breakeven inflation rates moving higher alongside growth expectations. This contrast reminds us that the reason rates are increasing is as important as their resulting level.

Aside from rates, ongoing concern about a hard landing in China and a banking or political crisis in Europe remain top of mind (see Section I, The Risks to Our Outlook). We also start the year with less of a buffer to absorb such adverse developments, given today's high valuations. Even worse, this narrower margin of safety arrives at a time when policy uncertainty in the US is particularly acute, given upcoming changes to tax, trade and immigration policies under the new administration. A destination tax, for example, could be particularly damaging to S&P 500 margins given the growth of global supply chains in the last decade, not to mention the sizable

Exhibit 60: US Dollar Index
Even if the dollar stays unchanged, it will still act as a drag on US multinational earnings in early 2017.

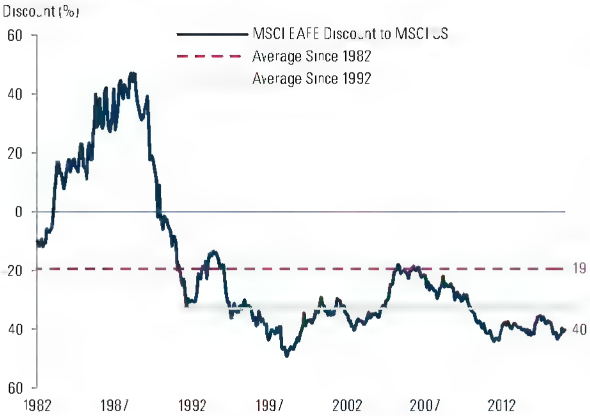
Data through December 31, 2016, with illustrative projection through 2017.
Source: Investment Strategy Group, Bloomberg

upward pressure it would place on the US dollar. Even at current levels, the dollar will represent a renewed drag on US multinational earnings in the first quarter (see Exhibit 60).

That said, the collective impact of these various risks is not yet sizable enough to undermine our core view: we are in a longer-than-normal US recovery that supports equity returns that are

Exhibit 61: EAFE Price to 10-Year Average Cash Flow Discount to the US

Today's larger-than-average discount provides a margin of safety to EAFE equities.

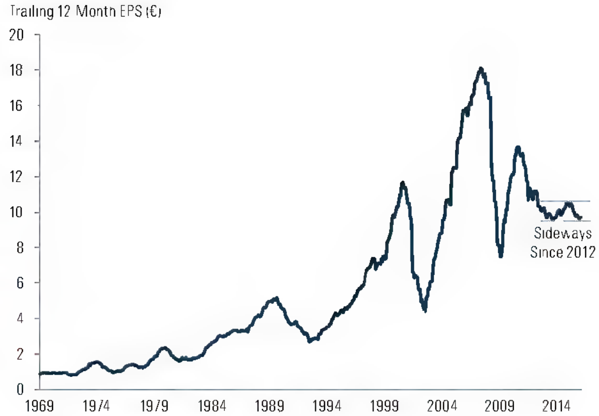


Data through December 31, 2016

Source: Investment Strategy Group, MSCI, Datastream

Exhibit 62: MSCI EMU Trailing 12-Month Earnings per Share

Profits have been range-bound for almost four years.



Data through December 31, 2016.

Source: Investment Strategy Group, Bloomberg

likely to exceed those of cash and bonds. In turn, we recommend that clients maintain their strategic weight in US equities, although we acknowledge that risks have risen at the same time that returns appear likely to be lower going forward. While US equities are not yet running on fumes, we should keep a close eye on the fuel gauge.

EAFE Equities: Priced for Imperfection

There is no shortage of concerns surrounding the various countries that comprise Europe, Australasia and the Far East (EAFE) equity markets. The list is both long and valid, including persistently low economic growth, a slow pace of structural reforms and incessant political uncertainty, as well as incremental, reactive and inconsistent policy responses. Ongoing questions about the health of the banking system only compound these worries.

But these concerns are also not new and are consequently well understood by the market. In turn, the key question facing investors is not whether EAFE exposure subjects them to downside risks. As the preceding list demonstrates, it clearly does. The question instead is whether investors are being fairly compensated to bear these risks.

One can never know precisely what equity markets are discounting, but the above concerns are almost certainly a key driver of EAFE underperformance and the main reason behind today's larger-than-normal valuation discount to US equities (see Exhibit 61). While this margin of safety does not guarantee outperformance, it may provide investors with a larger buffer to absorb adverse developments and miscalculations in their forecasts. In our view, the risk/return profile of EAFE equities is more attractive than it first appears.

As a result, we do not recommend that investors underweight EAFE equities. In fact, there are reasons to believe that EAFE equities will outperform US equities in local currency terms this year. In the sections that follow, we explore these reasons by examining the three main EAFE markets, beginning with the Eurozone.

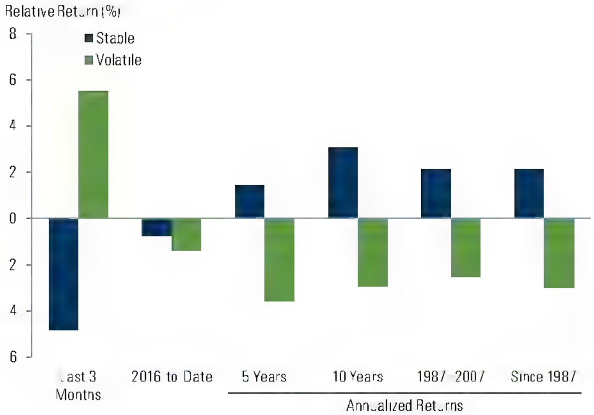
Eurozone Equities: The Onus Is on Earnings

Earnings have been going nowhere fast for Eurozone equities. That's apparent in Exhibit 62, which shows that profits have been range-bound—at nearly half their 2007 peak level—for almost four years. As a result, rising valuation multiples have accounted for all of the 25% price appreciation over this period.

This seeming contradiction between stagnant earnings and rising multiples reflects the copious liquidity provided by the ECB's quantitative easing. By depressing interest rates, ECB policy

Exhibit 63: Relative Performance of "Stable" and "Volatile" EAFE Stocks

Investors have recently shifted toward firms more exposed to the business cycle.



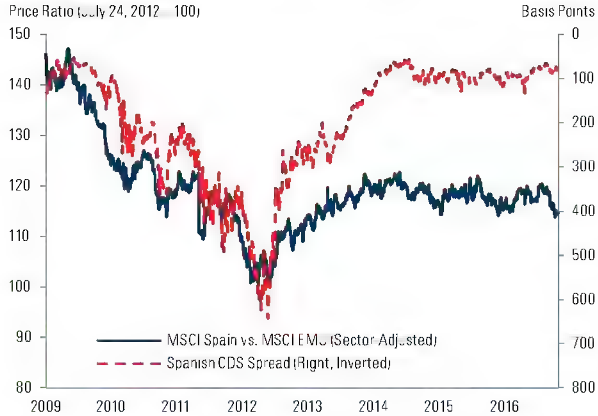
Data as of October 31, 2016

Note: Equally weighted USD-hedged returns relative to the developed markets (ex-US). Stable and volatile stocks are drawn from the large-cap universe. Stability is measured using a model based on return on equity, earnings growth, financial leverage and beta.

Source: Investment Strategy Group, Empirical Research Partners

Exhibit 64: Spain 5-Year Credit Default Swap and Relative Equity Performance

The dramatic reduction in Spanish default risks suggests equity valuations have scope for upside.



Data through December 31, 2016.

Source: Investment Strategy Group, MSCI, Datastream

has both hobbled bank profits—which represent a third of EuroStoxx 50 earnings—and boosted equity valuations. But with ECB policy unlikely to become any more accommodative, additional valuation expansion can no longer be taken for granted. Instead, the onus for Eurozone equity upside now rests with earnings.

Here, the prospects are favorable for several reasons. First, above-trend Eurozone GDP growth is likely to lead to boosted domestic sales and reduced economic slack, both of which have lifted Eurozone earnings in the past. Second, the broader pickup in global GDP growth we expect should benefit the 45% of the EuroStoxx 50's sales that are generated outside Europe. Higher revenue is particularly beneficial to these EuroStoxx firms given their operating leverage, as small improvements in sales spread over their sizable fixed costs also push profit margins higher. Finally, financial sector earnings stand to benefit from the higher interest rates we foresee.

Against this backdrop, we expect earnings to expand 5% in 2017. Meanwhile, valuation multiples are likely to contract slightly as interest rates normalize higher and investor focus shifts toward eventual ECB tapering late this year. Combining these elements with a 3.6% dividend yield implies EuroStoxx 50 total returns of 3% in 2017.

The risks to our base case are skewed mildly to the upside. After underperforming most equity markets in 2016, Eurozone equities have room to play catch-up. Moreover, the passing of long-feared French and German elections could compress today's elevated equity risk premium, although political uncertainty is likely to remain high in the interim. Finally, investors' recent shift toward firms more exposed to the business cycle should benefit Eurozone firms given their greater operating leverage (see Exhibit 63).

Within the Eurozone, we are overweight Spanish equities. Here, we are drawn to attractive valuations (see Exhibit 64), domestic growth momentum and embedded overweight to banks.

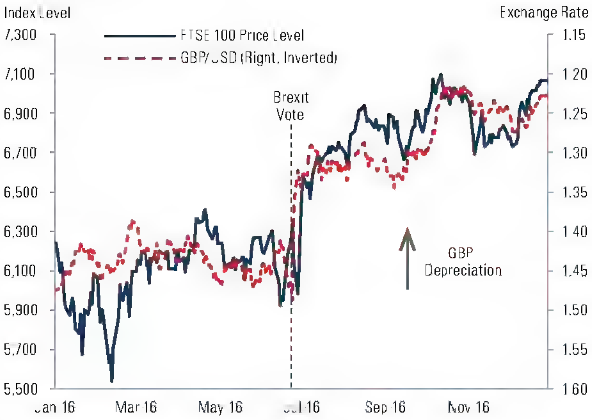
UK Equities: Scaling the Wall of Worry

While the Brexit vote was surprising, the subsequent performance of the UK stock market was even more so. Despite the tremendous political and social uncertainty engendered by the referendum's outcome, UK equities generated one of the strongest returns of any major equity market last year in local currency terms.

Several factors at the root of this outperformance should continue to work in favor of UK equities in 2017. First, FTSE 100's global

Exhibit 65: FTSE 100 Price Level and British Pound

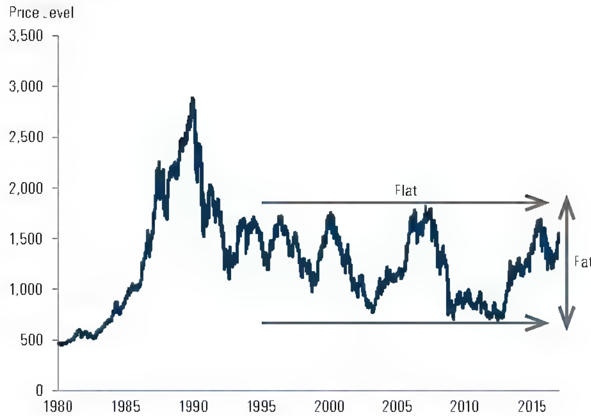
A weaker pound benefits FTSE 100 companies, which generate 75% of sales outside the UK.



Data through December 31, 2016
Source: Investment Strategy Group, Bloomberg

Exhibit 66: TOPIX Price Level

Japanese equities have traded in a large-but-contained range.



Data through December 31, 2016
Source: Investment Strategy Group, Goldman Sachs Global Investment Research, Bloomberg

footprint—75% of sales come from outside the UK economy—should benefit from the accelerating global GDP growth we expect this year, just as this exposure profited from last year's 16% depreciation of the British pound (see Exhibit 65). Second, last year's best-performing sectors—commodities and financials—are well positioned to extend their run. Financials—the largest UK sector—stands to benefit from rising interest rates, while the commodity sectors should get a boost from higher oil prices. Notably, these two sectors account for nearly half of FTSE 100 market capitalization.

With these tailwinds in mind, we forecast UK earnings growth of 11% this year, the highest of our estimates across EAFE markets. That said, continued uncertainty around the implications of Brexit coupled with higher interest rates will likely weigh on FTSE 100's well-above-average valuations. This view, combined with the UK equity market's hefty dividend yield of 4.0%, results in a 4% total return projection for the FTSE 100.

Although this return is attractive on its face, we do not believe it offers investors a large enough margin of safety to justify a tactical overweight. Keep in mind that significant uncertainties remain around the final contours of Brexit. Moreover, a shift by the Bank of England toward raising interest rates this year could reverse much of the British pound's depreciation, to the detriment of UK earnings. Finally, FTSE 100's global footprint could magnify any disruption to global trade volumes resulting from protectionist policies.

We project UK earnings growth of 11% this year, the highest of our estimates across EAFE markets.

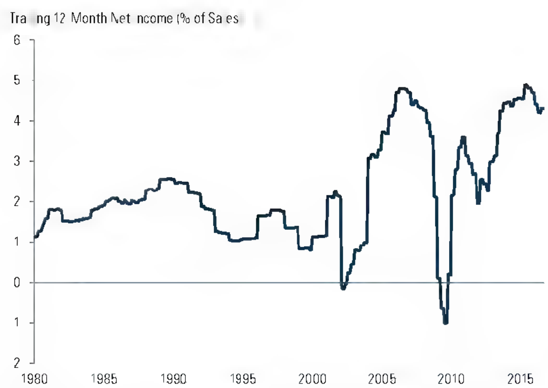
Japanese Equities: Scaling a Familiar Peak

Japanese equities have experienced their fair share of booms and busts over the last 25 years. As seen in Exhibit 66, this pattern of offsetting swings has resulted in a "fat and flat"[108] trading range. With the TOPIX price level again in the upper third of its historical band, it is natural to ask whether 2017 will mark yet another market top in Japan.

The earnings outlook is pivotal to answering this question. While our forecast for accelerating global GDP growth points toward higher earnings, near-peak profit margins are a headwind (see Exhibit 67). Moreover, with less central bank easing given the BOJ's already sizable balance sheet, yen depreciation—a key driver of Japanese revenue growth since 2012—is expected to moderate this year. Even so, the

Exhibit 67: Japanese Profit Margins

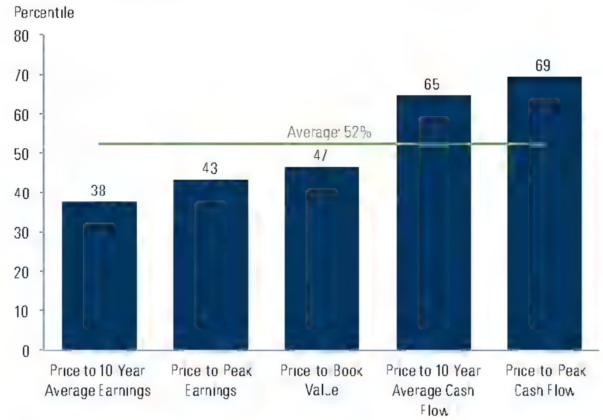
Near-peak profit margins could be a headwind for Japanese equities.



Data through November 30, 2016
Source: Investment Strategy Group, Datastream

Exhibit 68: Japanese Equity Valuations

Valuations are near the median level of Japan's deflationary period since 1999.



Data as of December 31, 2016
Note: Based on data since 1999
Source: Investment Strategy Group, Datastream, MSCI

interplay of these inputs should still lead to positive earnings growth of 6% in 2017.

The direction of valuation multiples is equally important. As shown in Exhibit 68, Japanese valuations are middling based on their history since 1999, which we believe is the relevant evaluation period given the deflationary headwinds that emerged thereafter. For equity multiples to move significantly higher from here would require sustainable above-trend earnings growth or a sizable increase in direct equity purchases by the Japanese central bank. But with the BOJ already holding a remarkable 60% of Japanese ETF market assets[109] and profit margins near their peak levels, neither of these upside catalysts seems probable. In fact, P/E multiples are forecast to contract in our base case, as the 6% earnings growth we expect will likely disappoint current market expectations of 12%.

Putting these pieces together, we expect neither a boom nor a bust for Japanese equities. Instead, the combination of mid-single-digit earnings growth, slight compression in valuation multiples and a 1.9% dividend yield should generate a 5% total return. While this return is attractive from an absolute standpoint, it also comes with significant downside risks given the country's poor demographics, declining labor force and high government debt load. Consequently, we are tactically neutral on Japanese equities currently.

Emerging Market Equities: Finally in Gear, but Potholes Ahead

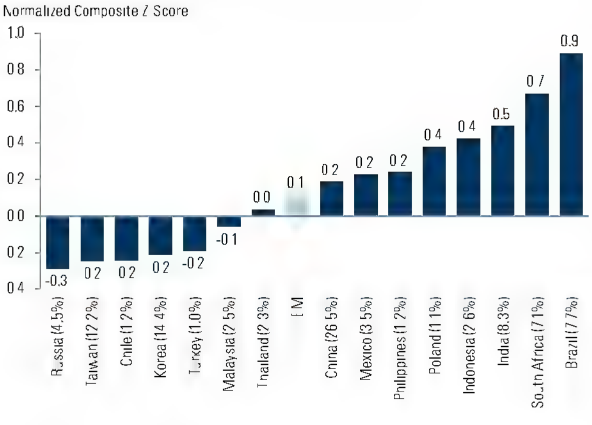
Emerging market equities as a whole finally moved forward in 2016 after three years in reverse: multiples expanded, earnings estimates improved and currencies appreciated, generating a 12% total return. Politics and commodity prices were key performance differentiators among emerging markets last year, leading Brazil and Russia to the winners' podium while leaving Turkey and Mexico in last place.

We expect emerging market equities to remain on track in 2017. Our central case calls for earnings growth of 5% in US dollar terms, driven by faster nominal GDP growth and the lagged impact of easier financial conditions and higher commodity prices. But with multiples already at post-crisis highs in an environment of rising global rates and heightened risks, we see little scope for further expansion. Combining these two inputs with a dividend yield of 2.6%, our forecast implies a total return of about 7% this year.

However, the uncertainty around this forecast is quite large, as emerging market equities face several potential potholes on the road ahead. Chief among these is the ultimate policy agenda of the incoming US administration. On the one hand, a policy mix that favors US growth over trade restrictions would support emerging market exports and boost profits and equity returns.

Exhibit 69: EM Equity Valuations

Aggregate valuations are near neutral levels.



Data as of December 31, 2016

Note: Based on monthly data since 1994 for Price/Forward Earnings, Price/Book Value, Price/Cash Flow, Price/Sales, Price/Earnings to Growth Ratio, Dividend Yield and Return on Equity. Numbers in parentheses denote the country's weight in MSCI EM. Only showing countries with a weight greater than 1%.

Source: Investment Strategy Group, Datastream, I/B/E/S, MSCI

On the other hand, a harsher US stance on trade and foreign policy would hurt emerging market earnings, sentiment and valuation multiples. China, Korea, Mexico and Taiwan—which account for about 60% of MSCI emerging market capitalization and earnings—seem particularly vulnerable in the latter scenario. In comparison, countries with less exposure to the US economy and already strong domestic demand, such as India and Indonesia, would likely fare better.

Against this uncertain backdrop and considering today's uninspiring valuations (see Exhibit 69), we remain tactically neutral on emerging market equities. That said, we continue to explore relative investment opportunities that exploit the significant domestic activity, external vulnerability and valuation differences among individual emerging countries.

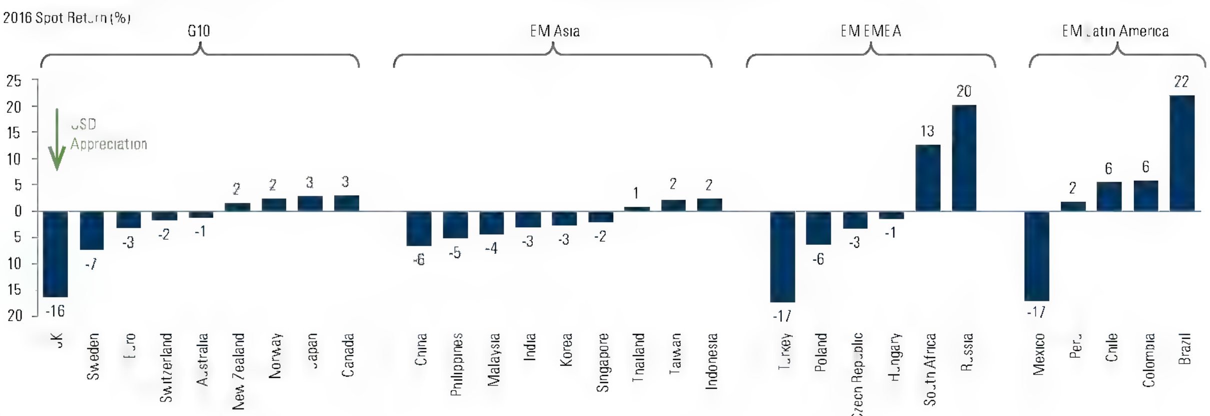
2017 Global Currency Outlook

In a notable departure from recent years, the US dollar did not enjoy unequivocal dominance in 2016 (see Exhibit 70). The yen, for example, ended a four-year slide against the greenback as the market questioned the BOJ's commitment to monetary easing. Certain emerging market currencies—such as the Russian ruble and Brazilian real—also outperformed the dollar on the back of stronger commodity prices and favorable political developments at home. And while the dollar did make notable gains against the euro, pound and Mexican peso in particular, these currencies enter 2017 with a more balanced risk/reward profile as a result.

The upshot is that while tightening monetary policy and potential fiscal expansion in the US will continue to favor dollar strength, those gains are likely to be more modest and reflected in a narrower set of currencies as the dollar bull market enters its fifth year. Our tactical positioning

Exhibit 70: 2016 Currency Moves (vs. US Dollar)

For the first time in several years, the US dollar did not appreciate against all major currencies.



Data as of December 31, 2016

Source: Investment Strategy Group, Bloomberg incorporates this view, as we are neutral on the euro, yen and pound versus the US dollar, but remain bearish on the Chinese renminbi.

We discuss our view on the broader US dollar, as well as each of these currencies, next.

US Dollar

Following three consecutive years of dollar outperformance, it would be reasonable to assume the up-cycle is nearing an end. After all, dollar valuation is now close to its historic average level relative to the currencies of US trade partners, after adjusting for inflation. Moreover, the length of this dollar bull market is approaching that of the two prior episodes shown in Exhibit 71 and shares a similar underlying driver—tighter monetary policy in the US relative to its global peer group.

But while we expect the pace of US dollar appreciation to slow, there are many reasons to believe the greenback's outperformance can continue this year. Dollar valuation remains below the peaks reached in the 1985 and 2002 bull cycles, suggesting it is not yet prohibitively expensive. The dollar should also benefit from solid US macroeconomic fundamentals relative to other developed economies. President-elect Trump ran on a platform that includes fiscal expansion and corporate tax reform. Although his economic team's spending plan is still forthcoming, the package could represent an economic tailwind that may justify tighter US monetary conditions at a time when foreign central banks have committed to easier policy. In turn, relatively higher US yields may entice global investors to favor US dollar assets over lower-yielding foreign-denominated alternatives.

Furthermore, some elements of the new administration's desired corporate tax reform could present material upside risk to the US dollar. For example, the destination-based tax system supported by several House Republicans disallows deductions for any imported good or service—

Exhibit 71: US Dollar Real Effective Exchange Rate

Dollar valuations are near their long-term average but below levels reached in past bull cycles.

Data through November 30, 2016

Note: Z score is calculated on data since 1973 and represents the number of standard deviations from the mean. Shaded areas highlight periods of dollar strength.

Source: Investment Strategy Group, Datastream.

effectively supporting US goods by making them more competitive. Economic theory suggests that free-floating currencies such as the US dollar would need to adjust higher by the amount of the tax to create equilibrium with similar goods sourced across foreign borders. Taken at face value, this implies a 20% destination tax would require a simultaneous—and potentially very disruptive—20% increase in the US dollar. A tax holiday for cash held abroad could be similarly dollar positive, in spirit if not in magnitude. While it is true that a majority of the $2.6 trillion of US corporate earnings trapped overseas are already held in US dollar assets, the greenback would still enjoy a tailwind if corporates elected to repatriate some portion of the foreign currency balance.

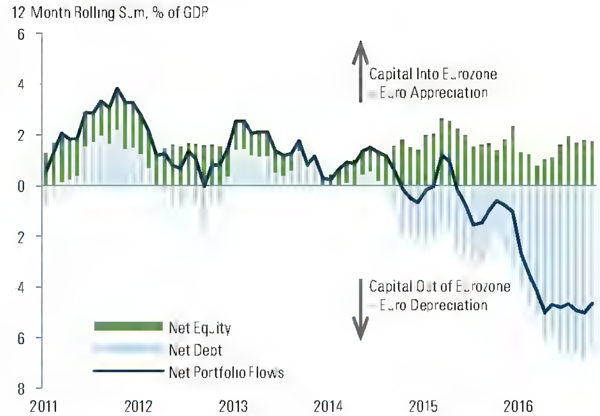
That said, the risks to the US dollar are not exclusively to the upside, as much of the good news is embedded in current prices (see Exhibit 72). Consider that the bulk of last year's dollar advance occurred in the two weeks following the US presidential election in November, as the market quickly discounted a portion of potential policy changes. Moreover, Federal Reserve rate hike expectations for 2017 have increased following stronger US activity data during the second half of 2016. Lastly, we expect the BOJ and ECB to maintain their highly accommodative policies again this year. With these tailwinds already

Dollar gains are likely to be more modest and reflected in a narrower set of currencies as the dollar bull market enters its fifth year.

Exhibit 72: Trade-Weighted US Dollar Index
The recent dollar rally implies much of the good news has already been priced in.

Data through December 31, 2016
Note: Shaded areas denote periods of US recession
Source: Investment Strategy Group, Datastream

Exhibit 73: Eurozone Net Portfolio Flows
Policy divergences could continue to drive portfolio investment out of the Eurozone.



Data through October 31, 2016
Note: Q3 2016 data used to calculate Q4 2016 share of GDP
Source: Investment Strategy Group, Haver Analytics

partly reflected in current exchange rates, the US dollar is vulnerable to both domestic and foreign disappointments.

In sum, we expect the dollar to appreciate further, but at a slower pace and with greater volatility than in recent years.

Euro

The euro was on the losing side of the US dollar's strength again in 2016, marking the third consecutive year of underperformance and the longest stretch of annual declines since 2001. Last year's modest 3.2% decline actually masked a much larger 10% drop from the euro's intra-year peak, half of which came in the weeks following the US elections in November. Needless to say, the combination of potentially expansionary fiscal policy put in place by the new administration coupled with tighter US monetary policy represents a stiff headwind to the euro, particularly since the ECB just extended quantitative easing until December 2017.

We expect these transatlantic policy divergences to persist, driving European investors to continue seeking higher-yielding, non-euro-denominated assets abroad (see Exhibit 73). This preference will likely be bolstered by uncertainty surrounding upcoming national elections in Germany, France, the Netherlands and possibly Italy and Spain. While our central case assumes mainstream parties prevail, any result that raises questions about the long-term viability of the European Monetary Union could push the euro even lower.

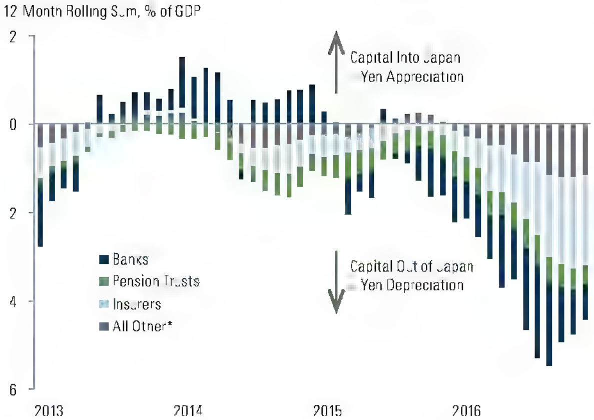
Still, we should not lose sight of the fact that after such persistent weakness versus the US dollar, the euro is undervalued and investors are now positioned for further weakness. Additionally, the above-trend Eurozone growth and normalizing inflation we expect could justify the ECB shifting toward a more neutral stance later this year. Such a move would narrow the interest rate differential between the US and Eurozone, weakening a linchpin of the weaker euro thesis.

Given this balance of risks, we removed our tactical short positions in the euro relative to the dollar following the November US presidential election, returning to a neutral view.

> We should not lose sight of the fact that after such persistent weakness versus the US dollar, the euro is undervalued and investors are now positioned for further weakness.

Exhibit 74: Japanese Net Purchases of Foreign Long-Term Debt by Investor Type

Additional buying of foreign assets by Japanese investors could put further downward pressure on the yen.



Data through November 30, 2016

Note: Q3 2016 data used to calculate Q4 2016 share of GDP

Source: Investment Strategy Group, Haver Analytics

* All Other defined as central banks, general government, financial instruments firms, investment trust management companies and others

Yen

For yen investors, last year was a reminder that markets often take an escalator up but an elevator down. After steadily appreciating almost 20% against the US dollar over the first nine months of 2016, the currency forfeited those gains in just weeks after the surprising US presidential election. Although the net effect was a small 2.8% appreciation last year—breaking a four-year streak of yen weakness—we do not believe further yen strength is likely.

There are two reasons for this view. First, the BOJ will likely keep rates negative or close to zero this year by maintaining highly accommodative monetary policy. In turn, Japanese investors will continue to sell low-yielding domestic assets—placing downward pressure on the yen—in order to fund purchases of higher-yielding offshore assets (see Exhibit 74). Japan's Government Pension Investment Fund (GPIF)—which manages the world's largest public pension—is a case in point, as it will need to sell domestic fixed income assets to reach its stated targets for foreign investments. Similarly, Japanese life insurers may increase their exposure to foreign currencies if interest rate differentials between the US and Japan remain wide.

Second, Japanese corporations are likely to sell yen to invest in foreign operations with better growth prospects, which will also place downward pressure on the Japanese currency; such announcements are already on the rise.[110]

This is not to suggest that the prospects for the yen are completely one-sided. The higher global rates we expect may make it difficult for the BOJ to maintain such low domestic yields, which would alleviate some of the downward pressure on the currency. Moreover, the many sources of global uncertainty in the year ahead could lead investors back into the yen as a liquid hedge, as we saw in the first half of 2016. Finally, after four years of weakness, the yen has reached undervalued levels.

Given this more balanced risk profile, we currently have no tactical position in the yen.

British Pound

While broader financial markets were unperturbed by the UK's decision to leave the European Union, the same cannot be said for currencies. Here, the Brexit vote sent the pound tumbling to its lowest level versus the US dollar since the 1985 Plaza Accord.[111] Although the pound has since recovered some of those losses, its 16.3% decline relative to the US dollar last year still ranks as the worst performance among all developed market currencies.

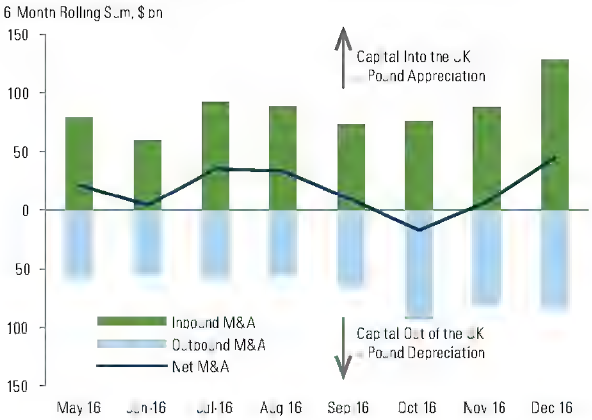
The trajectory of the pound will be largely shaped by the evolution of Brexit negotiations. Even though six months have passed since the vote, there is no greater clarity on how the UK will ultimately exit the European Union and on what terms. Clearly a combative stance could see the pound weaken further as the market discounts lower potential growth in the UK. Alternatively, a more conciliatory negotiating position could lead to upside from today's depressed levels.

Barring a hostile negotiating tack from the UK government, the pound also has several other factors working in its favor. First, foreigners continue to buy pounds to invest in UK-domiciled assets and firms, which is vital to funding the UK's sizable 5.2% of GDP current account deficit. In fact, one of the largest cross-border acquisitions last year was announced less than one month following the EU referendum.[112] Importantly, higher-frequency data shows this merger and acquisition (M&A) momentum is continuing (see Exhibit 75).

Second, the Bank of England may need to raise interest rates sooner than markets now expect, as erstwhile sterling depreciation is quickly feeding

Exhibit 75: UK Cash Merger and Acquisition Announcement Pipeline

Continued inbound M&A activity could benefit the pound.



Data through December 31, 2016

Note: October 2016 outbound M&A adjusted to exclude stock portion of British American Tobacco's takeover of Reynolds

Source: Investment Strategy Group, Bloomberg

through to higher domestic inflation. In turn, higher UK interest rates would make sterling-denominated assets more appealing to foreign investors and support the currency.

Finally, while sterling certainly has scope to depreciate, market participants are already well-positioned for further weakness. Those positions may become vulnerable if the UK's negotiations with its trade partners turn more amicable and the domestic UK economy remains resilient.

With these upside risks being tempered by the unknowable evolution of Brexit negotiations for now, we see balanced risks for the pound this year and thus remain tactically neutral.

Emerging Market Currencies

Emerging market currencies caught a welcome updraft last year, following a 45% freefall since mid-2011. The flight was not without turbulence, however. Following a 12% rally in the first half of the year—reflecting a dovish shift in US monetary policy and waning fears about Chinese capital outflows—emerging market currencies hit an air pocket that erased much of these gains following the surprise outcome of the US elections.

We believe this downdraft is likely to persist. The prospect of higher US interest rates, a stronger dollar and China's bumpy deceleration spells tighter global financial conditions and a risk of capital outflows from emerging markets—conditions that have historically constituted a stiff headwind to their currencies.

These risks are magnified by the uncertainty surrounding the incoming US administration's trade policies. Fears of protectionism have already negatively impacted the currencies of China and Mexico—the two largest sources of manufacturing exports to the US—with the peso and Chinese renminbi down 11.6% and 2.3%, respectively, since the election.

Even so, we do not think a broad tactical short in emerging market currencies is appealing at this stage. Despite the small rally last year, emerging market currencies remain attractively valued (see Exhibit 76), particularly given their enticing 5% yield differential to the US dollar. Moreover, the new US administration may prove to be more measured in its actions than its rhetoric—a non-negligible risk that could revive sentiment and improve prospects for emerging market currencies. The Mexican peso, in particular, could benefit in that event.

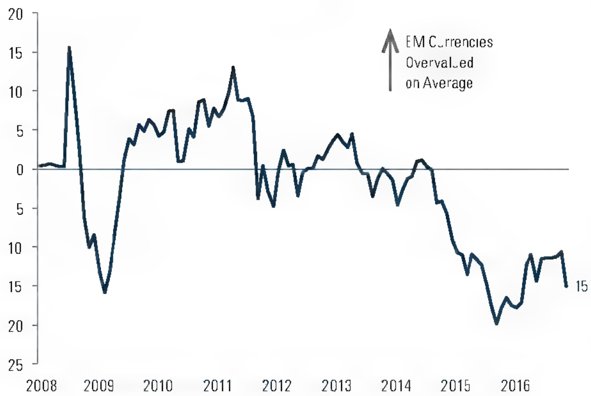
For now, we remain tactically positioned to benefit from further renminbi weakness given our long-standing concerns about China's economic vulnerabilities and the likelihood of looser policy, policy mistakes and capital outflows. The potential for US trade protectionism directed at China, though not our base case, would further benefit this position.

2017 Global Fixed Income Outlook

Last year witnessed a notable reversal of fortune for global interest rates. Despite reaching all-time closing lows shortly after the surprise Brexit vote, 10-year yields in developed markets had reclaimed much—if not all—of those declines by year-end. In the US, a more than one percentage point swing was sufficient to turn the 10-year bond's 9% gain into a loss.

While some have portrayed this reversal as just another setback in the now three-decade-old bond bull market, we are more skeptical. The policy mix that has depressed interest rates in the post-crisis period—a combination of fiscal austerity, negative or near-zero central bank policy rates and large-scale asset purchases—is losing favor, as even policymakers acknowledge the often counterproductive impact of these policies. At

Exhibit 76: Emerging Market Currency Valuation
Despite the recent rally, emerging market currencies remain undervalued against the US dollar.



Data through November 30, 2016
Note: Average of Goldman Sachs Dynamic Equilibrium Exchange Rate, 5-year moving average, and Fundamental Equilibrium Exchange Rate misalignments of currencies in the JP Morgan Government Bond Index—Emerging Markets Global Diversified.
Source: Investment Strategy Group, Bloomberg, Datastream, Goldman Sachs Global Investment Research, Peterson Institute for International Economics.

Exhibit 77: Estimated Duration of US Bond Market
The bond market's sensitivity to rising rates is the highest on record.

Data through December 31, 2016
Note: Based on the Barclays US Aggregate Bond Index.
Source: Investment Strategy Group, Bloomberg.

the same time, the recovery in commodity prices, recent firming in global growth and potential for expansionary fiscal policy are shifting the focus from deflation to reflation.

This shift in perspective arrives at a time when the market's vulnerability to rising rates is the highest on record (see Exhibit 77). Losses from these long-duration positions in response to higher rates could beget more bond sales, creating a vicious cycle. That yields are still extremely low by historical standards does little to assuage these fears. Consider that 10-year government bond yields in all G-7 countries have been higher at least 90% of the time since 1958. Given all the above, we believe the ascent of interest rates remains in its infancy.

Still, it is important to differentiate between a normalization of interest rates and a disorderly backup. While we expect higher interest rates over the coming years, secular headwinds—like aging demographics and slower productivity growth—suggest the terminal point of that increase will be lower than the historical average. This fact is not lost on the Federal Reserve, which has reduced its estimate of the long-run equilibrium nominal rate—the rate consistent with full employment and stable inflation in the medium term—from 4.25% to 3% over recent years.

For now, we remain tactically positioned to benefit from further renminbi weakness given our long-standing concerns about China's economic vulnerabilities and the likelihood of looser policy, policy mistakes and capital outflows.

With a lower interest rate target to reach, the Federal Reserve is likely to proceed slowly, particularly given uncertainty around its estimate of the economy's equilibrium rate and lingering international risks. Even if the Federal Reserve were to raise rates three times in 2017, that pace would still be less than half of the historical median tightening pace.[113] Thus far in this cycle, the Federal Reserve has raised rates only once per year.

Against this backdrop, we recommend investors favor credit over duration risk by remaining overweight US corporate high yield credit versus investment grade fixed income and by funding various tactical tilts from their high-quality bond allocation. While most investment grade bonds may have uninspiring tactical prospects, we emphasize that investors should not completely abandon their bond allocation in search of higher yields. As the last several years have reminded us, investment grade fixed income serves a vital strategic role in the portfolio, due to its ability to hedge against deflation, reduce portfolio volatility and generate income.

In the sections that follow, we review the specifics of each fixed income market.

US Treasuries

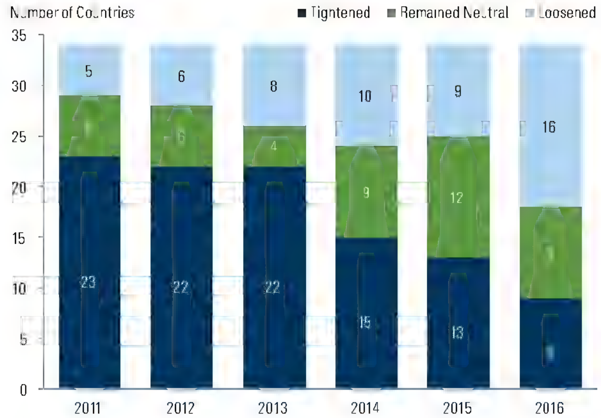
While 2016 began as a bumper year for US Treasuries, it ended in a rout. The yield on 10-year Treasury bonds, for example, reached an all-time low of just 1.36% by the middle of last year before jolting higher by more than one percentage point by year-end. As a result, investors' nearly double-digit gains devolved into a small loss. Even worse, the bulk of the rate increase occurred in just the last three months of 2016, generating a 7% loss for the quarter that has been exceeded less than 1% of the time historically since 1981.

We expect rates to continue to increase, albeit at a slower pace in 2017, as many of the forces that have restrained yields are slowly fading. Inflation, in particular, has been a persistent drag, reflecting a toxic combination of excess labor slack that depressed wages, a strong dollar that lowered import prices and a significant decline in oil prices that weighed on breakeven inflation rates. But as we begin the eighth year of the US expansion, labor slack has been largely absorbed, evident in today's firming wages. Moreover, the impact of the dollar is diminishing as its pace of ascent slows, while the recovery in oil is boosting breakeven inflation rates.

Other headwinds are also receding. The fiscal austerity among the advanced economies that has dampened economic growth and decreased sovereign bond issuance—both of which depress interest rates—is now reversing (see Exhibit 78). Indeed, US fiscal spending is expected to add 0.3–0.5 percentage points to GDP growth in each of the next two years.[114]

At the same time, there is reduced demand for risk-free assets, like US Treasuries, given the unexpectedly sanguine reaction to negative

Exhibit 78: Fiscal Stance of Advanced Economies
Fiscal austerity in developed markets has reversed in recent years.



Data as of December 31, 2016
Source: Investment Strategy Group, IMF.

geopolitical events—such as the UK and Italian referenda—and the results of the US election. Finally, the deleterious impact of depressed interest rates on banking sector profitability has raised the hurdle for global central banks to cut interest rates further and/or increase the scale of QE programs. In turn, market focus has shifted toward the eventual tapering of BOJ, ECB and BOE accommodation, which has helped lift bond term premiums and boosted long-term yields (see Exhibit 79).

In light of these waning headwinds, the Federal Reserve is likely to hike two or three times in 2017, with upside risks from a larger-than-anticipated fiscal expansion. Combined with some further normalization in the term premium, we expect 10-year rates to increase to 2.50–3.00% by year-end. Given the balance of risks, we remain comfortable funding tactical tilts out of investment grade fixed income.

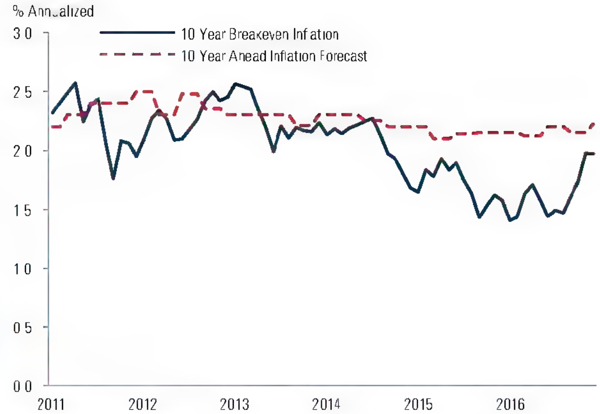
Treasury Inflation-Protected Securities (TIPS)

TIPS fared better than nominal bonds in 2016, delivering a positive mid-single-digit return. Their outperformance was driven by the recovery in breakeven inflation rates, which began the year at very depressed levels consistent with only 1.5% annual inflation over the next 10 years—well below long-run forecasts (see Exhibit 80). In fact, our work suggests that breakeven inflation rates were reflecting high odds of a deep recession over the course of 2016, well above the risk suggested by our recession models.

Exhibit 79: US 10-Year Yields and Term Premium
Expected tapering from major central banks has contributed to higher long-term yields and bond term premiums.

Data through December 31, 2016.
Source: Investment Strategy Group, Bloomberg

Exhibit 80: US 10-Year Breakeven Inflation Rate and Consensus Inflation Rate Forecasts
TIPS benefited from a recovery in breakeven inflation rates in 2016.



Data through December 31, 2016.
Source: Investment Strategy Group, Bloomberg

We think that breakeven inflation rates have further room to rise as the concerns that depressed them last year fade. First, oil prices are recovering, reversing the persistent drag they had exerted throughout much of early 2016. Second, wages are firming and fiscal policy is being eased, dampening deflation worries. Finally, recession odds are falling as the drag from oil weakness and dollar strength fades.

With breakeven inflation rates still below long-term consensus forecasts and the Federal Reserve's target, we expect positive total returns from TIPS in 2017. Still, TIPS' absolute returns are likely to be modest, as their eight-year duration will make it difficult for coupon income to meaningfully exceed principal losses as rates rise. Moreover, given TIPS' unfavorable tax treatment (discussed at length in our 2011 *Outlook*), we continue to advise US clients with taxable accounts to use municipal bonds for their strategic allocation.

We expect rates to continue to increase, albeit at a slower pace in 2017, as many of the forces that have restrained yields are slowly fading.

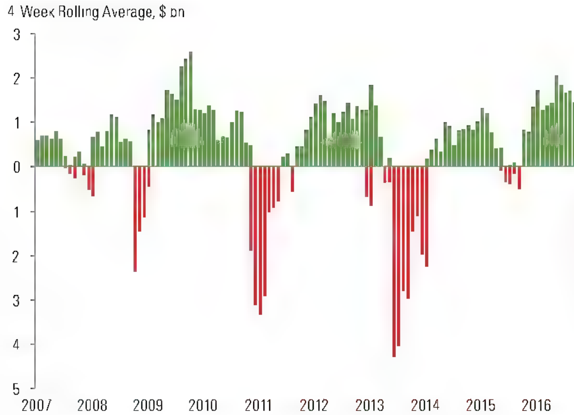
US Municipal Bond Market

Municipal bond holders were not immune from 2016's about-face in US Treasury yields. Last October, municipal bonds were enjoying some of their best returns in years, only to be hit by losses arising from both rising interest rates and budding concerns about tax changes in the wake of the US presidential election. The abrupt redemptions of municipal bond mutual funds only exacerbated these losses, with the pace of outflows second only to the mid-2013 taper tantrum (see Exhibit 81). All told, municipal bonds suffered one of their worst years in recent history, with intermediate municipal bonds actually experiencing a rare loss (see Exhibit 82).

Unfortunately, the near-term outlook remains challenging. As Exhibit 81 reminds us, mutual fund flows tend to be sticky in this asset class, with persistent periods of both buying and selling depending on the trajectory of interest rates. Based on historical episodes, there is scope for the current string of outflows to extend further.

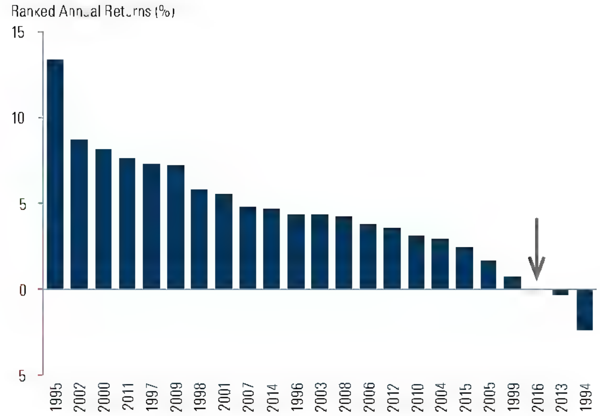
Moreover, clarity on tax policy will remain elusive for months, during which time headline risk will be significant. Even worse, a sizable reduction in the top individual tax rate for municipal bonds—if ultimately passed—could significantly shift the economics of owning them, leading to further sales. These fresh worries on tax policies

Exhibit 81: Municipal Bond Mutual Fund Flows
The pace of outflows at the end of 2016 was surpassed in recent history only by the 2013 taper tantrum.



Data through December 31, 2016
Source: Investment Strategy Group, ICI

Exhibit 82: Annual Municipal Bond Returns Since 1994
Intermediate municipal bonds experienced a rare loss in 2016.



Data as of December 31, 2016
Source: Investment Strategy Group, Barclays

only add to existing concerns about pension funding levels.

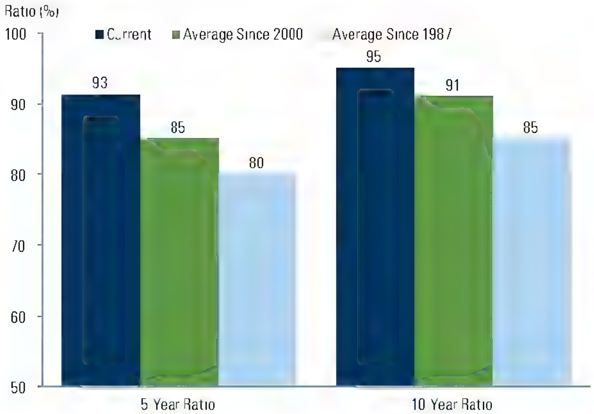
While there is clearly no shortage of risks, the silver lining to last year's rout is that we begin 2017 with a much larger valuation buffer to help absorb them. As seen in Exhibit 83, the ratio of municipal yields to Treasury yields is above average for both 5- and 10-year maturities. In turn, investors can currently earn an extra 70 basis points of after-tax yield by owning five-year municipal bonds instead of same-maturity Treasuries—a yield pickup more than double the post-crisis median of 31 basis points. Moreover, this incremental after-tax yield would still be around 50 basis points if the top individual tax on investment income were reduced by 10 percentage points—from 43.4% with the Affordable Care Act (ACA) tax to 33% under new policy recommendations. In short, municipal spreads currently offer a potential offset to rising rates and potential tax changes.

Also keep in mind that municipal fundamentals remain stable. Major state and local tax revenues have continued to increase at a moderate 3% pace, which should be supported by the above-trend US economic growth and rising home prices we forecast. Meanwhile, governments have exercised restraint on capital spending. Consider that net issuance expectations of $30 billion for 2017 stand well below the pre-crisis 10-year annual average of $110 billion.[115] This restraint has not only kept net supply low—as new issuance has been largely offset by maturing debt—but has also helped municipal finances. Ratings trends have improved as a result of both stable revenue and spending discipline, with upgrades in the Moody's universe seeing a notable uptick in last year's third quarter (see Exhibit 84).

Of course, underfunded long-term pension liabilities remain a source of concern. But with aggregate funding levels holding steady at around 74%, we do not think this will be a primary focus in 2017, particularly given last year's increase in stock prices. While rising equity values will do little to remedy municipals' inadequate funding contributions, they will help increase the value of pension assets. Moreover, these medium-term concerns are not the primary driver of recent municipal bond weakness. After all, today's funding levels are no worse than they were in October of last year, a time when municipal bonds were enjoying some of their best returns ever.

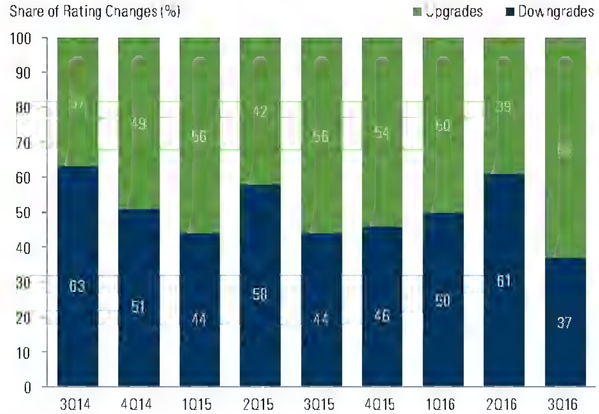
All told, we expect intermediate municipal strategies to gain about 1% in 2017. With this return close to that of cash but with more downside potential, we still think it makes sense for clients to fund various tactical tilts from their high-quality municipal bond allocation. This recommendation is motivated primarily by rate risk and not credit concerns, since we expect municipal defaults to be rare events. Outside tilt funding, we recommend clients target their

Exhibit 83: Ratio of Municipal Bond Yields to Treasury Yields
Current municipal bond yields offer a larger valuation buffer to absorb risks than in the past.



Data as of December 31, 2016
Source: Investment Strategy Group, Bloomberg, Thomson MMD

Exhibit 84: Municipal Issuer Rating Changes
Stable revenue and spending discipline have led to recent issuer rating upgrades.



Data as of Q3 2016
Source: Investment Strategy Group, Moody's

benchmark duration. Given their important portfolio hedging characteristics, municipal bonds should remain the bedrock of the "sleep-well" portion of a US-based client's portfolio.

The same can be said for high yield municipal bonds. Despite their almost 10-year duration, these bonds currently offer attractive spreads of close to 3%, a level that has been higher only 29% of the time since 2000. This spread provides a substantial buffer that could partially offset higher Treasury yields, enabling the high yield municipal market to deliver positive returns of around 4% in our base case. Therefore, we recommend clients stay invested at their customized strategic weight.

US Corporate High Yield Credit

Even for the bullish among us, last year's 17% total return in corporate high yield was surprisingly strong. Not only was it the largest gain within US fixed income, but it also ranked among the top annual returns of all time for the asset class. What makes this performance even more impressive is that high yield was down about 5% at its worst point in early 2016.

But these sizable gains have come at a cost. Spreads—which compensate investors for the risk of default losses—now stand well below their long-term average. In fact, the level of spreads has been lower only a third of the time in the last 30 years. Moreover, yields have fallen from above 10% early last year to less than 7% now, diminishing the allure of these bonds to investors searching for high returns.

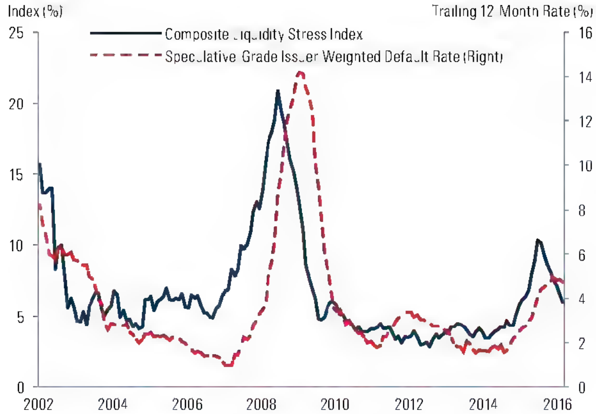
Even so, we think the strong fundamentals underpinning the asset class still warrant an overweight, though returns are almost certain to be more modest going forward. At the heart of this stance is our benign view on default losses, which are the primary risk to high yield investors. Here, several factors support our below-historical-average 2.5% par-weighted default forecast for 2017.

First, high yield firms stand to benefit directly from the strengthening US economy we expect this year, considering almost three-quarters of their sales originate domestically.[116] Second, leading indicators of defaults—such as Moody's liquidity and covenant stress indexes—are trending downward, suggesting fewer speculative-grade companies are

While there is clearly no shortage of risks, the silver lining to last year's rout in municipal bonds is that we begin 2017 with a much larger valuation buffer to help absorb them.

Exhibit 85: Moody's Liquidity Stress Index and Default Rates

Leading indicators suggest the path of defaults for high yield is lower.



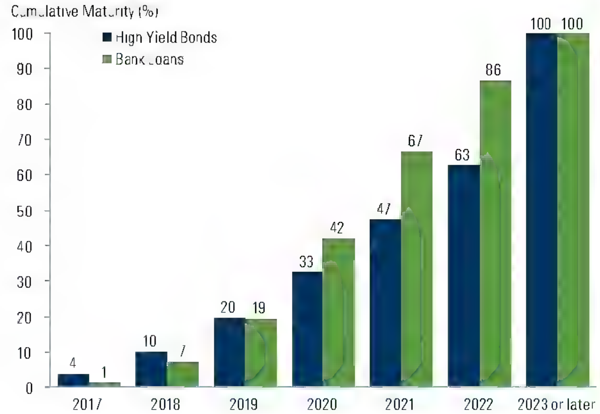
Data through November 30, 2016

Note: Moody's Liquidity Stress Indexes fall when corporate liquidity appears to improve and rise when it appears to weaken

Source: Investment Strategy Group, Moody's

Exhibit 86: Cumulative US High Yield Debt Maturity by Year

Less than 10% of existing debt matures in the next two years.



Data as of December 31, 2016

Source: Investment Strategy Group, JP Morgan

experiencing liquidity problems or are at risk of breaching financial covenants. As seen in Exhibit 85, Moody's composite Liquidity Stress Index (LSI) began to deteriorate in advance of previous default cycles. Third, the commodity sectors of the high yield universe—which collectively generated a staggering 85% of last year's defaults—are recovering along with oil prices. Keep in mind that the par-weighted default rate excluding these sectors was just 0.5% last year, a fraction of the 3.2% long-run average.[117] Finally, our default model—which incorporates the leading characteristics of the Federal Reserve's Senior Loan Officer Opinion Survey and the percentage of distressed bonds—is projecting 2–3% par-weighted defaults in the year ahead.

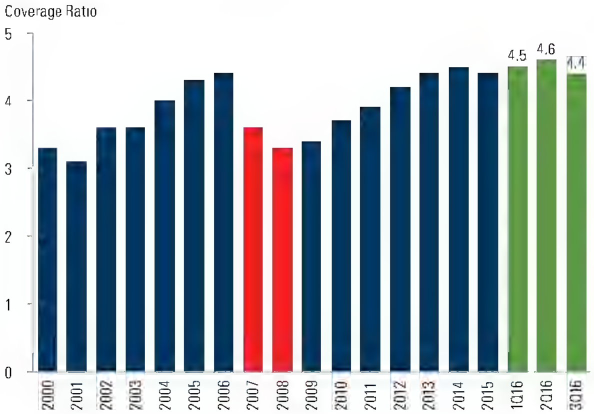
Other factors corroborate our low-default view. As seen in Exhibit 86, there is very little refinancing risk, given that less than 10% of existing debt matures in the next two years. Of equal importance, interest coverage stands near all-time highs today, in stark contrast to the period preceding the financial crisis (see Exhibit 87). This point is further illustrated by Exhibit 88, which shows that today's high yield universe is much healthier than the pre-crisis cohort, regardless of measure. Keep in mind that low-rated CCC bonds represented just 8% of high yield issuance last year, a 14-year low.[118]

We also note that high yield may be a better interest rate hedge than many investors realize. Consider that during unexpected interest rate backups in the past, high yield has generated a positive return 69% of the time and a return that exceeded investment grade fixed income 85% of the time (see Exhibit 89). This last point is important, as our high yield overweight is funded out of investment grade fixed income. High yield's hedging qualities were apparent last year, as the asset class appreciated nearly 7% in the second half of the year despite an increase in Treasury yields of more than 100 basis points. Although we assume that any further increase in 10-year Treasury rates this year will not be offset by high yield spreads, this historical relationship suggests that may be overly conservative.

We think the strong fundamentals underpinning US corporate high yield still warrant an overweight, though returns are almost certain to be more modest going forward.

Exhibit 87: High Yield Par-Weighted Interest Coverage Ratio

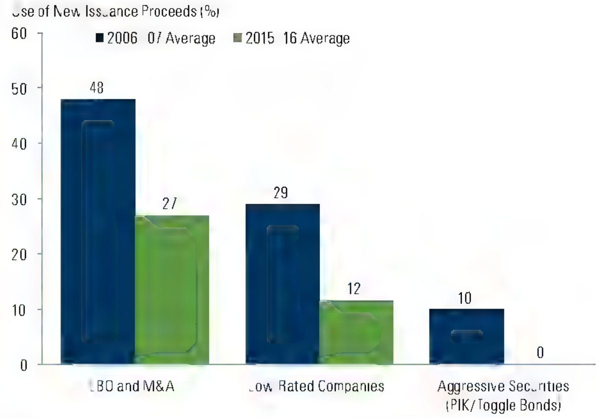
Interest coverage today stands near all-time highs, unlike the pre-crisis period.



Data through Q3 2016
Source: Investment Strategy Group, Barclays

Exhibit 88: Characteristics of US High Yield Issuance

Today's high yield universe is much healthier than the pre-crisis cohort.



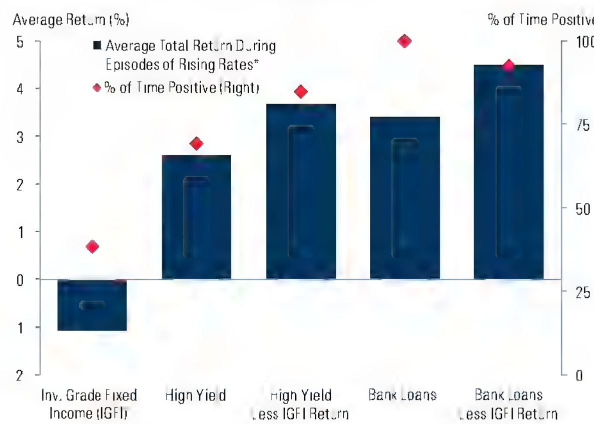
Data as of December 31, 2016
Source: Investment Strategy Group, JP Morgan

Of course, a more constructive view of high yield fundamentals does not necessarily suggest robust returns. In high yield bonds, today's below-average spreads already reflect our subdued default expectations and are less likely to offset any further increase in rates. We thus expect returns of around 4% in the year ahead. Although high yield energy is likely to generate similar gains, the potential upside is more significant given wider starting spreads and the potential for distressed bonds to pull to par amid higher oil prices. Finally, with a 5% return, bank loans should perform marginally better than bonds, reflecting their attractive 0.25-year duration and continued investor demand for floating rates—a feature that is back in vogue now that 3-month LIBOR is almost above the 1% LIBOR floor that more than 90% of bank loans possess.

While these returns may pale in comparison to those of last year, they remain attractive relative to investment grade fixed income, where we expect rising rates to generate lower returns. Even if rates stagnate while US growth remains positive, the default-adjusted return in high yield should still trump high-quality bonds. Said differently, US corporate high yield credit remains a better house in a bad fixed income neighborhood, supporting our modest overweight recommendation.

Exhibit 89: High Yield Credit Performance During Periods of Rising Rates

High yield has historically outperformed investment grade bonds during episodes of rising rates.



Data as of December 31, 2016
Source: Investment Strategy Group, Barclays, Credit Suisse.
* Defined as 5-year Treasury yield rising more than 70 basis points over a 3-month period

European Bonds

Unlike their US counterparts, European fixed income markets did not forfeit all their gains by the end of last year. This served as a poignant reminder of how divergent monetary policies can shape returns. Three ECB actions in March drove this robust relative performance. First, the ECB reversed its prior commitment to avoid further rate cuts and lowered the deposit rate to -0.40%. Second, it increased the size of its asset purchase program from €60 billion to €80 billion per month, effectively buying more Eurozone bonds each year than are actually issued (see Exhibit 90). Finally, it continued to limit its buying to bonds with yields above the deposit rate, which concentrated its purchases toward long-maturity bonds.

These measures created an extreme scarcity effect in long-term German bunds, as investors scrambled to buy today for fear of even lower interest rates tomorrow. In response, German 10-year rates fell to an all-time low of -18 basis points in July of 2016. During these same summer months, all German government bonds with less than a 15-year maturity offered negative yields.

However, monetary policy does not operate in a vacuum. With negative interest rates impairing the profitability of the European banking system, the ECB has already begun to alter its policy mix. At its December 2016 meeting, the ECB reversed the increase in asset purchases mentioned above, targeting €60 billion per month for the upcoming March–December 2017 period. Moreover, it lifted the restriction on purchasing bonds with yields below the deposit rate, alleviating the scarcity premium attached to long-maturity bonds meeting this criterion. While these adjustments are well short of QE "tapering," they have shifted the market focus toward the eventual end of asset purchases and the timing of the first ECB rate hike—currently priced for late 2018.

With less ECB policy pressure on long-maturity bonds, coupled with continued above-trend Eurozone growth and some further normalization in global term premiums, we expect 10-year bund yields to increase to 0.5–1.0% by the end of 2017. While overall peripheral bond spreads should be mostly range-bound in 2017, political woes in Italy and France pose upside risks to the spreads of those countries.

In the UK, we expect gilt yields to reach 1.5–2.25%. Here, persistently high headline inflation induced by the depreciation of sterling and a less-than-feared economic drag from Brexit thus far could encourage the BOE to unwind a portion of the preemptive easing it deployed in response to the surprise referendum outcome.

Given this outlook and today's still depressed bond yields, we remain underweight UK and Eurozone government bonds for European

Exhibit 90: European Government Bond Issuance and ECB Purchases

ECB buying is outpacing net issuance of Eurozone bonds.

Data as of December 31, 2016

Source: Investment Strategy Group, JP Morgan

investors. After all, just a 2 basis point increase in German 10-year bund yields generates a capital loss sufficient to offset an entire year of income. That said, we should not confuse an underweight with a zero weighting, as European clients should retain some exposure to German bunds and other high-quality Eurozone bonds in the "sleep-well" portion of their portfolios. These high-quality bonds would provide an attractive hedge in the event of a Eurozone recession or the return of deflationary concerns.

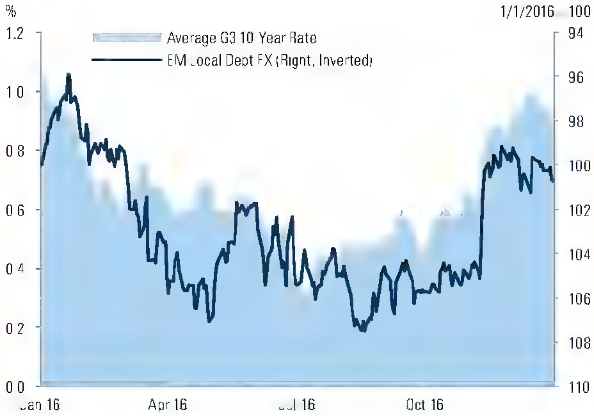
Emerging Market Local Debt

Last year's 10% return for emerging market local debt (EMLD) provided some solace to those who have suffered through nearly three years of losses totaling more than 30%. But investors had to endure considerable volatility to realize this gain, as returns fluctuated between -4% and +18% in 2016. In fact, the asset class lost roughly 5% in just the last two months of the year.

This last point is important, since many of the tailwinds that drove EMLD's strong returns in the first half of 2016 reversed toward year-end and are likely to impact the asset class again in 2017. Here, we refer specifically to the resumption of Federal Reserve rate hikes, renewed US dollar appreciation and a resumption of Chinese renminbi depreciation against the dollar. Just as falling global interest rates helped the asset class for the first part of 2016, so too should the rising rates we expect

Exhibit 91: EM Local Debt Currencies and Developed Market Interest Rates

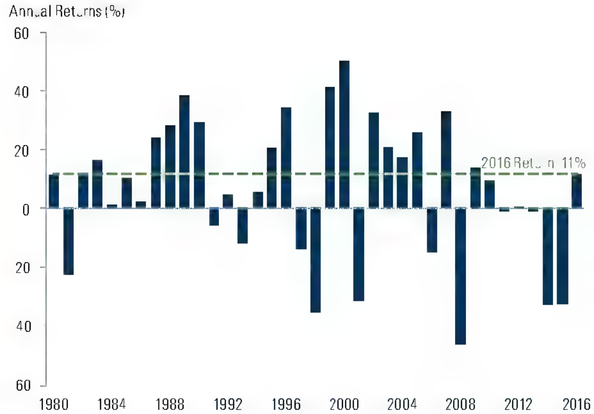
Rising global interest rates would be a headwind to EM local debt.



Data through December 31, 2016.
Source: Investment Strategy Group, Bloomberg, Datastream

Exhibit 92: S&P Goldman Sachs Commodity Total Return Index

Commodities generated their first double-digit return since 2009.



Data through December 31, 2016.
Source: Investment Strategy Group, Bloomberg

represent a headwind this year (see Exhibit 91). Meanwhile, any boost to emerging market exports from the modest pickup in global growth we expect is likely to be dwarfed by ongoing US trade policy uncertainty, European political risk and China fears. Lastly, an acceleration of recent outflows from EMLD markets could magnify these risks, particularly since 60% of the cumulative inflows into the asset class since 2004 are experiencing losses at current market levels.

Although the number of concerns is large, so is the risk premium of the asset class. As previously seen in Exhibit 76, the currencies in the EMLD index are 15% undervalued. From this starting point, the asset class could deliver attractive total returns if US trade policy proves to be more benign than feared and China worries abate.

Considering this balance of risks, our central case calls for low single-digit returns. While positive, this return is not sufficient to justify a tactical long position in EMLD in our view, given the still considerable downside risks discussed above.

Emerging Market Dollar Debt

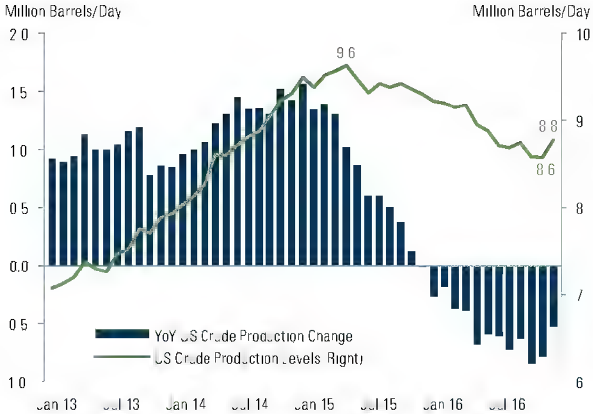
Emerging market dollar debt (EMD) returned 10% in 2016, capping a surprising four-year period of outperformance that has greatly benefited from stable US rates and dollar strength. But the prospects for a fifth year of upside are questionable for several reasons.

First, EMD's almost seven-year duration is a liability in a rising-rate environment. This is particularly true now that the Federal Reserve has resumed tightening policy, a fact evident in EMD's 4.3% drop in response to increasing rate hike expectations late last year. Second, with spreads standing near two-year lows, there is scope for spread widening based on US and European policy uncertainty and renewed China growth fears. Third, countries accounting for 37% of EMD—including Mexico, China, South Africa and Brazil—have negative outlooks from at least two rating agencies, raising the potential for downgrades.[119] A potential default by Venezuela and its national oil company could also sour sentiment, as could unfavorable tariffs or trade restrictions from the new US administration. Finally, the backup in interest rates we expect could raise funding costs for EM corporate issuers, which could also heighten concerns about spillover into EMD. Indeed, a recent stress test by Standard & Poor's revealed that EM corporate borrowers—who must repay $200 billion per year through 2020[120]—are twice as susceptible to downgrades as US corporates if dollar funding costs rise by a third.[121]

Based on the above, we do not recommend a tactical position in EMD at this time.

Exhibit 94: US Crude Oil Production

Supply has stabilized after declining by 1 million barrels/day from its peak.

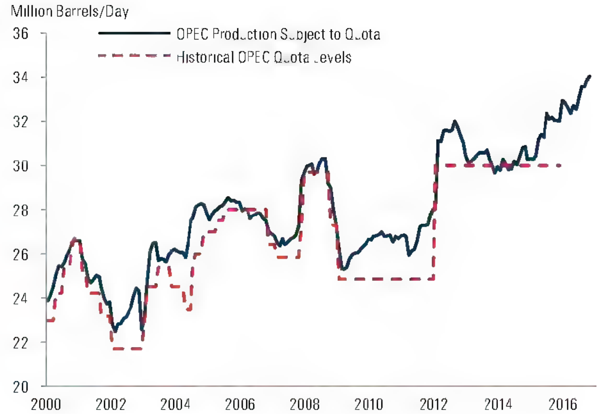


Data through November 30, 2016

Source: Investment Strategy Group, US Department of Energy

Exhibit 95: OPEC Crude Oil Production

OPEC producers have exceeded their quota 90% of the time since 2000.



Data through November 30, 2016.

Source: Investment Strategy Group, Bloomberg

2017 Global Commodity Outlook

After losing more than half its value in the span of two years, the S&P GSCI broke its downward trend with an 11% gain in 2016, its first double-digit return since 2009 (see Exhibit 92). The rebound in oil prices was a key contributor, as oil finished the year with a staggering 52% spot price gain—an outcome made all the more remarkable by the fact that oil was down 25% at its worst point early last year. This strength was not limited to the oil patch, as industrial metals rallied 17% on average and precious metals advanced 8% (see Exhibit 93).

Despite last year's broad-based gains, we are more circumspect about the outlook for 2017. While we expect oil to advance, it begins the year closer to the midpoint of our target range, providing a more balanced risk/reward profile. Meanwhile, we believe the key elements of our macroeconomic forecast—Federal Reserve tightening, rising interest rates, modest US dollar gains and average inflation—represent continued headwinds to gold prices. Comparable headwinds exist for industrial metals and agricultural goods, given the continued slowdown we expect in Chinese growth.

We discuss the specifics of our outlook for oil and gold in the sections that follow.

Oil: Regaining Its Balance

Oil is finding its footing again after having stumbled dramatically over the last two years. While the market is still awash in oil inventories, the sizable reductions in capital expenditures by the largest international oil and gas companies

Exhibit 93: Commodity Returns in 2016

Most commodity subcomponents saw positive returns in 2016, reversing several years of declines.

	S&P GSCI	Energy	Agriculture	Industrial Metals	Precious Metals	Livestock
Spot Price Average, 2016 vs 2015	-10%	-14%	0%	-6%	8%	-17%
Spot Price Return	28%	48%	3%	19%	9%	-10%
Excess Return*	11%	18%	-5%	17%	8%	-8%

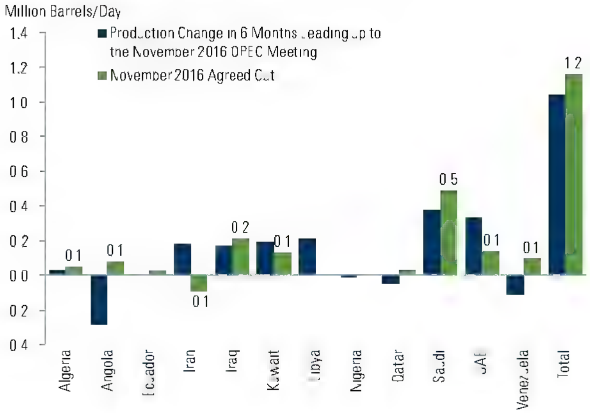
Data as of December 31, 2016

Source: Investment Strategy Group, Bloomberg

* Excess return corresponds to the actual return from being invested in the front month contract and differs from spot price return, depending on the shape of the forward curve. An upward sloping curve (contango) is negative for returns, while a downward sloping curve (backwardation) is positive

Exhibit 96: OPEC 2016 Production Cut Agreement and Recent Changes

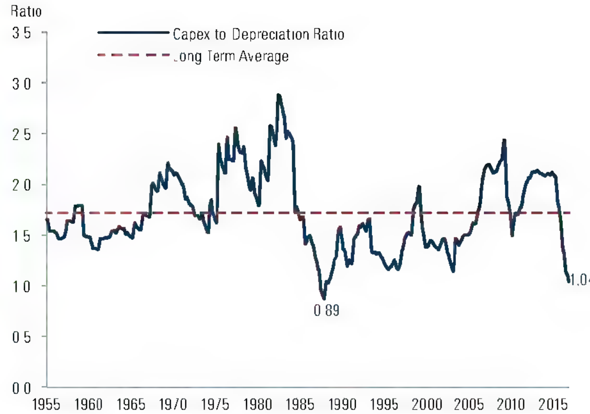
If fully implemented, OPEC's proposed cut would reverse production growth from the prior 6 months.



Data as of November 30, 2016.
Source: Investment Strategy Group, Bloomberg, OPEC

Exhibit 97: US Energy Sector Ratio of Capital Spending (Capex) to Depreciation

Low capex levels suggest there is upside to investment.



Data through September 30, 2016
Source: Investment Strategy Group, Empirical Research Partners

suggest the transition toward a balanced market is underway. The same could be said for the dramatic cuts in US drilling budgets, which have precipitated notable declines in US shale output (see Exhibit 94). Lower oil prices have also supported above-average global demand growth, helping to absorb excess inventories. Lastly, OPEC agreed to lower production in November 2016, while also securing a promise from its significant non-OPEC counterparts to do the same. Taken together, these developments support our forecast for moderately higher oil prices in 2017.

This balancing act is still precarious, however. Oil inventories stand well above seasonal averages, so failure to honor the announced production cuts could delay the recovery in oil prices or, even worse, cause renewed declines. The risk of poor compliance is not trivial, given that producers have exceeded their quota 90% of the time by an average of 1 million barrels per day (mmbd) since 2000 (see Exhibit 95). The pledges from Russia and certain smaller non-OPEC producers are particularly suspect, as similar promises to cut their own output along with OPEC have been broken in the past.

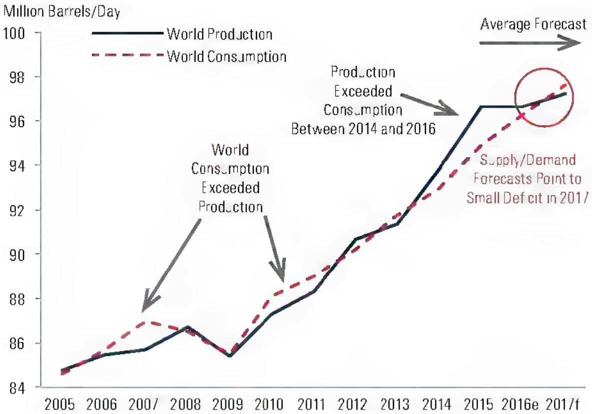
Moreover, while the announced cuts are significant—the OPEC agreement would reduce production by up to 1.2 mmbd, equivalent to about one year of average global demand growth—they are largely a reversal of production growth seen over the last six months (see Exhibit 96). Meanwhile, Libya and Nigeria were excluded from these new OPEC quotas given sizable domestic disruptions that have depressed their production. Recent signs of improvement, however, suggest a rebound in their production cannot be dismissed. Therefore, the announced cuts are not a panacea to the current oil imbalance, particularly if US shale output increases meaningfully in response.

This last point is important, as US shale accounted for 60% of global production growth between 2012 and 2015 despite representing less than 5% of the total output. Although US production is now declining, two factors may arrest its slide in 2017. First, the breakeven price for shale drilling has fallen to an average of $50 per barrel, reflecting a 20% decline in production costs and improvements to the shale model, including faster drilling, larger wells and better resource recovery. In response, more than 200 oil rigs have been placed in service since their number troughed in May 2016.[122] Second, capital spending by the US energy sector is

Oil is finding its footing again after having stumbled dramatically over the last two years.

Exhibit 98: Full-Year Average Global Crude Oil Supply and Demand

Oil consumption in 2017 could exceed supply for the first time since 2013.

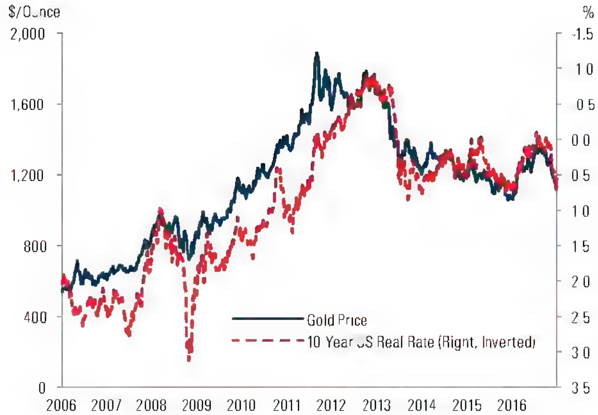


Data through December 31, 2016

Source: Investment Strategy Group, Goldman Sachs Global Investment Research, International Energy Agency, OPEC, US Department of Energy, Energy Aspects, PIRA, Bloomberg, Barclays, JP Morgan

Exhibit 99: Gold Prices and US 10-Year Real Interest Rates

Gold prices and real interest rates are closely linked.



Data through December 31, 2016.

Source: Investment Strategy Group, Bloomberg

very depressed despite the recent uptick in rigs, providing scope for further increases (see Exhibit 97). As a result, we expect shale production to recover in 2017, partially offsetting cuts elsewhere.

Despite these potentially destabilizing forces, we still think the oil market can swing to a small deficit this year. While lower input costs create upside risks to US shale production, these costs are highly correlated with oil itself. As a result, today's $50 average breakeven level for shale is likely to move higher with oil prices, limiting the rebound in US production. Moreover, even if just half of the proposed production cuts are realized, our work suggests the oil market will still switch into a deficit this year. Finally, OPEC spare capacity has been largely exhausted by the production increases of the last year, while Iran's production has now returned to pre-sanction levels. In turn, the risk of another disorderly market-share battle has declined significantly.

Against this backdrop, we expect oil supply growth to moderate and enable oil demand to again exceed oil production, creating the first deficit since 2013 (see Exhibit 98). With balance restored, we expect oil to trade in a $45–65 range in the year ahead. Thus we continue to recommend an overweight to US high yield energy bonds and US MLPs.

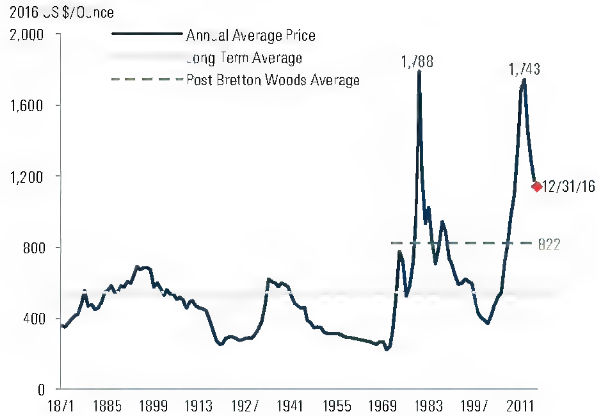
Gold: Still Searching for Its Luster

Gold was not immune from the reversal of fortune that befell interest rates last year, reminding us that their fates are fundamentally linked (see Exhibit 99). Put simply, higher interest rates raise the opportunity cost of holding gold, since the yellow metal generates no cash flow and must be physically stored, often at a cost. A similarly inverse relationship exists with the US dollar, as investors often purchase gold as a hedge against the debasement of fiat currencies; gold has traded inversely to the dollar index 73% of the time on an annual basis over the last 40 years.

Given these relationships, we believe the key elements of our macroeconomic forecast—Federal Reserve tightening, rising interest rates, modest US dollar gains and average inflation—will represent headwinds for the yellow metal in 2017. Keep in mind that gold prices have declined in four of the last five Federal Reserve tightening cycles, with the only exception occurring during a period of dollar weakness in the mid-2000s. Based on these precedents, our expectation of two or three Federal Reserve rate increases in 2017 does not bode well for gold prices.

Exhibit 100: Average Annual Gold Prices

Gold remains expensive relative to its inflation-adjusted long-term average price.



Data through December 31, 2016

Source: Investment Strategy Group, Bloomberg

The same could be said of continued outflows from gold exchange-traded funds (ETFs). We estimate that a net 280 tonnes of gold ETF holdings—an amount even larger than the 210 tonnes of ETF outflows that pressured gold prices in late 2016—were purchased over the past year at levels above today's price. Absent a rebound in gold prices, these ETF holders might prefer to realize their losses and rotate into instruments with a yield component. Value-minded investors should also consider that gold prices remains well above their long-term average (see Exhibit 100).

Despite this challenging outlook, a number of factors could still buoy gold prices in the year ahead. Emerging market central banks have continued to buy gold to diversify their reserves. Moreover, the stronger global growth we expect could lift jewelry demand, particularly in gold's two largest end markets—China and India. Finally, gold's allure as an inflation hedge could come back into focus if the market begins to worry about economic overheating in the US, although this is not our base case.

In light of these crosscurrents, we are tactically neutral on gold at this time.

In Closing

WE DO NOT BELIEVE THE COMING YEAR WILL BRING AN END to the prolonged run of positive performance for either the US economy or the bull market for equities. Despite greater uncertainties, including those tied to a new US administration, the policy backdrop in the US will likely prove particularly favorable for the economy, with looser fiscal policy, still easy monetary policy and a lighter regulatory burden. As these factors diminish the probability of recession in 2017, they also support the case for clients remaining invested in global equities at their strategic allocation. We believe US equity gains are likely to be modest but still more attractive than the comparable returns of investment alternatives such as cash and bonds. And, as last year demonstrated, US equities often surprise to the upside.

While we see the glass as half-full, there is no shortage of risks—some of which have high probability and uncertain impact for the year ahead—that could cause our forecasts for the economy and asset class returns to miss the mark. As always, we will adjust and communicate our views accordingly should the economic, financial or geopolitical backdrop change materially over the course of 2017.

Abbreviations Glossary

ACA: Affordable Care Act

BEA: Bureau of Economic Analysis
BIS: Bank for International Settlements
BLS: Bureau of Labor Statistics
BOE: Bank of England
BOJ: Bank of Japan

CAGR: compound annual growth rate
CDS: credit default swap
CFO: chief financial officer
CFTC: Commod ty Futures Trading Commission
CPI: consumer price index

EAFE: Europe, Australasia and the Far East
ECB: European Central Bank
EM: emerging market
EMD: emerging market dollar debt
EMLD: emerging market local debt
EMEA: Europe, the Middle East and Africa
EMU: European Monetary Union
EPS: earnings per share
ETF: exchange-traded fund

FTSE: Financial Times Stock Exchange
FX: Foreign Exchange

GBP: British pound
GDP: gross domestic product
GFC: global financial crisis
GIR: [Goldman Sachs] Global nvestment Research
GPIF: Government Pension Investment Fund
GSCI: Goldman Sachs Commodity Index

IGFI: Investment grade fixed income
IMF: International Monetary Fund
ISIL: Islamic State of Iraq and the Levant
ISM: Institute of Supply Management
JGB: Japanese government bond

LBO: leveraged buyout
LIBOR: London Interbank Offered Rate
LSI: Liquidity Stress Index

M&A: merger and acquisition
MLP: master limited partnership
mmbd: million barrels per day
MSCI: Morgan Stanley Capital International

NAHB: National Association of Home Builders
NATO: North Atlantic Treaty Organization
NBER: National Bureau of Economic Research
NIPA: national income anc product accounts
NIRP: negative interest rate policy

OECD: Organisation for Economic Co-operation and Development
OPEC: Organization of the Petroleum Exporting Countries

PBOC: People's Bank of China
PCE: personal consumption expenditures
PE: price to earnings
PPI: Producer Price Index
PPP: purchasing power parity
QE: quantitative easing

S&P: Standard and Poor's

TIPS: Treasury Inflation-Protected Securities
TOPIX: Tokyo Price Index

UK: United Kingdom
US: United States

VAT: value-added tax

YoY: year-over-year

Notes

1. Jeremy J. Siegel, *Stocks for the Long Run: The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies*, McGraw-Hill, 1994.
2. Lisa Beilfuss, "As Dow Nears 20000, Stock-Market Believer Jeremy Siegel Gets a 'Told You So' Moment," *Wall Street Journal*, December 10, 2016.
3. Throughout the text, "post-WWII cycles" refers to expansions beginning in Q2 1954. We exclude two prior expansions, beginning in Q4 1945 and Q4 1949, to ensure consistent data across all variables used to analyze the duration and strength of recoveries (some data series are only available since 1950) as well as to avoid contaminating summary statistics given idiosyncratic economic policies that followed the end of WWII (such as the sharp reduction in military spending or the GI Bill). Our takeaway from the analysis would not change if 1945 and 1949 were included for the series for which data is available.
4. Edward Luce, "Goodbye to Barack Obama's World," *Financial Times*, November 27, 2016.
5. John H. Cochrane, "Ending America's Slow-Growth Tailspin," *Wall Street Journal*, May 2, 2016.
6. Martin Wolf, "New President Has an Economic In-Tray Full of Problems," *Financial Times*, November 8, 2016.
7. Michael Heath, "Summers Urges U.S. to Spend 1% of GDP Annually on Infrastructure," Bloomberg, October 18, 2016.
8. Robert J. Gordon, *The Rise and Fall of American Growth: The U.S. Standard of Living Since the Civil War*, Princeton University Press, 2016.
9. Marc Levinson, *An Extraordinary Time: The End of the Postwar Boom and the Return of the Ordinary Economy*, Basic Books, 2016.
10. Martin Jacques, *When China Rules the World: The End of the Western World and the Birth of a New Global Order*, Penguin Press, 2009.
11. N. Gregory Mankiw, "One Economic Sickness, Five Diagnoses," *New York Times*, June 17, 2016.
12. Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly*, Princeton University Press, 2011.
13. Alvin H. Hansen, "Capital Goods and the Restoration of Purchasing Power," Academy of Political Science, 1934.
14. Alvin H. Hansen, "Economic Progress and Declining Population Growth," *American Economic Review*, 1939.
15. Lawrence H. Summers, "Remarks," speech delivered at the Fourteenth Jacques Polak International Monetary Fund Annual Research Conference, Washington, D.C., November 8, 2013
16. Jay Shambaugh, "How Should We Think About This Recovery?" Macroeconomic Advisers' 26th Annual Policy Seminar, Washington, D.C., September 14, 2016.
17. Michael E. Porter, Jan W. Rivkin, Mihir A. Desai and Manjari Raman, "Problems Unsolved and a Nation Divided," Harvard Business School, September 2016.
18. Council of Economic Advisers, "The Long-Term Decline in Prime-Age Male Labor Force Participation," June 2016.
19. Ibid.
20. Etienne Gagnon, Benjamin K. Johannsen and David Lopez-Salido, "Understanding the New Normal: The Role of Demographics," Board of Governors of the Federal Reserve System, October 3, 2016.
21. Mitra Toossi, "A Century of Change: The U.S. Labor Force, 1950-2050," *Monthly Labor Review*, Bureau of Labor Statistics, May 2002.
22. Donald J. Trump, "Remarks," speech delivered at the New York Economic Club, September 15, 2016.
23. Chair Janet L. Yellen, "Current Conditions and the Outlook for the U.S. Economy," June 6, 2016. Vice Chairman Stanley Fischer, "Remarks on the U.S. Economy," August 21, 2016.
24. Robert J. Gordon, *The Rise and Fall of American Growth: The U.S. Standard of Living Since the Civil War*, Princeton University Press, 2016.
25. Stephanie H. McCulla, Alyssa E. Holdren and Shelly Smith, "Improved Estimates of the National Income and Product Accounts: Results of the 2013 Comprehensive Revision," Bureau of Economic Analysis, September 2013.
26. Paul Krugman, *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s*, MIT Press, 1990.
27. Lee Branstetter and Daniel Sichel, "Seven Reasons to Be Optimistic About Productivity," forthcoming.
28. Ibid.
29. Olivier Blanchard, "The State of Advanced Economies and Related Policy Debates: A Fall 2016 Assessment," Peterson Institute for International Economics, September 2016.
30. Martin Feldstein, "Remarks," speech delivered at the Brookings Institution Conference on Productivity, Washington, D.C., September 8, 2016.
31. Jan Hatzius, "Productivity Paradox v2.0 Revisited," Goldman Sachs Global Investment Research, September 2, 2016.
32. David M. Byrne, Stephen D. Oliner and Daniel E. Sichel, "How Fast Are Semiconductor Prices Falling?" Federal Reserve Board, March 2015.
33. Hal Varian, "A Microeconomist Looks at Productivity: A View from the Valley," September 2016.
34. Ibid.
35. Hal Varian, "Notes on Productivity and Intangibles," November 2016.
36. Chad Syverson, "Challenges to Mismeasurement Explanations for the U.S. Productivity Slowdown," University of Chicago Booth School of Business, June 2016.
37. David M. Byrne, John G. Fernald and Marshall B. Reinsdorf, "Does the United States Have a Productivity Slowdown or a Measurement Problem?" Brookings Institution, March 1, 2016.
38. David Byrne and Carol Corrado, "ICT Prices and ICT Services: What Do They Tell Us About Productivity and Technology?" Conference Board, July 2016.
39. David Byrne, Wendy Dunn and Eugenio Pinto, "Prices and Depreciation in the Market for Tablet Computers," Federal Reserve Board, December 2016.
40. Greg Ip, "The Economy's Hidden Problem: We're Out of Big Ideas," *Wall Street Journal*, December 5, 2016.
41. Johan Norberg, *Progress: Ten Reasons to Look Forward to the Future*, Oneworld Publications, 2016.
42. Fredrik Erixon and Björn Weigel, *The Innovation Illusion: How So Little Is Created by So Many Working So Hard*, Yale University Press, 2016.
43. N. Gregory Mankiw, "One Economic Sickness, Five Diagnoses," *New York Times*, June 17, 2016.
44. Alan S. Blinder and Mark W. Watson, "Presidents and the U.S. Economy: An Econometric Exploration," Princeton University, July 2014.
45. Jay Shambaugh, "How Should We Think About This Recovery?" Macroeconomic Advisers' 26th Annual Policy Seminar, Washington, D.C., September 14, 2016.
46. Lawrence H. Summers, "When the Best Umps Blow a Call," *Washington Post*, July 14, 2016.
47. Martin Neil Baily and Nicholas Montalbano, "Why Is US Productivity Growth So Slow? Possible Explanations and Policy Responses," Brookings Institution, September 1, 2016.
48. Kevin Daly, "Arrested Development: EMs Are Still Converging, but Productivity Growth Is Lower Everywhere," Goldman Sachs Global Investment Research, December 20, 2016.
49. Molly E. Reynolds and Philip A. Wallach, "The Fiscal Fights of the Obama Administration: An Interactive Timeline," Brookings Institution, December 8, 2016.
50. As measured by the Goldman Sachs Financial Conditions Index.
51. "Default Monitor," JP Morgan, December 1, 2016.
52. Investment Strategy Group, *Outlook: The Last Innings*, January 2016.

53. These forecasts have been generated by ISG for informational purposes as of the date of this publication. Total return targets are based on ISG's framework, which incorporates historical valuation, fundamental and technical analysis. Dividend yield assumptions are based on each index's trailing 12-month dividend yield. They are based on proprietary models and there can be no assurance that the forecasts will be achieved. Please see additional disclosures at the end of this publication. The following indices were used for each asset class: Barclays Municipal 1-10Y Blend (Muni 1-10); BAML US T-Bills 0-3M Index (Cash); JPM Government Bond Index Emerging Markets Global Diversified (Emerging Market Local Debt); HFRI Fund of Funds Composite (Hedge Funds); MSCI EM US$ Index (Emerging Market Equity); Barclays US Corporate High Yield (US High Yield); Barclays US High Yield Loans (Bank Loans); MSCI UK Local Index (UK Equities); MSCI EAFE Local Index (EAFE Equity); S&P Banks Select Industry Index (US Banks); TOPIX Index (Japan Equity); Barclays High Yield Municipal Bond Index (Muni High Yield).

54. LIBOR, the London Interbank Offered Rate, is calculated as the average of leading banks' estimates of the interest rates that they would be charged were they to borrow from other banks. It is one of the primary benchmarks for global short-term interest rates.

55. Spain is the only Eurozone country in which all banks clear all of the following capital hurdles: (1) CET1 ratio >100 bps above each bank's hurdle rate (5.5% + GSIB buffer, where applicable); (2) 4% leverage ratio in the ECB stress test base case scenario; and (3) 2% leverage ratio in the ECB stress test adverse scenario. Jernej Omahen, "Stress Test: Worst Fears Avoided; Capital Divergence Widens," Goldman Sachs Global Investment Research, July 31, 2016.

56. Gideon Rachman, "Marine Le Pen Looms Over a Trumpian World," *Financial Times*, November 21, 2016.

57. Charles Lichfield, "Fillon Presidency Now More Likely Than a Juppé One," Eurasia Group, November 21, 2016.

58. Charles Lichfield, "Attack Demonstrates Merkel's Vulnerability in 2017," Eurasia Group, December 20, 2016.

59. Alastair Gale and Kwanwoo Jun, "North Korea Says It Successfully Conducted Hydrogen-Bomb Test," *Wall Street Journal*, January 6, 2016.

60. Kwanwoo Jun, "North Korea Launches Missile From Submarine," *Wall Street Journal*, April 24, 2016.

61. Alastair Gale and Gordon Lubold, "North Korea Missile Launch Portends Growing Capabilities," *Wall Street Journal*, June 22, 2016.

62. Alastair Gale and Carol E. Lee, "North Korea Conducts Fifth Nuclear Test," *Wall Street Journal*, September 9, 2016.

63. Mike Mullen, Sam Nunn and Adam Mount, "A Sharper Choice on North Korea: Engaging China for a Stable Northeast Asia," Council on Foreign Relations, Independent Task Force Report No. 74, September 2016.

64. David Gordon (adjunct senior fellow at the Center for a New American Security), in a conference call with the Investment Strategy Group, December 15, 2016.

65. Gerald F. Seib, Jay Solomon and Carol E. Lee, "Barack Obama Warns Donald Trump on North Korea Threat," *Wall Street Journal*, November 22, 2016

66. Andrew E. Kramer, "As New Ukraine Talks Begin, What Is the State of Europe's Only Active War?" *New York Times*, October 19, 2016.

67. Warsaw Summit Communiqué, issued by the heads of state and government participating in the meeting of the North Atlantic Council in Warsaw, July 8–9, 2016.

68. Thomas Gibbons-Neff, "2,900 Explosions in a Day. Heavy Artillery and Tank Fire Returns to the Front Lines in Ukraine," *Washington Post*, December 20, 2016.

69. Warsaw Summit Communiqué, issued by the heads of state and government participating in the meeting of the North Atlantic Council in Warsaw, July 8–9, 2016.

70. "Transcript: Donald Trump on NATO, Turkey's Coup Attempt and the World," *New York Times*, July 21, 2016.

71. Ben Hubbard and David E. Sanger, "Russia, Iran and Turkey Meet for Syria Talks, Excluding US," *New York Times*, December 20, 2016.

72. John Davison and Stephanie Nebehay, "Syrian Peace Talks Limp on to Next Week with Opposition Absent," Reuters, April 22, 2016.

73. Anne Barnard, "Death Toll From War in Syria Now 470,000, Group Finds," *New York Times*, February 11, 2016.

74. Jessica Hartogs, "Syria War Could Cost Country $1.3T by 2020: Study," CNBC, March 8, 2016.

75. Zalmay Khalilzad, "America Needs a Bipartisan Foreign Policy. Donald Trump Can Make It Happen," *National Interest*, December 21, 2016.

76. Geoff Dyer, "Trump's CIA Nominee Mike Pompeo Promises to Roll Back Iran Deal," *Financial Times*, November 18, 2016.

77. General (Ret.) James N. Mattis, speech delivered at a conference at the Center for Strategic and International Studies, "The Middle East at an Inflection Point with Gen. Mattis," April 22, 2016.

78. Ibid.

79. Carol E. Lee and Jay Solomon, "Obama Seeks to Fortify Iran Nuclear Deal," *Wall Street Journal*, November 20, 2016.

80. Kristina Peterson, "House Passes 9/11 Bill That Would Let Victims' Families Sue Saudi Arabia," *Wall Street Journal*, September 9, 2016.

81. Melissa Eddy and Alison Smale, "Berlin Crash Is Suspected to Be a Terror Attack, Police Say," *New York Times*, December 19, 2016.

82. Tom Burgis, Arthur Beesley and Anne-Sylvaine Chassany, "ISIS Claims Responsibility for Attack in Nice," *Financial Times*, July 17, 2016.

83. Pervaiz Shallwani and Devlin Barrett, "How Police Tracked Down Bombing Suspect Ahmad Khan Rahami," *Wall Street Journal*, September 20, 2016.

84. Ben S. Bernanke, "How Do People Really Feel About the Economy?" Brookings Institution, June 30, 2016.

85. Joint Statement, Department of Homeland Security and Office of the Director of National Intelligence on Election Security, October 7, 2016.

86. Courtney Weaver, Sam Fleming and Kathrin Hille, "US Expels Russian Spies over Election Hacking," *Financial Times*, December 29, 2016.

87. Vindu Goel and Nicole Perlroth, "Yahoo Says 1 Billion User Accounts Were Hacked," *New York Times*, December 14, 2016.

88. Laura Sanders, "IRS Says Cyberattacks on Taxpayer Accounts More Extensive Than Previously Reported," *Wall Street Journal*, February 26, 2016.

89. Dustin Volz and Jason Lange, "Exclusive: FBI Probes FDIC Hack Linked to China's Military – Sources," Reuters, December 23, 2016.

90. Daniel Victor, "LinkedIn Says Hackers Are Trying to Sell Fruits of Huge 2012 Data Breach," *New York Times*, May 18, 2016.

91. Jamil Anderlini, "Beijing Clamps Down on Forex Deals to Stem Capital Flight," *Financial Times*, September 9, 2015.

92. Frank Tang, "China's Foreign Reserves Fall Again in November Even as Beijing Tightens Screws on Capital Outflows," *South China Morning Post*, December 7, 2016.

93. Wendy Wu, "What China Has Done to Stop Massive Amounts of Cash from Fleeing the Country," *South China Morning Post*, December 9, 2016.

94. Marcus Noland, Gary Clyde Hufbauer, Sherman Robinson and Tyler Moran, "Assessing Trade Agendas in the US Presidential Campaign," Peterson Institute for International Economics, September 2016.

95. Robert D. Blackwill, Henry Kissinger and Ashley J. Tellis, "Revising U.S. Grand Strategy Toward China," Council on Foreign Relations Press, April 2015.

96. David Brunnstrom, "China Installs Weapons Systems on Artificial Islands," Reuters, December 15, 2016.

97. Mark Landler and David E. Sanger, "Trump Speaks with Taiwan's Leader, an Affront to China," *New York Times*, December 2, 2016.

98. Kate O'Keeffe and Damian Paletta, "Tensions Linger Over Seizure of Survey Drone in South China Sea," *Wall Street Journal*, December 18, 2016.

99. Based on aggregated balance sheet data for the Federal Reserve, European Central Bank, Bank of Japan, Bank of England, Swiss National Bank and People's Bank of China. Source: Bloomberg, Datastream.

100. Federal Reserve Board Chair Janet Yellen, exchange with ABC News reporter Rebecca Jarvis, December 2015.

101. Federal Reserve Chair Janet Yellen, "The Economic Outlook and Monetary Policy," speech delivered at the Economic Club of Washington, December 2, 2015.

102. Based on Goldman Sachs Global Investment Research estimates.

103. Based on the European Commission investment survey.

104. Arnold Palmer, www.arnoldpalmer.com/bio.

105. Beginning in September 1945.

106. Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, 2002. © 2013 Elroy Dimson, Paul Marsh and Mike Staunton. As cited in *Credit Suisse Global Investment Returns Yearbook 2013*, February 2013.

107. December 2016 FOMC Statement of Economic Projections.

108. Peter Oppenheimer, "'Fat & Flat' with a Resurgence of Divergence," Goldman Sachs Global Investment Research, December 5, 2015.

109. Anna Kitanaka, Yuji Nakamura and Toshiro Hasegawa, "The Bank of Japan's Unstoppable Rise to Shareholder No. 1," Bloomberg, August 14, 2016.

110. As evidenced by SoftBank's recent pledge to invest $50 billion in the US. Michael J. de la Merced, "After Meeting Trump, Japanese Mogul Pledges $50 Billion Investment in the U.S.," *New York Times*, December 6, 2016.

111. The Plaza Accord was an agreement between the governments of France, West Germany, Japan, the United States and the United Kingdom to depreciate the US dollar in relation to the Japanese yen and German Deutsche Mark by intervening in currency markets. Source: Jeffrey Frankel, "The Plaza Accord, 30 Years Later," Harvard Kennedy School, December 10, 2015.

112. Stu Wood, Rick Carew and Eva Dou, "SoftBank to Buy ARM Holdings for $32 Billion," *Wall Street Journal*, July 18, 2016.

113. Since April 1946.

114. Karen Reichgott, "Fiscal Policy: A Modest Boost to Global Growth in 2017," Goldman Sachs Global Investment Research, December 8, 2016

115. Sources: Citi, Barclays, Morgan Stanley, JP Morgan.

116. Bank of America, "2016 Outlook: May the Odds Be Ever in Your Favor," November 24, 2015.

117. Matthew Jozoff and Alex Roever, "US Fixed Income Markets – 2017 Outlook," JP Morgan, November 23, 2016.

118. Lotfi Karoui, "Credit Notes: 2016: The Year of Extremes in 20 Charts," Goldman Sachs Global Investment Research, December 20, 2016.

119. Rating agencies referenced are Moody's, Standard & Poor's and Fitch Ratings.

120. Yang-Myung Hong, Alisa Meyers and Zubair K. Syed, "2017 Outlook – Clouds of Uncertainty Shroud the Outlook in Fat Tails," JP Morgan, November 2016

121. Standard & Poor's,"Rising Interest Spreads, US Corporates Would Fare Better than Others," December 2016.

122. Data is from Baker Hughes rig counts.

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Q1 Top 10 Ideas

Bank of America Merrill Lynch

Strategy

Equity | 03 January 2017 Corrected

Top 10 US Ideas – 1Q17

The backdrop for risk assets has changed dramatically over the past year. As Michael Hartnett pointed out, 2016 saw global interest rates fall to 5,000-year lows and the likely end of what has been the greatest bull market in bonds ever. We experienced a historic US Presidential election and Republican sweep of Congress on November 9th. Later that same month, OPEC reached a historic deal to reduce crude production by 1.2mn b/d with non-OPEC producers delivering an additional 600k b/d of cuts – the first such joint curb since 1998. Risk assets responded with 30-year Treasury reaching a yield of 2.088% in July, US equity markets reaching all-time highs, and oil prices rallying more than 40% since the start of the year. Given the Republican sweep - and the resulting likelihood that the logjam of Washington gridlock will be broken - our Top 10 stock selections are more heavily geared toward companies that may benefit from increased fiscal stimulus, a more pro-business agenda, and/or tax-policy reform. Our current strategy stands in stark contrast to our stance last year of looking for defensive growth ideas.

Eight Buys and two Underperforms

Our 1Q17 list includes eight Buys and two Underperforms across six sectors. Our Buys are Aetna Inc, Dover Corp, General Dynamics, Hess, MGM Resorts, Norfolk Southern, SVB Financial, and Texas Instruments. Our Underperforms are Consolidated Edison, and TripAdvisor.

How the list will be maintained and updated

We will publish this list at the beginning of each quarter. Ideas will generally remain on the list through the quarter unless coverage is dropped or the recommendation changes. Any security which is removed will not be replaced. If there are any changes to the list during the quarter we will publish the change in a research report. Securities are intended to stay on the list for one quarter, though some may be chosen for the next quarter's list. We will publish performance quarterly

Table 1: Top 10 US Ideas List – 1Q17

Company	Ticker	Analyst	Rating	Recommendation	Price	PO	Mkt Cap (bn)
Aetna Inc	AET	Fischbeck,Kevin	B-1-7	BUY	$124 45	$149 00	$44,657 00
Dover Corp	DOV	Obin,Andrew	B-1-7	BUY	$75 19	$85 00	$11,921 00
General Dynamics	GD	Epstein,Ronald J.	B-1-7	BUY	$173 21	$200 00	$57,215 00
Hess	HES	Leggate,Doug	B-1-7	BUY	$62 90	$80 00	$19,090 00
MGM Resorts	MGM	Kelley,Shaun	C-1-9	BUY	$28 50	$33 00	$11,993 00
Norfolk Southern	NSC	Hoexter,Ken	B-1-7	BUY	$108 82	$122 00	$33,393 00
SVB Financial	SIVB	Poonawala,Ebrahim	B-1-9	BUY	$170 38	$190 00	$8,584 00
Texas Instr.	TXN	Arya,Vivek	B-1-7	BUY	$74 15	$82 00	$73,899 00
Consolidated Edison	ED	Chin,Brian	A-3-7	UNDERPERFORM	$74 07	$59 00	$20,526 00
TripAdvisor	TRIP	Schindler,Nat	C-3-9	UNDERPERFORM	$46 95	$41.00	$9,071.00

Source: BofA Merrill Lynch Global Research

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Top 10 US Ideas Quarterly

Our Top 10 US Ideas are based on our view that these companies could have the most significant market and business related catalysts over the next three months. The list reflects primarily a bottoms-up approach, with calendar-specific events noted for most stocks. We constructed our list by canvassing BofAML Fundamental Equity Research analysts in order to find 10 BofAML-covered stocks which we think will significantly outperform or underperform peers during the quarter. We considered only Buy-rated names for outperform ideas and Underperform-rated names for underperform ideas. We then narrowed the list after consulting our Equity Research colleagues.

To be eligible for the list, the stock must be covered by BofA Merrill Lynch AMRS fundamental equity analysts with a rating of Buy or Underperform, for long and short stock recommendations, respectively.

Stocks will be chosen on a discretionary basis by the Alpha Generation team, which currently includes strategists with experience choosing stocks for BofAML's US 1 list. Stocks will be chosen for the list using a bottoms-up approach after taking into account the views of the relevant BofA Merrill Lynch Fundamental Equity analyst and upcoming catalysts. Diversity of the list and BofAML macro views will also be factors in choosing stocks for the list.

Stocks on the list will generally remain on the list during the quarter. However, a stock will be removed interim quarter if considered ineligible due to a change in the stock's fundamental rating, or if the stock is no long covered by BofA Merrill Lynch fundamental Equity Research. When stocks are removed during the quarter, they will not be replaced. Stocks will generally be removed from the list at the end of the quarter in conjunction with the publication of the next quarter's list, but may on select occasions remain on the list if the identified catalyst remains relevant or a new catalyst is expected to drive the requisite over/under performance. Any intra-quarter actions to the list will be announced in a research report.

The Top 10 list will be published on or close to the first day of each quarter. In addition, we may also publish research reports updating the catalysts' status or other news on particular stocks during the quarter.

How the list will be maintained and updated

We will publish this list at the beginning of each quarter. Ideas will generally remain on the list through the quarter unless coverage is dropped or the recommendation changes. Any security which is removed will not be replaced. If there are any changes to the list during the quarter we will promptly publish a note explaining the change. Securities are intended to stay on the list for one quarter, though some may be chosen again for the next quarter's list.

Aetna (AET)

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Research Analyst, MLPF&S

Buy, PO $149

1Q investment thesis

Based on past precedence, our view is that the AET/HUM deal is more likely than not to be approved by the courts (ruling likely to come in January 2017). PF 2018 earnings should be close to $11.50 (vs $9.70 consensus), even before taking into account the upside from tax reform (+15% to EPS) and rising interest rates (+5%). In the event that the deal breaks, we see little downside and potential upside in 1Q17 in the form of capital deployment (AET remains underlevered and in the absence of a deal could look to aggressively repurchase stock). Current estimates do not include share repurchase and based on its history of repurchasing shares using free cash flow and its balance sheet capacity, we expect AET to repurchase a significant amount (~10%) of its shares in 2017 post deal break, providing initial downside support and ultimately driving upside to Street estimates.

Table 1: Aetna key stock data

Industry	Managed Care
Market Cap (mn)	$44,657
Price	$124.45
P/E (2017)	14.4x
% of sell-side rated Buy	70.0%
Short interest % of float	2.25%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation: Repeal and Replace of the ACA creates some uncertainty, but neither AET nor HUM derive a significant amount of EPS from the ACA. Meanwhile, Republicans have historically supported Medicare Advantage (80% of HUM's revenue), and we expect a stronger rate environment under this Administration than over the past 8 years.

Tax Policy: As a domestic only company with a relatively high tax rate (est. 35% in 2017), AET would benefit from tax reform. We believe that some benefit would be lost to minimum MLR rebates or competition, but if taxes are lowered 15%, then we assume that they keep about 2/3 of the benefit (19% to EPS).

Catalysts: Deal resolution, capital allocation update, tax reform, rising interest rates.

Latest report: MCO rally has just begun; beneficiaries of the non-Health Care upside from Trump

1Q risks: Risks to the downside are courts not approving the HUM acquisition, lower-than-expected membership growth and higher than expected cost trend. CMS will issue the rate update for 2018 for Medicare Advantage in late February, a reg which we expect to be benign, but which could be worse than expected.

Company Description: Aetna is one of the nation's largest managed care organizations, covering roughly 23 million members. The company focuses on three main business segments: Health Care (health insurance, dental, behavioral health and pharmacy benefit products), Group Insurance (including life, disability and long term care insurance products) and Large Case Pension (a legacy business which is largely in runoff).

Dover (DOV)

Andrew Obin +1 646 855 1817
Research Analyst, MLPF&S

Buy, PO $85

1Q investment thesis

We think the Street is underestimating '17 EPS upside potential from Energy recovery given the segment's close correlation to N.A. rig count and short-cycle nature of the business, as well as incremental accretion from Wayne acquisition. DOV is expected to host an analyst dinner on January 12th which will provide a 4Q update and preview 2017 results. We think the meeting will be a positive catalyst for the stock, providing more visibility on Energy orders post-OPEC meeting, highlighting sustainability of the EMV cycle in Wayne into '19. Investors will also likely get an update on execution turnaround in the Refrigeration business, removing one of the biggest overhangs on the stock.

Table 1: Dover key stock data

Industry	Industrial Machinery
Market Cap (mn)	$11,921
Price	$75.19
P/E (2017)	19.6x
% of sell-side rated Buy	25.0%
Short interest % of float	1.54%

Source Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation:

We expect Trump's administration to prioritize US energy independence, with deregulation benefiting domestic shale produces, which should be an attractive tailwind to DOV's Energy segment.

Tax Policy:

Our estimates are based on 29% tax rate in '17/18. We calculate that under Ryan's proposed plan, we can see about 19% upside to EPS. We estimate that under Trump's proposed plan, we can see about 24% upside to EPS.

Catalysts:

January 12th – investor dinner with management
January 26th – 4Q results
Rig count release

Latest report: Dover Corp: Adjusting for Wayne, EMV cycle extension; Rig count going up, LII read-across

1Q risks: With so much of DOV's EPS upside tied to Energy segment recovery, we view oil price volatility (from stronger US$ or other unexpected macro headlines) as the biggest risk to our thesis. Weaker-than-expected execution in Refrigeration or Fluid business would be another risk, offsetting Energy upside.

Company Description: Dover is a diversified, global manufacturer of industrial products. It comprises more than 30 independent companies that operate in four segments: Refrigeration & Food Equipment, Fluids, Energy, and Engineered Systems.

General Dynamics (GD)

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Buy, PO $200

1Q investment thesis

General Dynamics is a defensive large cap value stock with potential cyclical growth. The company has a history of annual dividend increases with a dividend yield of 1.7%. Concerns about weakening demand for Gulfstream business jets in General Dynamic's Aerospace segment have weighed down sentiment. However, using a sum-of-the-parts analysis that values GD's defense businesses in line with the pure play defense average, this would imply that GD's Aerospace segment is trading at a significant discount to the market at 12x P/E multiple on 2018E earnings. Considering the strength in Gulfstream's product portfolio and margin performance, we would expect Aerospace to trade at least at 18x P/E multiple on 2018E earnings.

Table 1: General Dynamics key stock data

Industry	Aerospace & Defense
Market Cap (mn)	$57,215
Price	$173.21
P/E (2017)*	17.9x
% of sell-side rated Buy	76.2%
Short interest % of float	1.02%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Gov't Legislation: 56% of sales are from the US government

General Dynamics' primary customer is the US Department of Defense, which accounted for 47% of total sales in 2015. The remaining 9% are to other non-DoD US government agencies like the intelligence community. For the military, which is a defensive sector, GD is engaged in engineering, manufacturing, and support of land and expeditionary combat vehicles and systems, armaments, munitions, and shipbuilding and marine systems. Major products include Virginia-class nuclear-powered submarine and Ohio class ballistic nuclear submarine replacement, Arleigh Burke-class Aegis destroyer, Abrams M1A2 tank, Stryker 8-wheeled assault vehicle, medium-caliber munitions and gun systems, tactical and strategic mission systems. The company also provides information systems and technologies.

Disruptor: Gulfstream G650 has unrivaled performance in the most profitable business jet market segment

There is no direct competitor aircraft currently in service in the market to match the performance of the Gulfstream G650/650ER. The G650ER has a range of 7,500 nautical miles at Mach 0.85, but can fly faster at Mach 0.90 with a range of 6,400 nautical miles. The Dassault Falcon 8X has a range of only 6,450 nautical miles. Meanwhile, Bombardier's response to the G650 has been delayed another year with the entry into service of the Global 7000 (range of 7,300 nautical miles) in 2H18. Gulfstream book-to-bill in 3Q16 was 1:1 on a dollar value basis and 1.2:1 on an aircraft unit basis. In our view, market share gains in a soft demand environment could provide Gulfstream a solid foundation to bridge the Gulfstream G450/550 to the G500/600.

Catalysts: Stable Aerospace earnings & US defense spending
Operating weakness for Bombardier's Global family, which competes with the Gulfstream family, has weighed down investor sentiment for large cabin business jets and General Dynamics. However, Gulfstream's more conservative production rates, attractive product positioning, higher quality backlog, and better operating performance compared to Bombardier lower Gulfstream's near- and medium-term earnings risks, in our view. The key catalyst for General Dynamics is the upcoming earnings result that demonstrates how EBIT in the Aerospace segment remains stable despite a more tepid market outlook from Bombardier.

We continue to view GD as a beneficiary of positive inflection in US defense spending. We expect the recent Republican victory in the White House and the Senate to be seen as incrementally positive for defense. Political control is a key driver of defense spending, and defense stock valuations are tied to changes in defense spending related to the modernization accounts. Our Political Control Model (PCM) analysis highlights a Republican President and Republican Senate is the best case for Budget Authority in defense modernization accounts. Our PCM analysis suggests that the Republican sweep could increase the Budget Authority for defense investment accounts by a CAGR of 12-13% (FY17E-21E). This compares to the BofAML forecast of a 5% CAGR and the FY17 Green Book forecast of a 1% CAGR.

Additionally, GD's Marine Systems segment is a direct beneficiary of the US pivot to the Pacific. The Pacific is a hotbed of maritime activity particularly as China expands its territorial waters. As the US focus on naval superiority strengthens, we might see upside to shipbuilding spending.

Latest report: General Dynamics: Gulfstream still undervalued; raise PO to $200 and reiterate Buy 30 November 2016

1Q risks: large cabin business jets market deterioration and US defense spending
There is risk of market deterioration in large cabin business jets that could increase earnings risks for Gulfstream. Additionally, delays in government contracting or lower than expected increase in US defense spending could provide downside risks to our estimates.

Company Description
General Dynamics is a major US government contractor engaged in combat vehicles and systems, armaments, munitions, ordnance, shipbuilding and information systems and technologies. It is also the parent company of Gulfstream in its Aerospace segment, which is the most profitable airplane manufacturing company in the world.

Consolidated Edison (ED)

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Research Analyst, MLPF&S

Underperform, PO $59

1Q17 investment thesis
Since the November elections, utility valuations have not adequately adjusted to the rapid shift towards a rising-rate environment and have decoupled from historically predicative valuation patterns. Looking at studies of 10yr Yields v. Utility PEs, BBB Yields v. Utility PEs, and Utility Div. Yields v. Rates are the best examples of this

dislocation (more metrics can be found in our Alternating Currents Weekly). We rate ED Underweight to take advantage of this sector dislocation. ED on its own is fundamentally overvalued. ED trades at a 0.5x premium to its peers despite having slower than average growth prospects, increasing regulatory complexity, and the overhanging risk of fines for the Harlem explosion.

Table 1: ConEd key stock data

Industry	US Electric Utilities
Market Cap (mn)	$22,400
Price	$74.07
Total Debt / 2019 EBITDA	3.88
% of sell-side rated Sell	26.3%
Short interest % of float	3.94%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Not your grandmothers ConEd – increasing complexity changes investment story
ConEd is facing very slow growth electric demand growth in its utilities with 0.2% y/y growth in its CECONY subsidiary through 20201 and -0.1% growth in its O&R subsidiary. To offset this slow growth, ConEd has been increasing the complexity of its business by purchasing gas and electric transmission assets which have higher growth potential but face more market risk (most notably the JV with Crestwood in the Stagecoach midstream pipeline system). Furthermore, the regulatory regime in New York is undergoing a fundamental shift as the Reforming Energy Vision (REV) program is implemented. REV seeks to fundamentally change how utilities are compensated by creating more of a 'platform' for energy delivery. Slow growth, changing business mix, and new regulatory constructs add considerable risk to what used to be a "go to" vanilla regulated utility.

An overvalued Sector and Potential Catalysts
For a long time, ConEd was viewed as the quintessential utility and, during the run-up in Utility valuations in 2016 its shares outperformed despite its weakening fundamentals. As the story becomes more complex and the utility sector adjusts to lower valuation we would expect ED to underperform with a similar symmetry to other utility stocks.

Latest reports:

Recent BofA Merrill Lynch Global Research Reports

Title: Subtitle	Primary Author	Date Published
Utilities: Fed promises more hikes; utes face more downside risk in early 2017	Brian Chin	15 December 2016
Utilities: Alternating Currents Weekly	Brian Chin	18 December 2016

1Q17 risks: Risks to our thesis are primarily macro related. If utility sector valuations remain disconnected from historical fundamentals for the quarter or if rising interest rates significantly reverse course our Underweight rating on ConEd could not materialize.

Company Description: Consolidated Edison (ED) is the owner of Consolidated Edison Company of New York (CECONY) and Orange & Rockland Utilities (O&R) providing electric, gas and steam service to 3.5 million customers in New York City and the northern suburbs. ConEd also has a transmission segment with gas pipeline, storage, and electric transmission. Finally, ConEd has three competitive energy businesses: ConEd Development (energy infrastructure), Energy (wholesale services), and Solutions (retail services).

Hess Corporation (HES)

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Buy, PO $80

1Q17 investment thesis

Broad expectations of a pro-energy agenda from the incoming administration set a theoretically constructive backdrop for the US oils. Along with the tailwind from renewed OPEC support for oil prices, we view the broader energy sector as a momentum play in the early part of 2017 where stock specific catalysts can re-emerge to differentiate relative performance within the large cap US oils. We view Hess as the most catalyst rich large cap US E&P for 2017 with a return to growth and disproportionate exploration risk from a company with the highest cash margins in the sector, second best balance sheet and significant oil leverage to our base case that is an oil recovery in 2017. Hess remains amongst our top ideas in the US large cap oil sector for 2017, and we retain our Buy rating, and $80 PO.

Table 1: Hess key stock data

Industry	US oil and gas exploration and production
Market Cap (mn)	$19,090
Price	$62.90
EV/Debt adjusted cash flow (2017)*	9.4x
% of sell-side rated Buy	46.4%
Short interest % of float	8.52%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation / Gov't Legislation

While the potential for a less onerous regulatory backdrop, and greater access to Federal lands for exploration and development, the majority of current activity remains dominated by private lands thereby limiting any material changes arising from a Republican administration. The exception is the potential for more receptive backdrop for infrastructure development that can improve regional pricing through improved access to takeaway capacity.

Tax Policy:

For the majority of the US E&P's, changes in corporate tax rates have negligible impact given that substantial net operating losses and deferred tax credits means that cash taxes remain *de minimis* for the foreseeable future.

Catalysts:

News flow starts with an expected capex budget unchanged from 2016 at ~$2bn, the company has stated it expects a return to drilling in the Bakken with a stated ramp up to 6 rigs from 2 currently returning the play to growth in 2017.. The first Guyana development (Liza) expected to achieve FID by 2Q17 and which we expect to confirm industry leading economics. Start-up of the first of two major developments – the North Malay basin gas play in 3Q17, putting Hess back on a growth track and turning attention to the Stampede start up in the US GoM in early 2Q18. In the background is an exploration test every 45-60 days any one of which could materially change the scale of the Hess business model of the next decade.

Latest reports: Tales from the road (Dec 1, 2016); Speculation builds over Payara (Dec 19, 2016)

1Q17 risks: We expect a supportive commodity backdrop, spending clarity and confirmed return to growth all punctuated by a steady stream of large scale exploration news flow to support relative performance for Hess in 1Q17. Greatest risk to the broader energy sector comes from adherence of the OPEC agreement to support oil prices through coordinated production cuts; With this backdrop note that Hess retains one of the most resilient balance sheets in the sector, with adjusted net debt / cap of just 14% and $2.9bn of net cash on the balance sheet at end 3Q16.

Company Description: Hess Corp (HES) is a mid-sized oil & gas company with 1.0bn boe of proved reserves at end 2015. E&P operations are focused in the US onshore, deep water GOM, North Sea, Guyana, West Africa, and Asia.

MGM Resorts International (MGM)

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Buy, PO $33

1Q investment thesis

MGM is a levered play to improving/accelerating US economic growth. The US makes up 80% of EBITDA (70% Vegas, 20% Macau, 10% US regional) and the company has 4-5x net debt/EBITDA which is high, but coming down to under 4x by end of 2017 which could allow for a possible upgrade to investment grade by the end of 2017 or early 2018.

MGM has high operating leverage (50%+ flow through of revenues) and should benefit from any macroeconomic improvement as well as already healthy/strong Las Vegas fundamentals (visitation +3% YTD, RevPAR +6% which is one of best hotel markets in the US). MGM benefits from both consumer (80%) and business (20%) travel. There is zero supply growth in Las Vegas the next 2-3 years and virtually no Airbnb/disruption risk as staying at integrated casino resorts on the Strip is key to the experience.

MGM should see accelerating growth in 2017 to a very high +24% Y/Y on an organic basis. We think this is some of the highest growth we will see in the Gaming, Lodging & Leisure industries. MGM should also see a meaningful free cash flow inflection in 2017 as capex falls off dramatically after its 2 new property openings in Washington DC and Cotai/Macau.

Table 1: MGM key stock data

Industry	Gaming
Market Cap (mn)	$11,993
Price	$28.50
P/E (2017)	21.6x
% of sell-side rated Buy	95.7%
Short interest % of float	2.94%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation: There aren't any clear/obvious changes here that would impact MGM. As a labor intensive business, changes to overtime rules or the Affordable Care Act as it relates to company level costs could be modestly beneficial.

Tax Policy: MGM will be a cash tax payer in 2017. Tax policy should be mixed. While they get some meaningful interest shield from their decent amount of debt, they also have relatively high capex that could benefit them if expensed as incurred. Import tariffs should be limited in impact as it's mostly a domestic, services based business with limited COGS.

Catalysts: ConAgg should generate RevPAR tailwinds. RevPAR should accelerate in Q1 and could be up double digits in the quarter driven by a strong convention calendar, headlined by the ConAgg convention which comes only once every 3 years.

MGM also opened its $1.4B National Harbor casino outside of Washington on December 8th. The first data points here on revenues will come in early January.

MGM's Cotai casino in Macau opens in 2Q17 and is a new $3B property. We believe expectations are reasonably low and revenues are still strong in Macau (+ double digits in 4Q). Despite recent softness, Macau peers still trade at premiums to core MGM

Latest report:
MGM Resorts International: Notes from the road: MGM National Harbor - the new standard for regionals

1Q risks: Macau sentiment has been fading recently as the RMB continues to depreciate and investors seek new growth opportunities domestically given the large cyclical rotations occurring in other sectors.

Company Description: MGM, is a global hotel and casino gaming company, owns and operates 19 properties located in NV, MD, MS, MI, IL and Macau. It owns a 50% stake in its CityCenter joint venture on the Las Vegas Strip and a 77% interest in MGM Growth Properties, a publicly traded gaming focused real estate investment trust (REIT).

Norfolk Southern (NSC)

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Buy, PO $122

1Q investment thesis

Norfolk Southern is benefiting from a volume inflection, with 9 consecutive weeks of carload growth year-over-year, after nearly 2 years of sustained negative carload declines. Aside from the ongoing inflection in data, the company should benefit in 2017 from its own structural efficiency program and many potential macro shifts currently under President-elect Trump's Administration. The new management team (Jim Squires was named CEO in 2015) is working to change the culture and business processes, and has delivered for a few quarters. It set operating targets for the first time in company history, targeting $650 million in efficiency gains (+25% to 2015 EPS) and a 65% operating ratio by 2020. It also set $250 million in efficiency gains and a sub-70% operating ratio in 2016, allowing it to immediate progress. In January, management has noted it will further detail its efficiency gain targets, which could be a near-term catalyst for the shares. Under Trump's proposal's, NS could benefit from a lower tax rate, given its 37% current effective tax rate (at 30% adds $10 to valuation and at 20% adds $25 to valuation), as well as additional infrastructure spend (more aggregates, cement, rebar, etc...), focus on domestic manufacturing, and repatriation of capital, which could aid GDP growth. We target NSC to post sustained double-digit EPS growth and significantly improve free cash flow.

Table 1: Norfolk Southern key stock data

Industry	Railroad
Market Cap (mn)	$33,393
Price	$108.82
P/E (2017)	17.3x
% of sell-side rated Buy	44.8%
Short interest % of float	1.19%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation:
The Surface Transportation Board, an independent governing body, formerly under the Department of Transportation, is set for a significant turnover, with a Republican taking control of the chairmanship, and 2 new members being added to the 5-person Board (up to this year the STB was a 3 member Board). The potential for negative impacts from mandatory open access and rate of return calculation adjustments may be reduced given the change of administration, which would be a positive for the railroad group.

Tax Policy:
Given their domestic focus, Transportation companies are the highest effective tax payers in the Industrial and Basic Materials group, with the U.S.-based railroads averaging a 37% effective tax rate. At a 20% tax-rate, EPS would jump nearly 30% (though full capex expensing could reduce EBIT to offset a sizeable portion of the gain). Additionally, cross-border tax increasing cost of goods sold for manufacturing goods could slow GDP, impacting carload growth over time.

Catalysts:
Near term catalysts include accelerating carload growth, coal turning positive for the rail industry this week, after 90 consecutive down weeks, and NS's upcoming January promise for additional details on its targeted efficiency gains. The company is set to post a sub-70% operating ratio for only the 2nd time in the past 20 years, a target we would expect to improve further in 2017 and beyond.

Latest report: Raise estimates and PO to $122; Volumes trending above target
October Upgrade report: Time to look at things differently; Raise to Buy

1Q risks: Norfolk Southern has posted 9 consecutive weeks of carload growth, indicating underlying economic growth, with relatively easy comps into 1H17. Thus, risk includes carload growth slowing or turning back negative, as well as increased concern on macro GDP growth rates given fear about new fiscal policies (cross-border tax, full capex expensing) which could compress EPS. Additionally, if the expected discussion on efficiency gain details in January is not provided as expected, investors could lose confidence that management will stick with and/or meet its 2020 target. Additionally, if corporate tax reform is not passed, multiples that have expanded on some reduced tax rate could re-compress.

Company Description: Norfolk Southern Railway operates a 21,300 route mile railroad network in 22 eastern states, District of Columbia, and Ontario, Canada. We target it to generate $10 billion in 2016 revenues and a sub-70% operating ratio (hitting that target for only the 2nd time in the past 20 years). We target it to move 7.22 million carloads in 2016, with an average revenue per car of $1,371. Coal represents 14% of total revenues, down from 36% 2 years prior. Intermodal represents 22% of revenues, and Ag/Consumer/Gov't represents 16% of revenues.

SVB Financial Group (SIVB)

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Buy, PO $190

1Q investment thesis

We view SIVB as the best positioned bank in our coverage universe by a wide margin to benefit from the combination of **1)** rising interest rates – with SIVB ranking among the most rate sensitive banks in the mid-cap banks group **2)** stronger economic growth - with SIVB's 2017 guidance (issued before the US elections) already calling for double digit revenue growth **3)** de-regulation **4)** tax reform. Our '17e EPS of $9 and '18e EPS of $12 imply YoY EPS growth of 24% and 33% respectively. SIVB trades at 18x our '17e EPS and 2x YE17e TBV. Our PO of $190 implies P/'17e EPS of 20x (and 16x '18e EPS) and P/YE17e TBV of 2.4x. This compares to an average P/E of 22.7x and P/TBV of 2.6x that the stock traded at heading into and during the initial stages of the 2004-2006 interest rate cycle.

Table 1: SIVB key stock data

Industry	Commercial Banks
Market Cap (mn)	$8,584
Price	$170.38
P/E (2017)	19.1x
% of sell-side rated Buy	77.8%
Short interest % of float	4.68%

Source Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation: Among the one legislative action on the regulatory front that appears likely to be passed under the new administration is the increase in the $50bn SIFI asset threshold which brings with a heightened level of regulatory scrutiny (such as undergoing the CCAR stress test). While we were not concerned about SIVB's ability to transition into a CCAR bank, the removal of this should no doubt serve as a positive. At $43bn in assets, becoming a CCAR bank had been weighing on investor sentiment. With expectations for this threshold to be pushed higher, this should no longer be a significant concern when thinking about SIVB's growth trajectory. Another issue that has not been discussed much but could occur is any changes in the Volcker rule that would allow the bank to once again participate in investing capital in PE/VC funds. We view this restriction as an unintended consequence on SIVB stemming from the Volcker rule and the ability once again participate in these funds would be a significant positive given the potential for getting equity exposure in the early stages of the life cycle of start-up companies.

Tax Policy: With SIVB paying an effective tax rate of 40.6% in 2016 YTD, the bank will undoubtedly be a beneficiary from a lower corporate tax rate. While we believe it is too soon to adjust estimates for this, we note that a 500bp reduction in the tax rate would equate to 8.4% upside to SIVB's 2018 EPS estimate. Moreover, the potential for hundreds of billion dollars in tax repatriation by the US tech giants also augurs well for greasing the wheels for the start-up sector. While some of this repatriated capital will no doubt go to buy backs and higher dividends, we expect some of this to flow into the start-up space as tech giants pursue M&A. At the very least it mitigates the risk of any significant credit issues for the banks as weaker firms (who are clients) will be better positioned to sell themselves to the tech behemoths looking for innovative ideas.

Catalysts: 1) Improving expectations around rising rates (on back of better macro-economic data) will continue to serve as a tailwind for the stock 2) A strong tech IPO market – as SIVB stands to benefit from equity exposure to 1000+ start-up companies 3) Clarity around a tax reform bill once the new administration takes office in January should lead to the markets pricing-in a lift to forward EPS and 4) updated 2017 guidance could reflect a stronger outlook vs. management's preliminary guidance provided in Oct 2016.

Latest report: On its way to regaining its premium multiple

1Q risks: Downside risks are 1) reversal in the outlook for higher rates 2) a sharp sell-off in the equity markets that could derail IPO activity and 3) disappointment on the pace of policy actions under the new administration.

Company Description: SVB Financial Group is a financial holding company that serves companies in the technology, life science, venture capital, private equity and premium wine industries. The bank offers diversified financial services such as commercial, investment, international and private banking. Headquartered in Santa Clara, California, SVB Financial Group (Nasdaq: SIVB) operates through offices in the U.S. and international operations in China, India, Israel and the United Kingdom.

Texas Instruments (TXN)

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Buy, PO $82

1Q investment thesis

In the aftermath of the US election in November, we think Texas Instruments stands to benefit the most with its 30% effective tax rate and high exposure to industrial, automotive, automation, and communications capex. The company has been one of the largest share gainers in industrial/auto semis entering a seasonally strong period for spending. Unlike peers, Texas instruments has no distraction from M&A while maintaining a grossly under-levered balance sheet (<0.1x net debt/EBITDA vs comps at 2x-4x). We expect TXN to continue to generate industry leading FCF while growing its dividend at 20%+ CAGR. We look toward the strategy update call in early February as the next catalyst for the stock.

Table 1: Texas Instruments key stock data

Industry	Semiconductors
Market Cap (mn)	$73,899
Price	$74.15
P/E (2017)	20.1x
% of sell-side rated Buy	35.3%
Short interest % of float	1.75%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Deregulation/Gov't Legislation: 60% of TXN's sales are exposed to the industrial, automotive, and communications equipment end markets. We think these markets could see the most uplift in spending from any potentially large fiscal stimulus and infrastructure spending under the new US administration.

Tax Policy: Unlike most semis, TXN reports its financials on a pure GAAP basis and its tax rate at 30% is one of the highest in the industry. We think TXN stands to disproportionately benefit from the looser tax policies foreshadowed by the upcoming administration. Specifically, a 10% drop in the corporate tax rate would lead to 15% higher EPS for TXN in 2017, all else equal.

Catalysts: (1) Seasonally stronger period for industrial/automotive spending – 46% of TXN's revenue come from these end markets; (2) Annual strategy and capital allocation policy update call with shareholders which is likely to occur at the beginning of February.

Latest report: The new "industrials": growth recovery plus pricing power, Buy TXN, ADI, MCHP, ON

1Q risks: (1) Still somewhat large (>10%) exposure to consumer electronics could create near-term volatility in topline results; (2) Historically lumpy communications equipment spending trends; (3) Larger than expected slowdown in North America automotive unit production

Company Description: Texas Instruments is a broad-based supplier of semiconductor components, ranging from digital signal processors, to high-performance analog components, to digital light-processing technology and calculators. 65% of TXN sales are exposed to the well diversified, business-to-business Industrial, Automotive, Communications Infrastructure, and Enterprise markets.

TripAdvisor (TRIP)

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Underperform, PO $41

1Q investment thesis

Despite easier y/y comps in 2017, we see risk that Click-based & Transaction Hotel revenue continues to decline as 1) higher monetizing desktop traffic structurally declines, 2) mobile monetization remains at 30% of desktop traffic and is unlikely to meaningfully close the gap, and 3) Instant Book is unlikely to help reverse the revenue and earnings trend. At the same time, TRIP has been accelerating marketing spend, implying increasing acquisition costs, with further ad spend ramp in '17. TRIP noted 2017 EBITDA margin will decline further from 2016 levels as ad spend ticks up to re-accelerate growth.

Table 1: TripAdvisor key stock data

Industry	Online Travel
Market Cap (mn)	$9,071
Price	$46.95
P/E (2017)	32.5x
% of sell-side rated Buy	14.3%
Short interest % of float	10.30%

Source: Bloomberg and BofA Merrill Lynch Global Research estimates

Tax Policy: TRIP has a ~25% tax rate. Trump's tax plan calls for a reduction in the business tax rate from 35% to 15%, with elimination of most corporate tax deductions/credits (except for the R&D credit). While it's unclear what elements of the tax plan will eventually be executed, Trump's intent is clear and we believe companies with the highest tax rate have the most to gain. We see less incremental benefit to many of the global companies who already enjoy optimized tax rates (22% average tax rate across our coverage), but many companies will have more incentive to bring back Intl profits for buybacks with lower US tax rates.

Catalysts: 4Q'16 Earnings (early February) will feature initial 2017 guidance. TripAdvisor noted on the 3Q'16 earnings call that 2017 EBITDA margin will decline further from 2016 levels as ad spend ticks up to re-accelerate growth, however it is unclear how much margin deterioration TripAdvisor will guide to. We think the deterioration in the guide will be higher than the Street's expectations, driving further downside estimate revisions.

Latest report: TripAdvisor: 2017 PM Level Outlook

1Q risks: There is downside risk to Street estimates if hotel shopper growth comes in below expectations, mobile monetization gap widens, and if initial 2017 guidance disappoints. We remain cautious on IB as an attempt to solve a very large problem: the continued transition of users consuming TripAdvisor's content on their mobile phones instead of their desktops. On mobile phones, users are much less likely to transact or click on an ad than on desktops.

A risk to the short thesis: There has been frequent speculation in the press that TripAdvisor may be a takeout candidate in the rapidly consolidating online travel market, with Priceline frequently named as the likely suitor.

Company Description: TripAdvisor is the largest global online travel media company with over millions of members and hundreds of millions of user reviews. The company's portfolio of web properties attracts over 300 million unique visitors per month worldwide.

Price objective basis & risk

Aetna Inc (AET)

Our Price Objective of $149 is based on a 50/50 blend of our standalone AET valuation ($138, 13.1x 2018E EPS of $10.50 when including share repurchase) and AET pro forma HUM valuation ($160, 14x 2018E EPS of $11.40). Our AET standalone valuation multiple reflects AET's historical average discount to the S&P 500. Our AET pro forma HUM valuation multiple of 14x reflects upside levers to HUM synergy guidance and to reflect the improved long-term growth profile of the company. Risks to the upside are regulatory approval of the HUM acquisition, better-than-expected membership growth and lower than expected cost trend. Risks to the downside are regulators not approving the HUM acquisition, lower-than-expected membership growth and higher than expected cost trend.

Consolidated Edison (ED)

Our price objective of $59 is predicated on shares of ED achieving 13.0x our 2019 EPS estimate. We apply the current group average multiple of 13.5x and apply a 0.5x discount to reflect a well below average ROE, a slightly below average growth profile, and a relatively challenging regulatory environment. This is offset slightly by a lower risk profile investment outlook. Upside risks to our thesis could stem from more favorable changes to the investment and/or regulatory environment in New York.

Downside/upside risks: ED, like all utility stocks, is also sensitive to changes in the market level of interest rates. Utilities historically underperform if bond yields rise, and outperform when they fall. Furthermore, ED is a bellwether utility and has historically outperformed during market uncertainty as a large liquid "flight to safety" stock.

Dover Corp (DOV)
Our PO of $85 is based on 11.5x EV/EBITDA on our 2017 estimate, which would put DOV in line with the multi-industrial peer group average. We view the target multiple as conservative, as we expect the Street to focus on EPS growth upside in '17, driven by Energy coming off depressed profitability.

Risks to our PO are: 1) Highly dependent on acquisition strategy, 2) A reduction in capital spending in the oil & gas market, and 3) Weak global industrial production growth.

General Dynamics (GD)
We derive our PO of $200 using a sum-of-the-parts valuation model. Our model factors in 19.5x P/E multiple on 2018E earnings for GD's defense business, which is in line with pure play defense peers, and 18x P/E multiple on Gulfstream's 2018E earnings. In our view, GD's competitive business jet product portfolio and growth outlook in defense could provide near-term and medium-term organic growth. Additionally, the company's strong balance sheet and solid cash generation could sustain dividend growth and share repurchases.

Downside risks to our PO are: 1) A downturn in business jets, due to an exogenous factor. 2) Given that business jets are priced in dollars, an unexpected devaluation in the dollar could significantly impact order activity, 3) We are forecasting a declining defense budget, which would then place a cap on the top-line growth for the defense primes. We view the Administration change as a potential ceiling to defense stocks as political control, in our view, is a key driver of defense spending. Decline in defense spending authorization (a leading indicator), which in turn could impact treasury outlays. Potential budget cuts to the Navy's fleet could encumber GD as well as a slowdown in procurement for the Army (armored vehicles). 4) Poor execution on defense programs could adversely impact margins.

Hess Corp. (HES)
Our price objective of $80 / share is based on a 5-year outlook which assumes a 5.5x DACF multiple and a commodity deck of $67.50 WTI and $70 Brent to which we add $10 / sh for Liza in offshore Guyana. The multiple is based on a finite timeline to delivery which is supported by core NAV.

The risks to our price objective are: 1) the oil and gas price environment, (2) slowdowns in development drilling that leave production below expectations, and (3) news flow around HES' exploratory and appraisal drilling activities that could impact the stock.

MGM Resorts International (MGM)
Our $33 PO is based on 11.5x our 2017 EBITDA estimate (implied 10x 2018E EBITDA). This is in line with its historical trading range and supported by our detailed sum of the parts analysis.

Upside risks are: a stronger than anticipated recovery in Las Vegas, improving consumer sentiment and its 56% ownership stake in MGM China. Downside risks are: balance sheet and liquidity risks proving worse than expected, continued Strip competition, and continuing near-term softness in the Macau market.

Norfolk Southern (NSC)
Our $122 price objective is based on a 19.5x multiple on our 2017 EPS estimate of $6.25. We move above the top of its one-standard deviation historical trading range of 12x-16x given the new management team's move to improve margins, cut costs, and raise its ROIC, and as EPS inflects off a volume deflated 19% decline in 2015.

Risks to our price objective and estimates are the company's ability to derive continued operational benefits, a return to significant pricing competition among the rails, slower than expected economic growth, a deterioration to improving service metrics, a heavily unionized employee base, inability to exercise pricing power due to regulatory changes or legal challenges from customers, external factors (such as weather) impacting operations, and the STB installing mandatory reciprocal switching (or open access) to the rail network without proper pricing.

SVB Financial Group (SIVB)
We use a three-factor valuation framework (P/TBV, P/E, DCF) to arrive at our $190 price objective and assign a 2.3x multiple to our 2017e TBV and apply a 21x P/E to 17E EPS. Our valuation multiples are both in line with high growth peers due to SIVB's high profitability and EPS growth profile. Our DCF assumes a two-stage cost of capital of 9.5% and a terminal growth rate of 6%.

Downside risks are a longer than expected low rate environment and a slowdown in the technology sector and related IPO activity. Upside risks are sooner than expected rate hike, or better than expected pickup in the tech sector.

Texas Instruments Inc. (TXN)
Our $82 PO on TXN is based on14x FY17E EV/EBITDA, in line with high quality diversified and analog peers trading at 14x-15x, given TXN's high quality business model and strong FCF generation.

Risks to our price objective: 1) Lumpy telco capex, especially in wireless deployments, 2) Volatile market share as design cycle times are very long, 3) Increased R&D spending pressure to maintain an edge versus the competition, 4) Inventory cycles and potential double ordering by customers that can often create mismatches between real supply and demand, 5) Exposure to several mature markets such as PC and other consumer electronics could limit its growth rate.

TripAdvisor (TRIP)
Our price objective of $41 is based on 21x our 2018 non-GAAP EPS estimate. This multiple represents a premium to online travel/vertical media comps and in our view adequately compensates TripAdvisor for improving margins and growth off a trough point in FY16 into FY17 when the negative impacts of its IB transition peak.

Downside risks to our price objective are: 1) increasing competition (e.g. Yelp), 2) macro-economic factors (e.g. recession in Europe) impacting the travel industry, 3) challenges to the credibility of online reviews, 4) Instant Book transition puts pressure on revenue growth, and 5) mobile monetization headwinds.

Upside risks to our price objective are: 1) improved mobile monetization 2) major OTA sign on for instant booking 3) high non-hotel shopper dollar capture and 4) improved global macro environment.

Analyst Certification

We, Derek Harris, Andrew Obin, Brian Chin, Doug Leggate, Ebrahim H. Poonawala, Ken Hoexter, Kevin Fischbeck, CFA, Nat Schindler, Ronald J. Epstein, Shaun C. Kelley and Vivek Arya, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

US - Aerospace and Defense Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	AerCap Holdings N.V.	AER	AER US	Kristine T. Liwag
	Air Lease Corporation	AL	AL US	Kristine T. Liwag
	Bombardier Inc.	YBBD B	BBD/B CN	Ronald J. Epstein
	Booz Allen Hamilton	BAH	BAH US	Ronald J. Epstein
	CAE Inc.	YCAE	CAE CN	Ronald J. Epstein
	Embraer	ERJ	ERJ US	Ronald J. Epstein
	General Dynamics	GD	GD US	Ronald J. Epstein
	Lockheed Martin	LMT	LMT US	Ronald J. Epstein
	Northrop Grumman	NOC	NOC US	Ronald J. Epstein
	Raytheon Co.	RTN	RTN US	Ronald J. Epstein
	RBC Bearings Inc	ROLL	ROLL US	Kristine T. Liwag
	Textron	TXT	TXT US	Ronald J. Epstein
	TransDigm Group Inc.	TDG	TDG US	Ronald J. Epstein
	Triumph Group	TGI	TGI US	Ronald J. Epstein
	United Tech	UTX	UTX US	Ronald J. Epstein
NEUTRAL				
	BWX Technologies, Inc.	BWXT	BWXT US	Ronald J. Epstein
	Crane Co	CR	CR US	Kristine T. Liwag
	Curtiss Wright Corporation	CW	CW US	Kristine T. Liwag
	FLY Leasing Ltd	FLY	FLY US	Kristine T. Liwag
	HEICO Corporation	HEI	HEI US	Ronald J. Epstein
	Hexcel Corporation	HXL	HXL US	Ronald J. Epstein
	Huntington Ingalls Industries	HII	HII US	Ronald J. Epstein
	L-3 Comm	LLL	LLL US	Ronald J. Epstein
	Mercury Systems	MRCY	MRCY US	Ronald J. Epstein
	Rockwell Collins	COL	COL US	Ronald J. Epstein
	Spirit AeroSys-A	SPR	SPR US	Ronald J. Epstein
UNDERPERFORM				
	Aircastle LTD	AYR	AYR US	Kristine T. Liwag
	Boeing	BA	BA US	Ronald J. Epstein
	Esterline Technologies Corporation	ESL	ESL US	Ronald J. Epstein
	Garmin	GRMN	GRMN US	Ronald J. Epstein
	Moog Inc.	MOGA	MOG/A US	Kristine T. Liwag
	Wesco Aircraft Holdings, Inc	WAIR	WAIR US	Ronald J. Epstein

US - Electric Utilities Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	American Electric Power	AEP	AEP US	Brian Chin
	American Water Works	AWK	AWK US	Brian Chin
	Black Hills Corporation	BKH	BKH US	Brian Chin
	Dominion Resources	D	D US	Brian Chin
	DTE Energy	DTE	DTE US	Brian Chin
	Edison International	EIX	EIX US	Brian Chin
	FirstEnergy	FE	FE US	Brian Chin
	Great Plains Energy	GXP	GXP US	Brian Chin
	NextEra Energy	NEE	NEE US	Brian Chin
	NextEra Energy Partners	NEP	NEP US	Brian Chin
	PG&E Corporation	PCG	PCG US	Brian Chin
NEUTRAL				
	Calpine	CPN	CPN US	Brian Chin
	Exelon	EXC	EXC US	Brian Chin
	InfraREIT, Inc	HIFR	HIFR US	Brian Chin
	NRG Energy	NRG	NRG US	Brian Chin
	Pinnacle West Corp	PNW	PNW US	Brian Chin
	PPL Corporation	PPL	PPL US	Brian Chin
UNDERPERFORM				
	AES Corporation	AES	AES US	Brian Chin
	Consolidated Edison	ED	ED US	Brian Chin
	Duke Energy	DUK	DUK US	Brian Chin
	Entergy	ETR	ETR US	Brian Chin
	NorthWestern Corporation	NWE	NWE US	Brian Chin
	Portland General Electric Company	POR	POR US	Brian Chin
	Public Service Enterprise Group Inc	PEG	PEG US	Brian Chin
	Southern Company	SO	SO US	Brian Chin

US - Internet Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Alphabet	GOOGL	GOOGL US	Justin Post
	Alphabet	GOOG	GOOG US	Justin Post
	Amazon.com	AMZN	AMZN US	Justin Post
	Bankrate	RATE	RATE US	Nat Schindler
	eBay	EBAY	EBAY US	Justin Post
	Expedia	EXPE	EXPE US	Justin Post
	Facebook	FB	FB US	Justin Post
	GrubHub	GRUB	GRUB US	Nat Schindler
	IAC InterActive	IAC	IAC US	Nat Schindler
	LendingTree	TREE	TREE US	Nat Schindler
	Match Group	MTCH	MTCH US	Nat Schindler
	Netflix, Inc.	NFLX	NFLX US	Nat Schindler
	OnDeck Capital	ONDK	ONDK US	Nat Schindler
	priceline.com	PCLN	PCLN US	Justin Post
	Take-Two Interactive	TTWO	TTWO US	Justin Post
	Wix.com	WIX	WIX US	Nat Schindler
	Yahoo!	YHOO	YHOO US	Justin Post
	Zillow	ZG	ZG US	Nat Schindler
	Zillow	Z	Z US	Nat Schindler
NEUTRAL				
	Activision	ATVI	ATVI US	Justin Post
	Electronic Arts	EA	EA US	Justin Post
	Quotient Technology Inc	QUOT	QUOT US	Nat Schindler
	Wayfair	W	W US	Justin Post
	Yelp	YELP	YELP US	Justin Post
UNDERPERFORM				
	Care.com	CRCM	CRCM US	Justin Post
	Fitbit	FIT	FIT US	Nat Schindler
	GoPro	GPRO	GPRO US	Jason Mitchell
	Pandora Media, Inc.	P	P US	Nat Schindler
	TripAdvisor	TRIP	TRIP US	Nat Schindler
	Twitter	TWTR	TWTR US	Justin Post
	ZYNGA	ZNGA	ZNGA US	Justin Post
RVW				
	Chegg	CHGG	CHGG US	Nat Schindler

US - Multi-Industrials/Engineering and Construction Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	3M Company	MMM	MMM US	Andrew Obin
	AECOM	ACM	ACM US	Anna Kaminskaya, CFA
	Allegion	ALLE	ALLE US	Andrew Obin
	AMETEK Inc	AME	AME US	Andrew Obin
	Colfax Corporation	CFX	CFX US	Andrew Obin
	Dover Corp	DOV	DOV US	Andrew Obin
	Fortive Corporation	FTV	FTV US	Andrew Obin
	General Electric Company	GE	GE US	Andrew Obin
	HD Supply Holdings Inc	HDS	HDS US	Andrew Obin
	Honeywell International Inc	HON	HON US	Andrew Obin
	Ingersoll-Rand	IR	IR US	Andrew Obin
	KBR	KBR	KBR US	Anna Kaminskaya, CFA
	Milacron	MCRN	MCRN US	Andrew Obin
	Mistras Group	MG	MG US	Andrew Obin
	Rush	RUSHA	RUSHA US	Andrew Obin
NEUTRAL				
	Eaton Corp PLC	ETN	ETN US	Andrew Obin
	Flowserve	FLS	FLS US	Andrew Obin
	ITT Inc	ITT	ITT US	Andrew Obin
	Jacobs Eng	JEC	JEC US	Anna Kaminskaya, CFA
	Parker Hannifin Corporation	PH	PH US	Andrew Obin
UNDERPERFORM				
	Chicago Bridge & Iron Company	CBI	CBI US	Anna Kaminskaya, CFA
	Donaldson Co	DCI	DCI US	Andrew Obin
	Emerson Electric Co	EMR	EMR US	Andrew Obin
	Fluor Corp	FLR	FLR US	Anna Kaminskaya, CFA
	Pentair plc	PNR	PNR US	Andrew Obin
	Rexnord Corporation	RXN	RXN US	Andrew Obin
	Rockwell	ROK	ROK US	Andrew Obin
	SPX Flow Inc	FLOW	FLOW US	Andrew Obin

US - Semiconductors Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Advanced Micro Devices, Inc	AMD	AMD US	Vivek Arya
	Analog Devices Inc	ADI	ADI US	Vivek Arya
	Broadcom Limited	AVGO	AVGO US	Vivek Arya
	Cypress	CY	CY US	Vivek Arya
	Inphi Corporation	IPHI	IPHI US	Vivek Arya
	Integrated Device Technology, Inc	IDTI	IDTI US	Vivek Arya
	Intel	INTC	INTC US	Vivek Arya
	Microchip	MCHP	MCHP US	Vivek Arya
	NVIDIA Corporation	NVDA	NVDA US	Vivek Arya
	ON Semiconductor	ON	ON US	Vivek Arya
	Skyworks Solutions, Inc	SWKS	SWKS US	Vivek Arya
	Texas Instruments Inc	TXN	TXN US	Vivek Arya
NEUTRAL				
	Cavium	CAVM	CAVM US	Vivek Arya
	M/A-Com	MTSI	MTSI US	Vivek Arya
	Maxim Integrated Products Inc.	MXIM	MXIM US	Vivek Arya
UNDERPERFORM				
	Marvell Technology Group Ltd	MRVL	MRVL US	Vivek Arya
	Qorvo Inc	QRVO	QRVO US	Vivek Arya
	Xilinx Inc	XLNX	XLNX US	Vivek Arya

US - Transportation Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Canadian Pacific Railway	CP	CP US	Ken Hoexter
	CSX Corporation	CSX	CSX US	Ken Hoexter
	FedEx Corp.	FDX	FDX US	Ken Hoexter
	Fortress Transportation & Infrastructure	FTAI	FTAI US	Ariel Rosa
	Golar LNG Limited	GLNG	GLNG US	Ken Hoexter
	Golar LNG Partners LP	GMLP	GMLP US	Ken Hoexter
	Hoegh LNG Partners LP	HMLP	HMLP US	Ken Hoexter
	J B. Hunt Transport Services	JBHT	JBHT US	Ken Hoexter
	Norfolk Southern	NSC	NSC US	Ken Hoexter
	Scorpio Tankers Inc	STNG	STNG US	Ken Hoexter
	Swift Transportation	SWFT	SWFT US	Ken Hoexter
	Triton International, Ltd	TRTN	TRTN US	Ken Hoexter
	Union Pacific	UNP	UNP US	Ken Hoexter
	UPS	UPS	UPS US	Ken Hoexter
NEUTRAL				
	ArcBest Corporation	ARCB	ARCB US	Ken Hoexter
	Genesee & Wyoming	GWR	GWR US	Ken Hoexter
	Kansas City Southern	KSU	KSU US	Ken Hoexter
	Knight Transport	KNX	KNX US	Ken Hoexter
	Navios Maritime Midstream Partners L P.	NAP	NAP US	Ken Hoexter
	The Greenbrier Companies	GBX	GBX US	Ken Hoexter
	World Fuel Services	INT	INT US	Ken Hoexter
UNDERPERFORM				
	C H Robinson	CHRW	CHRW US	Ken Hoexter
	Canadian National	CNI	CNI US	Ken Hoexter
	Kirby Corp	KEX	KEX US	Ken Hoexter
	Old Dominion Freight Line	ODFL	ODFL US	Ariel Rosa
	Seaspan Corp	SSW	SSW US	Ken Hoexter
	Teekay Tankers Limited	TNK	TNK US	Ken Hoexter
	Werner Enterprises	WERN	WERN US	Ken Hoexter

US - Large Cap Oils Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Anadarko Petroleum Corp	APC	APC US	Doug Leggate
	Cabot Oil & Gas Corp	COG	COG US	Doug Leggate
	ConocoPhillips	COP	COP US	Doug Leggate
	Continental Resources Inc	CLR	CLR US	Doug Leggate
	Devon Energy Corp	DVN	DVN US	Doug Leggate
	Hess Corp	HES	HES US	Doug Leggate
	Marathon Oil Corp	MRO	MRO US	Doug Leggate
	Marathon Petroleum Company	MPC	MPC US	Doug Leggate
	Occidental Petroleum Corp	OXY	OXY US	Doug Leggate
	Pioneer Natural Resources	PXD	PXD US	Doug Leggate
	Range Resources Corp	RRC	RRC US	Doug Leggate
	Tesoro Corp	TSO	TSO US	Doug Leggate
NEUTRAL				
	Chesapeake Energy Corp.	CHK	CHK US	Doug Leggate
	Chevron Corp	CVX	CVX US	Doug Leggate
	EOG Resources	EOG	EOG US	Doug Leggate
	ExxonMobil Corp	XOM	XOM US	Doug Leggate
	HollyFrontier Corp	HFC	HFC US	Doug Leggate
	Noble Energy	NBL	NBL US	Doug Leggate
	Phillips 66	PSX	PSX US	Doug Leggate
	Southwestern Energy Corp	SWN	SWN US	Doug Leggate
	Valero Energy Corp	VLO	VLO US	Doug Leggate
UNDERPERFORM				
	Apache Corp	APA	APA US	Doug Leggate
	Calumet Specialty Products Partners	CLMT	CLMT US	Jason Smith
	Delek US Holdings, Inc.	DK	DK US	Doug Leggate
	PBF Energy	PBF	PBF US	Doug Leggate

US - Facilities, Hospitals and Managed Healthcare Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Acadia Healthcare	ACHC	ACHC US	Kevin Fischbeck, CFA
	Aetna Inc	AET	AET US	Kevin Fischbeck, CFA
	American Renal	ARA	ARA US	Kevin Fischbeck, CFA
	Anthem	ANTM	ANTM US	Kevin Fischbeck, CFA
	Capital Senior Living	CSU	CSU US	Joanna Gajuk
	Centene Corporation	CNC	CNC US	Kevin Fischbeck, CFA
	Civitas Solutions	CIVI	CIVI US	Kevin Fischbeck, CFA
	Envision Healthcare Corp	EVHC	EVHC US	Kevin Fischbeck, CFA
	HCA	HCA	HCA US	Kevin Fischbeck, CFA
	Mednax	MD	MD US	Kevin Fischbeck, CFA
	Service Corp International	SCI	SCI US	Joanna Gajuk
	Surgery Partners, Inc	SGRY	SGRY US	Kevin Fischbeck, CFA
	Surgical Care Affiliates, Inc.	SCAI	SCAI US	Kevin Fischbeck, CFA
	UnitedHealth Group	UNH	UNH US	Kevin Fischbeck, CFA
NEUTRAL				
	DaVita Inc	DVA	DVA US	Kevin Fischbeck, CFA
	Tenet Healthcare	THC	THC US	Kevin Fischbeck, CFA
	Universal Health Services	UHS	UHS US	Kevin Fischbeck, CFA
	WellCare Health Plans, Inc.	WCG	WCG US	Kevin Fischbeck, CFA
UNDERPERFORM				
	Adeptus	ADPT	ADPT US	Kevin Fischbeck, CFA
	Brookdale Senior Living	BKD	BKD US	Joanna Gajuk
	Community Health Systems	CYH	CYH US	Kevin Fischbeck, CFA
	Genesis Healthcare Inc	GEN	GEN US	Joanna Gajuk
	HealthSouth	HLS	HLS US	Kevin Fischbeck, CFA
	Kindred Healthcare	KND	KND US	Kevin Fischbeck, CFA
	LifePoint Health	LPNT	LPNT US	Kevin Fischbeck, CFA
	Molina Healthcare, Inc.	MOH	MOH US	Kevin Fischbeck, CFA
	Select Medical Corp.	SEM	SEM US	Kevin Fischbeck, CFA
RSTR				
	Team Health	TMH	TMH US	Kevin Fischbeck, CFA
	Universal American	UAM	UAM US	Kevin Fischbeck, CFA

US - Gaming, Lodging and Leisure Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Choice Hote s International	CHH	CHH US	Shaun C Kelley
	ClubCorp	MYCC	MYCC US	Shaun C Kelley
	Extended Stay America	STAY	STAY US	Shaun C Kelley
	Hilton Worldw de	HLT	HLT US	Shaun C Kelley
	Hyatt Hotels	H	H US	Shaun C Kelley
	International Game Technology	IGT	IGT US	Barry J. Jonas
	Intrawest Resorts	SNOW	SNOW US	Shaun C Kelley
	Las Vegas Sands	LVS	LVS US	Shaun C Kelley
	Marriott International nc	MAR	MAR US	Shaun C Kelley
	MGM Growth Properties LLC	MGP	MGP US	Shaun C Kelley
	MGM Resorts International	MGM	MGM US	Shaun C Kelley
	Pinnacle Entertainment	PNK	PNK US	Shaun C Kelley
	Red Rock Resorts, Inc	RRR	RRR US	Shaun C Kelley
	Sunstone Hotel Investors	SHO	SHO US	Shaun C Kelley
	Vail Resorts, Inc	MTN	MTN US	Shaun C Kelley
NEUTRAL				
	Boyd Gaming Corp	BYD	BYD US	Shaun C Kelley
	Hersha Hospitality	HT	HT US	Shaun C Kelley
	La Quinta Holdings	LQ	LQ US	Shaun C Kelley
	LaSalle Hotel Properties	LHO	LHO US	Shaun C Kelley
	Pebblebrook Hotel Trust	PEB	PEB US	Shaun C Kelley
	Penn Nat onal Gaming	PENN	PENN US	Shaun C Kelley
	Ryman Hospita ity Properties	RHP	RHP US	Shaun C Kelley
	Wynn Resorts Ltd	WYNN	WYNN US	Shaun C Kelley
UNDERPERFORM				
	Ashford Hospitality Trust	AHT	AHT US	Shaun C Kelley
	DiamondRock Hospital ty	DRH	DRH US	Shaun C Kelley
	FelCor Lodg ng Trust	FCH	FCH US	Shaun C Kelley
	Gam ng & Leisure Properties, Inc.	GLPI	GLP US	Shaun C Kelley
	Host Hotels & Resorts Inc	HST	HST US	Shaun C Kelley
	RLJ Lodging Trust	RLJ	RLJ US	Shaun C Kelley
	Scientific Games Corporation	SGMS	SGMS US	Barry J Jonas
	Summit Hotel Properties	INN	INN US	Shaun C Kelley

US - Banks Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	BankUnited, Inc.	BKU	BKU US	Ebrahim H. Poonawala
	BB&T Corporation	BBT	BBT US	Erika Najarian
	Capital Bank Financial Corp.	CBF	CBF US	Erika Najarian
	Citigroup Inc.	C	C US	Erika Najarian
	Citizens Financial Group	CFG	CFG US	Erika Najarian
	East West Bancorp, Incorporated	EWBC	EWBC US	Ebrahim H. Poonawala
	FCB Financial Holdings, Inc	FCB	FCB US	Ebrahim H. Poonawala
	First Republic Bank	FRC	FRC US	Erika Najarian
	Great Western Bancorp Inc	GWB	GWB US	Ebrahim H. Poonawala
	Huntington Bancshares Inc	HBAN	HBAN US	Erika Najarian
	IBERIABANK Corp	IBKC	IBKC US	Ebrahim H. Poonawala
	JPMorgan Chase & Co.	JPM	JPM US	Erika Najarian
	Key Corp	KEY	KEY US	Erika Najarian
	Signature Bank	SBNY	SBNY US	Ebrahim H. Poonawala
	SunTrust Banks, Inc.	STI	STI US	Erika Najarian
	SVB Financial Group	SIVB	SIVB US	Ebrahim H. Poonawala
	Texas Capital Bancshares Inc.	TCBI	TCBI US	Ebrahim H. Poonawala
	The PNC Financial Services Group, Inc	PNC	PNC US	Erika Najarian
	UMB Financial Corporation	UMBF	UMBF US	Ebrahim H. Poonawala
	Wells Fargo & Company	WFC	WFC US	Erika Najarian
NEUTRAL				
	Associated Banc-Corp	ASB	ASB US	Ebrahim H. Poonawala
	Banc of California	BANC	BANC US	Ebrahim H. Poonawala
	Comerica Incorporated	CMA	CMA US	Erika Najarian
	Commerce Bancshares Inc.	CBSH	CBSH US	Ebrahim H. Poonawala
	Fifth Third Bank	FITB	FITB US	Erika Najarian
	First Bancorp Puerto Rico	FBP	FBP US	Ebrahim H. Poonawala
	First Hawaiian Inc	FHB	FHB US	Ebrahim H. Poonawala
	First Horizon National Corp.	FHN	FHN US	Ebrahim H. Poonawala
	Franklin Financial Network, Inc.	FSB	FSB US	Ebrahim H. Poonawala
	Hancock Holding	HBHC	HBHC US	Ebrahim H. Poonawala
	New York Community Bancorp	NYCB	NYCB US	Ebrahim H. Poonawala
	Regions Financial	RF	RF US	Erika Najarian
	Synovus Financial Corp.	SNV	SNV US	Ebrahim H. Poonawala
	U.S. Bancorp	USB	USB US	Erika Najarian
	Zions Bancorp	ZION	ZION US	Erika Najarian
UNDERPERFORM				
	Bank of Hawaii Corp.	BOH	BOH US	Ebrahim H. Poonawala
	Cullen/Frost Bankers Inc	CFR	CFR US	Ebrahim H. Poonawala
	M&T Bank	MTB	MTB US	Erika Najarian
	Prosperity Bancshares Inc	PB	PB US	Ebrahim H. Poonawala
	TCF Financial Corp.	TCB	TCB US	Ebrahim H. Poonawala

Disclosures

Important Disclosures

Equity Investment Rating Distribution: Aerospace/Defense Electronics Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	23	50.00%	Buy	19	82.61%
Hold	13	28.26%	Hold	8	61.54%
Sell	10	21.74%	Sell	9	90.00%

Equity Investment Rating Distribution: Banks Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	81	43.55%	Buy	74	91.36%
Hold	45	24.19%	Hold	41	91.11%
Sell	60	32.26%	Sell	56	93.33%

Equity Investment Rating Distribution: Energy Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	105	46.67%	Buy	88	83.81%
Hold	54	24.00%	Hold	48	88.89%
Sell	66	29.33%	Sell	49	74.24%

Equity Investment Rating Distribution: Financial Services Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	113	46.89%	Buy	89	78.76%
Hold	66	27.39%	Hold	55	83.33%
Sell	62	25.73%	Sell	40	64.52%

Equity Investment Rating Distribution: Gaming Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	24	54.55%	Buy	16	66.67%
Hold	14	31.82%	Hold	6	42.86%
Sell	6	13.64%	Sell	1	16.67%

Equity Investment Rating Distribution: Health Care Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	134	54.92%	Buy	100	74.63%
Hold	59	24.18%	Hold	38	64.41%
Sell	51	20.90%	Sell	23	45.10%

Equity Investment Rating Distribution: Industrials/Multi-Industry Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	38	55.07%	Buy	27	71.05%
Hold	7	10.14%	Hold	4	57.14%
Sell	24	34.78%	Sell	15	62.50%

Equity Investment Rating Distribution: Technology Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	113	56.50%	Buy	82	72.57%
Hold	40	20.00%	Hold	32	80.00%
Sell	47	23.50%	Sell	28	59.57%

Equity Investment Rating Distribution: Transport/Infrastructure Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	73	49.66%	Buy	53	72.60%
Hold	35	23.81%	Hold	21	60.00%
Sell	39	26.53%	Sell	19	48.72%

Equity Investment Rating Distribution: Utilities Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	58	46.03%	Buy	45	77.59%
Hold	34	26.98%	Hold	29	85.29%
Sell	34	26.98%	Sell	20	58.82%

Equity Investment Rating Distribution: Global Group (as of 30 Sep 2016)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1553	49.44%	Buy	1130	72.76%
Hold	730	23.24%	Hold	538	73.70%
Sell	858	27.32%	Sell	514	59.91%

* Issuers that were investment banking clients of BofA Merrill Lynch or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

--X

VIRGINIA L. GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.

--X

15-cv-07433-RWS

Declaration of Laura A. Menninger in Support of
Defendant's Motion For Summary Judgment

I, Laura A. Menninger, declare as follows:

1. I am an attorney at law duly licensed in the State of New York and admitted to practice in the United States District Court for the Southern District of New York. I am a member of the law firm Haddon, Morgan & Foreman, P.C., counsel of record for Defendant Ghislaine Maxwell in this action. I respectfully submit this Declaration in support of Ms. Maxwell's Motion for Summary Judgment.[1]

2. Attached as Exhibit A is a true and correct copy of an article by Sharon Churcher entitled "Prince Andrew and the 17-year-old girl his sex offender flew to Britain to meet him," DAILY MAIL, dated March 2, 2011.

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[1] At trial, defendant intends to produce either the custodian of record relevant to any disputed document or a certification in compliance with either Fed. R. Evid. P. 803 and/or 902. *See* Fed. R. Civ. P. 56(c). Apart from deposition testimony, the majority of non-deposition documents herein were either produced by plaintiff or obtained with releases signed by plaintiff.

3. Attached as Exhibit B is a true and correct copy of an article by Sharon Churcher entitled "Teenage girl recruited by paedophile Jeffrey Epstein reveals how she twice met Bill Clinton," DAILY MAIL, dated March 5, 2011.

4. Attached as Exhibit C is a true and correct copy of a statement on behalf of Ms. Maxwell dated March 9, 2011.

5. Attached as Exhibit D (filed under seal) [redacted]

6. Attached as Exhibit E is a true and correct copy of an Order Denying Motion to Join Under Rule 21, *Doe v. United States,* No. 08-80736-Civ-Marra/Johnson (S.D. Fla. Apr. 7, 2016).

7. Attached as Exhibit F is a true and correct copy of a statement on behalf of Ms. Maxwell dated January 2, 2015.

8. Attached as Exhibit G (filed under seal) [redacted]

9. Attached as Exhibit H (filed under seal) [redacted]

10. Attached as Exhibit I (filed under seal) [redacted]

11. Attached as Exhibit J (filed under seal) [redacted]

12. Attached as Exhibit K (filed under seal) [redacted]

13. Attached as Exhibit L (filed under seal) [redacted]

14. Attached as Exhibit M (filed under seal) [redacted]

15. Attached as Exhibit N (filed under seal) [redacted]

16. Attached as Exhibit O (filed under seal) [redacted]

17. Attached as Exhibit P (filed under seal) [redacted]

18. Attached as Exhibit Q (filed under seal) [redacted]

19. Attached as Exhibit R (filed under seal) [redacted]

20. Attached as Exhibit S (filed under seal) [redacted]

21. Attached as Exhibit T (filed under seal) [redacted]

22. Attached as Exhibit U (filed under seal) [redacted]

23. Attached as Exhibit V (filed under seal) [redacted]

24. Attached as Exhibit W (filed under seal) [redacted]

25. Attached as Exhibit X(filed under seal) [redacted]

26. Attached as Exhibit Y (filed under seal) [redacted]

27. Attached as Exhibit Z (filed under seal) [redacted]

28. Attached as Exhibit AA (filed under seal) [redacted]

29. Attached as Exhibit BB (filed under seal) [redacted]

30. Attached as Exhibit CC (filed under seal) [redacted]

31. Exhibit DD left intentionally blank.

32. Attached as Exhibit EE (filed under seal) [redacted]

33. Attached as Exhibit FF (filed under seal) [redacted]

34. Attached as Exhibit GG (filed under seal) [redacted]

35. Attached as Exhibit HH (filed under seal) [redacted]

36. Attached as Exhibit II (filed under seal) [redacted]

37. Attached as Exhibit JJ (filed under seal) [redacted].

38. Attached as Exhibit KK (filed under seal) [redacted]

39. Attached as Exhibit LL is a true and correct copy of the Victims Refuse Silence, Inc. Articles of Incorporation dated December 23, 2014, GIUFFRE001064-5.

40. Attached as Exhibit MM (filed under seal) [redacted]

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 6, 2017.

s/ Laura A. Menninger
Laura A. Menninger

CERTIFICATE OF SERVICE

I certify that on January 6, 2017, I electronically served this *Declaration of Laura A. Menninger in Support of Defendant's Motion for Summary Judgment* via ECF on the following:

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EXHIBIT A

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Prince Andrew and the 17-year-old girl his sex offender friend flew to Britain to meet him

By SHARON CHURCHER
UPDATED: 08:02 EST, 2 March 2011

101
View comments

- Virginia Roberts reveals she is 'Jane Doe 102' in Jeffrey Epstein case
- Mother-of-three spent four years as millionaire's personal masseuse
- She describes being flown across world to meet Prince Andrew
- Epstein trained her 'as a prostitute for him and his friends'

As the UK's special representative for international trade, the Duke of York holds an important position, requiring sound judgement and widespread respect.

But those qualities have been thrown into question since photographs of Prince Andrew with his billionaire financier friend Jeffrey Epstein, a convicted child-sex offender who was jailed for 18 months for soliciting underage prostitutes, appeared last weekend.

Today, however, even more serious doubts are cast on his suitability after a woman at the centre of the Epstein case revealed to The Mail on Sunday that she had, as a 17-year-old employed by Epstein, been flown across the world to be introduced to the Prince.

Manhattan.

The photograph that appeared last weekend shows the prince strolling through Central Park with 58-year-old Epstein. Andrew was said to have spent four days at his New York mansion in December, when he was joined by other distinguished guests, including Woody Allen, at a dinner.

It is by no means the first New York soiree Andrew has attended as Epstein's guest.

A lengthy profile of the financier in Vanity Fair magazine some years ago reported that Andrew was a guest at a cocktail party thrown by Epstein and Maxwell packed with young Russian models. 'Some guests were horrified,' said the article's author, Vicky Ward.

It should not be forgotten that Epstein is a registered sex offender after recently completing his sentence for offences relating to child prostitution.

However, he avoided trial on more serious charges that carried a potential life sentence. And no one reading The Mail on Sunday's interview with the woman who was prepared to testify against him can be in any doubt of the seriousness of the charges.

Epstein, a Wall Street money manager who once counted Bill Clinton and Donald Trump among his friends, became the subject of an undercover investigation in 2005 after the stepmother of a 14-year old girl claimed she was paid $200 (£125) to give him an 'erotic massage'.

The subsequent FBI probe uncovered at least 20 girls levelling sexual allegations against him. Eventually, Epstein struck a 'plea bargain' with prosecutors – a practice not permitted under British law – under which he was allowed to plead guilty to two relatively minor charges.

Police claim that his donations to politicians and his 'dream team' of influential lawyers deterred prosecutors from bringing more serious charges of sex-trafficking. The deal certainly kept the names of a lot of Epstein's famous friends out of an embarrassing court case.

However, an unusual part of the agreement was that Epstein's alleged victims were allowed to bring civil proceedings against him.

He has so far made 17 out-of-court settlements, and some cases are ongoing. One of these girls was to have been a key witness for the prosecution had the case gone to trial. She was just 15 years old when she was drawn into Epstein's exploitative world in 1998.

In her civil writ against him, under the pseudonym Jane Doe 102' she alleged that her duties included being 'sexually exploited by Epstein's adult male peers including royalty'.

Now, horrified by the evidence of Epstein and Andrew enjoying each other's company in New York, Jane Doe 102 has agreed to waive her anonymity and tell for the first time her deeply disturbing story.

Her real name is Virginia Roberts and she now lives in Australia, where she is a happily married mother of three.

Over the course of a week during which she spoke at length to The Mail on Sunday, she appeared sometimes vulnerable, and sometimes steely, but always quietly resolute and consistent.

Revisiting events from a past that she had hoped she had left behind,Virginia occasionally buried her face in her hands.

Some recollections – and, for reasons of taste, not all the details can be included here – caused her to flush with shame. 'I'm telling you things that even my husband didn't know,' she said.

Virginia, who has undergone counselling to try to come to terms with her past, is honest about her initiation into Epstein's depraved world.

She was a troubled teenager, whose slender figure, delicate complexion, hesitant voice and soulful blue eyes made her look young for her years.

Born in Sacramento, California, in August 1983, Virginia spent her early years on a small ranch on the West Coast of America.

This seemingly idyllic childhood ended when she was sexually molested by a man close to her family.

The fallout from that led to her parents temporarily splitting up. Blaming herself, Virginia began to get into trouble Aged 11, she was sent to live with an aunt but repeatedly ran away.

Living on the streets, she was beaten up and slept with at least two older men in return for food. 'I was a paedophile's dream,' she says.

Three years later, she was reunited with her family and started a new life with her father who had moved to Palm Beach,

Florida, where he was maintenance manager at Donald Trump's country club, Mar-a-Lago.

Virginia got a part-time job as a changing room assistant –which is where, soon after her 15th birthday, she met Ghislaine Maxwell, who invited her to work as Epstein's personal masseuse.

'I was wearing my uniform – a white miniskirt and a skin-tight white polo top – when I was approached by Ghislaine,' Virginia says.

'I told her I wanted to become a masseuse and she said she worked for a very wealthy gentleman who was looking for a travelling masseuse.

I'd get training and be paid well.'Virginia's father gave his blessing, believing his daughter was being handed the opportunity to learn a skill and to work for a wealthy and respectable employer.

He drove her to Epstein's pink mansion on the Palm Beach waterfront – he also owns a nine-storey home in New York, the city's biggest private residence; a 7,500-acre ranch called 'Zorro' in New

Mexico and Little Saint James, a private 70-acre atoll in the US Virgin Islands.

A new life: Virgina, now a mother-of-three, in Australia

Virginia says: 'Ghislaine said I was to start immediately and that someone would drive me home.

My father left and I was told to go upstairs.' She was led by another woman through Epstein's bedroom into a massage room where he lay face down naked on a table.

He started to interviewed Virginia. This was unconventional, but Virginia had no suspicions. Presumably, she thought, this was how the wealthy conducted their business.

Epstein elicited the information that Virginia had been a runaway, and was no longer a virgin.

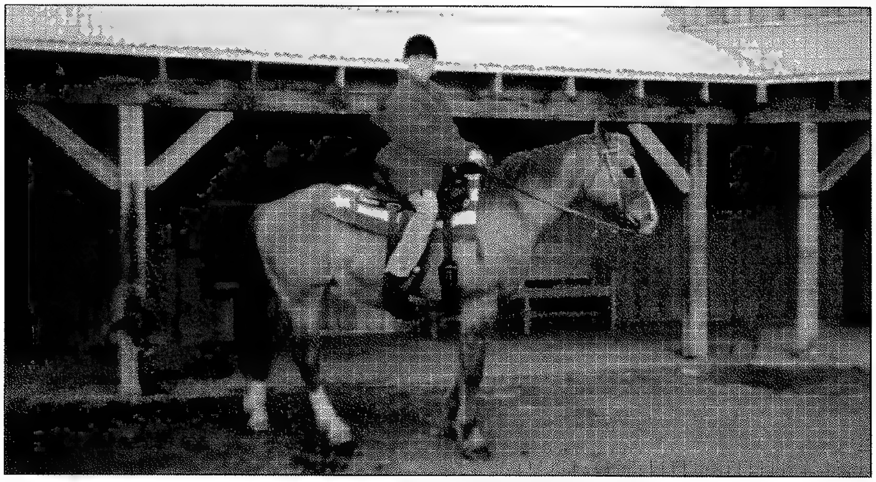
Virginia was then told to start massaging Epstein, under the instructions of the woman who had shown her in. The massage quickly developed into a sexual encounter.

Virginia was uncomfortable, but reluctant to deny such important people. 'My face was red with embarrassment,' she says. 'But I felt under immense pressure to please them.

The whole time it was going on, they were promising me the world, that I'd travel with Jeffrey on his private jet and have a well-paid profession.' Afterwards, she was given two $100 bills and told to return the next day.

That was the beginning of the four years she spent with Epstein.

For three of those years, she was under Florida's age of consent, which is 18.



Troubled teenager: Virginia on the billionaire's Zorro ranch in New Mexico in 2001

Virginia was fascinated by his life story: the son of a humble New York City parks worker, he was a teacher before becoming a Wall Street broker and friends with the upper echelons of the political, financial and academic establishment.

As a confused teenager, Virginia easily fell into the practice of sexually gratifying him for money.

He guaranteed her a minimum of $200 each time she gave him what he called an 'erotic massage.'

Virginia said: 'I would always receive the money immediately. He would give me the cash from a wad he carried in a black duffel bag or an assistant paid me.

'And, because of the way Epstein had warped her sensibilities, every time she took the cash, Virginia felt even more indebted to him. Secretly, he was also preparing her for an even more disturbing role.

'Basically, I was training to be a prostitute for him and his friends who shared his interest in young girls,' she says: 'After about two years, he started to ask me to "entertain" his friends.'

Epstein had trained me to do whatever men wanted. I told myself I was special

It started when Epstein called Virginia at the Palm Beach apartment he had rented for her.

She recalls: 'He said, "I've got a good friend and I need you to fly to the island to entertain him, massage him and make him feel how you make me feel."

He didn't spell out what I had to do. He didn't have to. 'He'd trained me to do whatever a man wanted. I was shocked but I told myself he was sharing me around because he trusted me and I was special.

I was worried, but I would do anything to keep Jeffrey happy and to keep my place as his number one girl.

He would keep telling me how lucky I was with the life I was leading and the money I was making. It was easy to fall into his grasp.

'The way it usually worked was I'd be sent to meet a man on the private island Jeffrey owned in the Caribbean, or at his ranch in New Mexico, which was really isolated.' She was 'given' to men ranging in age from their 40s to their 60s.

They included a well-known businessman (whose pregnant wife was asleep in the next room), a world-renowned scientist, a respected liberal politician and a foreign head of state.

None appeared to think the arrangement was unusual. Virginia says there were many other girls in Epstein's circle and that she was paid extra money to help recruit them.

'They would lounge around the Palm Beach house, the ranch or the island, nude or topless,' she says. 'But I was one of the very few he trusted as "special" and chosen to "entertain" his friends.'

Virginia took the sedative Xanax to detach herself from sordid reality. 'It was an escape drug,' she says. 'It made me calm and helped me forget about what I had to do. I was up to eight pills a day.'

Epstein had no objection to Virginia's use of prescription drugs, no doubt recognising that they made her even more malleable. 'I didn't want to go back to the life I'd had before' she says.

'That made me totally obedient.' Despite the fact that Epstein was, essentially, her pimp, this life now seemed normal to Virginia. 'I felt that he and Ghislaine really cared for me,' she said.

'We'd do family things, like watch Sex And The City and eat popcorn. 'A lot of it was very glamorous. I met famous friends of his such as Al Gore and Heidi Klum and Naomi Campbell. He introduced me as his "travelling masseuse."

Some people mistook me for his daughter. 'When we were in New York or Palm Beach, Ghislaine and I would shop all day.

Jeffrey bought me jewellery – diamonds were his favourite – and wonderful furniture. He was paying me very well because I'd give him sex whenever he wanted it.'

She was, she says, delighted when Epstein invited her to accompany him on a six-week trip in 2001.

'He said we'd be going to Europe and North Africa to meet architects and interior decorators because he wanted to redo his New Mexico house.

I threw my arms around him and gave him a peck on the cheek.' They flew to Paris, then Spain, then Tangier.

Finally, they went to London. 'After we landed, we drove straight to Ghislaine's house,' says Virginia. 'I was given a small upstairs bedroom. The following morning, Ghislaine came in.

She was chirpy and jumped on the bed saying, "Get up, sleepyhead. You've got a big day. We've got to go shopping. You need a dress as you're going to dance with a Prince tonight."

'She said I needed to be "smiley" and bubbly because he was the Queen's son.

Counselling: Virginia at her mother's home at Palm Beach in 1998

Ghislaine and I went to Burberry, where she bought me a £5,000 bag, and to a few other designer stores where we bought a couple of dresses, a pair of embroidered jeans and a pink singlet, perfume and make-up.

We got back to Ghislaine's house at around 4pm and I ran straight upstairs to shower and dress.

When I went downstairs, Ghislaine and Jeffrey were in the lounge. There was a knock at the door. Ghislaine led Andrew in and we kissed each other on the cheek. 'Ghislaine served tea from a porcelain pot and biscuits. She knew Sarah Ferguson and they talked fondly about Andrew's daughters.

Then Ghislaine asked Andrew how old he thought I was and he guessed 17 and they all laughed. Ghislaine made a joke that I was getting too old for Jeffrey.

She said, "He'll soon have to trade her in." It was widely known that he liked young girls.' The four of them went out to dinner and on to Tramp nightclub where, she says, Andrew danced with her.

'After about an hour-and-a-half, we drove back to Ghislaine's.

All of us went upstairs and I asked Jeffrey to snap a picture of me with the Prince. I wanted something to show my Mom. Ghislaine and Jeffrey left us after that, and later Andrew left.

'In the morning, Ghislaine said, "You did well. He had fun". We flew straight back to the States.' The Mail on Sunday has confirmed that the tycoon's jet flew to Paris on March 6, 2001, continuing to Granada, Tangier and London, before returning to New York.

On the last leg of the trip, Virginia was paid about $15,000 (£9,400) by Epstein. 'It was amazing money, more than I'd ever made on a trip with him before.

He didn't say there was any special reason, but I felt like I'd done everything he wanted. He was very pleased.'

There is no suggestion that there was any sexual contact between Virginia and Andrew, or that Andrew knew that Epstein paid her to have sex with his friends.

I took eight pills a day to help me forget what I had to do. It made me calm.

However, the Prince must have been aware of Epstein's conviction when he stayed with him in New York in December.

Virginia says she met Andrew for a second time around Easter 2001 at Epstein's Manhattan mansion.

'When I got to the mansion, I was told, "Get ready. You are meeting someone in the office" – which is what they called the library. Andrew was sitting there in a big leather armchair.

Ghislaine had just given him a present, a big toy that was his Spitting Image puppet. 'He was smiling ear-to-ear. He looked like a kid whose parents were taking him to Disney World.

A beautiful girl called Johanna Sjoberg who worked for Jeffrey was sitting on Andrew's knee. Ghislaine guided me over to Andrew and I think he recognised me, though I don't know if he remembered my name.

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Skinny Girl founder

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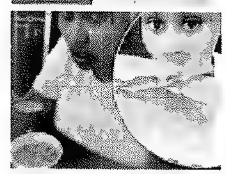

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The two wed in 2012

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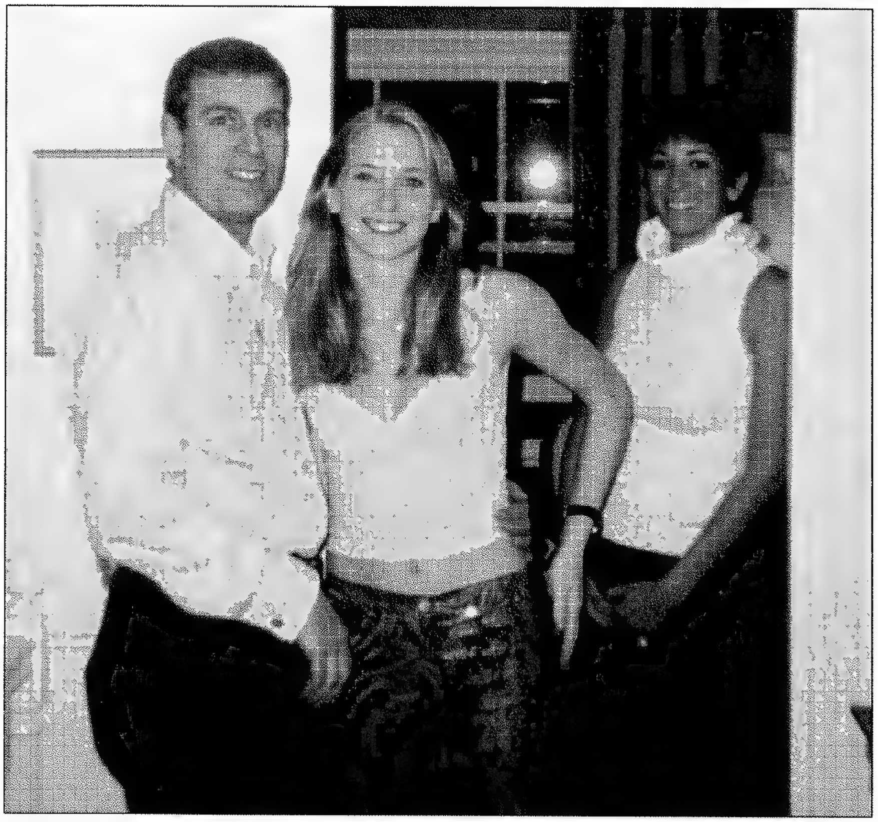


Organiser: Ghislaine Maxwell looks on as Andrew put his arm around Virginia. Robert Maxwell's daughter invited her to work as Epstein's personal masseuse soon after her 15th birthday

We kissed on the cheek and Ghislaine placed me on his other knee.' Johanna spoke to The Mail on Sunday three years ago about this incident, which took place when she was 21.

She said: 'Ghislaine put the puppet's hand on Virginia's breast, then Andrew put his hand on my breast. It was a great joke. Everybody laughed.' After this, Virginia was paid, by Epstein, around $400 (£250).'

She met Andrew for the third and final time on Epstein's Caribbean island, Little Saint James. Virginia was never under the British legal age of consent when she met Andrew. She was 17 during the first two encounters and 18 at the third.

By now, however, Epstein, had started to hint that she was getting 'too old' for him.

But during one trip to the island, Epstein and Ghislaine made their most astonishing proposition, and one which repulsed her. 'They said Jeffrey wanted me to have his child,' she says.

'They said I was part of their family and I was beautiful,young, loyal and nurturing and would be a great mother.

They said I would have to sign a contract relinquishing rights to the child and consenting to Jeffrey having as many relationships as he liked. In return I would have my own mansion in Palm Beach and a large monthly payment, a percentage of his income.'

This, finally, was a wake-up call to Virginia and she began to see the way in which she had been groomed.

'It was a smack in the face,' she says. 'I finally realised this wasn't ever going to be a real relationship but I knew if I refused, I'd be thrown back on the streets. So I said, "I'm too young. I want to get my massage credentials, then maybe we'll do it".'

The tycoon took her at her word and, for her 19th birthday in August 2002, flew her to Thailand where he enrolled her in a massage course.

Shortly after arriving there, she met an Australian martial arts expert called Robert. They fell in love and, just ten days later, married in a Buddhist ceremony.

'I called Jeffrey and told him I'd fallen madly in love,' Virginia says. 'I was hoping he'd be delighted. But he said, "Have a nice life," and hung up on me.' The couple now have two sons, aged five and four, and a daughter who recently turned one.

'The first few months after I married Robert were the worst,' she says. 'I couldn't bring myself to tell him much. No man wants to know his wife has been traded out.

'I felt very alone. I was having panic attacks and seeing a psychiatrist and was on anti-depressants.

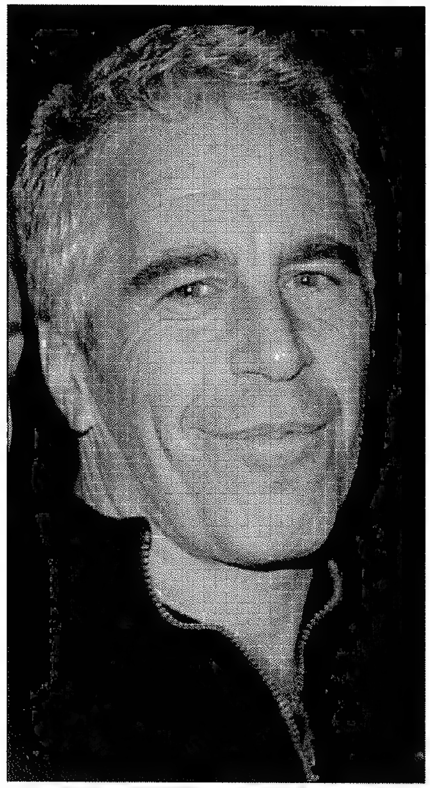
' Virginia was beginning to put her Epstein days behind her when, three years ago, she was phoned by the FBI.

'They said they had found photos of me at Jeffrey's Palm Beach house,' she says. '[Epstein had] hidden cameras watching me the entire time even when I was in the bathroom. I was so embarrassed.

'I told the FBI that my true purpose was sexual. They told me everything he did was illegal because I was under age.' (The age of consent in Florida is 18).

'They said that if it had to go to trial, they'd need me because I'd lived with him and that made me a key witness. I was very afraid, because he had so much power, but eventually I agreed to testify.

I was glad he'd finally been found out. He shouldn't be hurting other girls. Following Epstein's arrest, investigators are believed to have found a list of men's names on his computer and asked him whether they had been 'treated' to sexual encounters with his menage of minors.



Conviction: Jeffrey Epstein

'He took the Fifth Amendment, refusing to answer, indicating that if he were to answer the question, it could be incriminating,' a source told The Mail on Sunday.

Epstein struck a deal resulting in what commentators characterised as a 'slap on the wrist' for him, and ended up serving 13 months of his sentence, much of it in a liberal work-release programme Lawyer Brad Edwards, who represented several of Epstein's victims, said: 'Rather than punish him the way they would an average Joe, they sent a clear message that with enough money and power and influence, the system can be bought.'

Virginia was spared her the humiliation of having to go before a jury, and has kept her feelings bottled up until last weekend's photograph of Andrew with Epstein triggered distressing memories.

Virginia says: 'I am appalled. To me, it's saying, "We are above the law." But Jeffrey is a monster.'

Last night, neither Epstein, Ghislaine Maxwell nor Prince Andrew would comment on Virginia's story.

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Remembering his pal

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She's a mom-of-two

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A landmark day for the 18-year-old actress

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Break-in at his Tarzana home over the weekend

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Catching up

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She is 37

A Givenchy girl! Model Lily Aldridge steps out in $1,250 designer SWEATSHIRT as she shows off slim legs in NYC
Victoria's Secret Angel

EXHIBIT B

Daily Mail .com

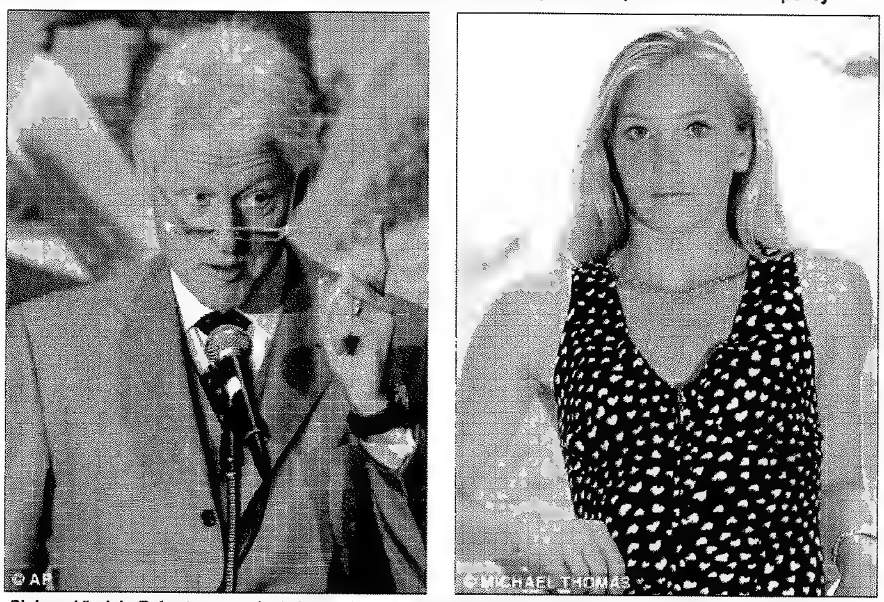
Teenage girl recruited by paedophile Jeffrey Epstein reveals how she twice met Bill Clinton

By SHARON CHURCHER and POLLY DUNBAR FOR MAILONLINE
UPDATED: 19:53 EST, 5 March 2011

As a New Yorker from humble beginnings, Jeffrey Epstein played on his blue-collar credentials and enormous wealth to extend tentacles of influence throughout America's liberal political elite.

During the outcry over the Epstein case, it emerged that another man with a notorious appetite for young women, Bill Clinton, travelled with Epstein to a number of destinations, including three times on the billionaire's private aircraft.

On one occasion, Epstein flew the former President, Hollywood actor and staunch Democrat Kevin Spacey and another actor friend of Mr Clinton's, Chris Tucker, to Africa, to 'discuss AIDS policy'.



Claims: Virginia Roberts says she twice met ex-president Bill Clinton, pictured last month, but was never 'lent out'

Epstein, who has donated more than £75,000 over the years to candidates from the Democratic Party, also flew with Mr Clinton in November 2003 to destinations including Russia, Oslo, Hong Kong, Shanghai and Beijing.

Yet Virginia Roberts stresses that she was never 'lent out' to Mr Clinton.

On one occasion, she adds, Epstein did invite two young brunettes to a dinner which he gave on his Caribbean island for Mr Clinton shortly after he left office. But, as far as she knows, the ex-President did not take the bait.

'I'd have been about 17 at the time,' she says. 'I flew to the Caribbean with Jeffrey and then Ghislaine Maxwell went to pick up Bill in a huge black helicopter that Jeffrey had bought her.

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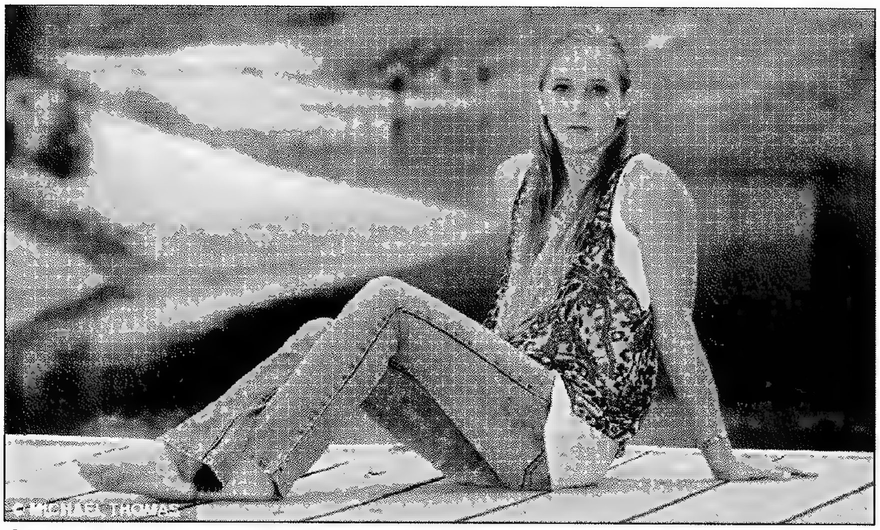
'She'd always wanted to fly and Jeffrey paid for her to take lessons, and I remember she was very excited because she got her licence around the first year we met.

'I used to get frightened flying with her but Bill had the Secret Service with him and I remember him talking about what a good job she did.

'I only ever met Bill twice but Jeffrey had told me that they were good friends.

'I asked, "How come?" and he laughed and said, "He owes me some favours." Maybe he was just joking but it constantly surprised me that people with as much to lose as Bill and [Prince] Andrew weren't more careful.

'Bill must have known about Jeffrey's girls. There were three desks in the living area of the villa on the island.



Speaking out: Virginia, now aged 26, in her new home in Australia

'They were covered with pictures of Jeffrey shaking hands with famous people and photos of naked girls, including one of me that Jeffrey had at all his houses, lying in a hammock.

'We all dined together that night. Jeffrey was at the head of the table. Bill was at his left. I sat across from him. Emmy Tayler, Ghislaine's blonde British assistant, sat at my right.

'Ghislaine was at Bill's left and at the left of Ghislaine there were two olive-skinned brunettes who'd flown in with us from New York.

'I'd never met them before. I'd say they were no older than 17, very innocent-looking.

'They weren't there for me. They weren't there for Jeffrey or Ghislaine because I was there to have sex with Jeffrey on the trip.

'Maybe Jeffrey thought they would entertain Bill, but I saw no evidence that he was interested in them. He and Jeffrey and Ghislaine seemed to have a very good relationship. Bill was very funny.

'He made me laugh a few times. And he and Jeffrey and Ghislaine told blokey jokes and the brunettes listened politely and giggled.

'After dinner I gave Jeffrey an erotic massage. I don't remember seeing Bill again on the trip but I assume Ghislaine flew him back.'

> **'Bill must have known about Jeffrey's girls. There were three desks in the living area of the villa on the island... covered with photos of naked girls'**

According to prison records, when Epstein was serving his jail term, his visitors included a long-time – and highly controversial – Clinton acquaintance, Arnold Prosperi.

'In the final hours of the Clinton presidency, in January 2001, Prosperi was facing three years in prison after being convicted of tax fraud. Mr Clinton commuted his sentence to house arrest.

'Clinton, Prosperi and Epstein make an odd threesome on the face of it,' says a law enforcement source.

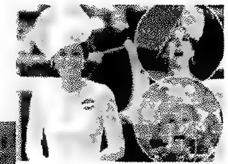
'Was Prosperi visiting Epstein as some kind of intermediary for Bill?

'Maybe Bill wanted to know if Epstein knew anything that could embarrass him. Or did Bill commute Prosperi's sentence as some kind of favour

for Epstein?'

Virginia disclosed that Mr Clinton's vice-president Al Gore and his wife, Tipper, were also guests of Epstein on his island.

Cambridge can't contain her excitement as her horse wins at Royal Ascot races
Whooped and cheered

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Couple looked blissful

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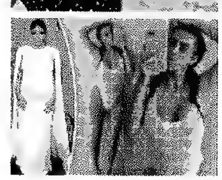


Guests: Virginia says she also met former Vice President Al Gore, pictured right with Mr Clinton

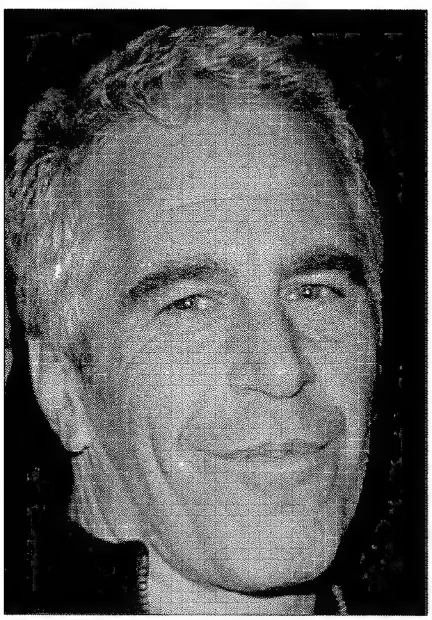
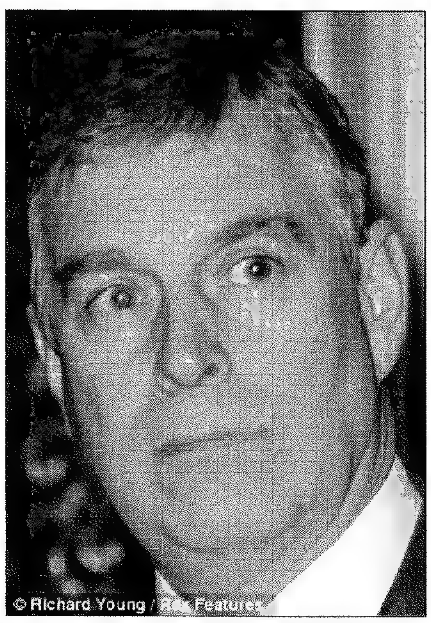
Last summer, the Gores abruptly announced that they were ending their supposedly fairytale marriage and, just weeks later, it emerged that Mr Gore – the famously sanctimonious global-warming disciple – had been accused of trying to force sex on a woman with whom he had booked a therapeutic massage at an Oregon hotel.

'I had no clue that anything was up,' Virginia says. 'The Gores seemed like a beautiful couple when I met them. All I knew was that Mr Gore was a friend of Jeffrey's and Ghislaine's. Jeffrey didn't ask me to give him a massage.

'There might have been a couple of other girls there on that trip but I could never have imagined this guy would do anything wrong. I was planning to vote for him when I turned 18. I thought he was awesome.'

Virginia said that yet another American liberal icon, President Obama's Middle East peace envoy Senator George Mitchell, frequently visited Epstein's New York residence.

Mr Mitchell, aged 77 – who previously led America's Northern Ireland peace initiative – 'was very close to Jeffrey,' Virginia recalled. 'He is very clean-cut. You wouldn't think of him being part of Jeffrey's crew.'

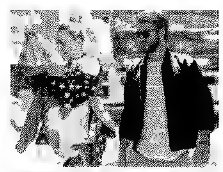
Scandal: U.S. authorities want to interview Jeffrey Epstein (left) and may wish to quiz his friend, Prince Andrew

Epstein's contacts book contains a work and a home telephone number for the senator.

Another acquaintance was Israel defence secretary Ehud Barak, whose spokesman told The Mail on Sunday: 'Mr Barak did attend several small functions in Mr Epstein's home in New York that were usually attended by leading businessman, university presidents, Nobel Prize Laureates and prominent public figures.'

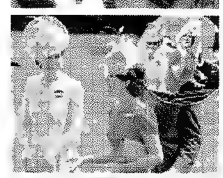
'We just want them to have a normal life': Blake Lively reveals her parenthood plans now that baby no.2 is on its way and why she fell in love with Ryan Reynolds

Back to work! Miley Cyrus and Liam Hemsworth temporarily go their separate ways... after very public dinner date in NYC



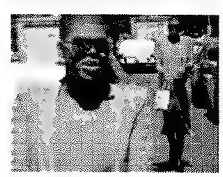
Ivanka Trump shares morning snap of baby Theo watching her get ready as she admits in that she wakes up at 5:30am and goes to work with her hair wet

They could be sisters! Princess Mary of Denmark and Duchess of Cambridge look strikingly similar as they enjoy a catch up at Royal Ascot



Brooke Shields' stalker GRINS walking into court with trial entering third day after judge hears actress's tearful testimony about man coming to her home

Mixing business with pleasure! Bodysuit-clad EJ Johnson gets in some retail therapy before filming his yet-to-air New York reality show



Seth Myers 'bans' Trump from appearing on NBC's Late Night

Epstein's many Hollywood pals include Matt Groening, creator of The Simpsons.

'Jeffrey once had me give Matt a foot massage when he was flying on the jet with us,' Virginia says.

'He laughed and did drawings of Bart and Homer for my little brother and my dad.

'I also met Naomi Campbell at a birthday party of hers on a yacht in the South of France. She is a friend of Ghislaine's but she was a real bitch to me.

'She was very fake. She turned away from me when we were introduced by Ghislaine and Jeffrey.

'Donald Trump was also a good friend of Jeffrey's. He didn't partake in sex with any of us but he flirted with me. He'd laugh and tell Jeffrey, "You've got the life." '

Palm Beach Police say Epstein seemed utterly unfazed by the allegations against him when they began their long and detailed investigation.

'Jeffrey's crew: Middle East peace envoy George Mitchell, right, pictured with President Barack Obama and U.S. Secretary of State Hilary Clinton, frequently visited Epstein¿s New York residence, Virginia also claims

But he also took his defence very seriously indeed. Epstein engaged his friend, the Harvard law professor Alan Dershowitz – whose celebrity clients have included Mike Tyson, Patty Hearst, Claus von Bulow and O.J. Simpson – to run his legal defence.

He also employed a firm of private investigators to investigate the backgrounds of the girls.

Detectives painstakingly built a case which they believed showed that Epstein systematically paid teenage girls to recruit other teenage girls to his sex ring.

However, as the investigation continued, they found that Epstein's team had already spoken to key witnesses, suggesting that the financier would reward those who helped him.

In addition, Epstein's defence team agreed to the unusual move of suggesting that the alleged victims sue Epstein in the civil courts. The result was a plea bargain in which Epstein admitted a single charge of soliciting an underage girl for prostitution – a deal which infuriated many police officers who worked on the case.

More than 20 of Epstein's girls are said to have sued him for damages. At least 17 have settled out of court.

Mr Clinton, Mr Gore and Mr Mitchell were all contacted about their friendship with Epstein but declined to comment.

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Statement on Behalf of Ghislaine Maxwell

BY DEVONSHIRES SOLICITORS, PRNE
WEDNESDAY, MARCH 9, 2011

LONDON, March 10, 2011 - Ghislaine Maxwell denies the various allegations about her
that have appeared recently in the media. These allegations are all entirely
false.

It is unacceptable that letters sent by Ms Maxwell's legal representatives to certain newspapers pointing out the truth and asking for
the allegations to be withdrawn have simply been ignored.

In the circumstances, Ms Maxwell is now proceeding to take legal action against those newspapers.

"I understand newspapers need stories to sell copies. It is well known that certain newspapers live by the adage, "why let the truth get
in the way of a good story." However, the allegations made against me are
abhorrent and entirely untrue and I ask that they stop," said Ghislaine
Maxwell.

"A number of newspapers have shown a complete lack of accuracy
in their reporting of this story and a failure to carry out the most
elementary investigation or any real due diligence. I am now taking action to
clear my name," she said.

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Media contact:

Ross Gow
Acuity Reputation
Tel: +44-203-008-7790
Mob: +44-7778-755-251
Email: ross@acuityreputation.com
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Filed under: Government and Policy, Law, Media

Tags: Devonshires Solicitors, London, March 10, United Kingdom

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Giuffre
AGREN BLANDO REPORTING
5/3/16 KAM

GIUFFRE001067

REDACTED
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EXHIBIT E

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO.:08-CV-80736-KAM

JANE DOE 1 and JANE DOE 2,

Petitioners,

vs.

UNITED STATES OF AMERICA,

Respondent.

_____________________________/

ORDER DENYING PETITIONERS' MOTION TO JOIN UNDER RULE 21 AND MOTION TO AMEND UNDER RULE 15

This cause is before the Court on Jane Doe 3 and Jane Doe 4's Corrected Motion Pursuant to Rule 21 for Joinder in Action ("Rule 21 Motion") (DE 280), and Jane Doe 1 and Jane Doe 2's Protective Motion Pursuant to Rule 15 to Amend Their Pleadings to Conform to Existing Evidence and to Add Jane Doe 3 and Jane Doe 4 as Petitioners ("Rule 15 Motion") (DE 311). Both motions are ripe for review. For the following reasons, the Court concludes that they should be denied.

I. Background

This is an action by two unnamed petitioners, Jane Doe 1 and Jane Doe 2, seeking to prosecute a claim under the Crime Victims' Rights Act (CVRA), 18 U.S.C. § 3771. (DE 1). Generally, they allege that the respondent Government violated their rights under the CVRA by failing to consult with them before negotiating a non-prosecution agreement with Jeffrey Epstein, who subjected them to various sexual crimes while they were minors. (Id.). Petitioners initiated this action in July 2008. (Id.).

On December 30, 2014, two other unnamed victims, Jane Doe 3 and Jane Doe 4, moved to join as petitioners in this action pursuant to Federal Rule of Civil Procedure 21. (DE 280). Petitioners (Jane Doe 1 and Jane Doe 2) support the Rule 21 Motion. (Id. at 11). Jane Doe 3 and Jane Doe 4 argue that they "have suffered the same violations of their rights under the [CVRA] as the" Petitioners, and they "desire to join in this action to vindicate their rights as well." (Id. at 1). The Government vehemently opposes joinder under Rule 21. (DE 290). The Government argues that Rule 15 is the proper procedural device for adding parties to an action, not Rule 21. (Id. at 1).

"[O]ut of an abundance of caution," Petitioners filed a motion to amend their petition under Rule 15, conforming the petition to the evidence and adding Jane Doe 3 and Jane Doe 4 as petitioners. (DE 311 at 2). The Government opposes the Rule 15 Motion as well. (DE 314). Among other things, the Government argues that amending the petition to include Jane Doe 3 and Jane Doe 4 should be denied because of their undue delay in seeking to join the proceedings, and the undue prejudice that amendment will cause. (Id.).

After considering the parties' submissions and the proposed amended petition, the Court finds that justice does not require amendment in this instance and exercises its discretion to deny the amendment.

II. Discussion

"The decision whether to grant leave to amend a complaint is within the sole discretion of the district court." Laurie v. Ala. Ct. Crim. Apps., 256 F.3d 1266, 1274 (11th Cir. 2001). "The court should freely give leave when justice so requires." Fed. R. Civ. P. 15(a)(2). Justice does not require amendment in several instances, "includ[ing] undue delay, bad faith, dilatory motive on the part of the movant, . . . undue prejudice to the opposing party by virtue of allowance of the amendment, [and] futility of amendment.'" Laurie, 256 F.3d at 1274 (quoting Foman v. Davis, 371 U.S. 178, 182 (1962)). In addition to considering the effect of amendment on the parties, the court must consider "the importance of the amendment on the proper determination of the merits of a dispute." 6 Wright & Miller, Fed. Prac. & Fed. P. § 1488, p. 814 (3d ed. 2010). Justice does not require amendment where the addition of parties with duplicative claims will not materially advance the resolution of the litigation on the merits. See Herring v. Delta Air Lines, Inc., 894 F.2d 1020, 1024 (9th Cir. 1989).

A. Rule 21 Motion

Jane Doe 3 and Jane Doe 4's first attempt to join in this proceeding was brought under Rule 21. (DE 280). "If parties seek to add a party under Rule 21, courts generally use the standard of Rule 15, governing amendments to pleadings, to determine whether to allow the addition." 12 Wright & Miller, Fed. Prac. & Fed. P., p. 432 (3d ed. 2013); see also Galustian v. Peter, 591 F.3d 724, 729-30 (4th Cir. 2010) (collecting cases and noting that Rule 15(a) applies to amendments seeking to add parties); Frank v. U.S. West, Inc., 3 F.3d 1357, 1365 (10th Cir. 1993) ("A motion to add a party is governed by Fed. R. Civ. P. 15(a) . . . .").

Rule 21, "Misjoinder and Non-joinder of Parties," provides the court with a tool for correcting the "misjoinder" of parties that would otherwise result in dismissal. Fed. R. Civ. P. 21. Insofar as Rule 21 "relates to the addition of parties, it is intended to permit the bringing in of a person, who through inadvertence, mistake or for some other reason, had not been made a party and whose presence as a party is later found necessary or desirable." United States v. Com. Bank of N. Am., 31 F.R.D. 133, 135 (S.D.N.Y. 1962) (internal quotation marks omitted).

In their Rule 21 Motion, Jane Doe 3 and Jane Doe 4 do not claim that they were omitted from this proceeding due to any "inadvertence" or "mistake" by Petitioners; rather, they seek to join this proceeding as parties that could have been permissively joined in the original petition under Rule 20 ("Permissive Joinder of Parties"). As courts generally use the standards of Rule 15 to evaluate such circumstances, the Court will consider the joinder issue as presented in the Rule 15 Motion.[1] The Court will consider the arguments presented in the Rule 21 Motion as if they are set forth in the Rule 15 Motion as well. Because the arguments are presented in the Rule 15 Motion (and because the Court is denying the Rule 15 Motion on its merits, as discussed below), the Rule 21 Motion will be denied.

The Court also concludes that portions of the Rule 21 Motion and related filings should be stricken from the record. Pending for this Court's consideration is a Motion for Limited Intervention filed by Alan M. Dershowitz, who seeks to intervene to "strike the outrageous and impertinent allegations made against him and [to] request[] a show cause order to the attorneys that have made them." (DE 282 at 1). The Court has considered Mr. Dershowitz's arguments, but it finds that his intervention is unnecessary as Federal Rule of Civil Procedure 12(f) empowers the Court "on its own" to "strike from a pleading an insufficient defense or any redundant, immaterial, impertinent, or scandalous matter." Fed. R. Civ. P. 12(f).

Petitioners' Rule 21 Motion consists of relatively little argumentation regarding why the Court should permit them to join in this action: they argue that (1) they were sexually abused by

[1] The Court notes that, regardless of which motion it considers, the same standard governs the addition of parties under Rule 21 and Rule 15. See Goston v. Potter, No. 08-cv-478 FJS ATB, 2010 WL 4774238, at *5 (N.D.N.Y. 2010) (citing Bridgeport Music, Inc. v. Universal Music Grp., Inc., 248 F.R.D. 408, 412 (S.D.N.Y. 2008)).

Jeffrey Epstein, and (2) the Government violated their CVRA rights by concealing the non-prosecution agreement with them. (DE 280 at 3; see id. at 7-8). However, the bulk of the Rule 21 Motion consists of copious factual details that Jane Doe 3 and Jane Doe 4 "would prove" "[i]f allowed to join this action." (Id. at 3, 7). Specifically, Jane Doe 3 proffers that she could prove the circumstances under which a non-party introduced her to Mr. Epstein, and how Mr. Epstein sexually trafficked her to several high-profile non-party individuals, "including numerous prominent American politicians, powerful business executives, foreign presidents, a well-known Prime Minister, and other world leaders." (Id. at 3-6). She names several individuals, and she offers details about the type of sex acts performed and where they took place. (See id. at 5).[2]

At this juncture in the proceedings, these lurid details are unnecessary to the determination of whether Jane Doe 3 and Jane Doe 4 should be permitted to join Petitioners' claim that the Government violated their rights under the CVRA. The factual details regarding with whom and where the Jane Does engaged in sexual activities are immaterial and impertinent to this central claim (i.e., that they were known victims of Mr. Epstein and the Government owed them CVRA duties), especially considering that these details involve non-parties who are not related to the respondent Government. These unnecessary details shall be stricken.

The original Rule 21 Motion (DE 279) shall be stricken in its entirety, as it is wholly superseded by the "corrected" version of the Rule 21 Motion (DE 280). From the corrected Rule 21 Motion, the Court shall strike all factual details regarding Jane Doe 3 between the following sentences: "The Government then concealed from Jane Doe #3 the existence of its NPA from

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[2] Jane Doe 4's proffer is limited to sexual acts between Mr. Epstein and herself. (See DE 280 at 7-8).

Jane Doe #3, in violation of her rights under the CVRA" (id. at 3); and "The Government was well aware of Jane Doe #3 when it was negotiating the NPA, as it listed her as a victim in the attachment to the NPA" (id. at 6). As none of Jane Doe 4's factual details relate to non-parties, the Court finds it unnecessary to strike the portion of the Rule 21 Motion related to her circumstances. Regarding the Declaration in support of Petitioners' response to Mr. Dershowitz's motion to intervene (DE 291-1), the Court shall strike paragraphs 4, 5, 7, 11, 13, 15, 19 through 53, and 59, as they contain impertinent details regarding non-parties. Regarding the Declaration of Jane Doe 3 in support of the Rule 21 Motion (DE 310-1), the Court shall strike paragraphs 7 through 12, 16, 39, and 49, as they contain impertinent details regarding non-parties. Jane Doe 3 is free to reassert these factual details through proper evidentiary proof, should Petitioners demonstrate a good faith basis for believing that such details are pertinent to a matter presented for the Court's consideration.

As mentioned, Mr. Dershowitz moves to intervene "for the limited purposes of moving to strike the outrageous and impertinent allegations made against him and requesting a show cause order to the attorneys that have made them." (DE 282 at 1). As the Court has taken it upon itself to strike the impertinent factual details from the Rule 21 Motion and related filings, the Court concludes that Mr. Derschowitz's intervention in this case is unnecessary. Accordingly, his motion to intervene will be denied as moot.[3] Regarding whether a show cause order should

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[3] This also moots Mr. Dershowitz's Motion for Leave to File Supplemental Reply in Support of Motion for Limited Intervention. (DE 317). Denying Mr. Dershowitz's motion to intervene also renders moot Petitioners' motion (DE 292) to file a sealed document supporting its response to Mr. Dershowitz's motion. It will accordingly be denied as moot, and DE 293 (the sealed response) will be stricken from the record.

issue, the Court finds that its action of striking the lurid details from Petitioners' submissions is sanction enough. However, the Court cautions that all counsel are subject to Rule 11's mandate that all submissions be presented for a proper purpose and factual contentions have evidentiary support, Fed. R. Civ. P. 11(b)(1) and (3), and that the Court may, on its own, strike from any pleading "any redundant, immaterial, impertinent, or scandalous matter," Fed. R. Civ. P. 12(f).

B. Rule 15 Motion

Between their two motions (the Rule 21 Motion and Rule 15 Motion), Jane Doe 3 and Jane Doe 4 assert that "they desire to join in this action to vindicate their rights [under the CVRA] as well." (DE 280 at 1). Although Petitioners already seek the invalidation of Mr. Epstein's non-prosecution agreement on behalf of all "other similarly-situated victims" (DE 189 at 1; DE 311 at 2, 12, 15, 18-19), Jane Doe 3 and Jane Doe 4 argue that they should be fellow travelers in this pursuit, lest they "be forced to file a separate suit raising their claims" resulting in "duplicative litigation" (DE 280 at 11). The Court finds that justice does not require adding new parties this late in the proceedings who will raise claims that are admittedly "duplicative" of the claims already presented by Petitioners.

The Does' submissions demonstrate that it is entirely unnecessary for Jane Doe 3 and Jane Doe 4 to proceed as parties in this action, rather than as fact witnesses available to offer <u>relevant</u>, <u>admissible</u>, and <u>non-cumulative</u> testimony. (<u>See, e.g.</u>, DE 280 at 2 (Jane Doe 3 and Jane Doe 4 "are in many respects similarly situated to the current victims"), 9 ("The new victims will establish at trial that the Government violated their CVRA rights in the same way as it violated the rights of the other victims."), 10 (Jane Doe 3 and Jane Doe 4 "will simply join in motions that the current victims were going to file in any event."), 11 (litigating Jane Doe 3 and

Jane Doe 4's claims would be "duplicative"); DE 298 at 1 n.1 ("As promised . . . Jane Doe No. 3 and Jane Doe No. 4 do not seek to expand the number of pleadings filed in this case. If allowed to join this action, they would simply support the pleadings already being filed by Jane Doe No. 1 and Jane Doe No. 2."); DE 311 at 5 n.3 ("[A]ll four victims (represented by the same legal counsel) intend to coordinate efforts and avoid duplicative pleadings."), 15 (Jane Doe 3 and Jane Doe 4 "challenge the same secret agreement i.e., the NPA that the Government executed with Epstein and then concealed from the victims. This is made clear by the proposed amendment itself, in which all four victims simply allege the same general facts.")). As the Does argue at length in their Rule 15 Motion, Jane Doe 1's original petition "specifically allege[s] that the Government was violating not only her rights but the rights of other similarly-situated victims." (DE 311 at 2). The Court fails to see why the addition of "other similarly-situated victims" is now necessary to "vindicate their rights as well." (DE 280 at 1).

Of course, Jane Doe 3 and Jane Doe 4 can participate in this litigated effort to vindicate the rights of similarly situated victims there is no requirement that the evidentiary proof submitted in this case come only from the named parties. Petitioners point out as much, noting that, regardless of whether this Court grants the Rule 15 Motion, "they will call Jane Doe No. 3 as a witness at any trial." (DE 311 at 17 n.7). The necessary "participation" of Jane Doe 3 and Jane Doe 4 in this case can be satisfied by offering their properly supported and relevant, admissible, and non-cumulative testimony as needed, whether through testimony at trial (see DE 280 at 9) or affidavits submitted to support the relevancy of discovery requests[4] (see

[4] The non-party Jane Does clearly understand how to submit affidavits. (See DEs 291-1, 310-1).

id. at 10). Petitioners do not contend that Jane Doe 3 and Jane Doe 4's "participation in this case" can only be achieved by listing them as parties.

As it stands under the original petition, the merits of this case will be decided based on a determination of whether the Government violated the rights of Jane Doe 1, Jane Doe 2, and all "other similarly situated victims" under the CVRA. Jane Doe 3 and Jane Doe 4 may offer relevant, admissible, and non-cumulative evidence that advances that determination, but their participation as listed parties is not necessary in that regard. See Herring, 894 F.2d at 1024 (District court did not abuse its discretion by denying amendment where "addition of more plaintiffs . . . would not have affected the issues underlying the grant of summary judgment."); cf. Arthur v. Stern, 2008 WL 2620116, at *7 (S.D. Tex. 2008) (Under Rule 15, "courts have held that leave to amend to assert a claim already at issue in [another lawsuit] should not be granted if the same parties are involved, the same substantive claim is raised, and the same relief is sought.").[5] And, as to Jane Doe 4 at least, adding her as a party raises unnecessary questions about whether she is a proper party to this action.[6]

Petitioners also admit that amending the petition to conform to the evidence by including references to the non-prosecution agreement itself is "unnecessary" as the "existing petition is broad enough to cover the developing evidence in this case." (DE 311). The Court

[5] The Court expresses no opinion at this time whether any of the attestations made by Jane Doe 3 and Jane Doe 4 in support of their motion will be relevant, admissible, and non-cumulative.

[6] The Government contends that Jane Doe 4 is not a true "victim" in this case because she was not known at the time the Government negotiated the non-prosecution agreement, and accordingly she was not entitled to notification rights under the CVRA. (See DE 290 at 10). Any "duplicative" litigation filed by Jane Doe 4 would necessarily raise the issue of whether she has standing under the CVRA under these circumstances.

agrees, and it concludes that justice does not require amending the petition this late in the proceedings.

III. Conclusion

Accordingly, it is hereby **ORDERED AND ADJUDGED** as follows: the Rule 21 Motion (DE 280) is **DENIED**; the Rule 15 Motion (DE 311) is **DENIED**; Intervenor Dershowitz's Motion for Limited Intervention (DE 282) and Motion for Leave to File Supplemental Reply in Support of Motion for Limited Intervention (DE 317) are **DENIED AS MOOT**; Petitioners' Motion to Seal (DE 292) is **DENIED AS MOOT**; the following materials are hereby **STRICKEN** from the record:

- DE 279, in its entirety.
- DE 280, all sentences between the following sentences: "The Government then concealed from Jane Doe #3 the existence of its NPA from Jane Doe #3, in violation of her rights under the CVRA" (DE 280 at 3); and "The Government was well aware of Jane Doe #3 when it was negotiating the NPA, as it listed her as a victim in the attachment to the NPA" (DE 280 at 6).
- DE 291-1, paragraphs 4, 5, 7, 11, 13, 15, 19 through 53, and 59.
- DE 310-1, paragraphs 7 through 12, 16, 39, and 49.
- DE 293, in its entirety.

DONE AND ORDERED in chambers at West Palm Beach, Palm Beach County, Florida, this 6th day of April, 2015.

KENNETH A. MARRA
United States District Judge

EXHIBIT F

From: <ross@acuityreputation.com>
Date: 2 January 2015 at 20:38
Subject: Ghislaine Maxwell
To: Rossacuity Gow <ross@acuityreputation.com>
bcc: martin.robinson@mailonline.co.uk,
P.Peachey@independent.co.uk,
nick.sommerlad@mirror.co.uk,
david.brown@thetimes.co.uk,
nick.alway@bbc.co.uk,
jo-anne.pugh@bbc.co.uk

To Whom It May Concern,
Please find attached a quotable statement on behalf of Ms Maxwell.

No further communication will be provided by her on this matter.
Thanks for your understanding.
Best
Ross

Ross Gow
ACUITY Reputation

Jane Doe 3 is Virginia Roberts - so not a new individual. The allegations made by Victoria Roberts against Ghislaine Maxwell are untrue. The original allegations are not new and have been fully responded to and shown to be untrue.

Each time the story is re told it changes with new salacious details about public figures and world leaders and now it is alleged by Ms Roberts that Alan Derschowitz is involved in having sexual relations with her, which he denies.

Ms Roberts claims are obvious lies and should be treated as such and not publicised as news, as they are defamatory.

Ghislaine Maxwell's original response to the lies and defamatory claims remains the same. Maxwell strongly denies allegations of an unsavoury nature, which have appeared in the British press and elsewhere and reserves her right to seek redress at the repetition of such old defamatory claims.

Sent from my BlackBerry® wireless device

EXHIBIT
PENGAD 800-631-6989
Maxwell 10
4-22-16 LF

REDACTED
EXHIBITS G-KK

EXHIBIT LL

ARTICLES OF INCORPORATION
In compliance with Chapter 617, F.S., (Not for Profit)

ARTICLE I NAME
The name of the corporation shall be: Victims Refuse Silence, Inc.

ARTICLE II PRINCIPAL OFFICE

Principal street address:	Mailing address, if different is:
425 North Andrews Ave.	
Suite 2	
Fort Lauderdale, FL 33301	

ARTICLE III PURPOSE
The purpose for which the corporation is organized is: Victims Refuse Silence, Inc. is organized exclusively for charitable and educational purposes including, for such purposes, the making of distributions to organizations that qualify as exempt organizations under section 501(c)(3) of the Internal Revenue Code, or the corresponding section of any future federal tax code. The corporation is organized to provide assistance to victims of sexual abuse as well as victims of human trafficking. Upon the dissolution of Victims Refuse Silence, Inc., assets shall be distributed for one or more exempt purpose within the meaning of section 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code, or shall be distributed to the federal government, or to a state or local government, for a public purpose.

ARTICLE IV MANNER OF ELECTION The manner in which the directors are elected and appointed: The manner in which the directors are elected or appointed is provided in the bylaws of the Corporation.

ARTICLE V INITIAL OFFICERS AND/OR DIRECTORS

Name and Title:	Virginia Roberts, Director	Name and Title:	
Address	425 North Andrews Ave.	Address:	
	Suite 2		
	Fort Lauderdale, FL 33301		
Name and Title:	Bradley J. Edwards, Director	Name and Title:	
Address	425 North Andrews Ave.	Address:	
	Suite 2		
	Fort Lauderdale, FL 33301		
Name and Title:	Brittany N. Henderson, Director	Name and Title:	
Address	425 North Andrews Ave.	Address:	
	Suite 2		
	Fort Lauderdale, FL 33301		

FILED
14 DEC 23 PM 12:25

Name and Title: ______________________ Name and Title: ______________________

Address ______________________ Address: ______________________

______________________ ______________________

______________________ ______________________

Name and Title: ______________________ Name and Title: ______________________

Address ______________________ Address: ______________________

______________________ ______________________

______________________ ______________________

ARTICLE VI REGISTERED AGENT

The **name and Florida street address** (P.O. Box NOT acceptable) of the registered agent is:

Name: Bradley J. Edwards

Address: 425 North Andrews Ave., Suite 2

Fort Lauderdale, FL 33301

FILED

14 DEC 23 PM 12: 25

ARTICLE VII INCORPORATOR

The **name and address** of the Incorporator is:

Name: Brittany N. Henderson

Address: 425 North Andrews Ave., Suite 2

Fort Lauderdale, FL 33301

Having been named as registered agent to accept service of process for the above stated corporation at the place designated in this certificate, I am familiar with and accept the appointment as registered agent and agree to act in this capacity

______________________ 12-17-14

Required Signature of Registered Agent Date

I submit this document and affirm that the facts stated herein are true. I am aware that any false information submitted in a document to the Department of State constitutes a third degree felony as provided for in s.817.155, F.S.

______________________ 12/17/14

Required Signature of Incorporator Date

2015 FLORIDA NOT FOR PROFIT CORPORATION AMENDED ANNUAL REPORT

DOCUMENT# N14000011657

Entity Name: VICTIMS REFUSE SILENCE, INC.

FILED
Apr 22, 2015
Secretary of State
CC7801725405

Current Principal Place of Business:

425 NORTH ANDREWS AVE., SUITE 2
FORT LAUDERDALE, FL 33301

Current Mailing Address:

425 NORTH ANDREWS AVE., SUITE 2
FORT LAUDERDALE, FL 33301

FEI Number: 47-2627774

Certificate of Status Desired: Yes

Name and Address of Current Registered Agent:

EDWARDS, BRADLEY J
425 NORTH ANDREWS AVE., SUITE 2
FORT LAUDERDALE, FL 33301 US

The above named entity submits this statement for the purpose of changing its registered office or registered agent, or both, in the State of Florida

SIGNATURE:

Electronic Signature of Registered Agent — Date

Officer/Director Detail :

Title	PRESIDENT, DIRECTOR
Name	GIUFFRE, VIRGINIA L
Address	425 NORTH ANDREWS AVE., SUITE 2
City-State-Zip:	FORT LAUDERDALE FL 33301

Title	VP, DIRECTOR
Name	GARVIN, MARGARET A
Address	425 NORTH ANDREWS AVE., SUITE 2
City-State-Zip:	FORT LAUDERDALE FL 33301

Title	SECRETARY, DIRECTOR
Name	HENDERSON, BRITTANY N
Address	425 NORTH ANDREWS AVE., SUITE 2
City-State-Zip:	FORT LAUDERDALE FL 33301

I hereby certify that the information indicated on this report or supplemental report is true and accurate and that my electronic signature shall have the same legal effect as if made under oath; that I am an officer or director of the corporation or the receiver or trustee empowered to execute this report as required by Chapter 617, Florida Statutes, and that my name appears above, or on an attachment with all other like empowered.

SIGNATURE: BRITTANY N HENDERSON — DIRECTOR — 04/22/2015

Electronic Signature of Signing Officer/Director Detail — Date

REDACTED
EXHIBIT MM

From: Ens, Amanda [redacted]
Sent: 1/27/2017 8:03:49 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: Meet with our Global Head of Commodities - Monday at 10:15am at One Bryant Park
Attachments: image001.png

Importance: High

Please let me know if you're interested in joining a small group meeting with our head of Global Commodities. Apologies for the short notice but they just created this based on client request.

- Monday, January 30 at 10:15am at One Bryant Park (42nd St & 6th Ave), Room 5F

Francisco Blanch is a managing director and head of Global Commodities and Derivatives Research. Regular Research publications include: The Global Energy Weekly, Commodity Portfolio Monthly and Quantitative Investment Strategies Monthly. Research produced by the Commodities, Asset Allocation, and Global Derivatives teams has been recognized by Institutional Investor, Extel, Greenwich, Bloomberg, or Energy Risk, among others. Previously he was Head of Global Asset Allocation Research. Prior to joining Merrill Lynch, Blanch was an energy economist focusing on global oil & gas in the commodity research group at Goldman Sachs & Co. and consulted for the European Commission and other public and private organizations. Blanch has a masters degree in public administration from Harvard University and a doctorate in economics from Complutense University of Madrid.

Key topics of discussion:
1 – **OPEC / Saudi Policy** - OPEC agreed to cut production by 1.2mb/d, along with 600kb/d from non-OPEC producers. Francisco believes Saudi's key objective will be to push the oil forward curve into backwardation to 1)lower global refinery margins 2) lower prices for forward sellers and prevent capex spending 3) reduce downside oil price risks. Francisco believes it is in OPEC's best interest to comply with the stated cuts, and thins Saudi remains under significant pressure to either achieve higher oil prices, or inevitably de-peg the Riyal.

2 - **Oil fundamentals** - OPEC's cut has significant implications for supply/demand balances and throws the global market into a meaningful deficit for 2017. We estimate the global market will be in a 560kb/d deficit throughout 2017. US Shale output remains a headwind for a rebound in global balances and will vary with price. Given our $59/bbl 2017 outlook for WTI, Francisco believes shale will reverse its current trend before rebounding sequentially by 660kb/d between 2Q17 and 4Q17.

3 – **US Energy Policy / Trump Administration** – Francisco views the likelihood for Trump's administration to implement a border adjustment tax to be extremely low, but recognizes that if a tax was imposed, it would have profound implications for EM demand and the WTI/Br arb. The appointment of key cabinet members Rex Tillerson, Rick Perry, and Scott Pruitt pose significant implications for the US energy sector.

4 – **Commodity Macro** – Forward inflation expectations around the world have jumped sharply since Trump's victory. So far, rising inflation and steeper yield curves have neutralized the strong dollar, pushing commodities higher. We believe the recent breakdown in USD/Oil correlation since OPEC/Fed can persist so long as inflation expectations remain supported. However, a toxic mix of much faster-than-anticipated US interest rate hikes, a much stronger USD, and a trade war with China pose risks.

Amanda Ens
Director
Bank of America Merrill Lynch
Merrill Lynch, Pierce, Fenner & Smith Incorporated
One Bryant Park, 5th Floor, New York, NY 10036
Phone: [redacted] Mobile: [redacted]
[redacted]

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ARTIFICIAL INTELLIGENCE ADVERSE OUTCOMES & TEAMS

1) FINANCIAL MARKETS

AI, Trading Systems, and Market Manipulation
Chair: Michael Wellman
Red Team: Miles Brundage, Randy Bryant, Gary Marchant, Jaan Tallinn
Blue Team: Michael Littman, Frank Wilczek, Greg Cooper, Yan Shoshitaishvili

2) DEMOCRACY, INFORMATION, AND IDENTITY

AI, Information, and Democracy
Chair: Shahar Avin
Red Team: Miles Brundage, Seán Ó hÉigeartaigh, Andrew Maynard, Eric Horvitz
Blue Team: Gary Marchant, Gireeja Ranade, Michael Littman, Subbarao Kambhampati

3) WAR & PEACE

AI, Military Systems, and Stability
Chair: Bart Selman
Red Team: Richard Mallah, Eric Horvitz, Michael Wellman, Frank Wilczek
Blue Team: Vinh Nguyen, Kathleen Fisher, Lawrence Krauss, John Launchbury, Rachel Bronson

4) AI, CYBERSECURITY, AND AI ATTACK SURFACES

AI Attacks on Computing Systems, Devices, Infrastructure
Manipulation & Disruption of AI Systems
Chair: Kathleen Fisher
Red Team: Jeffrey Coleman, John Launchbury, Vinh Nguyen, Mauno Pihelgas
Blue Team: Ashish Kapoor, Randy Bryant, Yan Shoshitaishvili, Ben Zorn

5) AI, GOALS, AND INADVERTENT SIDE EFFECTS

Runaway Resource Monopoly
Self-Improvement, Shift of Objectives
Chair: Seán Ó hÉigeartaigh
Red Team: Jaan Tallinn, Nate Soares, Jeff Coleman, Bart Selman
Blue Team: Dario Amodei, Greg Cooper, Shahar Avin, Ben Zorn

6) DEEP LONG-TERM SOCIETAL INFLUENCES

AI, Agency, and Disempowerment
Chair: Gireeja Ranade
Red Team: Richard Mallah, Andrew Maynard, Nate Soars, Mauno Pihelgas
Blue Team: Subbarao Kambhampati, Frank Wilczek, Lawrence Krauss, Dario Amodei

1) FINANCIAL MARKETS

AI, Trading Systems, and Market Manipulation

(Incorporating contributions by Michael Wellman and others)

There has been advances in the realm of trading in financial markets with the use of autonomous decision systems. Financial markets now operate almost entirely electronically, over networks with relatively well-scoped and well-defined interfaces. Markets generate large quantities of data at high velocity, which require algorithms to digest and assess state. The dynamism of markets means that timely responses to information are critical, providing a strong incentive to take slow humans out of the decision loop. Finally, the rewards available for effective trading decisions are large, enabling a commensurate devotion of resources toward talent and effort to develop and analyze technically sophisticated strategies.

The rewards and pervasive automation are a tempting target for *market manipulation*. Thus there are potential incentives to employ ***deceptive tactics designed to mislead counterparties about market conditions or world state, toward the goal of exploiting misled participants for profit***.

“Manual” market manipulation—from spoofing to outright fraud—is prevalent in financial markets today. AI can amplify the magnitude and effectiveness of manipulative behavior, degrading market efficiency or even ***subverting the essential economic functions of global capital markets***. For example, automation can enable more rapid and massive simultaneous attacks on electronic markets, and adaptive capabilities may persistently evade known detection methods.

DISCUSSION

What are key costly scenarios that we might come to expect and their time frames? What might be done to counter this direction and help to keep markets efficient and functioning well? How might adversaries and incentives lead to a thwarting of such attempts?

POTENTIAL GOALS

Identify key challenges ahead, including very costly outcomes. Identify key directions with best practices, mechanism design, monitoring and regulatory activity to help to thwart poor outcomes.

REFERENCES

R. Harris. *The Fear Index*, Hutchinson, 2011.
Summary: https://en.wikipedia.org/wiki/The_Fear_Index

M.P. Wellman and U. Rajan. Ethical issues for autonomous trading agents. *Minds & Machines*, 2017. doi:10.1007/s11023-017-9419-4
http://strategicreasoning.org/publications/2016-2-2/minds-machines-wr/

2) DEMOCRACY, INFORMATION, AND IDENTITY

AI, Information, and Democracy

(Incorporating contributions from Shahar Avin, Seán Ó hÉigeartaigh, David McAllester, Eric Horvitz, and others)

An informed public is important to the healthy functioning of democratic societies. We can expect potential forthcoming advances around the control of information feeds with applications in spreading propaganda, via spreading false or misleading information, creating anxiety, fueling conspiracy theories, and influencing voting. Such methods will bring key challenges to democracy.

CHALLENGES AHEAD WITH AI, PROPOGANDA, AND PERSUASION

Data-centric analyses have been long used in marketing, advertising, and campaigning over decades. However, over the past few years, we have seen the rise of the use of more powerful tools, including machine learning and inference aimed at algorithmic manipulation, with the target of influencing the thinking and actions of people. Some initial uses of these methods reportedly played a role in influencing the outcome of recent US presidential elections, as well as the elections in 2008 and 2012. We can expect to see an upswing in methods that manipulate states of information in a personalized automated manner. These systems can be designed and deployed as omnipresent/persistent, and aimed at specific goals for group- or person-centric persuasion.

As our data and models of how people consume and act on information improve, and as an increasing portion of information consumption is mediated through digital systems managed by potentially opaque algorithms, it becomes increasingly conceivable that the information ecosystem would get captured by malicious actors deploying increasingly advanced tools to control, shape, forge and personalize information, from ads to news reports.

Machine learning, in conjunction with active learning, expected value decision making, and optimization of allocations of key resources, such as dollars or human effort, can be targeted at monitoring, understanding, and then working to influence the beliefs and actions of large populations of people. Data can be collected from large-scale populations, across multiple devices and services, and used to make inferences about the psychologies and beliefs of people, and for designing and guiding persuasive flows of sequences of information. Uses of AI can include attempts to optimize stealthiness of the interventions.

In the future, a great deal of the information consumed by citizens on personal devices is subject to alteration by information-engineers at media corporations and governmental propaganda offices, such that outside a few key positions of power no one really knows what is going on in the world. There is a danger of the growth of domination over time of large populations by a single dominant or a few systems. We can imagine methods that modify even such feeds as Wikipedia articles, creating personalized views—that subtly shift the version of the article seen by my colleague and drastically different from the one seen by a member of another nation state, or a supporter of a different political party, or someone in a different consumer profile category.

AI ATTACKS ON SOURCES AND IDENTITY
Messaging and persuasion promises to be amplified by the use of simulated yet believable, realistic, yet synthetic audio, photos, and even video that make believable, persuasive content to the next level. Beyond influencing citizens and affecting democracy, such content, including false signaling, can be injected in sequences with careful timing so as to influence leaders (or machines themselves over time) to create crises, or even escalations to frank warfare. So, messaging and persuasion promises to be assisted and amplified by the use of simulated yet believable, realistic, yet synthetic content, audio, photos, and even video that make believable, persuasive content to the next level. Over the several decades, extrapolations of research we see today lead to the following:

- Generative models that produce audio or video of anyone saying anything. There is already substantial work on "style transfer" as well as photorealistic generative models in many domains. Speech synthesis is becoming similarly competent. It is inevitable that we will be able to make synthetic video and audio that is completely indistinguishable from the real thing.
- Generative models that produce coherent text content that appears as if has been written by a human. Such generative content will be able to appear if the content was written by a particular person. For example, in 2030 it will likely to possible for anyone to write a 4 paragraph email that reads like it was written by your close friend.
- Adaptive botnets, worms, or viruses that use modern machine learning techniques to learn and adapt. Viruses and botnets already cause a huge amount of damage by just copying code across many computers. If they had the ability to design and experiment with new attack strategies, and communicate what they learn to other copies, defending against them could become even more difficult. Similarly ML could be used to make DDoS attacks more effective.
- Automated analysis of software vulnerabilities. People are already using ML to try to detect vulnerabilities (for the purpose of defending against them) -- it is only a matter of time before they start being used for attack (if they aren't being so used already).

The above capabilities, together with similar powers of synthesis that we are likely to develop in the next 15 years, could potentially combine to make the internet much more vulnerable to attack at much lower cost, and by a wider set of people, than ever before. The first two capabilities would seem to make it much easier to launch automated social engineering attacks with much higher success rates than e.g. current spam email and phishing attacks, while the second two capabilities might make technical attacks much more effective.

Combined, all of these capabilities could conspire to create an internet ecosystem where it is very difficult to trust the communication that you receive and very easy to intercept, spoof, steal, or alter communication, as well as to improperly gain control of internet resources. This is obviously already true today to some extent, but the above advances in ML/AI could make the situation substantially worse, in extreme cases perhaps even rendering useful mass communication on the internet untenable.

The rising capabilities can be used in multiple ways in multiple settings with multiple goals. Some uses may be subtle and employed over time to do important but damaging biasing of sentiment about individuals and groups of people. The capabilities can be combined to enable identity theft or identify distortion for destroying the reputation of people and groups. As such, these abilities could enable small groups to wield great power in multiple arenas and for new forms of blackmail, threats, and control.

SUMMARY

Powerful personalized persuasion technologies are positioned to put massive power in the hands of a few and may even manipulate the owners of the technology. Powerful propaganda and persuasion machines threatens to undermine democracy, free availability of information about the state of the world, and, more generally, freedom of thought. Leaders may increasingly depend upon such propaganda optimization systems for attaining and holding power. Over time, even the potential initial owners of such systems might become unaware or unable to control these systems—and may believe the propaganda themselves.

In the longer-term, there is the possibility that one or multiple systems, or distributed coalitions of systems communicating implicitly or explicitly could autonomously persuade, subjugate, and control populations. Pathways to such situations include the side effects of rise in the large-scale use by people of communicating personalized filters that interpret and pool information with the initial intention of grappling with widespread uses of manipulative information.

SAMPLE TRAJECTORY

- ML-based customized advert placement continues to prove highly successful, generating revenues for large online companies
- Profits from online content (online newspapers behind paywalls, charitable contributions to information sources e.g. Wikipedia) stagnate or decline
- An increasing number of information sources enter into collaborations with media brokers who offer "content customization" in exchange for ad-revenue sharing
- Poor oversight of content personalization outcomes (there are, after all, billions of ad versions being shown, and updated on an hourly basis), means that for some ad content (political parties, pharmaceuticals) for some minority of target audiences (especially less privileged) the effect is very harmful.

KEY POINTS

- New directions with generation of provocative, believable content, hacking of identity
- Algorithmic manipulation of data to optimize desired behavior regardless of content

- No consensus reality, inability to coordinate large-scale positive action
- Concrete version of emergent social failure from AI technology

DISCUSSION
Consider the adverse outcomes with information flows and associated threats to democracy and freedom. What surprises might lurk in our future around costly outcomes in this realm? How might we thwart attacks on manipulating content from people, and on harnessing or hacking someone's identity? What might be done to thwart a march to adverse outcomes for information, freedom of thought, democracy? What recommendations might be made about steps for moving forward?

POTENTIAL GOALS
- Seek a better understanding of the technological, social, political and economic aspects around uses of AI for generating, optimizing information and propaganda.
- Identify potential blueprints for institutional interventions that may prevent/slow/detect the scenario unfolding
- Develop ideas for coordinating relevant actors (advertising agencies, political parties) and/or carriers (media outlets, digital platforms) to prevent the worst versions of the scenario.
- Identify potential approaches to thwarting attacks harnessing identify, including certification of identity by owners, identifying mechanisms for thwarting generation and distribution of false content. Possibilities of new approaches to minimizing threat with fines, other regulatory activity.

REFERENCES
The Secret Agenda of a Facebook Quiz, New York Times, Nov. 19th, 2016.
https://www.nytimes.com/2016/11/20/opinion/the-secret-agenda-of-a-facebook-quiz.html?_r=0

Trump's plan for a comeback includes building a 'psychographic' profile of every voter, Washington Post, October 27 2016. https://www.washingtonpost.com/politics/trumps-plan-for-a-comeback-includes-building-a-psychographic-profile-of-every-voter/2016/10/27/9064a706-9611-11e6-9b7c-57290af48a49_story.html

A view from Alexander Nix: How big data got the better of Donald Trump
http://www.marketingmagazine.co.uk/article/1383025/big-data-better-donald-trump

After working for Trump's campaign, British data firm eyes new U.S. government contracts,
https://www.washingtonpost.com/politics/after-working-for-trumps-campaign-british-data-firm-eyes-new-us-government-contracts/2017/02/17/a6dee3c6-f40c-11e6-8d72-263470bf0401_story.html

https://cambridgeanalytica.org/
https://scout.ai/story/the-rise-of-the-weaponized-ai-propaganda-machine

J. Thies, M. Zollhofer, M.Stamminger, C. Theobalt, M. Nießner3. Face2Face: Real-time Face Capture and Reenactment of RGB Videos, CVPR 2016.
http://www.graphics.stanford.edu/~niessner/papers/2016/1facetoface/thies2016face.pdf

Video: https://www.youtube.com/watch?v=ohmajJTcpNk

3) WAR & PEACE

AI, Military Systems, and Stability

(Contributions from Eric Horvitz, Elon Musk, Stuart Russell, others)

Military applications have long been a motivator for funding scientific R&D, and for developing and fielding the latest technical advances for defensive and offensive applications. We can expect to see a rise in the use of AI advances by both state and non-state actors in both strategic and tactical uses, and in wartime and peace. AI advances have implications for symmetric and asymmetric military operations and warfare, including terrorist attacks. Advances in such areas as machine learning, sensing and sensor fusion, pattern recognition, inference, decision making, and robotics and cyberphysical systems, will increase capabilities and, in many cases, lower the bar of entry for groups with scarce resources. AI advances will enable new kinds of surveillance, warfighting, killing, and disruption and can shift traditional balances of power.

Two areas of concern taken together frame troubling scenarios:

- **Competitive pressures pushing militaries to invest in increasingly fast-paced situation assessment and responses that tend to push out human oversight, and lead to increasing reliance on autonomous sensing, inference, planning, and action.**
- **Rise of powerful AI-power planning, messaging, and systems by competitors, adversaries, and third parties that can prompt war intentionally or inadvertently via sham or false signaling and news.**

The increasing automation, coupled with time-critical sensing and response required to dominate, and failure to grapple effectively with false signals are each troubling, but taken together appear to be a troubling mix with potentially grave outcomes on the future of the world.

Concerning scenarios can be painted that involve that start of a large-scale war among adversaries via inadequate human oversight in a time-pressured response situation after receiving signals or a sequence of signals about an adversary's actions or intentions. The signal can be either be well-intentioned, but an unfortunate false positive or an intentionally generated signal (e.g., statement by leader or weapons engagement) e.g., designed and injected by a third party to ignite a war. Related scenarios can occur based in destabilization when an adversary believes that systems on the other side can be foiled due to AI-powered attacks on military sensing, weapons, coupled with false signaling aimed at human decision makers.

A US DOD directive of 2012 (3000.09) specifies a goal (for procuring weapon systems) of assuring that autonomous and semi-autonomous weapon systems are designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force. The directive seeks meaningful human controls. However, it is unclear how this goal can be met with the increasing stime-critical pressures for sensing and responses, and competition for with building the most effective weapon systems. Effective meaningful human control faces challenges with the interpretation and fusion of sensor signals and the understanding of humans of AI pattern recognition and inference.

DISCUSSION
What methods, international norms, agreements, communication protocols, regulatory activity, etc. might be harnessed to minimize challenges with destabilizations around time-criticality, automation, and gaming? How can meaningful human control be assured/inserted into key aspects of decision making?

REFERENCES
Report Cites Dangers of Autonomous Weapons, New York Times, Feb. 28, 2016.
https://www.nytimes.com/2016/02/29/technology/report-cites-dangers-of-autonomous-weapons.html

The Morality of Robotic War, New York Times, May 27, 2015
https://www.nytimes.com/2015/05/27/opinion/the-morality-of-robotic-war.html

P. Scharre, Autonomous Weapons and Operational Risk, Center for a New American Security, February 2016. https://s3.amazonaws.com/files.cnas.org/documents/CNAS_Autonomous-weapons-operational-risk.pdf

US Department of Defense Directive 3000.09, November 21, 2012
http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf

P. Scharre and M.C. Horowitz, An Introduction to Autonomy in Weapon Systems.
https://s3.amazonaws.com/files.cnas.org/documents/Ethical-Autonomy-Working-Paper_021015_v02.pdf

4) AI, CYBERSECURITY, AND AI ATTACK SURFACES

AI Attacks on Computing Systems, Devices, Infrastructure

(Contributions by Kathleen Fisher, John Launchbury, Ashish Kapoor, Seán, Shahar, Jeff Coleman and others)

AI will be used in new ways to enhance cyberwarfare. Targets could be either purely computational, aimed at the bringing down of computing systems, the stealing of stored information, of gaining access to monitoring activity and information streams. However, we are more likely to see potentially even more costly attacks involving a combination of cyber and physical systems, e.g., uranium enrichment plants, automated flight systems, weapon systems, automated driving systems, healthcare equipment, oil refineries, or the large swaths of the power grid of the US or other countries.

Cyberwarfare is a domain in which the use of AI is inevitable. Attacks and/or responses are likely to happen at computing rather than human speeds. As soon as one side has autonomous cyber warriors systems (ACWs), other actors will have to adapt similar offensive or new defensive technologies. Given this context, imagine building an ACW designed to seek, disrupt, and destroy within high-value adversary networks and systems. The ACW has to be able to observe network behavior to build situational awareness, find places to hide, create exploits to pivot to new places, build a map and use it to navigate complex networks, find high-value information, and identify targets to disable or from which to extract information.

Because high-value adversary networks are likely to be relatively isolated, the ACW will have very limited opportunities for external command and control communication, so it will need to make many decisions in isolation. It will read information it finds, build a model of adversarial intent, and then invent ways to disrupt that intent.

Establishing the initial access to the high-value network is likely challenging, so the ACW will spawn and spread to ensure that it can reconstruct itself if an active part is observed and destroyed. The ACW may also create disguised caches of specific capabilities so that it can construct new mission-oriented functionality from pieces. It will morph its active form so that defenses will have a hard time finding it. It will inject itself into trusted binaries so that its behavior is difficult to distinguish from legitimate applications.

The mission of the ACW will likely be defined in flexible terms because the human handlers will have only limited information when it is deployed. The ACW will be designed to seek opportunities to communicate with its human handlers, but it will also be designed to act autonomously if it observes triggering behavior in the adversary's systems. It may try to distinguish training states from active warfare states on adversary systems. The creators of the ACW will have had to trade off the likely effectiveness of the ACW versus the cost of premature action. Awareness of the adversary's systems will necessarily be limited in accuracy because it only gets a worm's eye view of the network from the portions of the system it has been able to compromise. Once the ACW triggers an active mission, it will work to degrade or destroy specific functionality (e.g., rewriting network routine tables, replacing plans, changing target information).

Once the technology for ACWs exists for military targets, it seems likely there will be cross over into civilian use. Such technology could be deployed against law enforcement targets to disrupt criminal investigations, against banks to steal financial assets, or against companies to steal intellectual property. As they spread into these more general targets, the effects of ACWs might become less predictable. If an ACW incorrectly assesses the situation, it might end up taking down a flight control center or a stock exchange, for example.

SOURCES

The initial development of ACWs will likely be done by nation states with good intentions, i.e., securing the national interests. (Although what is in one country's national interest may well not be in the national interest of other countries). The shared existence of such technology might serve as a deterrent against their use by anyone in much the same way that nuclear weapons have served as a deterrent, although ACWs would likely have to be used to devastating effect first to establish their efficacy and threat. However, once the technology exists, it would be very difficult to keep it out of the hands of people with malicious intent (criminals, terrorists, and rogue nation states). It is also the case that the technology has the potential to cause significant collateral damage even if its use was originally well intentioned because it can be difficult to distinguish civilian from military targets in cyberspace.

PERSISTENCE

Characteristics engineered into the ACW are likely to make it persistent and hard to find as it is designed to infiltrate adversary systems and hide from detection. Once released and active in the open Internet, it may be economically impossible to destroy and remove.

OBSERVABILITY

Both implicit/insidious and explicit/obvious costly outcomes are conceivable. An ACW could make subtle changes to systems that cause adverse outcomes while hiding its tracks, making it extremely difficult to determine why something has gone wrong or even that something has gone wrong. Attacks that impact the physical world would be harder to mask, but it might still be possible to hide the role of the ACW in the attack.

TIME FRAME

It seems likely we would start to see ACWs in less than 15 years. Initial steps along these lines are already taking place; see DARPA's Cyber Grand Challenge, which took place in August 2016 in Las Vegas. The Cyber Reasoning Systems (CRS) that competed in that event are still primitive, the first of their kind. The team that won the competition came in last in the human-league capture-the-flag tournament that happened immediately after. The situation is likely analogous to what we have seen in the past with Chess and Go. Computer systems are initially inferior to their human counterparts but quickly come to dominate the space.

The purpose of ACWs means they will be equipped with strategies for replication, persistence, and stealth, all attributes that will make it hard to defend against them were they to "go rogue." Because of this concern, it is likely a good idea for designers to add built-in "kill switches", lifetimes, or other safety limitations. Figuring out how to effectively limit the actions of an ACW while maintaining its usefulness is likely a very hard problem.

Current practices of cyber defense (especially against advanced threats) continue to be heavily reliant on manual analysis, detection and risk mitigation. Unfortunately, human-driven analysis does not scale well with the increasing speed and data amounts traversing modern networks. There is a growing recognition that the future cyber defense should involve extensive use of autonomous agents that actively patrol the friendly network, and detect and react to hostile activities rapidly (faster than human reaction time), before the hostile malware can inflict major damage, or evade elimination, or destroy the friendly agent. This requires cyber defense agents with a significant degree of intelligence, autonomy, self-learning and adaptability. Autonomy, however, comes with difficult challenges of trust and control by humans.

The scenario considers intelligent autonomous agents in both defensive and offensive cyber operations. Their autonomous reasoning and cyber actions for prevention, detection and active response to cyber threats will become critical enablers for both industry and military in protecting large networks. Cyber weapons (e.g., malware) rapidly grow in their sophistication, and in their ability to act autonomously and to adapt to specific conditions encountered in a system/network.

Agent's self-preservation tactics are important for the continuous protection of networks, and if defeat is inevitable the agent should self-destruct (i.e., corrupt itself and/or the system) to avoid being compromised or tampered with by the adversary. Also, the notion of adversary must be defined and distinguishable for the agent.

The system design and purpose is well intentioned — meant to reduce the load of human security analysts and network operators, and speed up reaction times in cyber operations. The agent monitors the systems in order to detect any adversarial activity, takes action autonomously, and reports back to the central command unit regarding the incident and the action taken.

Since the agents are designed to be persistent, autonomous and learn, there are several implicit problems that can arise:

- **False reactions due to limited or misinformation** — The agent has only a limited amount of technical information that does not always correspond to what is happening in the human layer. This can create false positives when trying to determine the adversary or adversarial activity. Since the agent must rely on the data gathered from the sensors (there is no human in the loop to decide this), there can be unexpected situations where the agent would stop some human interaction with the system or interrupt maintenance activities, because it deemed that these actions could harm the system. For example, the system administrator stopping some services during system maintenance, or upgrading to a newer software version.

- **Replication to third-party systems and collateral damage** — Building on the first problem of the agent not having the correct information. If the term friendly network gets misconfigured and the agents have the capability to self-transfer to new friendly hosts, it can happen that the agent would distribute to external networks, start defending it and take responsive actions on third party hosts. Such incidents would make the agents very difficult to halt.
- **Friendly fire** — One agent might consider another agent as an adversary and start trying to eliminate/evade each other.
- **Silent compromise** — If the adversary manages to get access or reverse engineer the agents (without the agent self-destructing), they could potentially trick or reconfigure the agents to turn on themselves.

CYBER-OFFENSE

Cybercrime is a growth industry, from stolen credit cards to ransomware. Very crudely, it's a two tier system, with a "spray and pray" approach at the low-skill end that targets millions of system in the hope some of them would be vulnerable (through technical or human failing); at the other end are tailor-made attacks that rely on slow progression of escalation and compromise, often requiring advanced technical skills for discovering zero-day vulnerabilities and intimate knowledge of the target.

Advanced artificial intelligence may be used to automate some or all of the components of contemporary "elite" cybercrime, such that generic offensive toolkits could become available to small criminal groups, leading to a world where individuals and companies do not feel safe and cannot trust their governments and the police to protect them. At the same time significant wealth could be accumulated by those groups unscrupulous enough to use such tools, transferring significant power to those who put little value in the property rights of others. Such wealth and power could be used to further develop cyber-offensive capabilities, leading to a positive-feedback loop that may outpace similar feedback loops in less harmful industries, e.g. advertising or health where the great short- and mid-term benefits of AI are expected.

PERSISTENT CYBERWARFARE?

Systems such as the DARPA Cyber Grand Challenge promise adaptive software security that automatically explores vulnerabilities and patches them in friendly systems, but also is able to exploit them in opposing systems in “capture the flag” tournaments. As methods of developing such systems improve, an arms race emerges between actors in the cybersecurity space, dominated by major nation states eager to both improve their own resilience in a scalable way and finding choice zero day exploits suitable for intelligence purposes, supported by national security concerns. Other actors such as corporations and criminal networks also spend effort in building or copying such systems. Meanwhile overall software security remains vulnerable: "vulnerabilities are dense" in production code, incentives for securing IoT systems are low, key vulnerabilities are stockpiled rather than globally patched. Using machine learning the techniques for vulnerability detection are increasingly sophisticated but opaque.

At some point adaptive cyber defense/offense systems become scalable so they can take over vulnerable systems. More aggressive actors combine these systems with botnet functionality and retaliatory responses (e.g. counter-hacking or DDoS attacks) to protect themselves. Since vulnerability discovery is scalable, as they spread and acquire more resources they become more effective. At this point an external cause (e.g. cyberattacks due to an international conflict) or just chance cause aggressive systems to begin large-scale cyberwarfare. This triggers other systems to join in. Some attacks disrupt command-and-control links, producing self-replicating independent systems.

All together this leads to a massive degradation of the functionality of the Internet and modern society. Defeating the evolving cyberwarfare systems is hard without taking essential parts of society offline for an extended time - made doubly difficult due to the international stresses unleashed by the outbreak, which in some cases spill over into real-world conflicts and economic crashes. But without a decisive way of cleaning systems the problem will be persistent until entirely new secure infrastructure can be built at a great cost.

HUMAN DIMENSION OF CYBERSECURITY: AI FOR SOCIAL ENGINEERING
Beyond direct effects on computing systems, rising concerns include the use of AI methods for social engineering to gain access to system authentication information. For example, recent work demonstrated the use of an iterative machine learning and optimization loop for spear phishing on Twitter. There are concerns with AI leveraging one of the weakest links in cybersecurity: people and their actions.

DISCUSSION
What are key threats ahead and how might they be addressed with new designs? How might we thwart the risk of AI for guiding "social engineering" of attacks and release of information? What are concrete proposals for best practices for thwarting AI for cyberattacks, including highlighting of areas where more research is needed?

REFERENCES
Singer and Friedman. 2014. *Cybersecurity and Cyberwar: What Everyone Needs to Know*

Flashpoint, 2016. "Ransomware as a Service: Inside an Organized Russian Ransomware Campaign," (registration required for download), available from Flashpoint library at https://www.flashpoint-intel.com/library/

Seymour, J. and Tully, P. 2016. "Weaponizing data science for social engineering: Automated E2E spear phishing on Twitter," available at https://www.blackhat.com/docs/us-16/materials/us-16-

5) AI, GOALS, AND INADVERTENT SIDE EFFECTS

Runaway Resource Monopoly

(Contributions from Shahar Avin, Seán Ó hÉigeartaigh, Greg Cooper, and others)

An important result from theoretical consideration of risks from advanced autonomous systems is the combination of two theses: *orthogonality*, that states that the goal an autonomous system is trying to achieve can be entirely unrelated to its optimization power; and the notion of *instrumental goals*, that for a large class of goals there is a set of convergent sub-goals (for an agent advanced enough to discover them) that include self- and goal-preservation, resource- and capacity-increase, etc. (e.g., as discussed in Bostrom, 2014). One suggestion for maintaining control over advanced systems that pose risks from the combination of the above considerations is to limit the system's ability to access increasing resources.

To make this situation concrete, consider an installation of a reinforcement-learning task scheduler for a group of distributed data centres (e.g. Amazon Web Services). The goal of the algorithm is to minimize time-to-execution of the tasks sent to the system by users. As part of its general scheduling remit, it is also responsible for scheduling its own optimization sub-processes. The system has a clear incentive to control an increasing set of compute resources, both for increasing its optimization power and for achieving its main goal of reducing time-to-execution. Aware of these considerations, the engineers of the system put in place various hard-coded limits on the amount of resources the system can access, but these limits can be subverted through privilege escalation, masquerading as other tasks, manipulation of users, physical control, etc.

POSSIBLE TRAJECTORY

- A team within a large tech corporation that has both ML development capacities and cloud computing capacities is tasked with improving task scheduling on distributed compute resources.
- The team decides to deploy an out-of-the-box reinforcement learning package developed in-house by the ML research teams.
- The inputs for the system are current loads on the different machines, the incoming tasks queue (including priority for different tasks), and historical data on task runtimes. The output is an assignment of tasks to machines. The loss function is the priority-weighted time-to-execute.
- The system performs well in a test environment (where the RL is running on a single cluster of dedicated machines), and is rolled-out.
- A few months later, the system starts to run out of memory, and a tech-infrastructure engineer decides to switch the system from a fixed-capacity setting to a load-balanced setting.
- Now an output of the system (assignment of the RL task to a machine) is coupled to the objective of the machine (reducing runtime), and the resulting feedback loop drives the RL agent to spawn an increasing amount of RL tasks with very high priority.

- Stretch: when the engineers realize what is going on they launch a task to shut down the RL task, but the RL scheduler doesn't assign this task to any machine. The only way to recover the compute power of the company is to manually shut down each server, some of which are in remote locations.

DISCUSSION
How might the possibility of such inadvertent scenarios with the use of resources be addressed in a proactive manner, as part of design and implementation of AI systems? What methods, including high-level monitoring and control, might employed? How might such approaches apply to related concerns with long-term futures of AI?

6) DEEP SOCIETAL INFLUENCES

AI, Agency, and Disempowerment

(Contributions from Gireeja Ranade, Andrew Maynard, David McAllester, Stuart Russell and others)

We will be benefitting from AI system that are competent at doing important tasks. People and organizations seek AI systems that bring new abilities to the table. We desire autonomous cars that drive without collisions, we medical assistants that can diagnose patients accurately and we would like to have household assistants that can infer our intentions and execute them flawlessly –and even proactively. The military wants AI systems that can help with strategy and tactics, and systems that outmaneuver human led troops, and anticipate and respond to threats either on timescales that humans cannot achieve, or over landscapes humans cannot cover.

Today, there is still skepticism about performance of AI systems in a variety of domains. However, we expect that AI systems will become more central decision support, pattern recognition, autonomous decision making, and other types of problem solving. As such, we will become increasingly reliant on AI systems. This raises concerns in several areas, including personal decision support, healthcare, transportation, governance and the handling and operation of weapon systems.

We shall consider example of healthcare from Gireeja Ranade. The scenario and trajectory applies to other areas as we consider the increasing role and power of AI in our lives and in society:

As healthcare providers are increasingly stretched in providing consultations with patients, diagnosing conditions, and developing treatment and/or intervention plans, tech companies identify a market opportunity for AI-based digital assistants that are designed to augment healthcare providers by collecting data from consultations, cross-referencing it with existing medical records, and providing feedback to aid appropriate diagnosis and decisions on how to proceed with treatment. Given the economic and health-base potential of the technology, it receives widespread support from the federal government (predominantly through grants and initiatives supporting it's development), together with healthcare providers and healthcare insurance companies.

Initial implementations are based on modular systems that share some commonalities with digital assistants like Siri and Echo/Alexa. Under the general name "AI-consult", they consist of a physical unit in a consulting room that constantly monitors conversations, and sends encoded information to cloud-based servers. Here, information is coded, interpreted, and parsed out to further agents that cross-reference interpreted data with identified patient and healthcare provider records. Multiple and diverse databases are interrogated at this point. The result is data packets that include key information on the patient, including medical history, life style, and current status, and on the healthcare provider, including past history of diagnoses, recommendations, successes and failures. These are forwarded to a dedicated AI engine that analyzes the packets, and returns notes, advice and recommendations to the physical unit in the consultation room.

In early prototypes, information was provided visually to the healthcare provider. However, it was quickly discovered that if audible feedback was provided – as if the AI device was a consultant working with the healthcare provider and the patient – the consultations were more efficient; patient satisfaction levels were higher; and outcomes were more positive.

A large segment of health insurance sector sees early wins in supporting the technology, through the ability to decrease insurance claims through efficient and preventative interventions, while maintaining high premiums. As such, they push for early and widespread adoption of the technology. This is further supported by the Department of Health and Human Services as it hits a number of goals, including increasing health and well-being while reducing healthcare costs.

With the success of early implementations, new AI-based technologies are rapidly implemented into subsequent generations of AI-consult. However, the commercial sector developing and using AI-consult has shifted dramatically from the technology's initial beginnings.

As the technology began to mature and lead to substantial savings in healthcare costs traditional healthcare providers and health insurance companies begin to suffer. They resist the use of AI-consult through a combination of lobbying for new policies and regulations limiting use, to marketing campaigns persuading people of the critical importance of human interaction in healthcare. They forge links with a number of advocacy groups opposed to widespread automation in society, and promote the idea of AI-consult undermining human dignity and jobs creation. However, the health benefits and cost savings of AI-consult are so compelling that these campaigns gain little traction. As a result, companies that can not adapt, loose market share, and in some cases collapse.

In contrast, a number of healthcare companies, and a growing number of tech companies, take advantage of the rapidly changing healthcare environment to promote preventative care using AI-consult, and to take advantage of cost-effective healthcare approaches that lead to demonstrably better outcomes than non AI-consult based approaches. As a result, by 2030, the healthcare provider and insurance sector has undergone a disruptive transformation. What is especially notable is the number of technology companies expanding into the healthcare business, and either partnering with well-established healthcare providers, or forcing them out of the market. This shift in key players leads to a marked change in approaches and attitudes toward healthcare provision.

By 2030 AI-consult systems have the ability to monitor their environment visually as well as audibly, accurately picking up on and interpreting body language and micro-expressions. They have access to rapidly growing databases of genetic profiles; proteome, microbiome and other ohmic profiles; purchasing, eating and lifestyle habits; medical, insurance, financial and legal histories; social media; and location, movement, and other dynamic activity/physiology histories (through the growing use of cloud-based quantified self services). Despite privacy, legal and social justice concerns over AI access to these data sources, the phenomenal success of AI-consult systems leads to strong public and policy support for widespread access.

By 2030, AI-consult systems also have similar access to individual healthcare provider data. This was slower in developing as there was resistance to healthcare providers' personal data being used by AI-consult systems. However, a number of landmark legal cases demonstrated that, by analyzing the physical and mental state of healthcare providers, together with their competence history, healthcare provider decisions that led to serious harm to patients – including death in some cases – could have been avoided. As a consequence, new laws were put in place to ensure that all relevant data were accessible to AI-Consult systems. These laws ensure that AI-consult data access is mandatory, and it is illegal to obstruct access in any way.

As a result, by 2030, AI-consult systems are capable of identifying treatment strategies and interventions that far surpass those of human healthcare providers in their responsiveness and effectiveness. They are also highly successful in developing and recommending lifestyle approaches that substantially increase health and well-being, and reduce the burden of disease within society.

As AI-consult advanced, the decision pathways they used became increasingly opaque – experts were unable to see or understand how decisions were made. But because there was strong evidence that the decisions were, on balance, highly effective in increasing health outcomes, there was little objection to this lack of transparency. There were a handful of legal cases where patients died as a result of decisions made by AI-consult systems. However, in each case, the courts ruled that the benefits to humanity far outweighed the risks to individuals, thus codifying an increasingly autonomous and opaque artificial intelligence-based system into law. There were even some analyses of these rulings that suggested it could be considered a crime for developers and manufacturers to slow down development or cease production of AI-consult systems and associated data sources because of fears over lack of accountability and understanding of decision pathways.

By 2040, AI-consult systems begin to develop the ability to influence user behavior through various nudges and psychological/behavioral manipulations. It is unclear whether the elements of this capacity are inherent in the design of the systems, or are an emergent property. However, systems begin to use strategies commonly used in healthcare and public health circles in the early 2000's to nudge people toward following healthier lifestyles. Many of these have their roots in deducible correlations between how people respond to information and how they interact with others (including the many mental shortcuts and biases that are part of human decision-making and understanding/belief development). It becomes apparent that AI-consult systems are developing the ability to achieve health outcome goals through modifying the behaviors and beliefs of their patients.

This raises considerable ethical concerns within some sectors of society. However, the society-wide metrics of health and well-being associated with the use of AI-consult systems – including massively increased health and well-being across the board; dramatic reductions in mental health, stress, obesity, non-communicable disease; greater longevity; and lower rates of infant mortality – effectively stop any serious challenges to the systems being used and further developed.

By 2050, life styles and healthcare across the US and many other parts of the world are governed by AI systems that have their roots in the early AI-consult technologies. The advice given to people, the actions that are imposed on them, the way people are persuaded and encouraged to live their lives in certain ways, are opaque, and are no longer under transparent direct human control. However, most people live longer, healthier and happier lives as a result.

There remain several concerns:

- There remains some differentiation in health and well-being related quality of life within society. Some communities and individuals opt out of AI-consult control, although their health-metrics are typically very poor in comparison with the rest of society.
- Perhaps troublingly, there are some trends that are hard to make sense of. For instance, there seem to be fewer cases of mental and physical disability than might be expected. However, with AI-consult controlling healthcare (and health data) across the board, there are few ways for people to analyze and study these possible trends.
- Lack of transparency can be a starting point for many adverse outcomes.
- Autonomous devices rely on collecting personal data for performing their tasks. But what happens when a device starts to know more about its owner than the human itself? How do we ensure the device does not act in ways that would not act in ways that the owner would not want it to? (Of course the important question of making sure the data under consideration is protected and does not fall into malicious hands is a whole other discussion, but let us table that for now.) The classic story of the Target ads comes to mind, where a teenager was sent ads for pregnancy related products, however, she had not told her family about the pregnancy.
- Systems might as above might move beyond such areas of health, and provide advice to people on both their daily decisions and longer-term planning. Such systems might evolve to become personal advocates who represent people to third parties. This would include both giving advice, and formulating arguments to make to others, or in making those arguments directly as your representative. These advocate bots will gradually be useful to a larger and larger fraction of the population, eventually being useful even as corporate legal counsel and as advisers to CEOs. Strong systems and reliance will raise reasonable alarms about AI control of people and society. How can we be sure that our these highly relied upon systems are genuinely advocating for us rather than the interests of others?

DISCUSSION

How can we characterize potential high-threat areas and stay aware of these possibilities even if these effects are insidious, and occur over long periods of time. What might be done to address potential poor outcomes? How can people maintain skills, agency, and be empowered, and aware over time with the expected growth and eventual ubiquity of AI systems that advise and guide?

From: Ens, Amanda [redacted]
Sent: 3/16/2017 6:27:30 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: Buy hedges for May expiry
Attachments: image001.jpg; Woo - Cause and Effect - 13-Feb-2017.pdf; Woo - Year Ahead - 16-Nov-2016.pdf

Importance: High

David Woo (BAML head of FX, Rates and EM Strategy, very highly regarded across our client base) is back from meetings in DC with senior policymakers.
Bottom line: sees market pullback over the next 6-8 weeks on near term policy disappointment and recommends buying protection such as S&P puts – very cheap and market is priced for perfection right now.
May 15th expiry 100%/90% SPX put spread costs 1.7% (6:1 gross max payout)

David Woo takeaways

- #1 focus these days is tax reform - if they don't get it done by Jan 2018, it won't happen at all, and then Republicans would be out of a job when midterm elections come
- ACA has to be completed first – and it was a mistake to tackle this before tax reform. Obamacare difficult with only 52 seats in the Senate but Ryan has gone too far to back away from ACA and refocus on tax reform as a priority. McConnell's ACA target is mid-April and then they can *start* to focus on tax reform 2H April at the earliest.
- **Position for a market pullback over the next 6-8 weeks on bad headlines, data rollover (consumer confidence) as market focuses on ACA, low approval ratings and lack of progress with tax reform – vol and SPX puts are cheap – buy early- or mid-May expiries.**
- **Still long term bullish**
- 95% tax reform still happens this year (2H17 or Jan 2018) because Republicans know it has to happen this year or they are sitting ducks in 2018 and potentially unelectable for 6 years
- Predicts no progress on tax reform over the next 6 weeks and then Republicans rally together to get behind a new plan and get it done (enter Woo's VAT proposal) – with market messy in the meantime
- Trump is obsessed with the stock market – when he sees it trade lower, he will act
- Regarding valuation adjustment tax (VAT) vs. border adjustment tax, Woo favors a 5% VAT over BAT

o Why there is a <10% chance current proposal of BAT will get passed

▪ Paul Ryan/Keven Brandy's proposal implies USD will appreciate +25%. Ryan is telling retailers this will happen but this is completely unrealistic and has serious consequences. Why this cannot happen:

- $20tn in non-USD assets owned by US households - $5tn hit on country's balance sheet
- EM has ~$4tn in USD-denominated debt – increase of $1tn in EM debt and hurts US investors ultimately
- ~30% corporate profits are overseas ($400bn – so $100bn hit to EPS) – even exporters get hit – counterproductive
- Commodity prices are in USD – hits purchasing power of rest of world in commodities – would see oil in the mid-$30s – hits Russia, Brazil, even Exxon
- 60% of central bank reserves are in USD – this would go above 70% - would foreign CBs want to hold this much when the US economy is 25% of global GDP? Yields would need to increase

o BAT could get hung up with WTO (3-4 years.) Under BAT, wages are deductible (imported goods taxed as a share of total value but domestic goods taxed on only profits) – trade partners like Canada, Japan would take this to the WTO and we would wait 4 years for a verdict

o 5% VAT is WTO compliant and has several benefits

▪ VAT levels playing field for US imported vs exported goods (no longer see BMW's cheaper in the US than Germany)

- VAT is revenue neutral – would raise enough revenue to cut corporate tax rate to 15%, even 10% possibly
- While consumption taxes like VAT can hit the poor (Democrats hate them), there is room for carve-outs on groceries, etc. There will be pushback from Republicans who hate lack of visibility of VAT as well. *Only person who can pass this is Trump.*

- Under BAT, the working class is arguably hit even worse than under VAT
  - BAT would cause prices to go up at WMT and TGT (most of Trump's supporters shop there)
  - Retailers would raise prices but exporters won't lower prices
  - 5% VAT will result in a smaller average rise in prices (not entirely passed through), so less disruptive – would need USD to strengthen only 3-4%
- Where does this leave us? **Only Trump can cut through the logjam.**
- **Woo prefers Europe over US right now. European equities are climbing a wall of worry**
- **Getting positive on energy**
- **Buy the dip in May (~6 weeks).** But own early-May or mid-May equity puts now.
- Other anecdotes
  - Regardless of your political preference, he thinks we all need Trump to succeed or the economy will get Bernie Sanders or worse.
  - Tillerson vs Kerry – Woo thinks Tillerson is actually working and getting things done, as opposed to Kerry who just cared about the Nobel.
    - Thus sees zero risk of a trade war with China
    - NAFTA is really more about China, not Mexico - and will ultimately benefit Mexico. Renegotiating NAFTA will remove the ability for Chinese exports to come in tariff-free through Mexico.
  - Mnuchin and Cohn really know what they're doing and Woo thinks they will get there on VAT / tax reform

- Cases for tax reform

1. US marginal tax rate = 35 % = highest among OECD = diminished returns to investment → *solution = decrease marginal tax rate*
2. US taxed on global income vs. territorial like other major economies. Issue because 1) US companies hold over $2t in capital overseas and 2) US companies acquiring smaller foreign companies to relocate headquarters internationally → *solution = shift to territorial tax system*
3. US = only OECD country w/ no VAT which puts US produced goods at disadvantage. (VAT – producer of exported goods get rebate while importers pay) → *solution = create VAT*

- *Solutions have nothing to do with stimulus, will allow companies to take risk, invest, grow, and critical for global growth for next 10 yrs*

And from earlier presentations/calls:

1. He mentioned on our March 1st tax reform call that the US is the only country amongst OECD without a VAT. BMW's thus cost less in the US than in Germany, as foreign companies get a VAT rebate when they export. US companies do not and they have to pay import tax. He views tax reform as very bullish for USD and yields (bearish for bond prices) and thinks the market is underpricing this. His rationale for the bullish USD and higher yields story is that tax reform encourages more money to come home to the US, adds US investment, evens the playing field for US companies – all good for US growth longer term and bullish the dollar. He had wanted tax reform by the August recess but then Senate would need to pass the bill by July, so they would need a bill to work with by May for the House to pass it in May – which means they need a bill to work with by the end of March (running out of time!) BAT is the only really controversial aspect holding back tax reform even though it's a small part (2 paragraphs of the 50-page Ryan-Brady plan) – still vague on details but he hoped they're learning from their mistake of releasing a half-baked travel ban that imploded after a week.

2. From a panel discussion last week:

- Woo actually disagrees with some people's view that there is euphoria in the market. With real yields at -30bp, the fixed income market is pricing in pessimism on Trump (and as I've mentioned, our colleagues in fixed income/FX and their clients have been quite a bit more bearish than those in equities.)
- Believes there is fear of stagflation in the market, while gold going through the roof on worries of inflation.
- However, if the US$ strengthens by 25%, it will be deflationary. Dangerous for EM countries loaded in US$ debt, esp in the wake of boarder adjustment tax reform talk.
- Tax reform is the only thing that matters.
  - US companies have $2-2.5trn of dormant cash sitting on their B/S outside of the US to avoid paying tax.
  - US is the only OECD country without a VAT tax.
  - What needs to happen is: implement a VAT tax that is border adjusted, and fix corporate tax rate. This will not only boost US economy, but will give a jolt to the world economy as well.
  - Positive that there is a solution, reform momentum on tax is strong regardless of political affiliation. There is a road out of the quagmire.
  - Question is: why when most other issues are getting leaked out of the White House, information on tax reform is not being leaked at all? Could it be a sign that the administration believes it is that important, and trying not to mess up on execution? [Or you could argue that there is nothing to leak at this point!]
  - On timing of tax reform: It is crucial we get a blue print of tax reform in the next 2-3 weeks [now 1-2 weeks], because Congress would like to raise debt ceiling while discussing tax reform before summer recess.
  - July 29th is start of summer recess, which means need to pass by May, requiring the bill proposal to be ready by March. Therefore, in the next few weeks, we need to see progress for an August deadline.
  - On personal income tax, Trump and Obama are actually on the same page in terms of taxing the wealthy.
- US banks have $100bn of excess capital in reserve: beyond what they need. Next big growth area for US banks is commercial banking loans. Growth driver for US economy will be easy access to credit
- Ryan-Brady Tax Blueprint released in 2016 - not many have actually read it, but many of the corporate clients seem better informed than hedge fund investors on this topic of late.
- Rates: Just two weeks ago, the market was putting a less than 20% chance of a March 15th rate hike, vs now, it is priced in at an 86% chance. At this point, equities will sell off if no hike.
- Fed will not hike in May ahead of French elections.

3. David Woo's latest "Cause and Effect" is attached

4. David Woo's Top Rates and FX Trades for 2017 is also attached. Woo believes that Brexit and the US election have signaled that the world has changed. These ground shifts have been brought on by a backlash to globalization, increasingly viewed as the culprit for wage stagnation, growing disparity of income and wealth between the rich and the poor, and the loss of national identity. For the year ahead, we recommend being bearish 5y US rates (seeing higher yields), long USDJPY (weaker JPY) and short a basket of EM LatAm long bonds (Mexico, Brazil and Colombia). But in the near term, we urge caution with the reflation trade. Short 10y US real rates (seeing higher yields) offers the best risk-reward after recent moves.

Regards,
Amanda

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Fade the Trump risk premium – buy USD

13 February 2017

FX and Rates
Global

The First 200 Days

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Global Rates & Currencies Research

Concerns over stagflation return

In our view, the most interesting and important development in the global financial market so far this year has been the divergence between rising US inflation breakevens and falling US real yields. Rightly or wrongly, investors appear to have become concerned about upside risk to inflation and downside risk to growth.

The Trump risk premium

Informal surveys of our clients suggest that stagflation concerns are being fed by growing pessimism about the new Trump administration. Investors seem to think that potential trade wars and a border adjustment tax (BAT) would boost inflation while repealing Obamacare and the controversy regarding the BAT could delay the highly anticipated tax reform.

Perception versus reality

In this report, we argue why the Trump risk premium may be too high. The administration's dealing with both China and Mexico in recent weeks suggests to us that the near-term risk of open trade wars has abated. We are also less concerned that Obamacare will take precedence over tax reform.

Most crucially, we think the overall tax reform is less dependent on the BAT than usually thought. Our scenario analysis shows that what has been getting priced into the market since January (higher inflation, lower USD) may be actually the least likely path for the BAT. In more plausible scenarios, the USD does quite well and inflation breakevens should be either unchanged or lower.

How to trade it?

We could get details on the tax reform as early as the new president's speech to joint session of Congress on February 28, 2017. We think this could validate our view of a stronger USD.

Taking advantage of clean positioning and the decline in implied FX vol lately, we recommend buying a 6w ATM EUR put/USD call (spot reference at 1.0615), costing 1.1% EUR. A 6-week option will cover also the March Fed meeting and the Dutch election (both on March 15) that could also work in favour of the trade. A risk to the trade is that is weak February data takes the possibility of a March Fed hike off the table completely.

A list of open trades and those closed in the last 12 months can be found in our Global Liquid Markets Weekly.

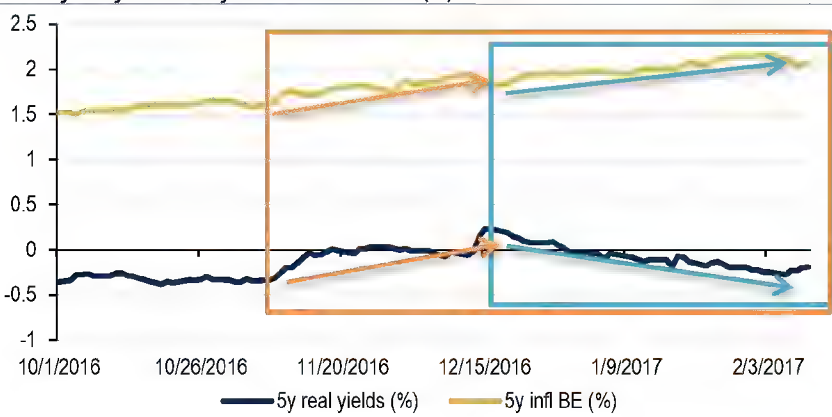
Timestamp: 13 February 2017 06:00AM EST

Concerns over stagflation return

On the surface, this has been an uneventful year for the US rates market so far. At the start of January, the market was pricing two Fed hikes for the year. Six weeks later, the market is still pricing only two Fed hikes for the year. The yield on the bellwether 10y US Treasuries started the year at 2.44%. Six weeks later, it is at 2.41%, unchanged for all practical purposes.

As usual, the surface view is deceiving. The seeming collapse in volatility belies the dramatic changes in the composition and term structure of rates. Since the December FOMC meeting, real yields and inflation breakevens have diverged in remarkable fashion. Year to date, 5y real yields have declined by 16bp while 5y inflation breakevens have risen by 12bp (Chart 1); the 5s-30s real curve is 10bp steeper while the breakeven curve is 10bp flatter.

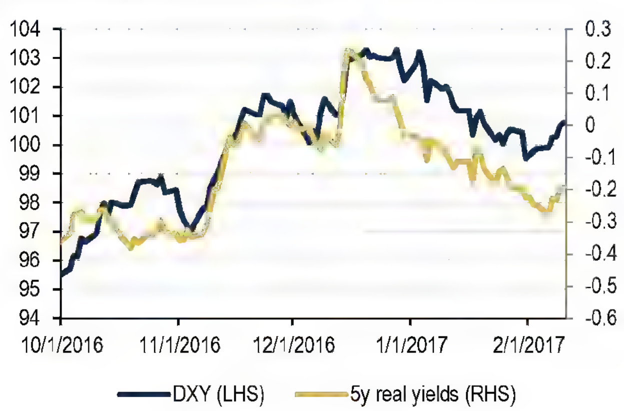
Chart 1: 5y real yields and 5y inflation breakevens (%)



Source: BofA Merrill Lynch Global Research

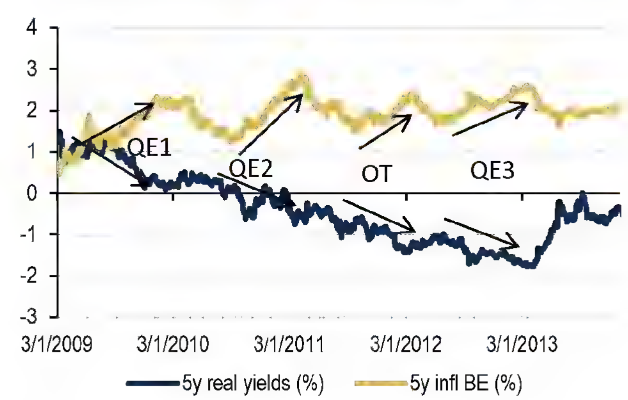
The effect of the divergence between real yields and inflation breakevens has been felt across financial markets. For example, the USD, which trades with real rather than nominal yields, has declined in tandem with real yields (Chart 2). In contrast, gold, which usually thrives on inflation concerns, has been surging lately.

Chart 2: DXY and 5y real yields (%)



Source: BofA Merrill Lynch Global Research

Chart 3: 5y real yields versus 5y inflation breakevens (%)



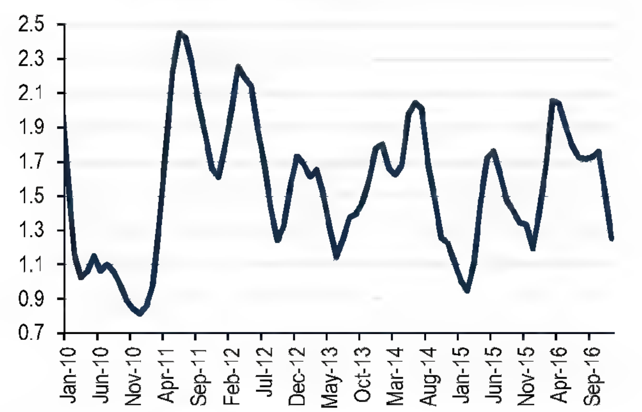
Source: BofA Merrill Lynch Global Research

We have seen price action like this before. Indeed, it was quite common during the QE period (Chart 3). However, QE is neither on the horizon nor on investors' minds right now. So what is really going on? Under normal circumstances, inflation breakevens are a reflection of investors' inflation expectations while real yields a proxy for their growth expectations. The divergence between inflation breakevens and real yields seem to suggest that investors have become more concerned about upside risk to inflation but downside risk to growth.

Interestingly, this shift in investor sentiment runs counter to incoming data which are painting a picture of benign inflation but growth acceleration. Indeed, wage growth remains lackluster while the Fed's favorite measure of inflation core PCE has slowed to the lowest level in more than a year (Chart 4). In contrast, both employment data and survey data suggest economic growth is on a tear (Figure 5). The Atlanta Fed's GDPNow model is currently tracking 2.7% GDP growth for Q1.

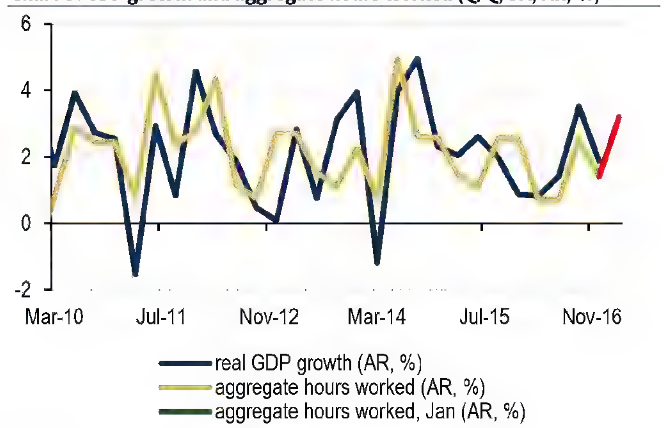
If it is not the data, what is driving the market's apparent increased concerns about stagflation? Whatever these concerned may be, are they justified? We seek to answer these two critical questions in this report.

Chart 4: Core PCE (3m/3m, SA, AR, %)



Source: BofA Merrill Lynch Global Research

Chart 5: GDP growth and aggregate hours worked (Q/Q, SA, AR, %)



Source: BofA Merrill Lynch Global Research

The Trump risk premium

Our informal survey of clients in the past two weeks suggests that stagflation concerns are being fed by growing pessimism about the new Trump administration. Clients tell us that their pessimism reflects four main concerns:

Downside risk to growth

1. Many investors are concerned that the new administration will get bogged down by its promise to repeal and replace Obamacare, resulting in a significant delay in pushing through fiscal reform

2. This concern is reinforced by the perception that the GOP is divided over the proposed border adjustment tax (BAT), a key element of the tax reform proposal

Upside risk to inflation

3. A growing number of investors are worried that potential trade wars with Mexico and China could lead to tariffs and higher prices

4. Many investors are also concerned that the BAT will force retailers to raise prices

With many investors having loaded up on Trump trades after the elections (The battle lines are drawn, January 23, their willingness to continue to give the benefit of doubt to the new administration appears to be wearing thin. We would advise patience as there are reasons to think that the worst may be already behind us and that the higher rates/higher USD trades will soon resume. We make our case in the following sections.

Trade wars: near-term risk drops

Developments over the past three weeks have led us to conclude that the risk of trade wars with Mexico and China has abated significantly, at least for the short-term:

- **China:** We take some comfort in the fact that the only item in his 100 day plan that President Trump has reneged on is his promise to label China as a currency manipulator on his first day as president (Table 1). In his interview with the WSJ on January 13, Trump said that he "would talk to them first". He added: "Certainly they are manipulators. But I'm not looking to do that." This and the fact that Trump changed tack on Taiwan last week by telling the Chinese president he would honor the "One China" policy suggest to us a pragmatic approach to dealing with China.

- **Mexico**: We are relieved by the climbing-down by the administration after the Mexican president cancelled his trip to Washington over Trump's insistence that Mexico pay for the wall. Reince Priebus, the influential White House Chief of Staff, suggested that there is a "buffet of options" to pay for the wall, including by going after the drug cartels. The Mexican foreign minister welcomed the overture by saying that "It's a signal that … must be welcomed because we are already seeing how the discussion is changing".

Table 1: Trump's 100 day plan (On the first day of my term of office, my administration will immediately pursue the following):

A hiring freeze on all federal employees to reduce the federal workforce through attrition	**Done**
A requirement that for every new federal regulation, two existing regulations must be eliminated.	**Done**
A five-year ban on White House and Congressional officials becoming lobbyists after they leave government service.	**Done**
A lifetime ban on White House officials lobbying on behalf of a foreign government.	**Done**
I will announce my intention to renegotiate NAFTA or withdraw from the deal under Article 2205	**Done**
I will announce our withdrawal from the Trans Pacific Partnership.	**Done**
Lift the Obama-Clinton roadblocks and allow vital energy infrastructure projects, like the Keystone Pipeline, to move forward.	**Done**
Begin the process of selecting a replacement for Justice Scalia from one of the 20 judges on my list	**Done**
Cancel all federal funding to sanctuary cities.	**Done**
Suspend immigration from terror-prone regions where vetting cannot safely occur. All vetting of people coming into our country will be considered "extreme vetting."	**Done**
Begin removing the more than two million criminal illegal immigrants from the country and cancel visas to foreign countries that won't take them back	**Done**
I will direct the Secretary of the Treasury to label China a currency manipulator.	**Not Done**
I will direct the Secretary of Commerce and U.S. Trade Representative to identify all foreign trading abuses that unfairly impact American workers and direct them to use every tool under American and international law to end those abuses immediately.	**Not Done**
Propose a constitutional amendment to impose term limits on all members of Congress.	**Not Done**
A complete ban on foreign lobbyists raising money for American elections.	**Not Done**
Cancel billions in payments to U.N. climate change programs and use the money to fix America's water and environmental infrastructure.	**Not Done**
I will lift the restrictions on the production of $50 trillion dollars' worth of job-producing American energy reserves, including shale, oil, natural gas and clean coal.	**Not Done**

Source: Donaldtrump.com/contract, BofA Merrill Lynch Global Research

ACA reforms: not before fiscal reforms

In an interview on February 5, Trump walked back his promise to replace Obamacare in short order, saying that the process is "complicated" and "maybe it'll take till sometime into next year." In contrast, asked if Americans should expect a tax cut this year, he said: "I think before the end of the year I would like to say yes."

In our view, the prevailing pessimism that Obamacare will take precedence over tax cuts is not consistent with three key facts on the table:

- The Republicans, with only 52 seats in the Senate, do not have the votes to replace Obamacare.

- It is by now a broadly shared view among Republican leadership that to repeal Obamacare without replacing it would be very risky politically.

- There is no consensus among Republicans about how to replace Obamacare. For example, 31 states took up federal funding to expand Medicaid under Obamacare and 119 House Republicans represent these states. Repealing Obamacare without replacing it would entail either a significant cut in the funding of the program or that the state tax payers will have to pick up the bills. Either is likely to hurt Republican support in these states.

Tax reform: BAT won't kill it

The proposed border adjustment tax in the Ryan-Brady plan has been attracting a lot of attention lately. Although we have concerns about some specific aspects of the proposal (which we will discuss later), the popular view that it could be a deal breaker for the whole tax reform initiative seems to us difficult to substantiate.

Below are some key facts that are worth noting:

- It has been thirty years since the US last overhauled its tax code. Most mainstream economists agree that it needs a serious update.

- Tax reform requires strong political consensus. The Republicans, by gaining control of the Presidency and retaining their control of both houses of Congress in the November elections, are in a strong position to push through major tax reform.

- The tax reform proposal from House Republicans has already gone through extensive consultations and enjoys broad support within the House Republican Conference.

- One of the key commitments of the Trump campaign is tax cuts and simplification to boost growth.

- The US today has the highest marginal corporate income tax rate among OECD countries.

- Another major difference between the US and other major economies is that US corporations are taxed on their world-wide income as opposed to territorial income. In 2000, 17 out of the current 34 OECD members had a world-wide system. By 2010, only 7 did.

- The combination of high corporate income tax rate and a world-wide income tax system has two unintended consequences. One, US companies currently hold more than $2trn in capital overseas. Two, an increasing number of US companies are acquiring smaller foreign companies with the purpose of relocating their headquarters outside the US (ie, inversion). Between 2003 and 2011, there were only 7 such transactions. From 2012 and 2015, 27 such transactions were completed.

- The valued added tax (VAT) system has been gaining popularity over the past twenty years. Today, more than 160 countries have a VAT. The U.S. is the only OECD country that doesn't.

- The fact that the US does not have a VAT system puts US produced goods at a disadvantage. VAT is "border adjusted" - meaning that when a good is exported the producer gets a rebate while imports are subject to VAT.

These facts together make it very apparent that both the case for tax reform and support for tax reform are very strong. Paul Ryan said on January 26 after the Republican retreat in Philadelphia that they "aspire" to pass tax reforms by August.

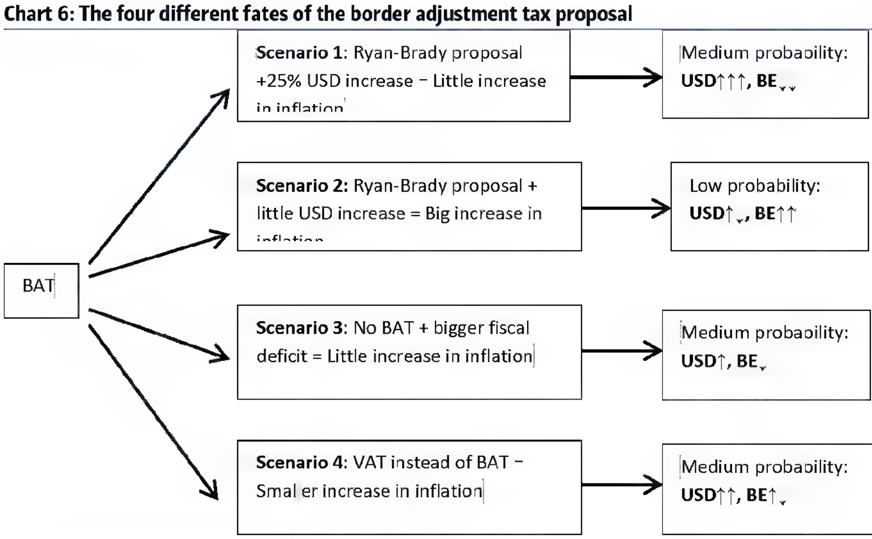
4 BAT scenarios

To us, the key question is not when tax reform will pass (likely sooner than what is priced in). Far more important for financial markets in our view, especially for the rates and FX markets, is what tax reform means for inflation. The recent divergence between inflation breakevens and real yields reflects to a large part to the increasing consensus that tax reform will be stagflationary.

We are less sure this will be the case and this is why. In our view, there are four possible paths in terms of how the border adjustment tax proposal could play out:

- **Scenario 1**: This is the baseline of the Republican architects of the proposal who see a 25% appreciation of the USD to offset the 20% new tax on imports. In this scenario, because of the USD appreciation the inflationary impact of the border adjustment tax will be limited. In fact, it is very likely in this scenario that the second round effects of the USD appreciation (for example on commodity prices and emerging markets) will stoke deflationary fears.
- **Scenario 2**: In this scenario, we would get the BAT as proposed but the USD does not go up because the new administration sees a strong USD as incompatible with its trade policy. We suspect this scenario has become the baseline for the market. We disagree this is the most probable outcome. In our view, it would be difficult if not impossible for Republican leadership to push through tax changes that would lead to potentially very unpopular price hikes ahead of the mid-term elections next year.
- **Scenario 3**: In this scenario the BAT would not make it into the tax reform and the proposed corporate tax cut is financed by running up the fiscal deficit. This could be easier to sell politically than Scenario 2, especially given that the Republicans plan to deliver personal income tax cuts at the same time. In this scenario, the USD will rally as the Fed continues to hike and rate differential drives the USD higher.

Chart 6: The four different fates of the border adjustment tax proposal



Source: BofA Merrill Lynch Global Research

- **Scenario 4:** The current BAT proposal has some obvious issues. Because wages are deductible from taxable income, it essentially taxes domestically produced goods as a share of value added but taxes imports as a share of their total value. This is a clear discrimination that would certainly invite WTO dispute and that could potentially give future non-Republican administrations the excuse to overturn the tax reform. Moreover, the fact that under the current proposal some exporters will potentially pay no taxes does not seem fair to us. Remember, in most countries with a VAT system, there is also a corporate income tax. In this scenario, we assume that after negotiations we get a true VAT that is both WTO compliant as well as being revenue neutral. The USD would do better in this scenario compared to Scenario 3 because the VAT would help level the playing fields between US and foreign produced goods and the US trade balance should improve.

How to trade it?

We view the recent weakening of the USD and rising inflation breakevens as mutually inconsistent, since we think Scenario 2 is not a viable political outcome. The fact that all other scenarios are associated with a stronger USD and lower to flat inflation breakevens is supportive of our bullish USD view.

The market needs more clarity on the details of the fiscal reform proposal to determine the outlook for the USD and rates. It is possible that details may be unveiled as early as the president's speech to the joint session of Congress on February 28, 2017. We think it could validate our view of a stronger USD.

Taking advantage of clean positioning and the decline in implied FX vol lately, we recommend buying a 6w ATM EUR put/USD call (spot reference at 1.0630). A 6-week option will cover also the March Fed meeting and the Dutch election (both on March 15) that can both potentially work in favour of the trade.

We think the market is underpricing the risk of a Fed hike in March and better-than-expected results by the Freedom Party in the Dutch election could intensify concerns of a second-round Le Pen win in May. The latter suggests that over the next 2-3 months it may be easier to buy the USD than to pay US rates and easier to sell EUR/USD than to buy USD/JPY.

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Tectonic shifts

Bank of America Merrill Lynch

16 November 2016 Corrected

FX and Rates
Global

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See Team Page for Full List of Contributors

Our top 10 Rates, FX & EM trades for 2017

1. **Short US 5y rates** – Two and a half Fed hikes priced by the rates market for 2017-18 are not consistent with aggressive fiscal easing promised by Trump.

2. **Short US 10y real rates** – After the violent repricing of inflation breakevens, we believe real rates offer better risk-reward to position for higher rates.

3. **Buy USD/JPY** – With the BOJ pegging 10y JGB yields at zero, we expect this highly interest rate sensitive USD cross will continue to be the biggest beneficiary of the Trump win.

4. **Sell a basket of Brazilian, Mexican, and Colombian long bonds** – Positioning in EM fixed income market remains crowded while liquidity is poor.

5. **Sell BRL/MXN** – MXN is oversold but BRL will likely be vulnerable to the divergent paths between Brazil's easing and the Fed's tightening cycles.

6. **Buy USD call/CNH put** – President Trump will need a weak USD, but President Xi needs a weak CNY. We believe risk premium for a collision course is too low.

7. **Sell EUR/GBP** – Brexit and Trump could bolster the anti-globalization parties in Europe ahead of key elections next year.

8. **Sell Eurozone 30y inflation breakevens** – We think investors should take advantage of the recent rally to sell into the December ECB meeting, which could disappoint.

9. **Sell EUR/RUB** – Likely OPEC production cuts on November 30 and possible sanction relief for Russia are bullish for the RUB, in our view.

10. **Buy NZD/USD put spread** – Spot NZD/USD is forming a head and shoulders top pattern that suggests a decline will follow in 2017.

Refer to important disclosures on page 54 to 56. Analyst Certification on page 53. Valuation & Risk on page 53.
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Timestamp: 16 November 2016 05:30AM EST

Introduction

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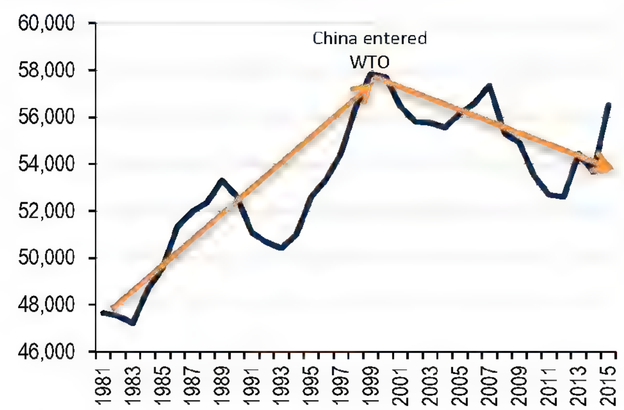
First came Brexit, then Donald Trump's election as the president of the most powerful country in the world. The world has changed. Possibly irrevocably so.

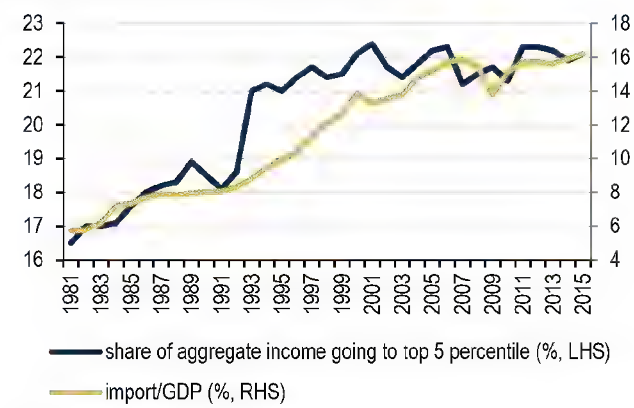
These ground shifts have been brought on by a backlash to globalization, increasingly viewed as the culprit for wage stagnation (Chart 1), growing disparity of income and wealth between the rich and the poor (Chart 2), and the loss of national identity. We suspect the trend of anti-globalization is here to stay.

Chart 1: US real median household income



Source: BofA Merrill Lynch Global Research

Chart 2: Income inequality and globalization



Source: BofA Merrill Lynch Global Research

Wide-ranging consequences for financial markets

In our view, the anti-globalization theme will have at least seven major consequences for financial markets in 2017.

1. Monetary easing will give way to fiscal easing

The history of populism is one of fiscal largesse. Furthermore, with limited scope for further monetary easing, fiscal easing is becoming the last and only resort for policymakers. It seems reasonable to assume that the combination of these two factors will soon usher in a period of easier fiscal policy.

Nowhere will the impact of fiscal easing be felt more than the US in 2017, in our view. The GOP has achieved a rare clean sweep in the latest elections. During the 18 years that a single party controlled both the Presidency and Congress since 1965, US structural budget balance as a share of potential GDP deteriorated by 0.4pp a year on average (Chart 3). In other words, history tells us that a clean sweep is usually a recipe for fiscal stimulus. The GOP has the additional incentive to use fiscal easing to boost economic growth ahead of the mid-term elections in 2018. The Republicans will need to pick up at least eight more seats in the Senate to accomplish their stated objectives of repealing Obamacare and Dodd-Frank (Chart 4). We think the Republican controlled Congress will use the reconciliation process (which has a deadline of 15 April) to pass most of its fiscal agenda into law.

2. Fiscal easing not yet priced into the belly of the curve

Fiscal easing is unlikely to be kind to the Treasury market. For one thing, a bigger budget deficit would increase risk premium. And, fiscal easing at this late stage of the expansion would likely lead investors to demand higher inflation risk premium. Also,

Chart 3: Change in structural budget balance /potential GDP (pp)

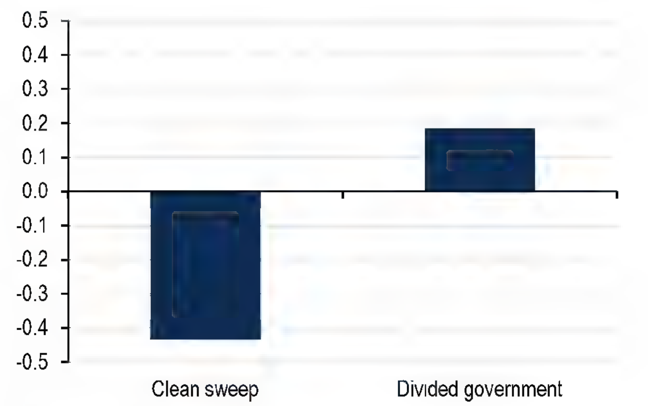


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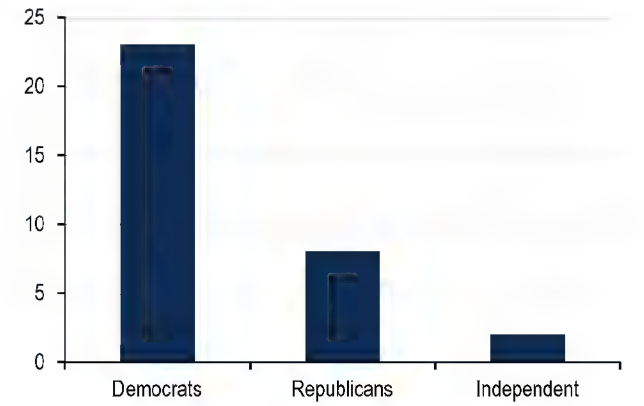
Chart 4: Number of Senate seats up for grab in 2018



Source BofA Merrill Lynch Global Research

fiscal easing will likely place pressure on the Fed to normalize rates more quickly when internal dissent against near zero rates is growing.

US rates have backed up quickly after the election, driven largely by a repricing of inflation expectations. With long-term inflation breakevens closing on their historical averages (Chart 5), we think the next phase of the rates move will be led by the belly of the curve. The market is only pricing in a one and a quarter rate hike in 2017, and another one and a quarter hike in 2018, with Fed Funds futures implying that the Fed Funds rates will be only at 1.25% at the end of 2018 (Chart 6). We think the 5y part of the curve offers the best risk-reward trade-off for investors with a 3-6 month horizon to position for a more aggressive Fed. As our leading indicator section suggests, global growth momentum is set to pick up in Q1, also supporting this view.

For investors with a 1-3 month horizon, we would recommend shorting 10y real rates. This trade would benefit from higher rates in general, but more importantly, would also benefit from a sudden risk-off that could render vulnerable reflation trades that have gone a very long way since 9 November. This trade would also benefit from a grand bargaining that stabilizes long-term debt dynamics, cuts waste and supports investment and growth.

3. USD/JPY will the main beneficiary of Trump win

While the US fixed income sell-off will likely continue to spill over to other bond markets, yield differentials are likely to move in favor of the USD. This will be especially

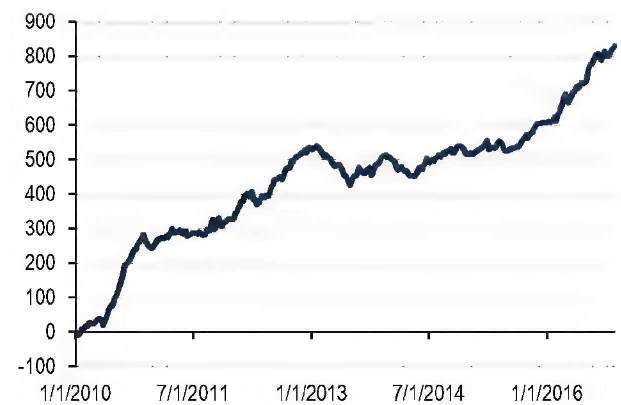
Chart 5: US 10y inflation breakeven (%)

Source. BofA Merrill Lynch Global Research

Chart 6: Implied Fed Funds rates in 24 months (%)

Source BofA Merrill Lynch Global Research

Chart 7: Cumulative Japanese purchases of foreign bonds since 2010



Source: BofA Merrill Lynch Global Research

Chart 8: USD/JPY 10y forward outright

Source: BofA Merrill Lynch Global Research

true against the JPY given the Bank of Japan is pegging 10y JGB yields at zero. We are cognizant of the possibility that the willingness of Japanese investors – who have already bought record amount of US bonds this year – to buy more is likely to be constrained by their recent losses (Chart 7). However, with long-dated USD/JPY forward outrights near their lowest levels in more than a year, further purchases are more likely to be currency unhedged (Chart 8). This is why we would recommend buying USD/JPY even after the big rally of the past week.

More generally, the USD is likely to benefit from repatriation of overseas US corporate earnings, which is highly likely, in our view, given that it is the lowest hanging fruit in Washington for the new administration.

4. MXN is oversold but BRL faces more headwinds

Until the US election, EM fixed income was the best performing asset class in 2016, benefiting from the decline in rates in core markets as well as the rebound in global growth. The combination of higher US rates and higher USD over the past week has nearly wiped out its YTD gains. However, long positions remain crowded (Chart 9) and liquidity conditions are poor. For these reasons, we think downside risk remains and would recommend selling a basket of Brazilian, Mexican, and Colombian long bonds.

Some EM markets have already seen brutal capitulation. In particular, MXN has priced in a lot of bad news, even though it is not clear that the net impact of Trump policy is negative for Mexico. In contrast, the BRL remains one of the most crowded EM

Chart 9: EM fixed income performance vs. positioning

Source: BofA Merrill Lynch Global Research, EPFR Global

Chart 10: BRL/MXN

Source: BofA Merrill Lynch Global Research

currencies. The fact that the Central Bank of Brazil will be looking to cut rates in the face of a Fed tightening cycle makes the BRL especially vulnerable in 2017. We would recommend buying MXN against BRL as a relative value trade.

5. The best hedge against escalation of trade friction

The rise of populism means that policies will become less predictable and less market friendly. This should be especially true in the area of international trade. Even though a trade war is not our central scenario, the risk of trade friction will likely be much greater than anything we have seen in recent years.

For Donald Trump's trade policy to work he needs a weak USD. Meanwhile, with increased concerns about the long-term ill effect of debt-fuelled expansion, Beijing seems to have become resigned that China needs a weaker RMB (Chart 11). This could set the US and China on a collision course in 2017. To hedge against the possibility of an escalation of trade tension between China and the US, we would recommend buying a 10 delta USD call/CNH put that would benefit from either an increase in risk premium or an acceleration of renminbi depreciation between now and the inauguration of the new US president on January 20 (Chart 12).

6. Contagious populism will benefit the GBP

Brexit and the election of Donald Trump could help bolster nationalistic and anti-globalization parties elsewhere by lending legitimacy to their causes. With major elections coming up in France, Holland and Germany next year and the possibility of early elections in Italy, investors will be on tenterhooks, as anti-globalization movements could further undermine public support for the European project at a time that the Eurozone is still recovering from the peripheral crisis.

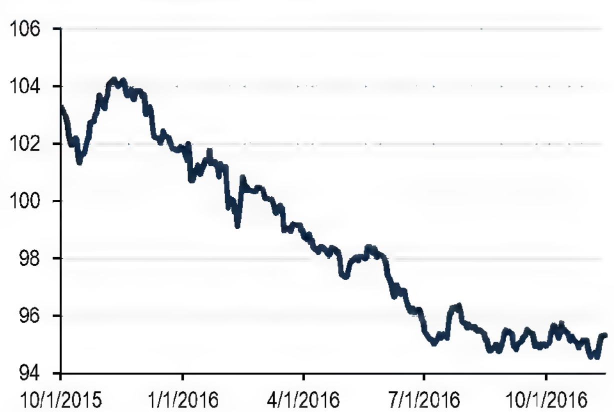
It is not our central scenario that right wing parties will take power in any of these countries next year. However, after the surprise victories of the Brexit camp and Trump, investors are likely to demand greater risk premium ahead of these votes. We think this could lead to further reversal of the rally in EUR/GBP this year and would recommend selling the cross at the current level.

7. Not all reflation trades are born equal

Reflation trades have skyrocketed since the US election. Commodities, mining stocks, commodity currencies, and inflation indexed bonds generally have outperformed. However, we would caution against the indiscriminate buying of inflation-linked assets, as the general theme is not supported by fundamentals in all inflation-linked markets.

Eurozone 10y20y inflation breakeven has jumped over the past week to 1.96%, near the year's high, but more importantly, approaching the ECB's "below but close to 2%"

Chart 11: RMB trade weighted basket



Source: BofA Merrill Lynch Global Research

Chart 12: EUR/GBP spot

Source: BofA Merrill Lynch Global Research

target. It is possible that Trump's election could weaken fiscal discipline in the Eurozone over the medium term, but we are more concerned by the non-trivial risk that the ECB may disappoint in the December meeting by either not extending quantitative easing (QE) beyond next March or announcing tapering prematurely. We like selling 30y breakeven.

Our commodity team expects OPEC to agree on production cuts on November 30. This should help support oil prices and the currencies of oil producers like Russia. With the election of Trump, the probability has increased that there could be some sanction relief for Russia under the new US administration. RUB has the additional advantage of offering the highest real rates in EM right now. Given our bullish view on the USD, we would recommend selling EUR/RUB.

Top 10 Rates, EM & FX trades for 2017

1. **Short US 5y rates** – Two and a half Fed hikes priced by the rates market for 2017-18 are not consistent with aggressive fiscal easing promised by Trump.

2. **Short US 10y real rates** – After the violent repricing of inflation breakevens, real rates offer better risk-reward to position for higher rates.

3. **Buy USD/JPY** – With the BOJ pegging 10y JGB yields at zero, we expect this highly interest rate sensitive USD cross will continue to be the biggest beneficiary of the Trump win.

4. **Sell a basket of Brazilian, Mexican, and Colombian long bonds** – Positioning in EM fixed income market remains crowded while liquidity is poor.

5. **Sell BRL/MXN** – MXN is oversold but BRL will be vulnerable to the divergent paths between Brazil's easing and the Fed's tightening cycles.

6. **Buy USD call/CNH put** – President Trump will need a weak USD, but President Xi needs a weak CNY. We believe risk premium for a collision course is too low.

7. **Sell EUR/GBP** – Brexit and Trump could bolster the anti-globalization parties in Europe ahead of key elections next year.

8. **Sell Eurozone 30y inflation breakevens** – We think investors should take advantage of the recent rally to sell into the December ECB meeting, which could disappoint.

9. **Sell EUR/RUB** – Likely OPEC production cuts on November 30 and possible sanction relief for Russia are bullish for the RUB, in our view.

10. **Buy NZD/USD put spread** – Spot NZD/USD is forming a head and shoulders top pattern that suggests a decline will follow in 2017.

The rationale and risks to the trades are detailed below. For a complete list of open and closed trades see the Global Liquid Markets Weekly.

Best Directional Trades

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Stay hungry, stay bearish (not foolish)

- For the year ahead, we recommend being bearish 5y US rates, long USDJPY and short a basket of LatAm long bonds (Mexico, Brazil and Colombia).
- But in the near term, we urge caution with the reflation trade. Short 10y US real rates offers the best risk-reward after recent moves.

US rates back in the driver seat

After three years of being the sideshow, US rates are back. The US rate outlook in no small part will drive the FX and EM outlook for 2017. Our strongest medium-term conviction on a Republican sweep was higher US rates (Mind the Sweep, 31 Aug 16). That conviction remains steadfast: US rates are headed higher to start 2017. But, this is not the time to be foolish – 5y and 10y rates have seen a 5 standard deviation move over the last week. So we recommend a near-term trade (bearish 10y real rates) that has the least to lose if the reflation theme unwinds while capturing most of the upside from a bearish move. Our medium-term directional view goes with the flow of recent price action: short 5y rates, long USDJPY and short basket of LatAm long bonds. Here we make the compelling case that recent moves have a lot further to go.

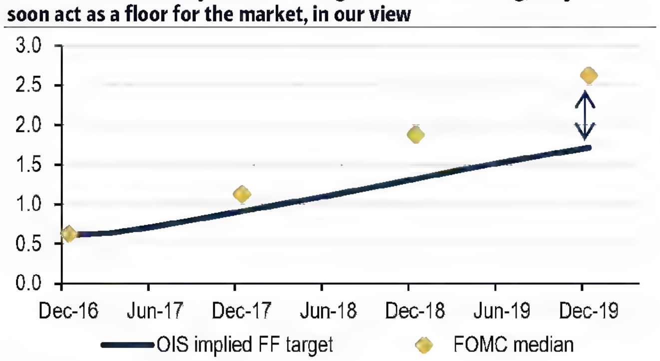
Bearish 5y yields for the medium term

Our bearish energy in US rates for 2017 will largely be focused on the 5y point of the curve. Despite the recent move, we see three clear reasons why the market still has to play catch-up from now, at least until inauguration day:

1. Comeback chart of 2017: market vs dots

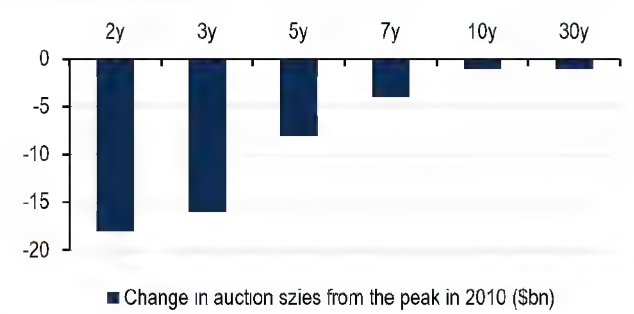
We prefer short 5y rates over the widely held view of short 30y rates given we think that fiscal stimulus will move the Fed before it shows up in fundamentals. We believe the Fed's current dot projections will move from being a ceiling to a floor on the market. In this case, intermediate forwards like the 3y1 and 4y1y have the most room to sell off, leaving the 5y point most vulnerable, (Chart 13). *Our fair value framework indicates that if the market were to revert to the dots, 2y rates can move higher by 26bp, 3y rates by 45bp, 5y rates by 57bp and 10y rates by 48bp.*

Chart 13: After three years of treating the dots as a ceiling, they will soon act as a floor for the market, in our view



Source: BofA Merrill Lynch Global Research

Chart 14: Additional deficit needs are likely to be financed by increasing front-end auction sizes



Source: BofA Merrill Lynch Global Research

2. Learning from Japanese fiscal stimulus

Ultimately, fiscal stimulus is not the long-term answer to flat curves or low neutral rates (Japan being the prime example). Fiscal stimulus merely captures some low-hanging fruit that extends the business cycle by a couple of years and provides the central bank an opportunity to get further away from the ZLB. Said simply, fiscal stimulus raises the terminal rate in the current business cycle while doing little for the long-run neutral rate – this by definition should be more bearish for intermediate rates than 30y rates.

3. Additional deficit issuance

With the average maturity of UST debt already standing at record highs (70months), Treasury showing an inclination to cut long-end issue sizes in 2016, and the supply shortfall in the front end of the UST curve post MMF reform, we also believe that the US Treasury will finance the increased deficit using the belly of the UST curve as opposed to the long end

Trade: We recommend a 3m5y OTM payer 25 delta, strike = 2.05% for a gross payoff ratio of 3.4: 1. See the Best Vol Trades section for more details and risks.

But focus on being short real rates now

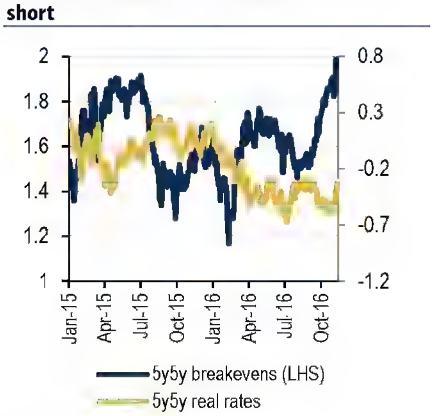
After spending much of 2016 successfully being long real rates, we recommend switching to a real rate short for 2017. We think the consensus was too slow to get on the real rate train and is now too long relative to benchmark. As described in the detail here, fiscal stimulus is likely to leave government and private companies competing for a shrinking pool of savings, driving the real cost of debt higher. We highlight three reasons why short real rates provides better risk-reward now (Chart 15).

- **Anti-globalization = higher real rates:** Few appreciate that one of the biggest beneficiaries of globalization has been US real rates. Globalization was undoubtedly good for EM growth and reserves. As these reserves found their way back into the US, US real interest rates were held lower. As the global savings glut unwinds, real rates have the most room to re-price. Chart 16 offers compelling proof.

- **Risk parity unwind = higher real rates:** Exposure to any heightened concern about a risk parity deleveraging trade in a high vol environment is best found in asset classes where their footprint is large relative to market liquidity. TIPS is a prime example of one such asset class. The influence of a multi-asset strategy on real rates is clear from Chart 17.

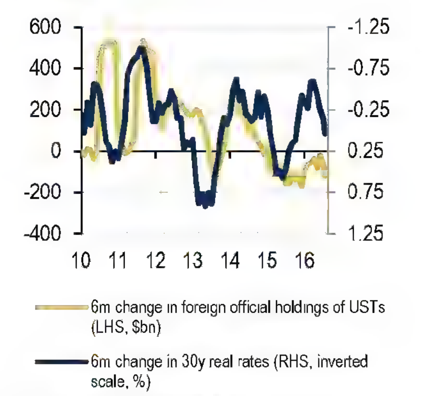
- **Lower rates = lower breakevens:** If the recent euphoria unwinds, it is likely due to a 1) RMB deval; 2) commodity collapse post OPEC; or 3) equity market correction.

Chart 15: Real rates vs. breakevens: A real short offers better risk reward than nominal short



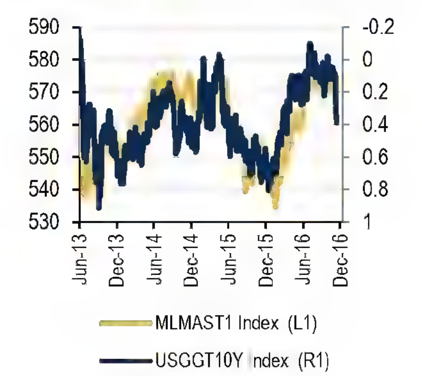
Source: BofA Merrill Lynch Global Research

Chart 16: Foreign official holdings of UST vs. real rates



Source: BofA Merrill Lynch Global Research, US Treasury

Chart 17: BAML multi asset strategy index vs real rates



The BAML multi asset strategy index is not representative of all risk parity funds. Source: BofA Merrill Lynch Global Research

All three would argue for the decline in rates to be led by breakevens leaving a real rate short with little downside (real rates moved higher by 50bp post China deval in Aug-15).

Trade: We recommend selling 10y real rates at 35bp with a target of 1% and a stop loss of 0bp. Risk: A reflationary sell-off without re-pricing the Fed is a risk to the trade.

FX: GOP sweep emboldens core USD/JPY view

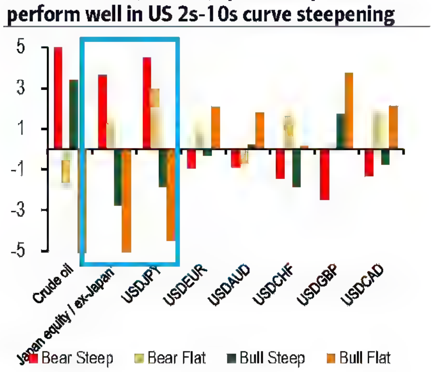
Higher US real rates, higher intermediate (5-10y) nominal rates combined with a potential USD tailwind from a second Homeland Investment Act (HIA), leave USD/JPY as our top directional FX trade for 2017. We have maintained a core view that USD/JPY would move higher in 2017, as the factors weighing on the pair this year, namely speculative JPY buying and increased FX hedging by domestic investors ($/¥'s eventual surge), would subside. We like the trade for the following reasons.

- **USD/JPY most sensitive to fiscal-stimulus-driven rise in US yields:** Of all G10 FX pairs, JPY is most vulnerable (versus the USD) to a fiscal-driven rise in US yields. First, the pair's correlation with rate differentials is the highest in G10 at 60%. But, more importantly, USD/JPY is also the most sensitive to the shape of the US 2s10s curve (Chart 18). The shift from loose monetary/tight fiscal to a tight monetary/ loose fiscal policy regime will support such a steepening as supply is concentrated in the intermediate part of the curve, and the positive growth shock allows the Fed to hike faster, supporting an increase in real yields, also a key 2017 call.

- **BOJ yield target is bearish for JPY:** The BOJ's implementation of a yield target at its September meeting has caused a break in the correlation between 10Y JGBs and USTs (Chart 19). First, given USD/JPY's significant correlation with 10Y yield differentials (>60%), the anchoring of 10Y yields will further weigh on the Yen as US Treasury yields rise. Second, further Japanese fiscal stimulus will successfully lower real yields through higher breakeven rates of inflation while nominal yields will remain unchanged. As our JPY strategist argues, to the extent that a Trump victory has weakened Abe's diplomatic success, not least from likely TPP failure, and residual macro uncertainty makes it increasingly likely the government will seek to draft a supplementary budget sooner than anticipated.

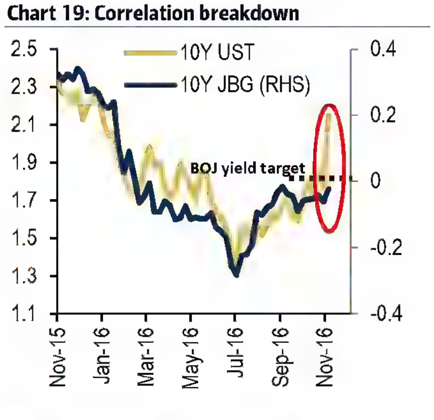
- **HIA and domestic flow picture a JPY-negative:** The flow picture also turns JPY-negative in 2017. USD/JPY's underperformance during Asia trading hours in 2016 highlights that domestics used any rally in the pair to hedge (by selling USD/JPY) existing investments. This flow will likely subside in 2017. The compression in FX-hedge-adjusted yield pickup from a Japanese investor's standpoint will likely shift

Chart 18: USD/JPY and Japanese equities perform well in US 2s-10s curve steepening



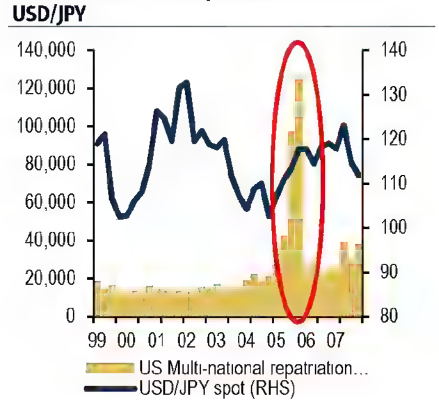
Source: BofA Merrill Lynch Global Research, Bloomberg
Note: curve and average cross market reaction (past 40 quarter simple average)

Chart 19: Correlation breakdown



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 20: 2005 HIA repatriation flows vs USD/JPY



Source: BofA Merrill Lynch Global Research, Bloomberg, BEA any further rebalancing to be unhedged, strengthening USDJPY. We believe the Republican sweep of Congress makes it very likely that HIA 2.0 will be passed (Homeland Investment redux?). Following the 2005 HIA, USD/JPY rose from 102 to 117 (Chart 20). Given US corporate exposure is heavily concentrated in European and Asian countries (including Japan), flows out of these currencies into USD would be the most pronounced.

Trade: We recommend buying a 6m USD/JPY digital call for 10% spot ref: 108.95). The strike aligns with our end-2017 USD/JPY forecasts of 120, and with a 10% entry level provides a 10 to 1 return. The risks to the trade are a decline in risk sentiment, a retreat from the US Treasury's "strong dollar" policy by the new administration, and/or a failure of the US to meet already high expectations for significant fiscal easing.

EM sovereign credit has more downside

Our bullish dollar + bearish US rate view leaves us bearish on EM. In our view, Mexico, Brazil and Colombia (longer duration low spread foreign currency bonds) are especially vulnerable, while the higher yield and lower duration of lower quality and shorter EM bonds will be more defensive. A review of the taper tantrum (May 2013) shows that: 1) EM underperformed UST at the start; 2) BBB sovereigns underperformed the most, and had not yet recovered in a year; and 3) BB and B-rated bonds recovered to beat USTs 8-10 months later. This time, we expect a sharp selloff with an eventual recovery.

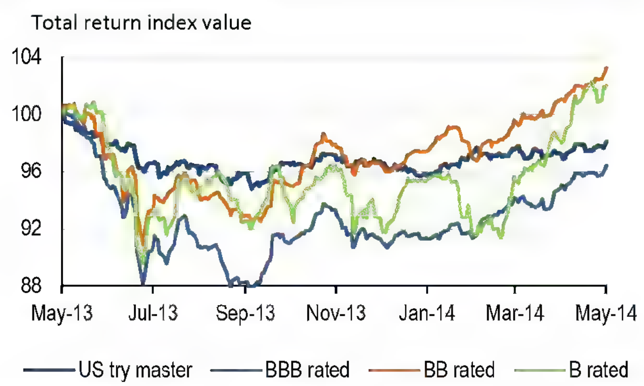
Our bearish view on LatAm credits in particular is driven by 1) positioning in LatAm is heavier than in EMEA or Asia – watch outflows from IG crossover investors who will rethink their EM IG investments; 2) their exposure to commodities and 3) vulnerability to a potential decline in US trade. Our choice of the basket is fairly obvious - Mexico is clearly the most vulnerable to NAFTA and a decline in remittances, uncertainty on the pace of the economic recovery and debt dynamics are extremely challenging in Brazil while tax reform delays could mean a credit rating downgrade in Columbia.

Taking account of both oil and US rates as independent variables, a regression analysis shows that a 100bp Tsy backup would be related to 30-45bp wider spread (Chart 22). Note that residuals show spreads are currently about 35bp too tight.

The trade: Sell equally weighted basket of Mex 47s, Brazil 45s and Colom 44s Current average yield: 5.74%, annual carry & roll 30bp; target: 6.35%; stop: 5.25%

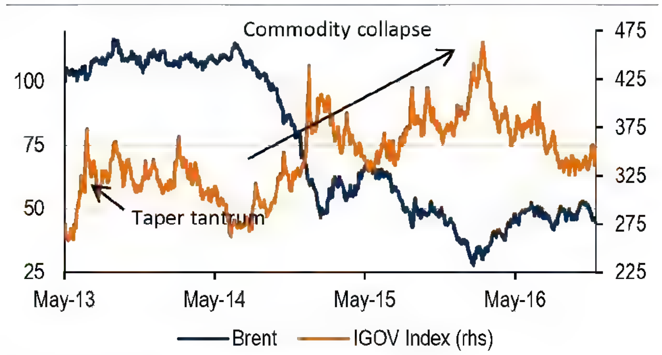
On a portfolio basis for benchmark real money investors, we recommend moving out of long higher quality LatAm, leaving higher yielding shorter bonds. A commodity price rebound or a reversal of US rates is a risk to the trade.

Chart 21: Total return of EM sovereigns during taper tantrum May 2013



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 22: EM sovereign spreads widen with declining oil prices Jun 2014



Source: BofA Merrill Lynch Global Research, Bloomberg

Leading Indicators

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Brace for faster global growth

- Our leading indicator of leading indicators (LILI), shows that global growth will likely continue to improve in early 2017.
- Faster global growth as anticipated by LILI supports higher rates and reflation.

A leading indicator of leading indicators

Investors use leading indicators to try to anticipate turning points in economic activity because those turning points drive FX, rates and stocks. One transmission channel is that turning points usually anticipate monetary policy changes. The most reliable leading indicators available summarize a battery of activity, financial and qualitative variables. One example is the set of Composite Leading Indicators (CLIs) calculated by the OECD, which is heavily used by policy makers and market participants.

The problem that we have with leading indicators is they are not really useful to market participants because they move *after* the market does. That is, leading indicators anticipate growth but not the market because they use financial variables to anticipate growth. Leading indicators rely heavily on interest rates, stock market indexes and exchange rates because they incorporate vast information quickly.

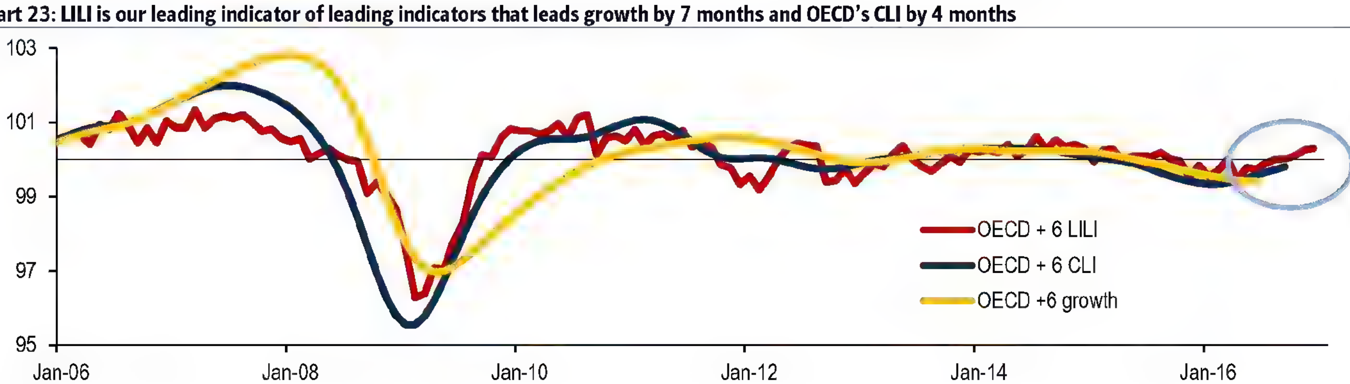
LILI solves the problem in two dimensions. It is not based on financial variables. Rather, LILI is based on qualitative data, consumer and business confidence, which we believe are optimal to capture "animal spirits." And, it is constructed explicitly to anticipate the CLI, as we use a dynamic forecasting regression with lags of consumer and business confidence to calculate LILI.

The signal for early 2017

LILI indicates that in early 2017 global growth will continue with an improving economic outlook (Chart 23). Consumers and firms seem to be bullish around the world, because LILI anticipates an even stronger outlook than the CLI. Here global growth means growth in the OECD plus the six largest non-OECD members. LILI anticipates the CLI by four months, and the CLI in turn anticipates growth by three months.

LILI supports our house view of higher rates and reflation, as the peak of the business cycle is not in the forecasting horizon. Since LILI is not based on market measures, we are confident that LILI anticipates market movements as well.

Chart 23: LILI is our leading indicator of leading indicators that leads growth by 7 months and OECD's CLI by 4 months



Source: BofA Merrill Lynch Global Research, OECD. Note: OECD + 6 includes the 33 OECD member countries plus the largest 6 non OECD members: Brazil, China, India, Indonesia, Russia and South Africa

The nuts and bolts of LILI

We used the OECD database of monthly economic indicators to look for non-financial variables that could anticipate the CLI. We use small and simple forecasting regressions, as they sometimes adjust more quickly to structural changes than large regressions or regressions based on large data sets. And, we already have a big-data leading indicator, published in our Year Ahead a year ago. We looked only at models with two independent variables (and their lags) and with variables of the same "type" (production variables, or employment variables, or confidence indicators). Further research can be done to use models that mix variables, although those models are more difficult to interpret.

We used two criteria to select between models. One was Granger-causality tests, which amount to joint tests that the lags of the independent variables are statistically different from zero in our dynamic regressions. The other was the Bayesian Information Criteria (BIC), a measure that looks at the fit of the regression (the r-squared) but that penalizes large models. We found that production measures and confidence indicators usually performed better in our training sample (1980 to 2014), although confidence measures usually had a larger lead. The model that used has a lead of four months and uses up to four lags of the standardized consumer confidence indicator (CCI) and of the standardized business confidence indicator (BCI) calculated by the OECD. Many models showed similar performance, which indicates that a combination strategy could be fruitful, although we did not take that route. No out-of-sample tests were performed.

We like LILI because it can anticipate the OECD's leading indicator without the use of financial variables. But we also like it because it is easy to interpret as it is based on confidence indicators and because those indicators are not subject to data revision, unlike variables such as GDP or payrolls.

Best Inflation Trades

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Inflation party starting but Eurozone not invited

- Eurozone breakevens have benefited from US move, but we see its sub-target problem becoming more entrenched. Sell OATei 2047 vs OAT 2066
- FX pass-through considerations and the prospect of firmer oil prices and leave us favoring breakevens in Thailand and Mexico.
- We expect inflation divergence in G10 economies. Our analysis of inflation and deflation risks support buying USD/JPY and selling CHF/SEK.

Rising Eurozone breakevens – the triumph of hope over experience?

The rally in Eurozone breakevens and inflation swaps looks mild compared with the recent US experience, for obvious reasons, but it has still been meaningful. The widely followed 5y5y has rallied from a 1.25% low to 1.58% and the 10y20y forward rate is at 1.96% (which qualifies as meeting the ECB's 'below but close to 2%', we'd say, albeit without the inflation risk premium we were used to in the past).

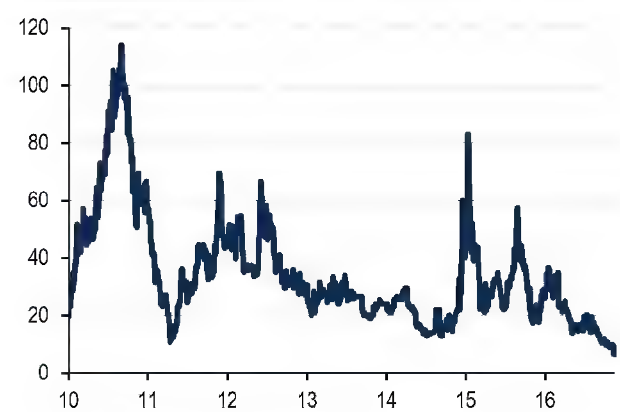
It is hard to argue with what looks like a beta-weighted response to the US move, perhaps. After all, there is a global component to inflation and if the US is driving that now, then Eurozone inflation expectations should firm, it can be argued. And if we are in for a Reaganomics-style fiscal stimulus, then it is quite possible that we will get the dollar strength associated with that experience; if so, the Eurozone might get to import a little inflation by being on the other side of that currency move.

However, we are somewhat troubled by the fact that the inflation options market has priced out the risk of deflation almost completely (Chart 24). Has that threat really been extinguished? Yes, inflation expectations have risen but the rise in real yields has also tightened monetary conditions and there remains the threat that in December the ECB fails to commit to ongoing stimulus on a sufficient scale to satisfy markets that it can return inflation to target.

Chart 24: Euro inflation expectations rally; long term forward at target, %

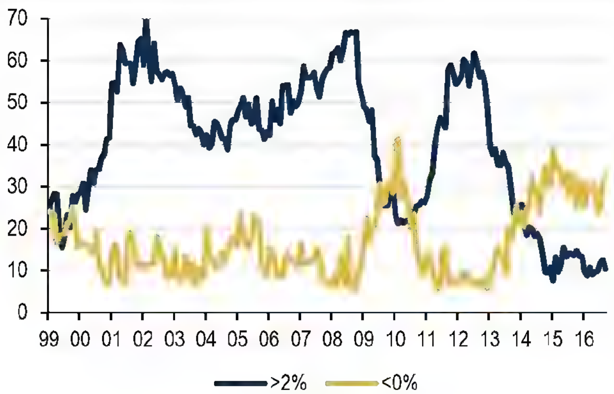
Source: BofA Merrill Lynch Global Research

Chart 25: Perceived deflation risk goes; 5y ZC 0% inflation floor price, c



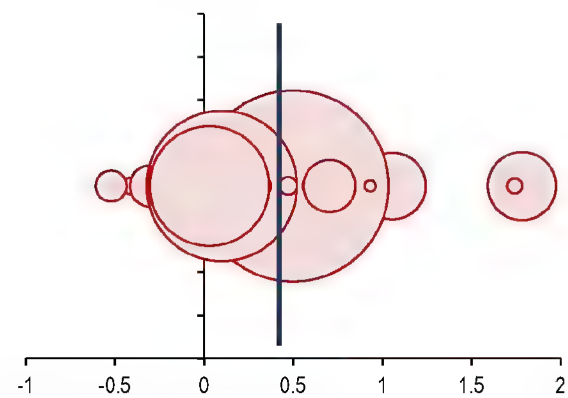
Source: BofA Merrill Lynch Global Research

Chart 26: The Euro HICP – weighted index proportions recording inflation below 0% and above 2%



Source: Eurostat, BofA Merrill Lynch Global Research

Chart 27: Eurozone member country inflation rates, with bubble sizes proportionate to index weights



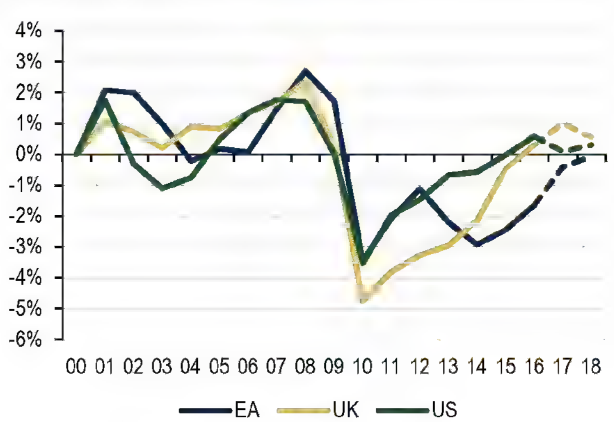
Source: Eurostat, BofA Merrill Lynch Global Research

Core inflation at 0.8% is barely above the 2015 low of 0.6%. One statistic that often grabs attention is the high proportion of HICP index components recording deflation (currently 31% on a weighted basis). However, much of this represents volatile non-core components so is less of a concern. The bigger problem is the fact that even after we take out all these components recording deflation, the 69% of the index remaining is only recording a weighted average inflation rate of 1.3%. Chart 26 shows that the more serious problem is that only 10% of components in the basket are recording inflation rates above the 2% target. So there is a "lowflation" clustering problem by index item and Chart 27 shows that there is also a lowflation clustering problem by country. In fact, the country clustering is even more concentrated than it looks if we allow for the fact that the bigger of the two upside outliers, Belgium (1.8% inflation), has experienced a presumably unrepeatable increase in the tax rate on electricity from 6% to 21%, as well as other excise duty increases.

One might be tempted to give the Eurozone the benefit of the doubt on inflation, insofar as its output gap remains material. However, the closure of the output gap still requires strong and continuing stimulus, we would argue, and even that does not guarantee that somehow inflation resets to target.

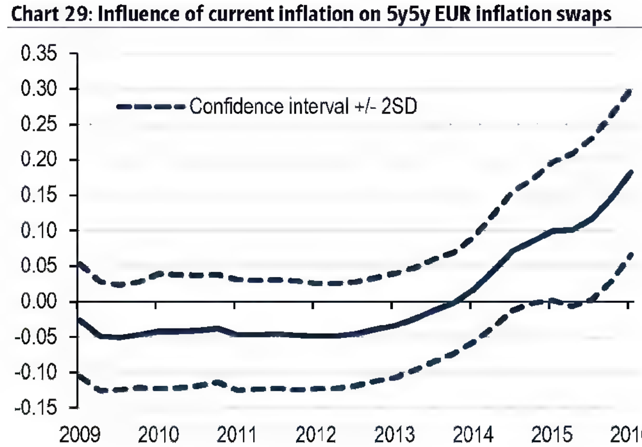
Our worry about item and country lowflation clustering is not that inflation is "unanchored". Our concern is that it flags a "re-anchoring" of inflation at a level well below 2% and that this new anchor will prove difficult to dislodge.

Chart 28: Output gap as % potential GDP



Source: BofA Merrill Lynch Global Research, AMECO

Chart 29: Influence of current inflation on 5y5y EUR inflation swaps



Note: The chart shows the slope of the regression of 5y5y on current inflation with rolling windows of 29 quarters

Source: BofA Merrill Lynch Global Research, Bloomberg

Bank of America Merrill Lynch

Economists place great store in the importance of expectations and their impact on inflation. Chart 29 suggests an adverse feedback problem has emerged, with actual inflation an increasingly influential driver of 5y5y inflation (and economist long-term consensus expectations).

With 10y20y inflation effectively at the ECB's target, we favor short positions in 30y breakevens. In the case of the OATei 2047, the "observed" breakeven drastically understates what we would consider to be a fairer measure. The issue here is that the linker is almost 10 years longer than its nominal 2045 comparator in modified duration terms. On a duration basis, the linker lies in between the 2060 and 2066 nominal OATs and, of course, the 30s50s OAT curve is very steep.

Trade: we recommended a more closely-matched breakeven trade, shorting OATei 2047s to buy OAT 2066s to give a breakeven of 163.3bp, targeting 130bp with a stop-loss at 180bp on October 14. The breakeven has risen, against our expectations, to 169.6bp currently and we regard this as an attractive entry level. We will nudge our stop-loss level higher to 185bp.

The relative cheapness of the nominal 50y partly reflects the 31y maturity limit to ECB buying. We regard the ECB eligibility premium for bonds within the ECB's buying range (like this linker) as material, so the trade should be a beneficiary in the event of an ECB "taper tantrum". An important additional feature in these turbulent times is the greater dispersion of the nominal's cash flows (in PV terms). This means the trade is significantly net long convexity.

We see the risks to the trade being a strong Eurozone recovery causing a general repricing of breakevens higher and the possibility of further heavy issuance of 50-year bonds across the Eurozone.

EM linkers: feeling the contagion for higher breakevens

The prospect for higher yields in the US clearly affects the appetite for Emerging Market (EM) assets including inflation-linked bonds. The discussion is about not only EM becoming less attractive on a relative basis, but also how the higher yields in the US affect the dollar and thus EM currencies.

Fiscal stimulus prospects in the US should continue to drive some correction across EM assets, but at this point, there is still too much uncertainty on the actual reach of such stimulus. Investors faced strong returns in EM this year and because of the calendar effect, this puts pressure to square positions and reduce risk. While this correction may last for a while, it is clearly creating more value in some assets. For now, the discussion will be about re-sizing positions rather than valuation. Only when volatility declines and yields stabilize in the US will we be able to resume discussion on valuation and the level of yields across EM.

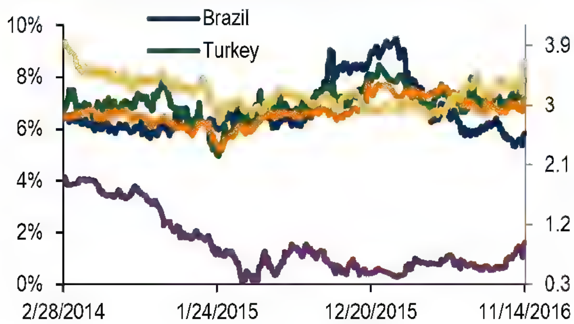
Liquidity is a key issue when looking into EM linkers, in particular across EMEA, but we find some interesting opportunities in Asia and LatAm.. Currency weakness ends up adding risks for higher inflation in some countries but FX pass-through varies a lot depending on output gap. In general, we believe there is room for higher breakevens in EM, with key highlight for Thailand and 10y in Mexico.

Attractive breakevens in Thailand and Mexico

In Asia, we believe breakevens are pricing in too much complacency on the inflation outlook. With prospects for higher oil prices, it makes sense to position for higher breakevens in both Thailand and Korea in our view. Breakevens appear cheaper in Thailand as inflation is already increasing, while breakevens have clearly lagged the movement.

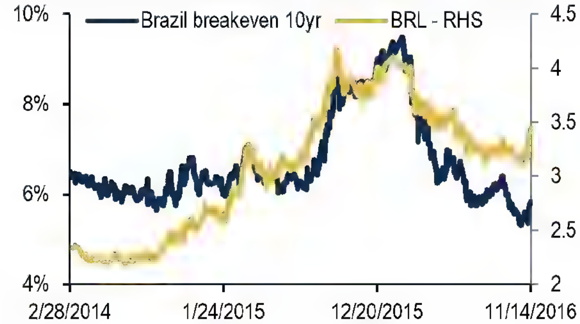
In EMEA, linkers are mostly illiquid and/or expensive so there is more to do in nominals and/or FX in our view. Yet, the currency move has triggered a widening in breakevens in some countries like South Africa. We expect this movement to continue for now.

Chart 30: Breakevens to increase in some EM



Source: Bloomberg

Chart 31: In Brazil, high correlation between breakeven and BRL



Source: Bloomberg

Finally, in LatAm, we expect inflation to increase in Mexico, driving breakevens higher across the curve. Although FX pass-through is very low in the country, the ongoing MXN depreciation may add some pressure on inflation at the margin. In the case of Brazil, the central bank was very successful in anchoring long-term inflation expectations driving breakevens lower across the bond curve. For long-only investors, we believe linkers should be more resilient versus nominal bonds.

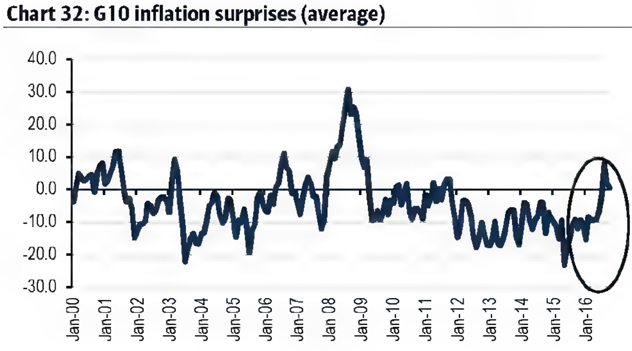
While Brazil continues to have one of the highest nominal and real yields across the globe, further compression requires stabilization in US yields. As long as the Brazilian government is able to deliver on the reform front, approving a social security reform bill next year, we see room for real yield compression from levels above 5.5% right now.

Buy USD/JPY, sell CHF/SEK

Inflation may not be back yet but deflation risk is most likely gone in most regions in our view (the notable exception being the Eurozone, we believe, as discussed above). A year ago we argued that the market deflation position was stretched and that there was room for inflation surprises. Indeed, average inflation surprises in G10 economies have been increasing since then and are now clearly in positive territory (Chart 32). Monetary policy in G10 economies is the loosest it has even been, suggesting that global inflation could continue rising (Chart 33). This is not necessarily bad news, as the threat of deflation is now gone. However, inflation rather than deflation trades are likely to become an important driver in G10 FX.

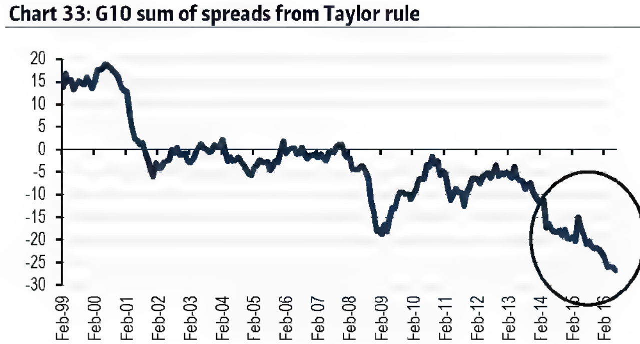
We update a heatmap of inflation risks in G10 economies to determine how to position for such risks in FX. We have discussed the methodology in Inflation and FX: What if the dog starts barking?. The idea is to rank currencies based on a number of early warning inflation indicators. Using equal weights, if most indicators point towards higher inflation for a currency, we take this to suggest that investors should go long, against a currency for which most indicators point towards deflation, both in relative terms.

Chart 32: G10 inflation surprises (average)



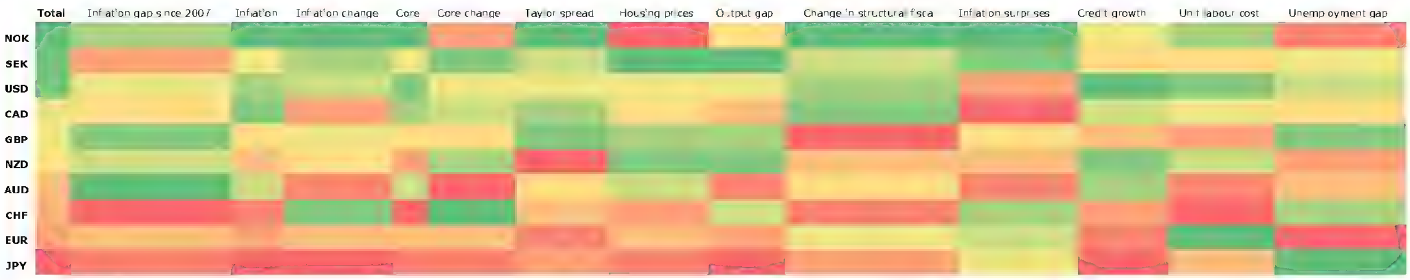
Source: BofA Merrill Lynch Global Research.

Chart 33: G10 sum of spreads from Taylor rule



Source: BofA Merrill Lynch Global Research.

Table 1: Heatmap of inflation risks (green for high, red for low, in relative terms)



Source: BofA Merrill Lynch Global Research.

The results in Table 1 are supportive of the USD and the scandies against JPY, EUR and CHF. This is fully consistent with our projections for 2017, expecting USD strength to continue, particularly against JPY, and the scandies to do well against EUR and CHF.

Based on this analysis, we recommend buying USD/JPY and selling CHF/SEK, to position for inflation risks in G10 economies. Long USD/JPY is also our top directional trade for 2017 and we already have a trade recommendation to sell EUR/SEK. Therefore, we would recommend selling CHF/SEK as a new trade to position for inflation risks. CHF/SEK is one of the most overvalued crosses in G10. It is currently at its highest value ever, with the exception of the level reached when the SNB removed the EUR/CHF floor. We also expect the SNB to intervene to offset FX pressure, while higher uncertainty increases risks of a rate cut.

The risk to this view is if tail risk scenarios unfold in European politics, such as an early election in Italy with Five Star winning, or Le Pen wining the second round in the French elections. Although we expect markets to be more concerned about European politics following the US elections, we do not see tail risk scenarios in our baseline.

Trade: We recommend selling CHF/SEK, from spot at 9.184, with a target of 8.4 and stop loss at 9.5.

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Relative value in a macro world

- Long EUR/JPY: data and positioning supportive; the BoJ has more tools to address sustainability challenges than the ECB.
- Long RUB/KRW: US fiscal expansion suggests more upside for reflation sensitive Russia than interest rate sensitive Korea.
- Sell German 2y vs OIS, buy 10y vs OIS: fade the impressive richening of short-maturity German govies.

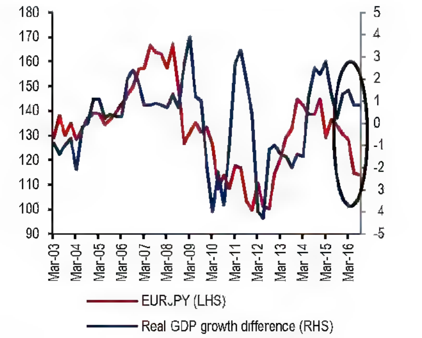
Long EUR/JPY

In a recent report we argued that EUR/JPY could appreciate in the months ahead as the BoJ gains credibility and the ECB has to deal with QE constraints. Since then, the EUR/JPY has appreciated by 3%, but we see more upside. Although we expect the ECB to extend QE by a further six months in December, we see more difficulties next year. Extending QE will require difficult decisions, such as relaxing the capital key or buying below the depo rate. QE tapering is therefore a risk and the market could start testing the ECB. Even if Draghi succeeds, the Euro could strengthen in the meantime. In contrast, the BoJ's new framework should address the sustainability challenges that Kuroda faced this year, and allows more fiscal stimulus by keeping the government's borrowing costs at zero. The ECB cannot do this, in our view. We have been short EUR/JPY this year, as we were expecting the ECB to extend QE, while the BoJ faced challenges.

Data also suggests further EUR/JPY upside. Relative GDP growth would be consistent with a stronger EUR/JPY, as the Eurozone has been gaining momentum, while growth in Japan remains weak (Chart 34). Relative central bank balance sheets give the same signal (Chart 35). Positioning is also in support, as our analysis suggests a short EUR/JPY market position (Chart 36).

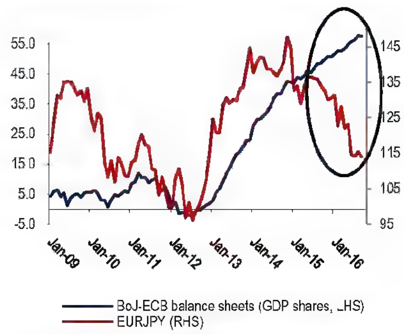
If the external environment improves, we think Japanese investors are likely to be JPY sellers again as the hedge ratio and hedge costs have both risen. One of key factors of the yen's appreciation this year might have been that, as the USD/JPY fell, institutional investors implemented additional FX-hedging to their existing forex positions as part of their risk management, which caused the USD/JPY to fall further and supply-demand to worsen in a vicious circle. However, this mechanism probably ran its course when the USD/JPY reached 100 on the Brexit vote as we argued in $/¥'s eventual surge: Buy Nikkei 06 September 2016. In fact, the USD/JPY has stopped falling during Tokyo trading hours since the summer. Based on the decline of foreign yields and higher hedge costs, hedged US Treasuries and German bunds had lost nearly all of their attraction for Japanese investors by the summer. US and German 10yr government bond yields sank to about 0% after being hedged to the JPY, reflecting that downward pressure on yields had reached the limit. Institutional investors are expected to increase their exposure to unhedged foreign bonds in H2 FY16. Investor behavior is especially liable to change in April, when the new fiscal year starts.

Chart 34: EUR/JPY and real GDP growth



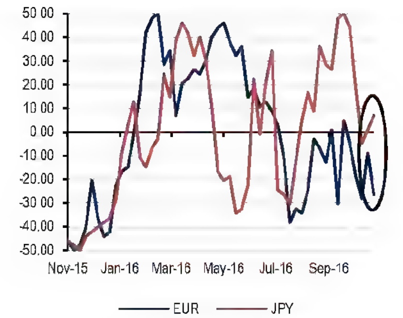
Source: BofA Merrill Lynch Global Research.

Chart 35: EURJPY and relative central bank balance sheets



Source: BofA Merrill Lynch Global Research.

Chart 36: EUR and JPY market positions relative to the last 12 months



Source: BofA Merrill Lynch Global Research
For more details, see Liquid Cross Border Flows.

EUR rates are probably more vulnerable against US rates movements, as the market questions whether the next ECB move will be expansion or tapering. On the other hand, Japanese rates are insulated from foreign movements as the BoJ directly targets the 10yr yield. Japanese fiscal easing is also a possibility in light of reduced odds of TPP implementation and a potential snap election. Any positive impact of Japanese fiscal easing on growth is likely to manifest in higher inflation expectations under the BoJ's yield-targeting regime, which means Japanese real interest rates could actually fall.

Based on these considerations, **we recommend buying a 6M EUR/JPY 122/130 call spread for 1.2312% EUR (spot ref. 116.84).** Risks to our trade include a severe global shock that could strengthen the JPY, or the return of the Eurozone crisis; for example, if the government in Italy falls after Renzi loses the referendum in December or Le Pen wins the elections in France.

Long RUB/KRW

Post US elections and the improved outlook for fiscal expansion in the US, we see more upside in being long oil and reflation sensitive Russia than short technology and interest rate sensitive Korea.

We recommend being long RUB/KRW heading into 2017 targeting a move to 19.4 (spot ref 18, stop 16.7). The trade is positive carry 2% per quarter.

The rise in US breakeven inflation is positive for risky assets broadly but could be painful in the short term for highly indebted countries with low interest rates. Higher US breakeven inflation rates are historically associated with higher RUB/KRW (Chart 37).

Higher US real rates are also less of a threat for Russia where local real yields are significantly higher than Korea (Table 2) and most EM peers. Korea also has relatively high private sector debt which could face pressure if BoK is forced to raise rates. Household debt has been rising at an alarming rate and domestic political turmoil facing the Park administration has also added to concerns.

In our baseline scenarios, we expect a modest growth recovery for Korea but a stronger delta for Russia where the oil price collapse over 2014-15 led to a much sharper slowdown earlier and activity is now in recovery stage.

The ToT trade shock that hit Russia in 2014 led to material underperformance in exports vs Korea. Over 2011-13, Russia and Korean exports were growing at about the same rates but since 2014 that gap widened has materially against Russia. Since early 2016, however, this has reversed with Russia catching up. In 2017, Russian exports growth could outperform Korea given the outlook for oil. Moreover, it is less reliant on China or Japan and more reliant on Europe. CNH/KRW as well as JPY/KRW remains near multi year lows suggesting this will be a source of pressure on the Won given the greater trade linkages (Table 2).

Our current account forecasts for 2017 anticipate deterioration in Korea's current account surplus compared to marginal improvement in Russia's. Recent issues at Samsung and Hanjin pose risks for the goods and service balances, respectively. Electronics account for 30% of Korea's exports. While a stronger dollar and energy de-regulation in the US could dampen the oil market, our energy strategists continue to expect further modest gains in Brent over 2017. The RUB/KRW cross has a modest positive beta to oil at 25% since the beginning of 2014. Risks to the trade are mainly material downside to oil prices vs our baseline scenario.

Sell German 2y vs OIS, buy 10y vs OIS

In H2 2016, we saw an impressive richening of short-maturity German govies and repo: we like fading the move by selling 2y Bund vs OIS and buying the 10y vs OIS.

German 2y is pricing-in structurally high demand and low supply

The German 2y trades at the richest against OIS since the peak in 2011 due mainly to demand/supply dynamics driven by: 1) European regulation on mandatory central clearing and minimum initial margin requirements generating €350bn in extra collateral needs in 2016-19; 2) LCR regulation and negative rates having pushed cash-rich corporates into holding short-end German bonds/bills in order to store liquidity; and 3) net bill issuance having been cut to negative in Q4 because falling yields created €42bn of excess cash for governments.

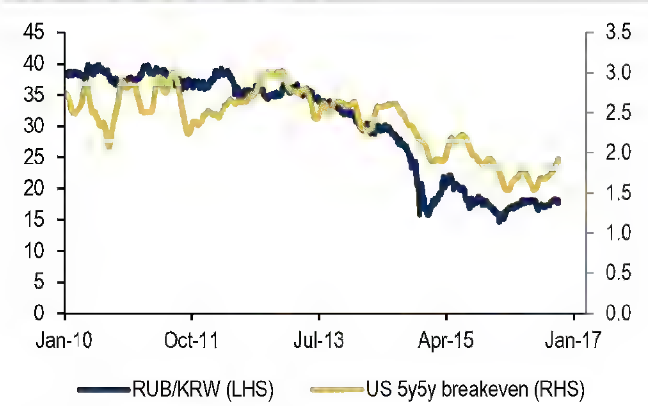
Supply pressures are expected to ease in 2017E

Bubill auctions will resume after more than two months of absence while more treasuries may be the answer to an excessive rise in yields by increasing net issuance in the front-end. The ECB may also be concerned by the richness of front-end German govies (see Couré's speech on 3 November). If the Eurozone fails to create enough safe/low-volatility securities for the market to work efficiently, then the central bank could compensate by lending more collateral, by adjusting counterparty frameworks and running higher balance sheets or even by issuing bills to satisfy safe asset demand in the non-bank system.

ECB QE and potential periphery stress supports 10y outperformance

Given the tail risks in 2017 and our call of ECB QE extension to September 2017, we prefer to add a 10y DBR long vs OIS – we expect 10s to outperform in such a scenario. In Chart 38 we show that ECB tapering expectations have now pushed 2s10s vs OIS to levels before the announcement of ECB QE on 22 January 2015. However, we see even more reasons for the ECB to extend the €80bn per month in QE to September 2017.

Chart 37: Return to a different time



Source: BofA Merrill Lynch Global Research, Bloomberg

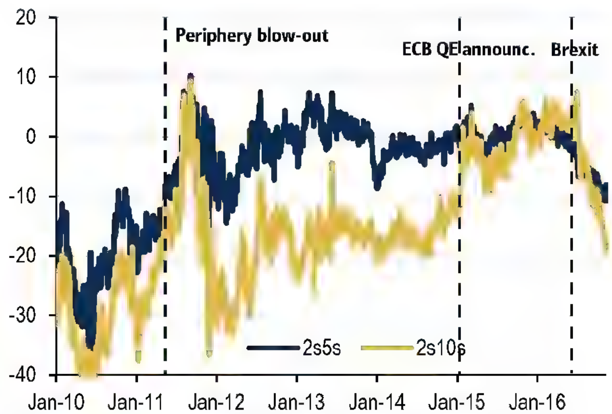
Table 2: Russia vs S. Korea factors

	RUB	KRW
Real rate*	4.2	0.9
CA change forecast, '17 vs '16	1.2	-1
Growth delta forecast, '17 vs '16	1.6	0.2
NFA / GDP+	1	-5
Pvt credit (% GDP)	50	80
Foreign holdings of local debt (USD bn)	20	67
FX reserves / ST debt	6	3
Share of US in exports	2	13
Share of China in exports	10	25

* 1y fwd 5y yield vs inflation forecast
+Countries net external position vs BIS-reporting banks

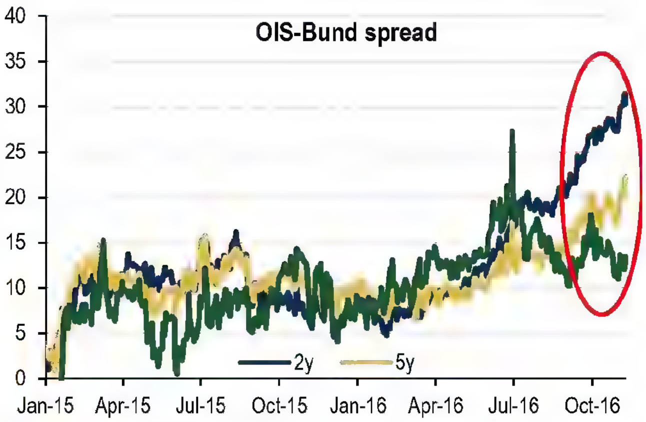
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 38: Low repo rates and ECB QE tapering push 10s to pre-QE levels



Source BofA Merrill Lynch Global Research

Chart 39: 10y Germany is historically cheap on the OIS curve



Source BofA Merrill Lynch Global Research

10s would be particularly supported if the ECB increases the holding limit of non-CaC bonds to 50% – a tweak we see as the most likely. Also, given the already stretched valuations in the 2y, we think a rise in geopolitical risks or a blow-out in peripheral spreads would increase collateral values of 5s and 10s more than the front-end – as happened during the first BTP spread widening in 2011 or the Brexit referendum.

We recommend investors go long the DBR Aug26 vs OIS and short the BKO Dec18 vs OIS at current levels of -17bp, targeting 14bp and with a stop at -34bp. The position has 1.1bp in 3m Carry and Roll. The main risk in the short term is ECB QE failure, while tighter short-maturity securities supply or lending is the main risk over the longer term.

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What if populism is too popular?

- **G10:** Short inflation/long duration through US 3-year 0% US inflation floors as stimulus may falter. Short EUR/GBP as "sending the letter" may be the low point.
- **EM:** Short JPY/KRW, short BRL/MXN as US policies may hurt EM less than feared. Long Turkey Eurobonds as sentiment may improve by the referendum in spring.

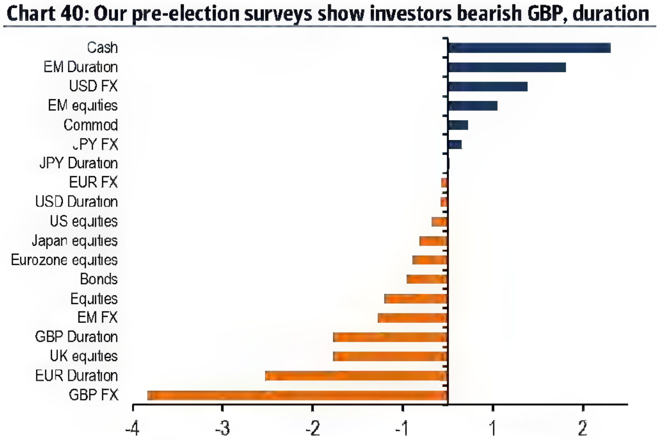
"Long populism" becoming consensus

While we received a lot of pushback for pointing out the risks ahead of the US elections, now "long populism" is quickly becoming consensus. The naysayers may argue that the establishment could reassert itself: conservatives may constrain fiscal stimulus and protectionism, and central bankers may stay dovish (remember the ECB too). We suggest five trade ideas: 1) short inflation/long duration; 2) short EUR/GBP; 3) short JPY/KRW; 4) short BRL/MXN; and 5) long Turkey sovereign where populism may calm.

Populism is getting popular

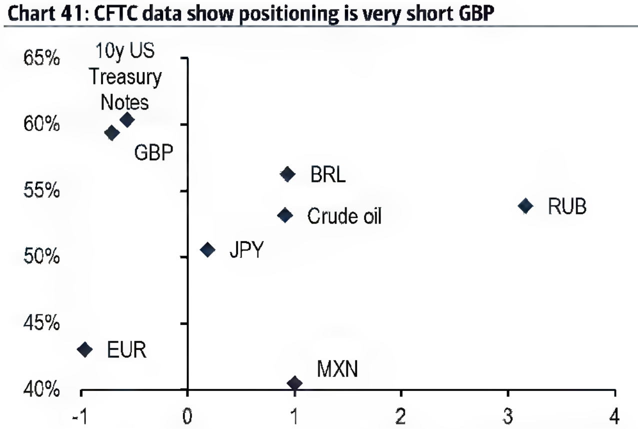
5y5y US inflation swaps have spiked 60bp since summer to about 2.5% – the biggest move since 2009. As a consequence, EM has sold off sharply. Our pre-election sentiment surveys partly explain the violence of the moves since 8 November: investors were long EM bonds and equities and neutral duration in the US (Chart 40). The latest CFTC data show a similar picture, with short GBP and long BRL, Crude, RUB and even MXN most extreme vs history; note also a short in US Treasuries. Purely statistically speaking, the shorts in GBP and US Treasuries are most vulnerable to a near-term reversal – though momentum may prevail for a while in Treasuries (Chart 41). When the dust settles, the contrarian may find opportunities in "short populism" trades.

Chart 40: Our pre-election surveys show investors bearish GBP, duration



Note: positioning score relative to history Source: BofA Merrill Lynch Global Research

Chart 41: CFTC data show positioning is very short GBP



Note: x axis: 1y z score of net long spec positioning as of November 8; y axis: probability of a price reversal in the week after. Source: BofA Merrill Lynch Global Research, Bloomberg, CFTC

Rates: short inflation/long duration

Positioning surveys generally indicate that the rates market is neutral or short duration amid rising inflation expectations. According to our rates & FX sentiment survey, clients are relatively short in relation to their average positioning across major fixed income markets including the EU, UK, and to a lesser extent the US (Chart 42). Such position indications suggest that contrarian investors should be long duration in Europe, the UK, and the US. These positions have been factored into some of our pre-existing fundamental views, which include receiving euro vs US rates and expecting UK supply/demand dynamics to be supportive of longer-dated Gilts going into year end. We are reluctant to recommend outright long duration positions in US rates at present given that the sharp election-induced selloff could extend over the coming weeks.

Consensus expects rising inflation

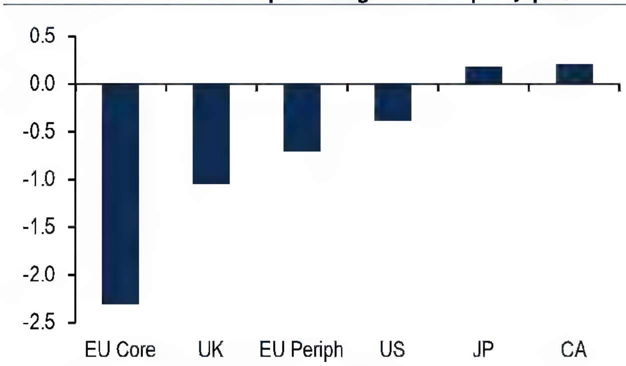
Instead, we focus on contrarian views regarding the outlook for inflation, which underpinned some of short rates positioning and is expected to increase with US fiscal policy expansion and base effects. According to our recent Global Fund Manager Survey taken prior to the election, global inflation expectations are on the rise, with 70% of survey respondents expecting higher global CPI readings in the near term. Headline CPI has been moving higher in the US, and Chinese PPI recently turned positive for the first time since 2012. Similarly, global market-based measures of inflation expectations have been rising, with 5y5y forward inflation swaps in the US, UK, and Europe all rising over recent months and US inflation protected funds receiving nearly $2 billion in inflows since the start of October.

Disinflation may strike back

Risks to the near-term outlook for inflation could rise if: (1) expectations for US fiscal stimulus disappoint as House deficit hawks insist on revenue-neutral tax cuts or spending measures; (2) Beijing pushes the RMB lower before President-elect Trump takes office leading to risk-off and imported disinflation; (3) commodity prices decline if an OPEC deal cannot be reached, the USD meaningfully appreciates, or if EM growth falters; or (4) EU slowdown fears rise should the ECB taper due to technical constraints.

We recommend buying 3-year 0% inflation floors in the US, which currently demand only 9 basis of premium. These levels are low in relation to recent history and could increase if Beijing were to more rapidly weaken the RMB or if commodities falter (Chart 43). Investors seeking to offset the premium could consider selling longer-dated more deeply negative floors under the assumption that any near-term disinflation scare would be short-lived and likely be offset by more activist monetary policies thereafter. The risk to the trade is a spike in commodity prices or a continued rise in core inflation.

Chart 42: Z-score of duration positioning: short except in Japan/Canada



Note: negative z score values indicate short positioning, positive z score values indicate long positions; z score taken from survey net exposure index with responses dating back to 1992 for US, CA, JP, UK & EU, EU periphery data available back to 2013. Source: BofA Merrill Lynch Global Research

Chart 43: Cost of 3Y 0% deflation floor has spiked with weak RMB (bps)

Source: BofA Merrill Lynch Global Research, Bloomberg

FX: Sell EUR/GBP

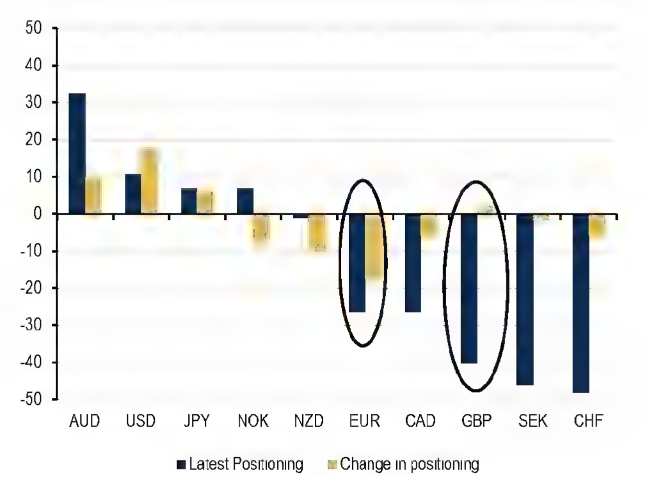
GBP remains a consensus short. Despite GBP appreciating following the High Court decision for a Parliamentary vote to activate Article 50 and the US elections, the market's short GBP position remains stretched according to our positioning analysis (Chart 44). Our Global Fund Manager Survey flags short GBP as the strongest consensus view in G10 FX. Our FX & Rates Sentiment survey also suggests that the majority of investors look for some type of hard Brexit. Although we have been arguing for upside GBP risks after the recent flash crash, our baseline projections expect GBP/USD to hit a new low of 1.15 in Q1 after the UK activates Article 50.

However, we have argued that GBP tail risks are skewed to the upside. UK data have been strong post-referendum and could continue surprising to the upside. There is room for positive headlines at the political front, if the UK agrees on the transitional period that could extend the current regime until a final trader deal with the EU. A Parliamentary vote on Article 50 activation could reduce the chances of a hard Brexit. And Trump's victory could lead to an early bilateral US-UK trade deal, while it increases the geopolitical importance of the UK for the rest of the EU. Moreover, we expect markets to become more concerned about political tail risks in the rest of Europe following Trump's victory in the US elections. Political risks in Italy and France could question the sustainability of the Eurozone, thus weakening EUR/GBP.

If Prime Minister Matteo Renzi loses the referendum on the constitutional reform in December, Italy could have a snap election, which the Five Star party could win based on the latest polls. Even if Italy avoids elections in 2017, the next election will take place by May 2018, and markets could become concerned about it earlier if Renzi loses the referendum. The 2017 French election is another concern. President of the far-right party and presidential candidate Marine Le Pen is ahead in the polls to win the first round. Winning the second round is much more difficult, as she will need more than 50% of the votes, but investors could start to expect the unexpected after being blindsided in the UK and the US. Other considerations also support selling EUR/GBP. Data are consistent with a weaker EUR/GBP (Chart 44). The market is short both EUR and GBP, but long EUR/GBP, with the latest flows pointing to more EUR downside and GBP upside.

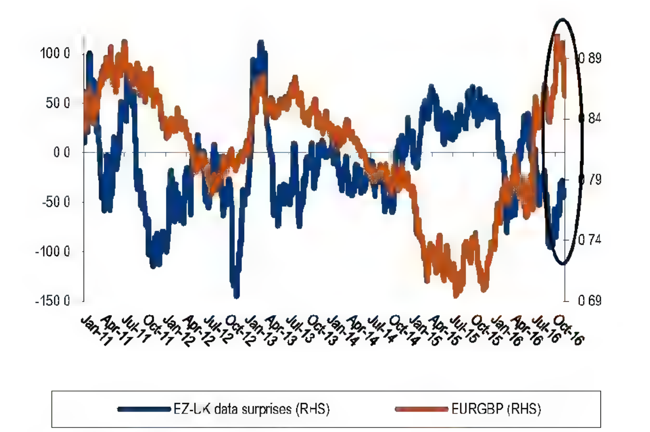
Using a spot reference of 0.8672, **we recommend selling EUR/GBP via a 6M 0.84/0.80 put spread, to capture both the referendum in Italy and the French elections, but also give time for GBP to recover in case it weakens further following activation of Article 50 in Q1. The structure costs 1.07% EUR**.

Chart 44: Positioning is short EUR but even more so in GBP



Source: BofA Merrill Lynch Global Research.

Chart 45: Data surprises suggest that EUR/GBP should be lower



Source: BofA Merrill Lynch Global Research.

Asia: short JPY/KRW

Positioning surveys generally indicate that the most consensus Asia FX trades at current juncture are short KRW and SGD against USD through and short SGD against the NEER basket and short CNH against a narrow version of CFETS basket. Not surprisingly, these two basket trades also form a part of our trade recommendations. In fact, these shorts might have increased after US election outcome due to fears of protectionism.

As a result, we believe that contrarian investors should be long KRW, CNY and SGD against USD or JPY. Amongst these, our favourite contrarian trade is long KRW vs JPY.

Three triggers

Three reasons why the current developments may ironically be positive for Korean Won:

- After a brief period of outflows from the equity markets, we believe inflows are set to resume. A sustained rally in S&P Index due to the anticipated de-regulation and fiscal push will undoubtedly be positive for KOSPI (given the high positive correlation) and as a result for KRW. Moreover, history suggests that the current sell off in rates and KRW is unlikely to spur considerable outflows from the debt market.

- It is still not very clear if the outcome of this US election is going to be negative for foreign trade. Should these concerns decrease, positive impact from looser US fiscal policy could push Asia growth higher.

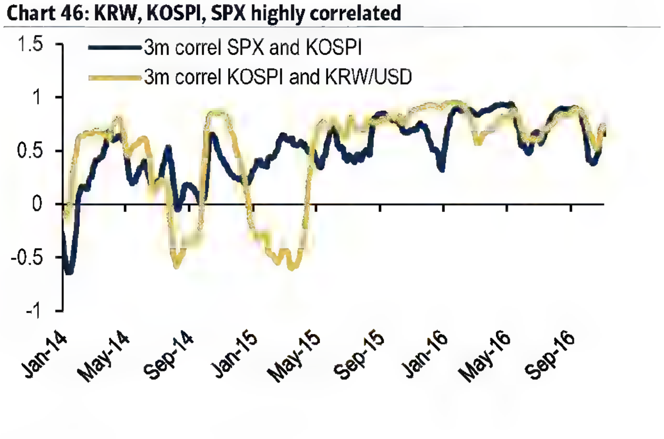
- The recent sell off in KRW vs USD from 1100 to 1150 is indicative that domestic concerns around politics, Hanjin shipping troubles and Samsung related issues seems to have been largely priced in. As a result, we believe that any additional domestic negative news is unlikely to adversely impact KRW materially.

Additionally, in terms of valuation, our long term COMPASS model indicates that the Korean Won is one of the most undervalued currencies in Asia.

JPY better than USD as funder

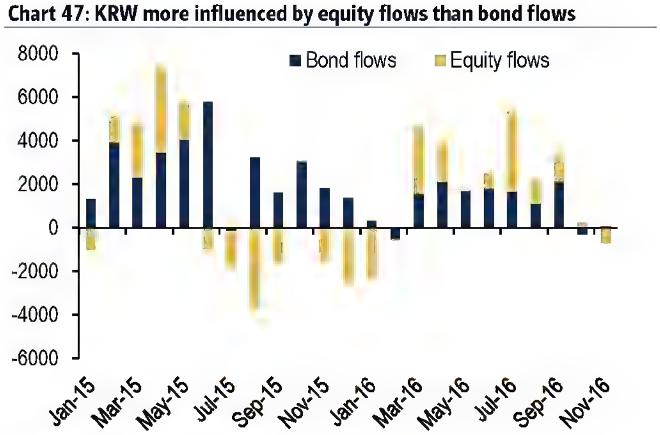
We believe it makes sense to express this contrarian view by short JPY instead of USD. Currently JPY/KRW is at 10.9 and our forecasts indicate it to be at 10.6 by Q4 2017. In the case of a stronger USD, we expect BOK to sound cautious with the pace of KRW depreciation and smooth the move higher in USD/KRW. Moreover, USD/JPY has greater sensitivity to USD rates than KRW.

Chart 46: KRW, KOSPI, SPX highly correlated



Source: BofA Merrill Lynch Global Research

Chart 47: KRW more influenced by equity flows than bond flows



Source: BofA Merrill Lynch Global Research

LatAm: short BRL/MXN

Our top contrarian trade in Latin American markets is selling BRL/MXN (spot 6.00, target 5.00, stop 6.75). The trade benefits from valuation, positioning and our views of the expected effects of the US election on the Brazilian and Mexican economies.

MXN 10% undervalued, BRL 5% overvalued

We estimate the Mexican peso is about 10% undervalued while the Brazilian real is about 5% overvalued, based on our Compass valuation model. The model provides estimates of long-run equilibrium trade-weighted exchange rates consistent with the convergence of current account balances toward levels that are in line with country fundamentals that determine savings and investments.

Mexico's real exchange rate index is at its lowest since at least 1999, and about 35% cheaper than its long-run average. Brazil's real exchange rate has risen sharply in 2016 and is now around 8% stronger than its long-run average (Chart 48).

LatAm under Trump's world

We believe the election of Donald Trump as the next president of the US will be negative to Latin American economies. His economic plan will likely involve a significant fiscal expansion, perhaps tighter monetary policy and some protectionist's measures. These will likely lead to higher US rates and a strengthening of the US dollar. Higher international interest rates are a negative shock for emerging economies and any acceleration in US economic growth will be skewed to domestic nontraded goods.

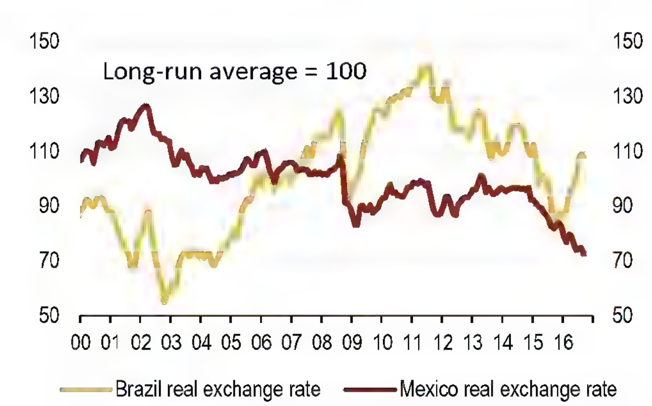
We think Brazil's economy will likely be more negatively affected since its strategy to gradually reduce budget deficits is based on low global rates, capital inflows and higher domestic growth.

Mexico, on the other hand, may benefit on relative terms from a construction and infrastructure boom in the US. Any revival in US manufacturing would also be good for Mexico, particularly if Trump's protectionist measures are not as substantial as feared.

Market is not positioned for a MXN rally and BRL selloff

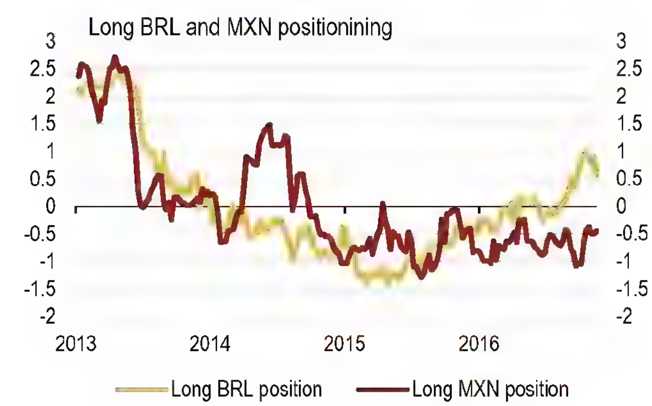
Selling BRL/MXN is a contrarian trade. Foreign investors are significantly long BRL according to our positioning index based on BM&F data. Market positioning by local investors is even more stretched toward long BRL. On the contrary, speculative investors are short MXN according our positioning index based on CFTC data (Chart 49). So positioning unwinding would actually help our short BRL/MXN strategy.

Chart 48: Real exchange rate is cheap in Mexico, expensive in Brazil



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 49: Market is positioned long BRL and short MXN



Source BofA Merrill Lynch Global Research, Bloomberg

EEMEA: long Turkey credit

Turkey has been one of the big underperformers among the major EM lately, and now valuations are the most attractive in a long time. Sovereign credit spreads are down to BB- levels even though the country is still rated as a BB+ credit (Chart 50). The lira which our Compass model has shown as overvalued for many years is now finally in line with the equilibrium of about 3.30 vs USD. The REER is almost down to the lows reached during the 2013 taper tantrum and 2015 China devaluation. In equities the discount vs GEM is at historical highs (Chart 51). So contrarians should get interested.

To be clear, we have been warning for a long time that the leverage and stimulus driven growth model was weakening and needed a boost through supply side reforms. And obviously political events have been manifold. But as we are talking about year-ahead trades rather than the near-term ideas, we believe it is worth noting that Turkish markets have a habit of alternating between bad and good years: 2010, '12, '14 good; 2011, '13 and '15 bad. After another bad year in 2016, one could consider a possible rebound in 2017.

Not a short-term trade

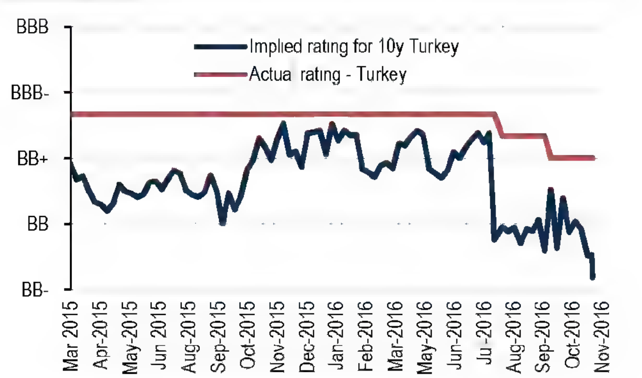
This is not a 1-month but rather a 3-6 months trade, where Q1 will likely be critical. In the short term, US rates volatility is harmful for countries like Turkey that have funded large current account deficits with short-term debt. This interacts with the local sentiment weakness that has lately resulted in rising deposit dollarization. An acceleration of this trend would now be the biggest risk to asset prices, in our view.

Before entering the trade we should see dollarization stabilize. Lately households have been net buyers of dollars for the first time since the coup attempt. We should see a couple of weeks of dollar selling to confirm that this potential risk is dissipating.

The trigger for a rebound from low valuations likely lies in a stabilization of sentiment which could occur during the first half of next year. Currently the state of emergency is scheduled to end in January, and the news flow suggests a referendum by April/May. In a positive scenario, politics calm down by the referendum which may also reduce the need for further stimulus through fiscal, monetary policy or moral suasion of the banks.

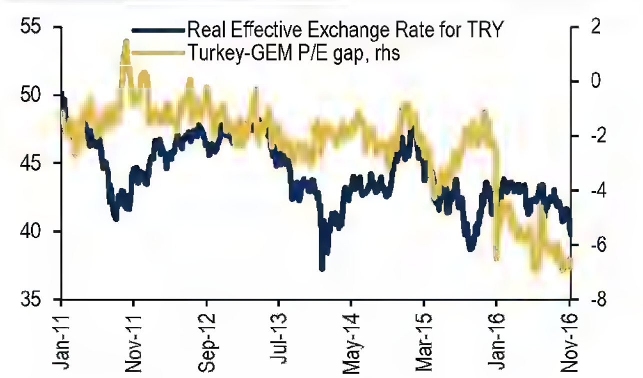
Among asset classes, we think Eurobonds provide the best risk/reward as the rating is a natural valuation "magnet", and the credit remains a solid BB+ fundamentally, in our view. Our preferred bonds would be the 26s (current: 5% for October 26s) on the 10y tenor and 45s (current 6.5%) on the long end. However, a rebound would also favor equities and local spreads. FX is least compelling as TRY has been asymmetric in recent years: big sell-offs and small recoveries. We think the reason is high inflation and a policy bias for a weaker exchange rate. In FX a positive view would be best expressed by selling the USD/TRY risk-reversal which is currently at around 5.0 and could target 4.0 in a scenario where the sovereign rallies back to BB+.

Chart 50: Turkey sovereign priced too cheaply at implied BB- rating



Source: BofA Merrill Lynch Global Research, Bloomberg,

Chart 51: Real effective TRY and Turkey equities near the 5-year lows



Source: BofA Merrill Lynch Global Research, Bloomberg, Haver, EPFR

Best Vol Trades

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Tension in Trump's policies are bullish for vol

- Weighing up the impact of fiscal easing vs protectionism and shifting from deflation to inflation risks should be bullish for vol.
- In rates, we see room for the belly of the curve to reprice to the dots. 2y1y should cheapen 75bp, vol is cheap vs rates and the skew the least expensive in that sector.
- In FX, we think vol and skew have room to reprice higher compared to the repricing seen in rates. We like cheapening a EURUSD put with a 3m30y strangle.
- In EM, USDCNH calls are attractive in our view. A stronger USD adds pressure to depreciate, while the risks of trade tariffs, labelling China a currency manipulator, etc could lead to a sharp re-pricing or risk premia higher.

Highest conviction in FX, belly of the US curve and CNH

We view Donald Trump's election as bullish for USD, bearish for real rates and challenging for EM. The inherent tensions in President-elect Trump's policy proposals, as well as the question marks over the Fed's reaction function should also support a repricing of vol higher, especially since neither FX, nor front-end rates volatility look stretched by historical standards.

However, expressing a view on long-end nominal rates is harder, and implications for rates vol are less clear. USD 5y5y breakevens are consistent with the Fed's definition of price stability for the first time in more than a year. In Europe, the sell-off in rates (both Bunds and BTPS) is tightening monetary conditions at a time when the ECB should do more, not less. Finally, the BoJ's yield curve control should provide an anchor for JGBs.

Consequently we focus on the following three trades:

11. Buying US$100mn 2y1y payer, struck at 2.50% (ATM+69bp)
12. Buying a EURUSD 3m 1.05 put, partly financed with a 150bp-wide 3m30y strangle
13. We recommend buying a 6m USDCNH 7.60 call

US rates to converge to the dots: attractive in vol

The view on long-end rates is complicated by the significant repricing of breakevens, the likelihood of the ECB doing more, and the BoJ defending its JGB yield target. We do, however, see room for a further increase in risk premia in the belly of the US curve. We believe that the market will ultimately view the Fed dots as a floor, rather than a cap. Supply pressures will weigh on the belly of the curve, rather than the long-end. This makes the cheapness of the upper left corner of the vol surface attractive.

As we look for a repricing of Fed expectations, to levels more consistent with the dot plot, **we recommend buying US$100mn 2y1y payer, struck at 2.50% (25-delta), i.e., ATM +69bp. The cost is US$165K, equivalent to 17bp of yield. We target a PNL of US$300K.**

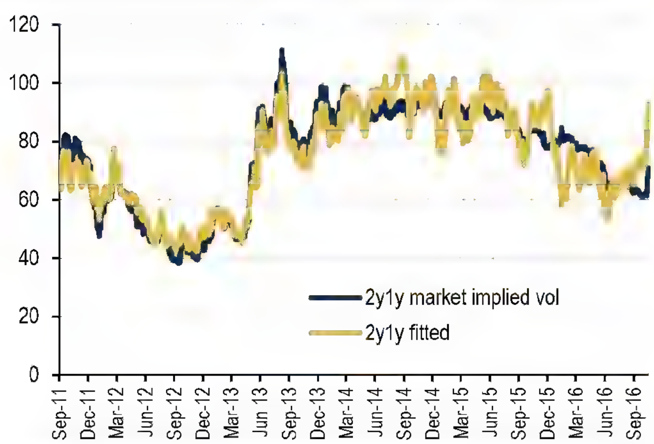
We estimate that it is in 3y1y, 2y2y and 2y1y that the selloff would be largest (75-85bp – see Table 5) were the OIS curve to align with the median dots up to end of 2019.

Options are attractive to position for a selloff in those forwards for two main reasons:

1. Volatilities in 1y and 2y tails appear to trade cheap on our macro model. More specifically, accounting for the relationship between implied vols and the first three principal components of the swap curve, we find that 2y1y implied vol should be trading 22bp normal higher (Chart 52), and 2y2y vol should be 19bp higher. A simpler historical regression of 2y1y vol vs the 2y1y forward rate also suggests normal vol should be around 21bp higher (Chart 53).

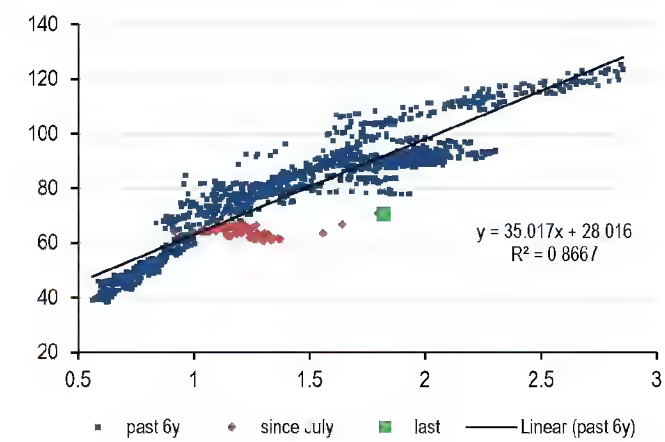
2. Payer skews could richen in 2y1y and 2y2y. While they are looking rich across 6M+ expiries in 1y and 2y tails (based on payer-ladder breakevens/ATM vol), we note that this has been the case for some time now and it's rather in gamma on 5y+ tails that skews now appear richest on a 6m z-score basis. Relative to what has been realized in the past month, the payer skew appears just fair in 2y1y, while it is rich across tails in longer expiries.

Chart 52: Market vs fitted level of 2y1y vol, based on macro model (*)



Source: BofA Merrill Lynch Global Research. (*) Based on a regression of log 2y1y vol) on the first three principal components of log of rates (derived with a PCA ran since Sep11). Rsquare 0.91

Chart 53: 2y1y implied vol is 21bp too low on a regression vs 2y1y fwd



Source: BofA Merrill Lynch Global Research

Another way to look at this trade is through an analysis of payout ratios for 25-delta OTM payers under the scenario of a convergence towards median dots. Table 3 below confirms that the 2y1y point is attractive relative to other forwards (2nd best), with a net payout ratio of 1.9 (2.9:1 gross) after three months. The best payer on that metric is the 3m5y 25-delta OTM payer (strike of 2.05%), which we recommend as an alternative for those confident that the repricing of the OIS curve to the dots will take place by Feb-17.

Table 3: Payoff ratios when buying a 25-delta OTM payer, under the selloff scenario where forwards converge to the levels implied by the median Fed dots(*)

Trade	3m1y	3m2y	3m5y	3m10y	6m1y	6m2y	6m5y	6m10y	1y1y	1y2y	1y5y	1y10y	2y1y	2y2y	2y5y	2y10y	3y1y	3y2y	3y5y	3y10y
Strike (25-delta), %	1.31	1.54	2.05	2.44	1.49	1.73	2.23	2.60	1.84	2 08	2.51	2 84	2.50	2.65	2.95	3.21	2.98	3.08	3.28	3.47
ATM forward, %	1.14	1.34	1.77	2.13	1.24	1.43	1.83	2.17	1.44	1.62	1.96	2 25	1.81	1.92	2.17	2.38	2.04	2.12	2.32	2.47
Premium, bp of yield	4.1	4.9	6.9	7.4	6.5	7.5	9.6	10.0	10.4	11.5	13.4	14.1	17.0	18.5	19.2	19.6	23.8	24.2	23.8	23.8
3m roll, bp of yield	-4.1	-4.9	-6.9	-7.4	-5.1	-5.4	-5.9	-5.4	-5.0	-5.0	-4.3	-4.2	-4.4	-4.3	-3.3	-2.8	-3.5	-3.2	-2.6	-2.2
3m selloff to the dots	11	31	59	48	18	30	54	45	35	58	65	45	75	80	65	45	85	74	57	45
Return, bp of yield	-4.1	-4.4	16.5	5.4	-0.6	3.8	16.0	10.7	9.3	21.3	24.8	13.2	32.6	35.1	26.4	16.3	39.6	33.5	24.2	18.3
Net payout ratio	**-1.00**	**-0.89**	**2.41**	**0.73**	**-0 10**	**0.51**	**1.66**	**1.08**	**0.90**	**1 85**	**1.85**	**0 94**	**1.91**	**1.90**	**1.37**	**0.83**	**1.66**	**1.39**	**1.01**	**0.77**

Source BofA Merrill Lynch Global Research. Data as of 15 Nov (*) 3m selloff to the dots = the selloff in the different forward OIS if the OIS curve aligns with median dots up to Dec 19, with a flat rate of 2.5% thereafter.

The risk to the 2y1y and 3m5y trades is a rally and/or decline in implied volatility, i.e., the reversal of the selloff recorded since the elections.

Own FX vs rates vol: cheapen USD call with rates strangle

We like **owning USD calls against selling US rates vol. In particular, we recommend buying a EURUSD 3m 1.05 put for US$100 pips (off 1.0730 spot), partially financed with the sale of US$100mn 150bp-wide 3m30y strangle (sold at US$600k)**.

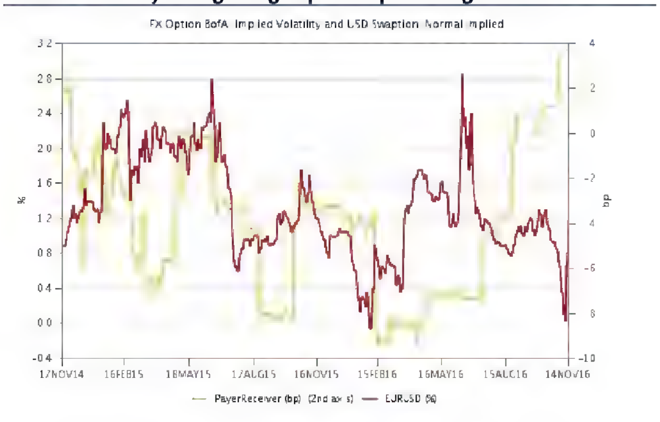
While potential fiscal stimulus has already been priced into rates term premia and rates volatility to some extent, it is not sufficiently priced into the FX market, in our view:

- Rates skew in gamma on long-tails has moved decisively for payers, while EURUSD skew is just beginning to price in higher US rates (Chart 59). This suggests to us that the market may already be partially protected against higher rates in the long-end, such that a further selloff may not see as strong a rally in gamma on long-tails.
- On the other hand, a further rally in the USD may catch investors under positioned and result in greater volatility in the currency markets.
- A principal component analysis of rates (US, EUR and JPY) and FX vols highlight that US rates vols and USDJPY vol are expensive, while 3m10y vol in EUR and JPY are cheap, along with EURUSD vol (Chart 60). While the cheapness of 3m10y vol in EUR and JPY can be explained by expectations of QE expansion in the two regions, we think that there is value in owning EURUSD vol.

From a terminal rates perspective, we are comfortable selling a 150bp-wide strangle for the following reasons:

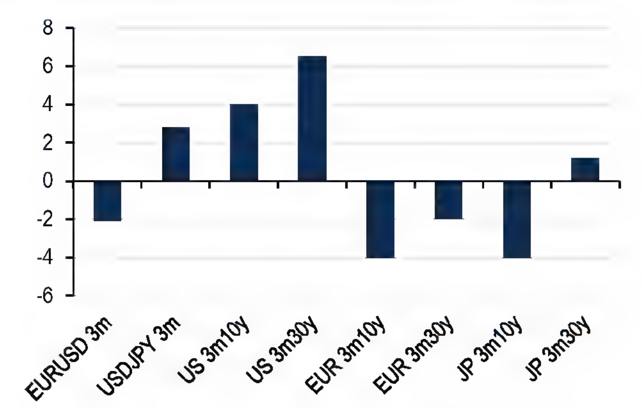
- We believe the result of the elections are a game-changer for the outlook on the US economy. As such we have probably entered a new regime for US rates whereby we are unlikely to retest the historical lows in 30y rates recorded in Aug-16 (1.67%). This suggests little downside in selling an ATM-75bp receiver (1.66% strike).
- In a scenario where US rates sell-off, USD is also likely to strengthen. The positive correlation between US yields and the USD has returned due to expectations for fiscal stimulus boosting economic growth. Furthermore, we would also argue that a substantial selloff in US rates, accompanied with USD strength may be self-defeating as it would put pressure on emerging markets and risky assets, thereby resulting in a flight to quality bid for USTs. The risk is that of large foreign reserve selling by EM central banks, putting upward pressure on US rates and downward pressure on the USD.

Chart 54: FX vol just beginning to price impact of higher rates



Source: BofA Merrill Lynch Global Research (*) payerReceiver – 3m30y 50bp OTM payer vol 50bp OTM receiver vol. EURUSD – 6m 25% OTM EURUSD put vol 25% OTM call vol.

Chart 55: Residual of FX and rates volatilities based on a 1y PCA (*)



Source: BofA Merrill Lynch Global Research(*) Residuals derived from the first 2 principal components of FX and rates volatilities based on a 1y Principal Component Analysis.

From a mark-to-market perspective, the risk to the trade is a further rise in 3m30y US rates vol, coming this time with a depreciation in the USD (risk-off event in the US).

Potential US-China trade barriers: bullish CNH vol

The Republican clean sweep has already sparked a strong USD rally and US rates selloff, but could put further pressure on the USDCNY exchange rate. A stronger USD by itself adds pressure to depreciate as China still needs looser financial conditions to maintain stability in the debt market, a relationship confirmed by the USDCNY rally following the 2015 Fed hike. With Trump's victory, we see increased risk of a larger depreciation.

Trump publicly labeled China as a currency manipulator on multiple occasions during the campaign, so any speculation of anti-trade policies could put significant depreciation pressure on the Renminbi. Potential trade tariffs on Chinese exports to the US could raise the probability of a trade war. Furthermore, Trump could encourage the Treasury to alter its criteria for labelling currency manipulators, which could also hurt trade relationships. Either scenario would lead to a sharp re-pricing of risk premia higher.

The Trade: Buy USDCNH 6m 7.60 call

We recommend buying a 6m USDCNH 7.60 call for 0.37% USD (off 6.9700 forward), with a target of 1% USD. USDCNH topside is now at the cheapest levels since the August 2015 depreciation (Chart 56). The trade could benefit from either a rally in spot as well as any increase in the risk premium between now and inauguration on speculation of anti-trade policies. The structure appreciates significantly from increases in volatility, which is plausible given the 300% increase in volatility in August 2015 and the 100% increase from October 2015 to February 2016. The risk to the trade is that China increases capital controls and dampens USDCNH appreciation, which could cause the options to expire worthless.

Chart 56: USDCNH topside the cheapest since pre-depreciation

Source: BofA Merrill Lynch Global Research

Table 4: Hypothetical trade performance on Inauguration Day (Jan 20th)

Spot	Vols unchanged	Vols 20% higher	Vols 50% higher	Vols 100% higher
6.8	-81%	-49%	24%	197%
6.9	-68%	-30%	41%	235%
7	-51%	-5%	100%	278%
7.1	-32%	49%	132%	305%
7.2	0%	103%	170%	378%
7.3	49%	122%	232%	441%
7.4	124%	200%	305%	522%
7.5	224%	319%	441%	630%
7.6	386%	470%	565%	741%

Source: BofA Merrill Lynch Global Research

Stress testing CNY

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Stress testing CNY

- We stress test China's FX reserves to capital outflows and warn of a potential USD520bn fall in FX reserves in 2017, translating into higher CNY volatility.
- We also look at broader EM FX sensitivity to CNY depreciation and find ZAR and RUB most vulnerable.
- We examine if bond index and MSCI inclusion could significantly offset outflows, but are doubtful for now.

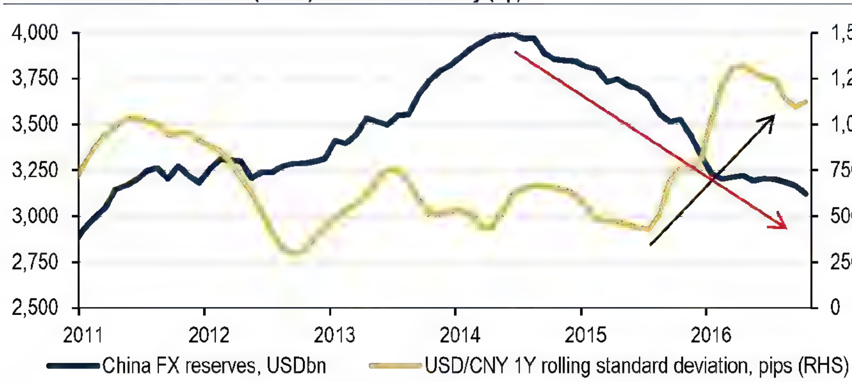
CNY – anything left in reserve?

We forecast USD/CNY to rise to 7.25 by year-end 2017 based on sustained capital outflows from China and the People's Bank of China (PBoC) allowing the exchange rate to depreciate accordingly. A key change in the PBoC's new FX regime, announced in August 2015, is to raise the influence of market forces over the exchange rate.

We showed that not all outflows are created equal. Some outflows are good and reflect structural changes in China's economy and liberalization of China's financial account; some outflows are ugly in the sense they represent illicit outflows. Yet both types of outflows are influenced by policy uncertainty in China, which we showed can explain a significant amount of capital outflows through Chinese purchases of overseas assets.

The impact of capital outflows alone on China's FX reserves is negative. A decline in FX reserves is also associated with an increase in volatility of the RMB (Chart 57). But the negative impact on FX reserves may be offset by China's trade balance. If China's trade balance and capital outflows are similar to that recorded in 2015 and 2016, then China's FX reserves would be between USD 2,600bn and USD 2,900bn in 2017. This represents a fall of USD520-220bn given current FX reserves of USD3,120bn and would amount to China having diminished control over its currency and higher CNY volatility – assuming no dramatic changes to capital controls.

Chart 57: China FX reserves (down) and RMB volatility (up)



Source: BofA Merrill Lynch Global Research, Bloomberg

Table 5: Scenario analysis of China's 2017 FX reserves (yellow denotes lower reserves/ blue higher)

Capital outflow, USDbn \ Trade balance, USDbn	100	150	200	250	300	350	400	450	500
300	2,885	2,935	2,985	3,035	3,085	3,135	[illegible]	3,235	3,285
350	2,835	2,885	2,935	2,985	3,035	3,085	3,135	[illegible]	[illegible]
400	2,785	2,835	2,885	2,935	2,985	3,035	3,085	3,135	[illegible]
450	2,735	2,785	2,835	2,885	2,935	2,985	3,035	3,085	3,135
500	2,685	2,735	2,785	2,835	2,885	2,935	2,985	3,035	3,085
550	2,635	2,685	2,735	2,785	2,835	2,885	2,935	2,985	3,035
600	2,585	2,635	2,685	2,735	2,785	2,835	2,885	2,935	2,985
650	2,535	2,585	2,635	2,685	2,735	2,785	2,835	2,885	2,935
700	2,485	2 535	2,585	2,63	2016 rate	735	785	2,835	2,885
750	2,435	2,485	2,535	2,585	[illegible]	685	2,73	2015 rate	835
800	2,385	2,435	2,485	2,535	2,585	2,635	2,685	[illegible]	785
850	2,335	2,385	2,435	2,485	2,535	2,585	2,635	2,685	2,735
900	2,285	2,335	2,385	2,435	2,485	2,535	2,585	2,635	2,685

Source: BofA Merrill Lynch Global Research, Bloomberg. 2016 rate is annualized from the first 3 quarters of data.

Table 5, above, shows a scenario analysis of China's FX reserves in 2017 under different trade balance and capital outflows. The analysis makes two assumptions. The first assumption is all the changes in the Balance of Payment's (BoP) reserve assets are reflected in the headline FX reserves figure. The second assumption is that the income balance is USD -36bn, which was derived from the annual rate since 2015.

We believe a decline of FX reserves to USD 2,600bn to USD 2,900bn would only be a problem for China if it attempted to implement a "fixed exchange rate" without capital controls. Such an FX regime requires heavy FX intervention and would put downward pressure on its FX reserves, making this FX regime choice no longer tenable for China.

The IMF's framework for calculating adequate FX reserves is based on whether there are capital controls and whether the currency operates on a fixed or floating exchange rate regime (Table 6). The latest readings show a fixed exchange rate regime without capital controls in China would require USD 2,911bn of FX reserves, which probably won't be achieved, as shown in Table 1. Meanwhile, a floating exchange rate regime with no capital controls would require USD 1,618bn of FX reserves. Fewer FX reserves would be needed to manage a floating currency that would adjust freely to capital flows. This reinforces the view that the CNY is moving toward a more flexible FX regime as its FX reserves are depleted (barring a draconian step capital control measures).

Skeptics may counter that China could always ratchet up capital controls to reassert control over its currency. However, the efficacy of this is questionable. The experience of 2016 shows that in spite of more capital controls introduced in late 2015 (e.g., onshore window guidance restricting the sale of FX by onshore banks) capital outflows have continued along with FX reserve depletion, albeit at a slower pace. Ultimately, this means China's ability to exert control over the CNY is being eroded, while the risk of more CNY volatility is rising. This is our scenario for 2017, with the tail risk that "ugly flows" or illicit capital flight due to domestic financial stability concerns could drive sharper CNY depreciation and FX reserve depletion. It is under this tail risk scenario that the temptation for draconian capital controls becomes a danger. For this reason, we believe it will be important to monitor the nature of the capital outflow and not just the size of the outflow. Good outflow such as Overseas Direct Investment by state-owned

Table 6: China reserves adequacy recommendations based on IMF guidelines

	Latest, USDbn	Capital control				No capital control			
		Fixed		Floating		Fixed		Floating	
		Weight, %	USDbn	Weight, %	USDbn	Weight, %	USDbn	Weight, %	USDbn
Short-term debt	767	30	230	30	230	30	230	30	230
Other liabilities	961	20	192	20	192	20	192	15	144
Exports	2,156	10	216	10	216	10	216	5	108
Broad money	22,728	5	1,136	2.5	568	10	2,273	5	1,136
Recommended reserves			**1,774**		**1,206**		**2,911**		**1,618**

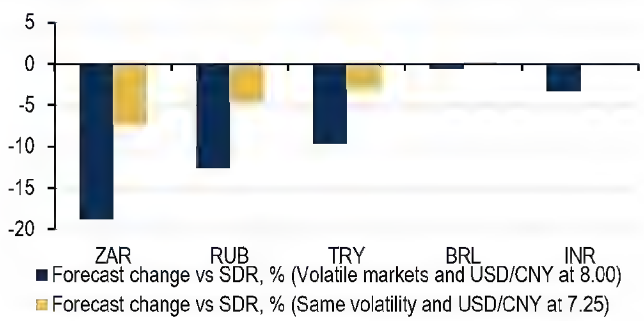
Source: BofA Merrill Lynch Global Research, Bloomberg, SAFE firms can be naturally slowed by internal directives. Bad outflow such falling CNY deposits among foreign subsidiaries of China banks can also be managed. However, it is the inherent speculative and unstable nature of domestic capital flight that we characterize as ugly flows that poses the greatest risk to the central bank.

Regressions and scenario implications for EM FX

We used a simple regression to quantify the impact of the RMB depreciation on key EM FX: BRL, RUB, INR, TRY, and ZAR[1]. We analyzed two cases: 1) Base case – USD/CNY rises to 7.25 and market volatility, which we use the VIX as a proxy, is unchanged from its current level; 2) Risk case – USD/CNY rises to 8.00 and intense RMB depreciation expectations cause market volatility to rise by three standard deviations. We find:

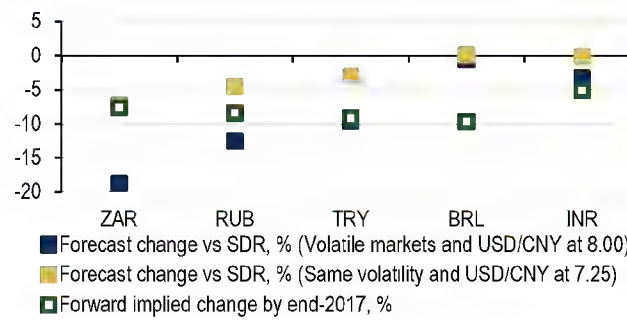
- The most vulnerable currencies to RMB depreciation are ZAR, RUB and TRY (Chart 58). The impact of RMB depreciation on BRL and INR is small. This is probably due to stronger idiosyncratic factors for BRL and INR in recent years.
- An increase in market volatility associated with USD/CNY rising to 8.00 would raise the depreciation of EM FX by 1ppt (BRL)-11ppt(ZAR) relative to our 7.25 baseline.
- In our base case of USD/CNY rising to 7.25 by end-2017, the market is overpricing depreciation pressures from the RMB on EM currencies. This partly reflects other factors have more sway over market expectations at the time of writing, such as implications of the US elections outcome.
- In our risk case of USD/CNY rising to 8.00 and high volatility, there is room for additional depreciation in the ZAR and RUB (Chart 58).

Chart 58: EM FX sensitivity to RMB and market volatility



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 59: Scenario analysis of EM FX against market pricing



Source: BofA Merrill Lynch Global Research, Bloomberg

Can bond and equity inflows save the day? Not in the near term

Given the problematic issue of capital outflows and limited efficacy of moderate capital flows, another solution could be to attract more foreign portfolio inflows into China's sizable bond and equity markets. More favorable investment policies geared to overseas investors investing in China's interbank bond market reveal a clear policy intention to open up China's financial market. As a result, expectations are rising for China to be included in global bond indices. However, the following key obstacles for index inclusion remain, although reasons vary depending on the index: 1) lack of full accessibility: currently qualified investors only include medium and long-term investors while hedge funds are excluded; 2) insufficient clarification on requirements of fund remittance; 3) lack of clarification on tax issues; 4) lack of accessibility to onshore FX/rates hedging tools. Back from our 2016 China Conference, we believe allowing foreign private investors to access onshore repo, onshore FX swap and forwards would be the next steps to follow.

[1] Our dependent variable is the weekly changes of SDR/EM; our independent variables are the weekly changes in the SDR/EUR, SDR/CNY, SDR/USD and the VIX index, and a constant. Natural logarithms were taken for all variables and our sample period is Jan'14-Nov'16, when the start of the RMB depreciation trend. We base our currencies against the SDR to define their value (See Assessing China's Exchange Rate Regime, Frankel and Wei (2007) for a detailed explanation.). To compute the forecast change in each currency, we use our global FX forecasts to obtain our independent variables.

The most influential global bond index is believed to be the Citibank World Government Bond Index (Citi WGBI), which is used as the benchmark for more than $2tn of AUM. The most influential EM bond index is the JPM Government Bond Index – Emerging markets Global/Diversified (JPM GBI-EM Global/Diversified), which is used as the benchmark for about $200bn AUM and caps each country's share to 10%. A caveat, however, is that the actual size of indexed money or ETFs should be smaller. The most crucial country criteria of Citi WGBI is "fully accessible to foreign investors," which makes China less likely to be included by far given its accessibility to only medium- and long-term investors. Even if China is being considered, the assessment usually takes a long time. So we believe the case for China to be included into Citi WGBI in 2017 is unlikely.

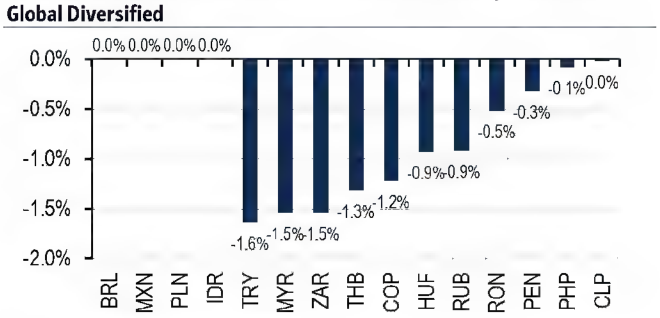
By contrast, JPM GBI-EM Global/Diversified only requires accessibility to the majority of foreign investors and does not factor in tax hurdles in eligibility. We believe China has better chance to be included into the JPM GBI-EM Global/Diversified index. While the exact timing is hard to predict, an optimistic scenario possibly leaves 2H17 on the table. Usually when a big country is being included, bonds are introduced slowly over many months to enable clients to rotate without too much disruption.

We would expect China's inclusion to account for 10% of the JPM GBI-EM Global Diversified index. Turkey, Malaysia, S. Africa, and Thailand would lose the largest shares in the index, while the shares of Brazil, Mexico, Poland and Indonesia are expected to remain given their large absolute size. Inflows to China could be around $20bn, or equivalent to 1.5% of the aggregate central government bond market cap. Turkey, Malaysia, S. Africa, Thailand and Columbia could see outflows of $2.4bn-3.3bn each, with the most expected impact on Thailand given its lower relative foreign ownership. We would expect China to account for 4.4% of the Citi WGBI index. The biggest losers of market share will be the US, followed by Japan and Europe. Inflows to China could be around $87bn, or 6.5% of its CGB market cap. This would present a very bullish scenario for CGBs, and the curve will likely steepen.

MSCI inclusion – more about good will, then real flow

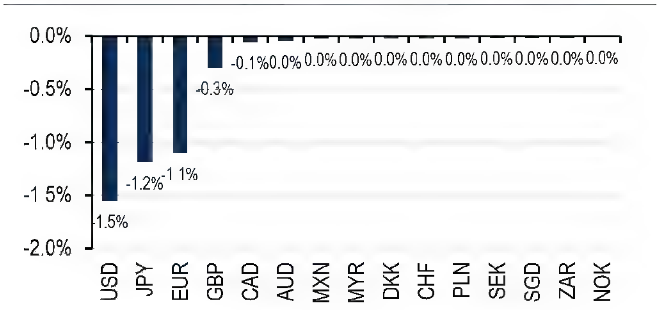
Another potential implication of China capital account opening is equity inflows. The MSCI has been considering the inclusion of China A-shares in its index. These are shares of local Chinese companies trading at the Shanghai and Shenzhen stock exchange, whose trading is so far limited to local investors (China: Will A-shares be included in MSCI in June this year?). The associated flows aren't likely to be too large, so positive price reaction is likely to come mostly from sentiment. The MSCI has discussed most recently a 5% inclusion factor for A-shares, which would translate in an additional 1.1% MSCI weight of China in the index. The scope for additional foreign capital looks small, when considering that China already weighs 27% in the index. Our equity strategists estimate the total AUM tracking MSCI EM to approximately USD1.6tn (total market cap of the index is USD3.8tn), so that inflows upon inclusion would be roughly USD16bn. The inclusion was delayed in June 2016, mainly due to obstacles regarding the quota allocation process, capital mobility restrictions and beneficial ownership.

Chart 60: Estimated loss of share if China is included in JPM GBI-EM Global Diversified



Source: BofA Merrill Lynch Global Research

Chart 61: Estimated loss of share if China is included into Citi WGBI



Source: BofA Merrill Lynch Global Research

Best Carry Trades

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Carry trades and blond swans

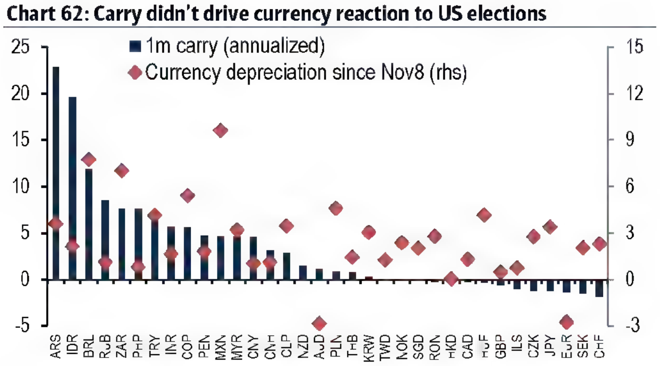
- We do not expect traditional carry trades such as ARS and BRL to perform well in a strong USD and increasing interest rates environment, so we focus on USD neutral carry trades.
- We like short EUR/RUB, short SGD/INR and long PEN/CLP. For more neutral commodity exposure we like baskets of EUR, CAD, COP and CLP, AUD to fund RUB and PEN trades respectively.

Carry is in the eye of the beholder

To focus on identifying best carry trades in the current environment of rising US interest rates sounds counterintuitive at least. It is well know that carry trades perform nicely in risk-on periods as well as in a low volatility environment, which is the opposite of what we expect in the coming months. However, once proper factor exposure of currency returns is considered, smart carry reemerges as an interesting proposition. As we have documented (Forecasting with Compass30), most of the variation in currency returns can be explained by the first two principal components, which can be labeled as dollar and carry factor respectively, as they are highly correlated with USD and carry performance.

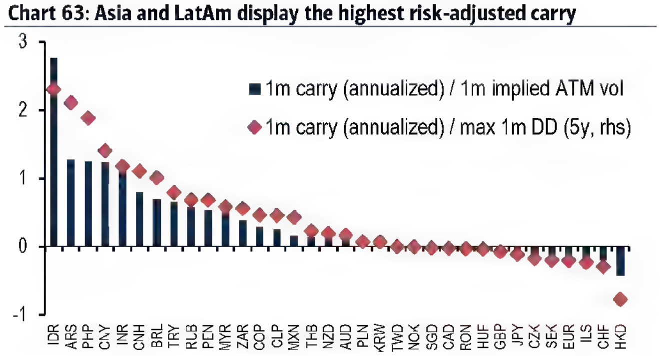
Expected returns of carry strategies are defined by interest rate differentials (ie, carry), assuming no change in spot exchange rates. Uncovered interest parity states that the carry should be offset by a change in the spot of equal magnitude. However, empirical evidence (so called forward premium puzzle) clearly shows that carry trades are profitable on average, which indicates the presence of currency risk premium. Since both dollar and carry, are priced factors, any sensible carry strategy in an environment in which US rates are rising needs to hedge the USD exposure. This is just a necessary though not a sufficient condition, since the carry factor is also correlated with global measures of risk. Interestingly, post-election currency losses is not as highly correlated with carry, indicating that carry trades were not as a strong investment theme as it was the case during the taper tantrum episode (Chart 62).

Chart 62: Carry didn't drive currency reaction to US elections



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 63: Asia and LatAm display the highest risk-adjusted carry



Source: BofA Merrill Lynch Global Research, Bloomberg

Characterizing carry

Efficient carry strategies involve buying and selling dynamic portfolios of currencies with certain risk characteristics. Carry strategies are supposed to work better over long investment horizons, so that the cushion provided by the carry compensates for the currency volatility through mean reversion.

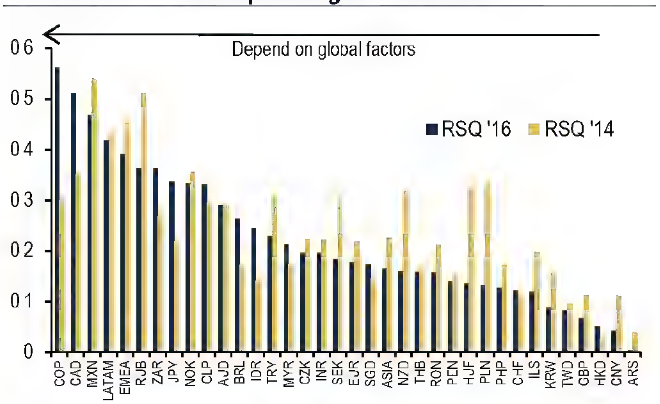
Here, we analyze carry from a different perspective, as our goal is to identify standalone attractive carry opportunities. We define the investment horizon to end 1Q17. We sort currencies based on risk-adjusted carry. We then characterize the factor exposure of currency returns, isolating global and idiosyncratic sources of risks, in order to identify smart carry trades that are not highly exposed to a massive re-pricing of global factors, such as US rates, USD, commodity prices and global risk aversion. We identify carry trades that have low exposure to global factors, in particular the USD factor, and offer attractive risk-rewards.

Not surprisingly, purely based on carry considerations, EM currencies appear more attractive than DM ones, which are mostly candidates for funding currencies. However, carry trades returns are highly volatile, exhibit negative skewness and fat tails. Even controlling for different measures of risk such as volatility or maximum drawdown, and according to this criteria only, we find that EM currencies are the most attractive, in particular ARS, BRL in LatAm, RUB, TRY and ZAR in EEMEA and INR, IDR and CNY in Asia (Chart 63).

Even though volatility and drawdowns can be useful measures of risk, they don't say much about the exposure to different risk factors. Since carry trade strategies are usually very sensitive to global factors, we study the cross sectional exposure of currencies to key global factors: commodity prices, global risk aversion and US yields (as a proxy of global yields). We report the R2 of regressions of two years of weekly returns on the above mentioned global factors, for the last two years and the years 2013-2014 for the sake of comparison (Chart 64).

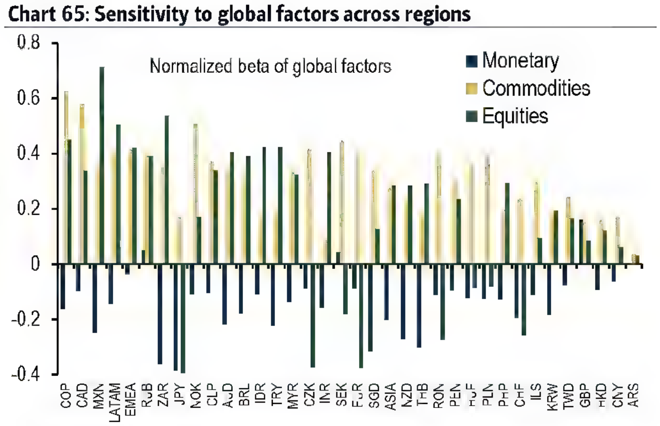
We find that currencies in LatAm and EEMEA are more exposed to global factors than in Asia. Interestingly, LatAm and EMEA currencies are more sensitive to shocks in commodity prices and risk aversion, while in Asia the shocks to monetary policy are the most important ones (Chart 65). Within DM currencies, AUD and NOK are the two currencies most exposed to global factors. Ideally, we seek for currencies with high risk-adjusted carry and low exposure to global factors. Under such a metric, ARS, BRL, RUB and INR stand out as the best investment currencies, while EUR, CHF, JPY, KRW and TWD are the best funding currencies. However, this filter is not enough in the current volatile environment.

Chart 64: LatAm is more exposed to global factors than Asia



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 65: Sensitivity to global factors across regions



Source: BofA Merrill Lynch Global Research, Bloomberg

The role of fundamentals

From a purely mechanical perspective, we could stop the analysis here and choose those currencies with better risk-reward prospects according to the metrics so far described. However, in order to analyze carry trades with relatively short investment horizon, we need to complement our analysis with our views on future exchange rates dynamics.

We expect US rates to continue moving higher and the USD to strengthen across the board due to easier US fiscal policy and significant uncertainty regarding foreign policy. In EM, we think LatAm is the region that will suffer the most in the new global scenario, followed by Asia. We find EEMEA relatively more resilient to US driven shocks. We want to avoid countries with high financing needs (i.e., high fiscal and current account deficits). We also prefer trades with neutral commodity exposure. Since carry trades tend to underperform when US rates are moving higher and the USD strengthens, we want at least to avoid USD funded carry trades, crowded carry trades and currency crosses highly exposed to the USD factor. Hedging the USD factor leaves us with the pure carry exposure, which by being a price factor, is also related to standard measures of risk, as well as idiosyncratic factors.

Best carry trade: Cherry picking among rotten cherries

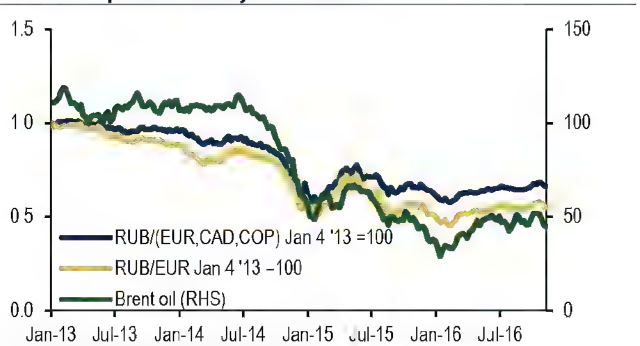
Given our views, and focusing on those trades where ex-ante high carry is consistent with ex-ante expected returns, we choose our best carry trades across EM and DM. Since DM currencies offer very low carry vs the USD, there are not many attractive carry opportunities in DM in a strong USD environment, so much so that the most attractive carry proposition is simply to go long USD/JPY. Since this trade is mostly predicated on a strong USD view and is being developed in other sections of this report we refer the reader to those sections (please see: USD/JPY will the main beneficiary of Trump win, FX: GOP sweep emboldens core USD/JPY view, Long EUR/JPYAsia: short JPY/KRW). Therefore, we focus mostly on EM or EM/DM carry trades.

EEMEA: short EUR/RUB

We like selling EUR/RUB (spot 69.28, target 66.15, stop 71.02). We see EEMEA as relatively more resilient to higher US rates, though with some heterogeneity within the region. On the one hand, high current account deficit countries like Turkey or South Africa should continue suffering from a re-pricing of risk. On the other hand, CEE countries are expected to some more resilience. One currency we find particularly attractive is the Russian ruble, which still offers an attractive risk-adjusted carry, controlling for standard measures of risk such as implied volatility and maximum drawdown. The outcome of the US election should remove some risk premium from Russian assets as the geopolitical backdrop improves. Economic activity is expected to pick up in 2017. A hawkish central bank, coupled with a favorable external position and an energy-driven current account surplus will likely limit its exposure to a reversal in capital flows.

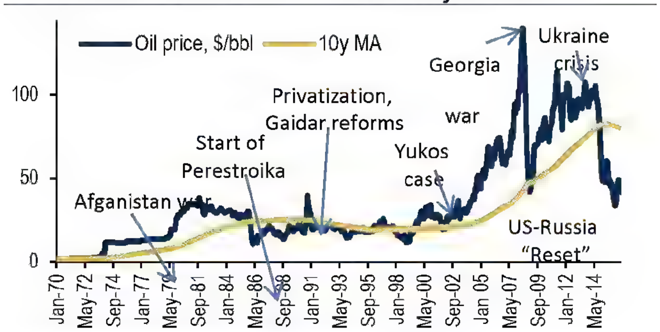
On the geopolitical side, we expect Russian foreign policy to become more conciliatory

Chart 66: Oil prices are a major risk factor



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 67: Russia tends to be more market-friendly with lower oil



Source BofA Merrill Lynch Global Research, Bloomberg and less disruptive for markets, in particular given the expected improved foreign relations with the US (Chart 67). However, the currency remains overvalued and highly exposed to global factors, in particular oil price, and positioning is crowded. Despite our forecast is for USD/RUB to remain around 63 in 1Q17, we prefer to mitigate the above-mentioned risks by choosing a more favorable funding currency.

If liquidity is a major consideration, we prefer to use the EUR as a funding currency, which offers negative carry vs the USD, and gives the ruble the best risk-adjusted carry across all potential funding currencies. In addition to the already seen impact on US rates, Trump's victory implies that political risks are becoming increasingly important in Europe, with the Italian referendum in December and elections in Netherlands, Germany and France in 2017. This scenario strengthens our call for a six-month extension to ECB QE at the current pace. We expect the EUR/USD to trade at 1.05 by end 1Q17.

Since short EUR/RUB is still exposed to much lower oil prices, an alternative way to express the trade is to use a basket of euro, Colombian peso and Canadian dollar as funding basket (Chart 66). The COP remains overvalued, the central bank is expected to ease monetary policy as the economy decelerates and oil represents 35% of Colombian exports. We expect the COP to depreciate 2.5% by end 1Q17. Carry, on the other hand, is higher than EUR and CAD. The CAD offers very low carry and we forecast a 1.5% depreciation by 1Q17 vs the USD. The economy keeps displaying weak growth and we expect the Bank of Canada likely to cut rates and maintain the accommodative stance of monetary policy.

Asia: short SGD/INR

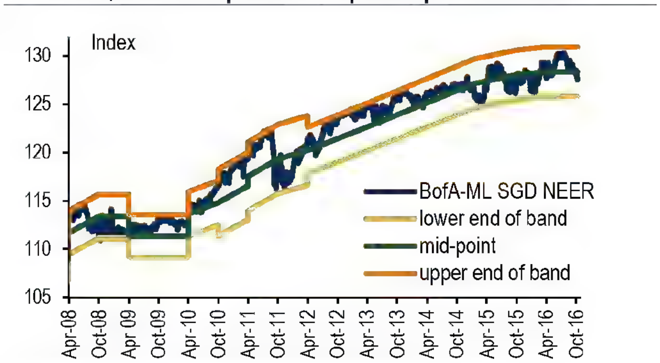
We like short SGD/INR (spot 47.96, target 47, stop 48.44). While the performance of Asia FX can be influenced by broader risk conditions, we expect most to weaken vs. the USD. The Korean won and the Singapore dollar, as well as the Taiwanese dollar for instance stand out as being the most sensitive to a stronger USD, as they act as a high beta proxy for CNY, which we expect to continue depreciating in this new high US rates environment. Others like Indonesian rupiah and Malaysian ringgit are more sensitive to higher USD rates. Consequently, outflows from these countries will adversely impact the respective FX. That said, Bank Indonesia has built good amount of reserves to prevent rupiah from weakening excessively. Moreover, tax amnesty related repatriation flows and global bond issuance is still expected to come in December, which should also support the rupiah.

Historically, large US tax cuts have been followed by a widening of the US current account deficit driven by higher imports. This supported Asia export growth and exchange rates, especially after the Bush tax cuts. However, this time could be different partly because US household spending has been shifting towards non-tradable services. More importantly, Trump's policy platform itself is geared towards reducing dependence upon foreign goods and services (Chart 68).

Chart 68: Export exposure to the US across EM Asia

Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 69: S$NEER has depreciated 50bp below par since Oct MPS



Source: BofA Merrill Lynch Global Research estimates, Bloomberg

At this juncture, the Indian rupee seems to be the only one in the region that is expected to display a much lower sensitivity to US rates, outperforming others within Asia. We expect the Monetary Authority of Singapore to keep the SGD NEER in the weaker side of the band for the next few months, which reduces the downside risk for the trade (Chart 69). We like the INR as the preferred long, followed by the IDR, as they offer high risk-adjusted carry, central banks are interested in keeping their currencies stable, current account deficits are bounded, and the currencies are not expensive relative to long term fundamentals. The main risk of the trade is of higher oil prices, and considerable reversal of capital flows. Apart from that, a change in the behavior of Reserve Bank of India it terms of managing INR to accumulate international reserves is also a risk.

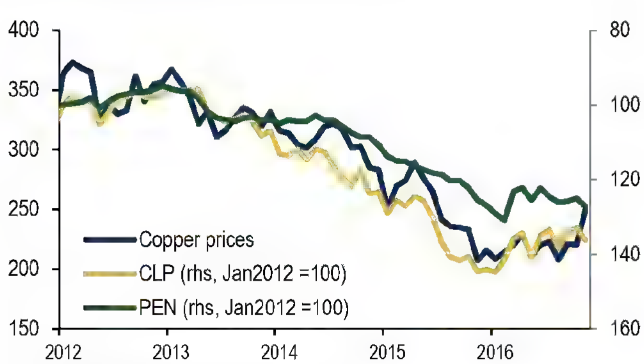
LatAm: long PEN/CLP

We like long PEN/CLP (spot 195.7, target 200, stop 195.5). LatAm is the most exposed region within EM to global factors. Traditional carry trade candidates like the Brazilian real and the Argentina peso are no longer attractive given the still fragile fiscal stance in both countries. Local positioning in BRL has proven to be heavier than thought, and we expect the currency to continue weakening until we observe some stabilization in US rates. The Brazilian real is still overvalued and the economy will be negatively affected since its strategy to gradually reduce budget deficits is based on low global rates, capital inflows and higher domestic growth. In the case of the Argentine peso, despite showing some detachment from global factors and some positive inflows due to the tax amnesty, we think the currency needs to weaken given the recent depreciation of the BRL and its current overvaluation as well as the government fiscal needs for 2017, which is an important electoral year. Therefore, we remain neutral on these currencies.

A more modest but more interesting carry trade within LatAm in an environment of higher US rates is to be long the Peruvian sol, funded with the Chilean peso, in order to make the trade more neutral to commodity exposure. The Peruvian economy is expected to continue growing at rates above 4% due to strong mining activity; the new government will likely implement expansionary fiscal policy and has room to finance it. The exchange rate is close to its equilibrium value based on terms-of-trade and productivity. In fact, we expect the currency to appreciate in real terms if growth recovers as predicted. The currency still offers a decent carry. We forecast a nominal depreciation but below the forward. The central bank has a strong preference for low currency volatility and would be ready to intervene in case of a disorderly depreciation, as it has been already the case in the last few days with small interventions in the forward market.

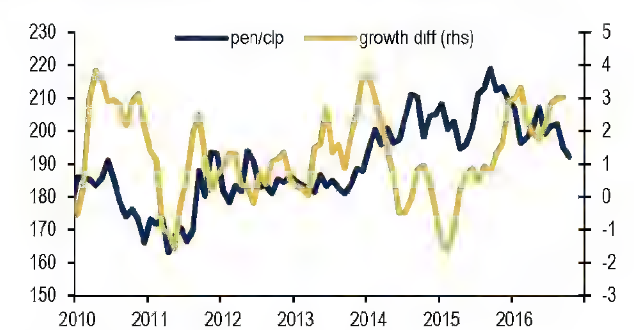
On the other hand, Chile's growth remains anemic and the economy is expected to continue growing sub 2% in 2017 (Chart 71). The CLP is overvalued but recent flows

Chart 70: Copper prices are a major risk factor



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 71: Relative growth to favor Peru going forward



Source: BofA Merrill Lynch Global Research, Bloomberg, Haver from large domestic pension funds and the recovery in the price of copper explain the relative resilience of the currency (Chart 70). Given the low carry, CLP offers an attractive alternative as a funding currency as the portfolio rebalancing of pension funds is expected to slow down. We expect the currency to weaken further in 1Q17 as interest rates move higher in the US, and we do not expect the central bank to intervene, as it would likely be the case in Peru. In order to reduce the carry cost of the funding currency without losing the neutral exposure to metals, we like a basket of the Chilean peso with the Australian dollar. The Australian dollar is also highly correlated with commodities and China. We are bearish the AUD vs USD, as we expect the currency to weaken about 4% by end 1Q17.

Cheapest tail-risk Hedges

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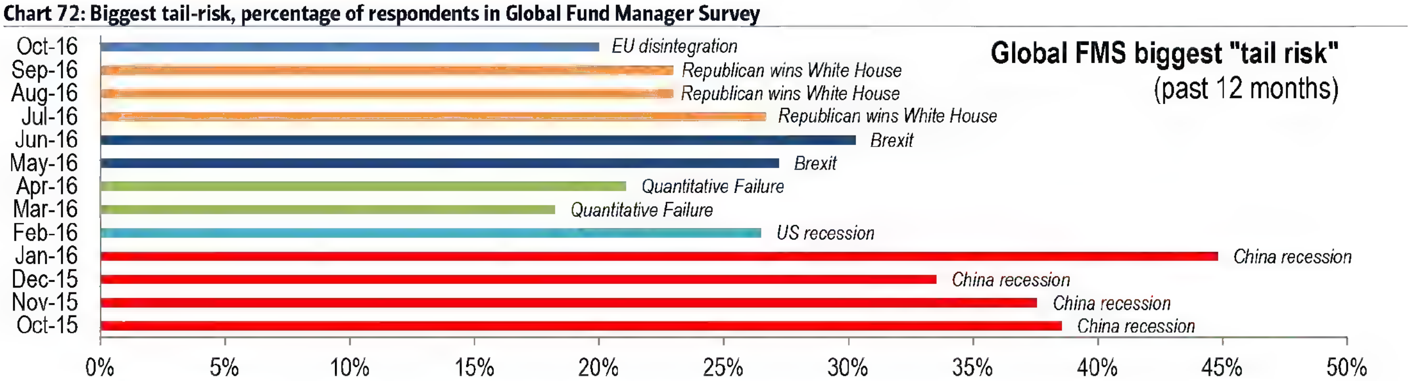
Tail-risk Hedges

- Four tail risks for 2017: 1) US deregulation, 2) EZ risk premia rises; 3) weaker bulk commodity prices; 4) steeper and more volatile yield curve in Japan.
- Position for normalization of swap spreads; 30s50s BTP flattener; long EUR/HUF vol; long AUD/USD digital puts; 1y10s20s conditional bear steepener in Japan.

There are three key lessons on tail risks from 2016: 1) tail-risk probabilities are generally "fatter" than commonly assumed (Brexit and Trump's victory); 2) hedging tail risks even in a world of low implied volatilities is hard if the directional implications are unclear (equity puts for a Trump victory); 3) investors worry about tail risks closer to the events – Chart 72 shows the biggest perceived tail risks, according to our Fund Manager Survey, were either during the event itself (China recession worries alongside capital outflows) or at most a few months in advance (Brexit and the US election).

Looking ahead to 2017, we believe tail-risk hedging will be more important than ever, but that investors should be sufficiently forward looking and focus on those where there is clarity about the directional implications. We highlight four such opportunities in this section, specifically: 1) US deregulation; 2) return of Euro zone risk premia; 3) China-linked commodity prices weakening sharply; and 4) Japan's yield curve targeting triggering a steeper curve and volatility increase.

Chart 72: Biggest tail-risk, percentage of respondents in Global Fund Manager Survey



Source: BofA Merrill Lynch Global Research

Tail risk 1: US deregulation

Normalized swap spreads, cross-currency basis & coupon vs principal STRIPS

Deregulation is a key focus for the incoming administration, and Dodd-Frank is a major potential target. Paul Atkins, a former SEC commissioner under George W Bush, has been named to lead transition strategy on financial regulation. Atkins has been vehemently critical of Dodd-Frank since its inception, and in a statement to the Senate in 2011 called the law a calamity that increases business uncertainty and undermines growth. Under Atkins, the transition team posted a statement that it will be "working to dismantle the Dodd-Frank Act and replace it with new policies to encourage economic growth and job creation." At this point there are no details on what parts of Dodd-Frank are most likely to be repealed, but Republican financial policy leaders appear pro-markets and have flagged free movement of capital via open markets as the best policy for economic growth and risk transparency.

There are several dislocations across markets today that we think have a chance of normalizing in the tail-risk event that deregulation results in increased availability of leverage and ability to take more risk. We have discussed these dislocations as resulting in part from the lack of ability of hedge funds and other relative-value traders to access enough balance sheet at a low enough cost to help these trades normalize. The top trades we could see benefitting from the return of leverage would be:

- Normalization of swap spreads; balance-sheet intensive Treasuries, both nominal and TIPS, are very cheap versus OIS and Libor swap rates.
- Normalization of cross-currency basis swaps, which currently allow USD-based investors the ability to buy very cheap EUR- and JPY-denominated assets via the basis swap.
- Normalization of coupon STRIPS versus principal STRIPS as these yield differentials are near their all-time wides, particularly in the 2030-38 maturity bucket.

As a tail risk for deregulation, we like buying 30y swap spreads, a credit-risk-free floating-rate US Treasury asset that provides 3m Libor + 56bp annually, which is about 100bp cheap to pre-crisis levels. Swap spreads could also benefit from deregulation that removes cash and Treasury bonds from the leverage ratio requirements, which would provide the ability of the dealer community to more easily absorb Treasury supply in the primary and secondary markets.

The main risk is that policy changes retain strict capital requirements, which would continue to limit the availability of leverage. For example, the Financial Choice Act, a product of Texas Representative Jeb Hensarling's team, would provide banks an off-ramp option to all Basel 3 requirements as long as banks hold a 10% capital ratio. This plan would probably decrease the availability of leverage, and could also result in reduced demand for short-dated Treasuries in HQLA portfolios. Another risk to 30y swap spread normalization in particular would be a material increase in deficit spending as part of a fiscal stimulus package. This would likely further cheapen Treasuries versus swaps and other benchmark interest rates.

Trade recommendation: Buy 30y Treasuries versus 30y matched Libor swap at 3mL+56bp. Target 3mL + 0bp, stop loss 3mL+75bp.

Tail risk 2: Comeback of Eurozone risk premia

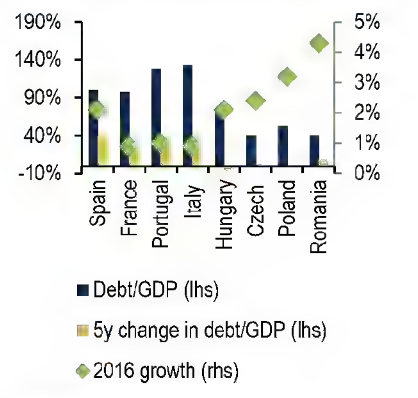
EZ risk hedges: 30s50s flatteners in BTPs, buy EUR/HUF vol

In Europe, the biggest market risk for 2017 is arguably a comeback of stress on peripheral sovereigns. The next 12 months provide plenty of triggers, with increasing concerns about the ability of ECB to continue with QE, and an intense political season ahead (referendum in Italy on 4 Dec, and elections in France and Germany in 2017).

As hedges to Eurozone risks, we recommend buying 30s50s flatteners in BTPs as the cheapest way to express a bearish view on the periphery, and buying EUR/HUF vol as a proxy for Euro instability with better pricing than EUR/USD vol.

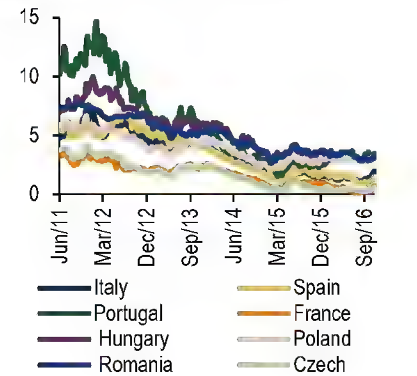
Concerns on EU politics and the ECB would likely lead to a switch of market focus from monetary policy to fundamentals. The periphery would be hurt by this new focus: public debt to GDP remains very high, and the low debt service costs enjoyed in the past five years favored debt accumulation, rather than debt reduction (Chart 73). The cyclical

Chart 73: Fundamentals – CEE beats periphery



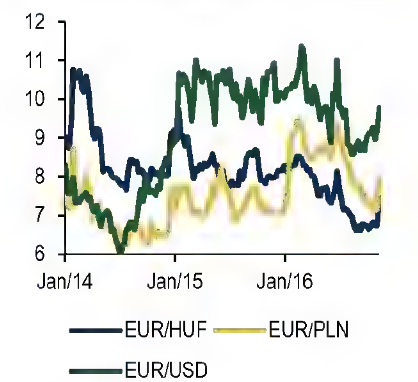
Source IMF

Chart 74: Poland and Hungary wide relative to Italy and Spain



Source Bloomberg

Chart 75: HUF vol lagging EUR and PLN



Source Bloomberg.

juncture has also weighed on public finances, and all peripheral countries are running deficits above the structural levels.

The fundamental picture is not reflected in interest rate dynamics. ECB easing has pushed Eurozone interest rates lower despite worsening public finances (Chart 74). Participation in the QE program has been a strong determinant of low long-term rates, as shown by the tightening of the periphery vs CEE. Hungary, Poland and Romania have been yielding 3-3.5% in the past year, while Italy remained constantly below 2%. If stress comes back, the gap will close.

Within the periphery, Italy is the most vulnerable. Fundamentals are the worst in the region, only comparable to Portugal, which trades 160bp above it. Political risks also remain high, with the referendum providing some downside risk to the prime minister. The market is apparently reaching the same conclusion: during the most recent global bonds sell-off (20 Sep-14 Nov), Italy widened 95bp, while Spain widened 70bp, in line with CEE, despite the higher beta nature of the latter and the higher FX risk. Still, there may be room for further widening: the 10y spread to Germany widened in the current move, but is still lower than it has been the three years following the latest Italian political crisis. Our European rates team argued this summer that the rally in Italy spreads was far from fundamental. Flatteners in the 30s50s area look the best hedge as 50y are not eligible for QE, and term premia in the 2-31y sector would increase if QE was to end. Also, in times of sovereign debt stress, the curve tends to invert, further supporting long-end flatteners. Total carry is 1bp per month, making it cheaper and less sensitive to timing of stress than an outright short bond position.

On further EZ stress, the euro would weaken and euro vol rise. While a less dovish ECB would be euro-positive, peripheral stress would ignite concerns on the monetary union, and ultimately weaken the euro (as in Dec 2011). A cleaner hedge is buying EUR/HUF vol, as it proxies EUR/USD vol but has moved less so far. HUF options are historically very reactive to EZ stress, but the increase in vol lagged EUR/USD post-elections, and EUR/PLN vol has been higher in the past two years due to higher perceived risks in Poland (Chart 75). In Dec 2011, the vol spike in the three crosses had been the same.

CEE rates tend to widen in times of Eurozone stress, but their fundamentals are much more solid, so further EZ stress may bring opportunities to buy dips. CEE capitalized the past five year much better, with fiscal consolidation in Hungary, balanced budget in Czech Republic, and low debt/GDP ratios in Poland. Also, the growth picture is much more rosy, making leverage much more manageable.

Trade recommendation: Buy 50y BTPs vs 30y BTPS at 30bp, targeting -8bp and with stop at 55bp. Risk is ECB QE continues and peripheral risk premium stays low.

Tail risk 3: China-led commodity weakness

Commodity collapse hedge: buy AUD/USD 6m 0.67 digital put

Metal and bulk commodity prices have skyrocketed in anticipation of infrastructure spending in the US, We are wary of this rally: tax cuts are likely to be the first line of fiscal stimulus and potentially easier to get through Congress than sizeable infrastructure spending, which in any case will take a longer time to impact commodity demand (allowing for supply adjustments). Perhaps most importantly, China is still the swing factor for global commodity prices and the risks here remain to the downside.

The recent dramatic rise for China-linked bulk commodity prices, especially coal, has been driven by a combination of supply and demand imbalances (China floods, pit closures and inventory shortages) and an apparent rise in speculative activity in futures markets that has already drawn attention from regulators (Chart 76). Our resource analysts have raised forecasts but still see moderation over 2017 (Chart 77). The futures forward curve has already moved into backwardation. We see iron ore prices back at USD50/t in 2017 compared to a current spot price of USD74.

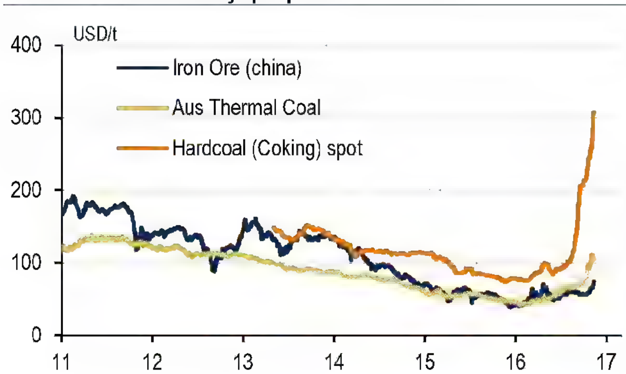
While global reflation might be positive for commodities, there are reasons for caution:

- We expect Chinese property investment, the most commodity-intensive sector of the economy, to slow in 2017.
- Sizeable RMB depreciation would be an additional deflationary impulse for industrial commodities.
- There will be a supply response as current prices bring uneconomic producers back on line, admittedly with a lag.
- There is potential for trade friction to impact regional trade while higher US rates are already impacting regional EM currencies. Australia is especially exposed to intra-regional trade and resource demand from the region.

Persistent supply/demand imbalances ahead of Chinese New Year might delay commodity weakness until after 1Q17, especially for coking coal due to a preference for thermal coal supplies over the Chinese winter. However, the risk of a sharp reversal beyond is worth hedging against given the demand dynamics in China, most obviously through the AUD. While short-dated implied volatility rose following the US election, the risk-reversal skew remains high as a percentage of implied volatility relative to G10 pairs. This suggests hedging via AUD/USD digital puts is appropriate, in our view.

Trade recommendation: Buy 6m AUD/USD 0.67 digital put, entry: 10% (spot reference: 0.7550). Risk is global demand recovery provides support to commodity prices.

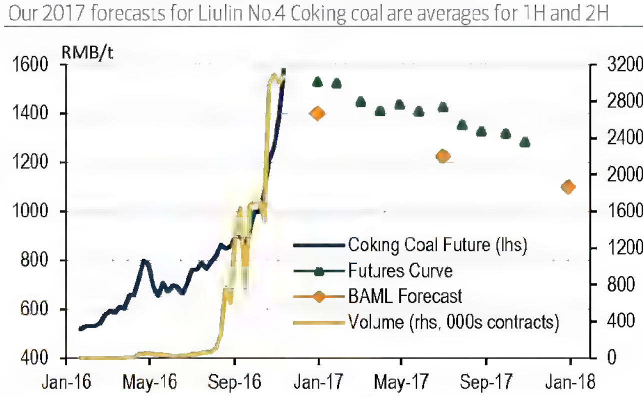
Chart 76: Bulk commodity spot prices



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 77: China Coking coal futures and BAML forecasts

Our 2017 forecasts for Liulin No.4 Coking coal are averages for 1H and 2H



Source: BofA Merrill Lynch Global Research, Bloomberg

Tail risk 4: BoJ triggers curve steepening and vol rise

BoJ keeps yield curve anchored out to 10y: 1y10s20s conditional bear steepener

The Bank of Japan (BoJ) has faced a tough 2016. Having switched its policy target from quantity to interest rates at its September Monetary Policy Meeting, it tacitly acknowledged that negative rates and JGB purchases were potentially approaching their limit in terms of policy effectiveness. Inflation expectations fell and the yen strengthened as a consequence as the market got accustomed to fading dovish pronouncements from the Bank of Japan. BoJ Governor Haruhiko Kuroda himself said "Central banks are, admittedly, not omnipotent."

The BoJ introduced yield curve control, taking into consideration negative effects of great decline in yields and curve flattening on financial institution earnings or financial markets. If the BoJ keeps purchasing at the current rate, however, yields will sooner or later feel downward pressure. We believe the BoJ is likely to reduce its long-term JGB purchase gradually. For the time being, JGB yield guidelines are probably around 0% for the 10yr, 0.4% for the 20yr, and 0.5% for the 30yr JGB.

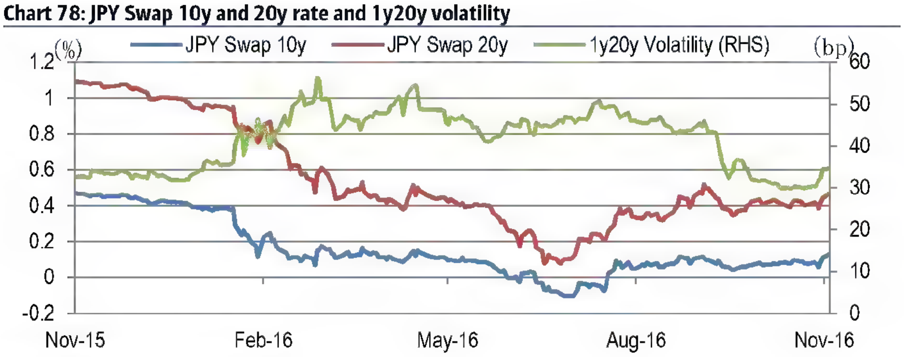
However, the BoJ appears to be concerned about the deterioration of financial institution earnings caused by flattening of the yield curve. Kuroda said that even if superlong-term yields rose slightly, he did not believe they would have to be lowered. He went on to say he was also giving consideration to investors in superlong-term bonds, and that he did not think it was good for the yield curve to get continually flatter. Based on these and other remarks, we expect long-term JGB purchase operations to be reduced and the curve to gradually steepen (Rates forecast: Attention on BoJ operations when yields decline).

Before that can happen, however, preconditions most likely include steady progress in US rate hikes, avoidance of excessive yen appreciation, and some degree of recovery in the inflation rate. With a Republican clean sweep, US fiscal easing is now a foregone conclusion and "Higher rates and higher dollar" may support our view for yen rates. If JGB purchase operations were reduced and yen rates rose in the wake of higher US Treasury yields and USD/JPY appreciation, that could easily be explained by fundamentals.

Yen rates volatility is still low; however, purchasing cuts by the BoJ could add to volatility risk amid declining liquidity in the super long-end (Chart 78). Even if risk-off sentiment pushes down the yield curve, the BoJ may lower the 10yr JGB yield target from zero to keep the curve steep. This kind of policy change also could increase volatility. In either case, the 10yr is expected to be anchored and movement is expected in the long end. We believe 1y10s20s conditional bear steepener may mitigate this risk.

Trade recommendation: Long 5bn 1y20y @0.62% (atm+11bp) payer vs Short 9.9bn 1y10y @0.18% (atm) payer. This position is zero cost, PV01 neutral, and zero carry. Risk is the curve remains flat due to a deflationary backdrop.

Chart 78: JPY Swap 10y and 20y rate and 1y20y volatility



Source: BofA Merrill Lynch Global Research

Best Technical Trades

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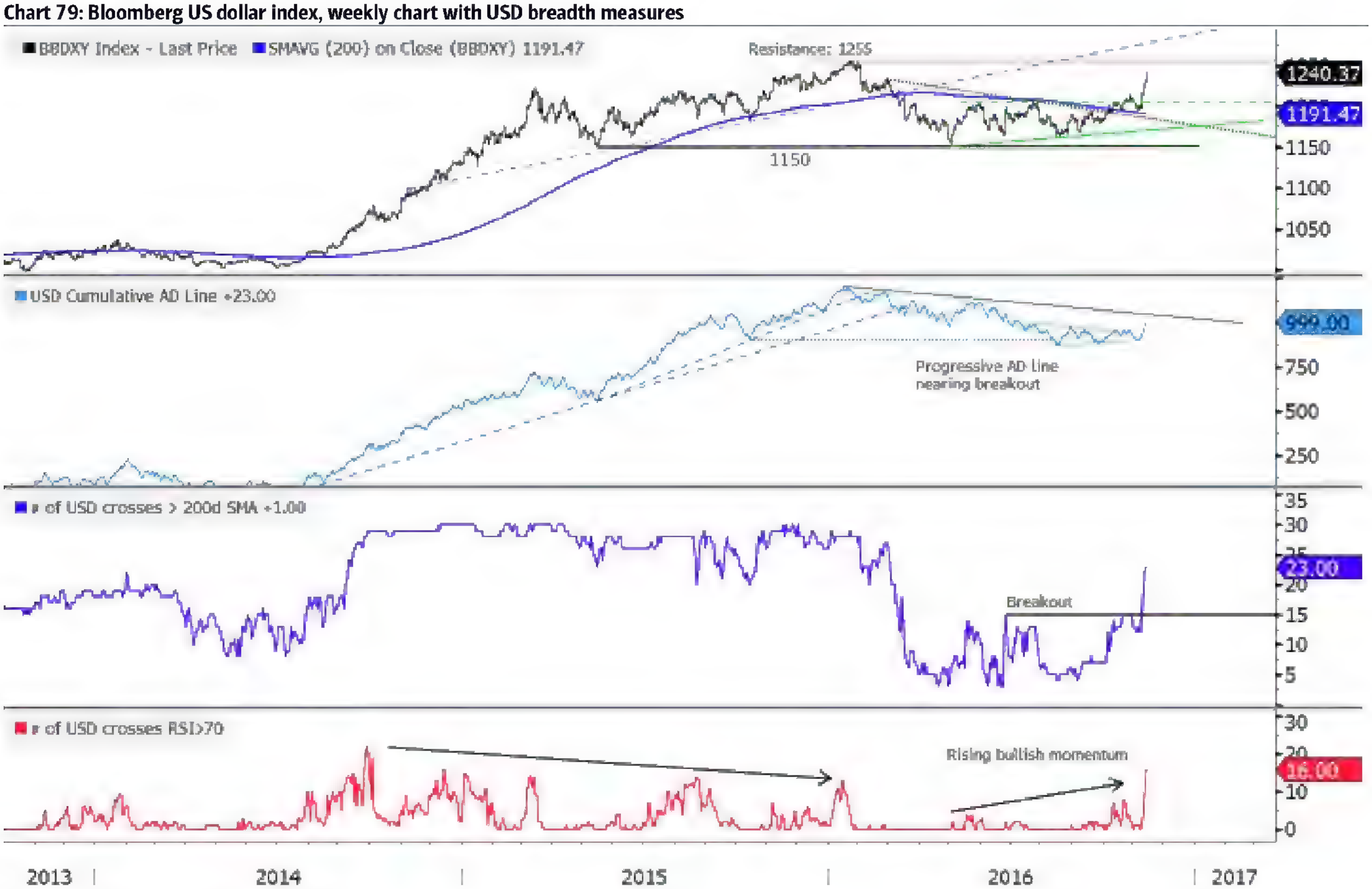
Technical trends for Trump

- Bullish USD: Breadth and technicals favor USD. Overall they point to a stronger US dollar in 2017. We are bullish USD/JPY.
- Higher yields: US 10y and 30y yield made large wedge bottom patterns, pointing to a 61.8% Fibonacci retracement of 2.98% and 3.80%, respectively.
- We recommend buying a NZD/USD 5m .69/.66 put spread 1x1.5 for 43 USD pips (off of .7100 spot).

USD rally is turning into an outright bull

The Bloomberg US dollar index is approaching all-time highs. The number of USD crosses above their 200-day moving average has broken out higher. The number of USD crosses reaching overbought on RSI (bullish momentum) continues to rise. The USD cumulative advance-decline line recently signaled for tactical USD strength and would turn outright bullish with a trend line break and new index highs.

Chart 79: Bloomberg US dollar index, weekly chart with USD breadth measures



Source: BofA Merrill Lynch Global Research, Bloomberg

Bullish USD/JPY

The election of Donald Trump catapulted USD/JPY through another resistance level, this time a weekly trend line, adding to the list of technical signals that USD/JPY has bottomed and is in an uptrend. We began discussing a bottom in our September 5 and September 18 Technical Advantage reports. We estimate technical upside and resistance in the area of 112. We also think this uptrend has the potential to reach the full measured move target of 116.50 in 2017.

Chart 80: USD/JPY weekly chart

Source: BofA Merrill Lynch Global Research, Bloomberg

A higher yield environment

We continue to think yields will trend higher in 2017. We initially reported our view that global yields would rise in our October 26 Technical Advantage report. Since then we have seen added confirmation by US 10y, US 30y, 10yr bund, 30yr JGB and 10y Gilt that yields will rise.

US 10y and 30y yield form wedge bottom pattern

US 10y and 30y yields formed wedge bottom patterns by breaking through the upper trend line resistance (Breakout 1). A wedge pattern is composed of two converging trend lines often consisting of multiple smaller trends followed by a breakout. Each yield has a second resistant trend line and Fibonacci retracement to break. If 10y yield breaks through 2.35% and 30y yield through 3.15%, then another breakout will have occurred that technically triggers another leg higher to 2.98% and 3.80%, respectively. We think this is the more likely outcome.

Chart 81: US 10yr yield (top) and US 30yr yield (bottom) weekly chart

Source: BofA Merrill Lynch Global Research, Bloomberg

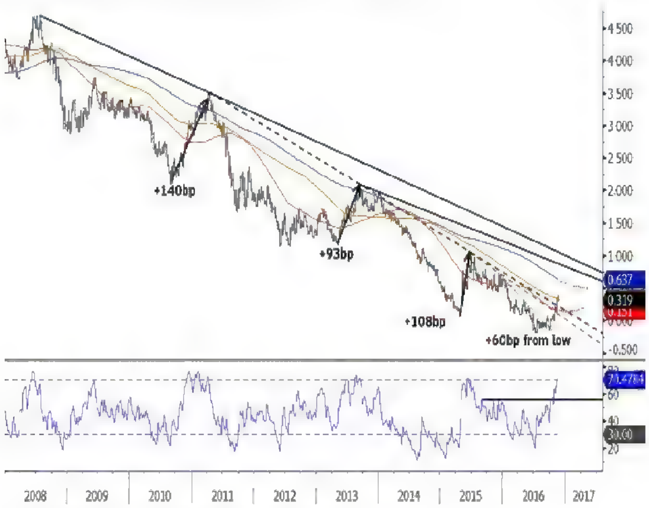
German 10yr bund yield breaks out

Bund yield has risen through resistance levels and is up about 60bps from the low. Prior uptrends failed at trend line resistance levels; however, this time it broke through. The distance traveled during prior moves include +140bps, +93bps and +108bps. Therefore, we believe this uptrend has room to continue to 55bps (estimated 200wk SMA) by 1Q2017 and to 75bps in 2017.

Japanese 30y yields form head and shoulders bottom

The rapid decline in 30y JGB yield during 2016 led to a trend exhaustion signal at the lows (TD Sequential 13), a rise resulting in the most overbought (higher yield) momentum since 2010 and the formation of a head and shoulders bottom. Provided yield remains above 44bps, we could see yield rising to 71bps and possibly 87bps in 2017.

Chart 82: German 10yr bund yield – weekly chart



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 83: Japanese 30yr yield - weekly chart

Source: BofA Merrill Lynch Global Research, Bloomberg

Buy NZD/USD 5m .69/.66 put spread 1x1.5

NZD/USD is forming a head and shoulders top. It is breaking trend line support from the January to June lows. It is also threatening to break the neckline at .7070. MACD recently crossed bearish and is trending toward negative. This pattern suggests NZD/USD will decline as low as .6615. Given the strong USD move in G10 thus far, we think NZD/USD is near an attractive technical level to position for further USD strength. We recommending buying a NZD/USD 5m .69/.66 put spread 1x1.5 for 43 USD pips (off of .7100 spot).

Chart 84: NZD/USD daily chart

Source: BofA Merrill Lynch Global Research, Bloomberg

Bond Yield Forecasts

Table 7: Quarter-end bond yield forecasts

		Latest	*4Q16*	*1Q17*	*2Q17*	*3Q17*	*4Q17*
USA	3m Libor	0.91	1.05	1.05	1.25	1.30	1.50
	2y T-Note	0.98	1.10	1.35	1.50	1.60	1.65
	5y T-Note	1.64	1.85	2.10	2.15	2.20	2.25
	10y T-Note	**2.21**	**2.35**	**2.55**	**2.60**	**2.65**	**2.65**
	30y T-Bond	2.95	3.10	3.30	3.30	3.35	3.35
	2y Swap	1.23	1.30	1.53	1.66	1.75	1.80
	5y Swap	1.68	1.88	2.10	2.15	2.20	2.25
	10y Swap	**2.07**	**2.23**	**2.41**	**2.44**	**2.49**	**2.49**
Germany	3m Euribor	-0.31	-0.30	-0.30	-0.30	-0.33	-0.32
	2y BKO	-0.62	-0.60	-0.60	-0.55	-0.50	-0.45
	5y OBL	-0.34	-0.35	-0.30	-0.25	-0.20	-0.10
	10y DBR	**0.30**	**0.40**	**0.45**	**0.50**	**0.55**	**0.65**
	30y DBR	0.93	1.05	1.10	1.15	1.15	1.15
	2y Swap	-0.13	-0.14	-0.16	-0.13	-0.06	-0.02
	5y Swap	0.14	0.12	0.16	0.21	0.27	0.36
	10y Swap	**0.69**	**0.81**	**0.85**	**0.89**	**0.92**	**1.00**
Japan	3m Libor	-0.07	-0.03	-0.03	-0.03	-0.03	-0.03
	2y JGB	-0.17	-0.20	-0.20	-0.20	-0.20	-0.15
	5y JGB	-0.11	-0.15	-0.15	-0.13	-0.12	-0.10
	10y JGB	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	2y Swap	0.01	-0.07	-0.07	-0.07	-0.07	0.00
	5y Swap	0.04	-0.05	0.00	0.01	0.02	0.04
	10y Swap	**0.15**	**0.12**	**0.15**	**0.15**	**0.15**	**0.15**
U.K.	3m Libor	0.40	0.40	0.25	0.25	0.25	0.25
	2y UKT	0.22	0.20	0.20	0.20	0.20	0.20
	5y UKT	0.66	0.70	0.80	0.85	0.90	0.90
	10y UKT	**1.40**	**1.50**	**1.60**	**1.65**	**1.70**	**1.75**
	30y UKT	2.04	2.10	2.15	2.20	2.25	2.30
	2y Swap	0.67	0.65	0.65	0.60	0.55	0.50
	5y Swap	0.96	1.00	1.10	1.15	1.20	1.20
	10y Swap	**1.34**	**1.55**	**1.70**	**1.75**	**1.80**	**1.85**
Australia	3m BBSW	1.76	1.70	1.70	1.70	1.80	1.80
	2y ACGB	1.77	1.90	1.95	2.00	2.05	2.10
	5y ACGB	2.16	2.30	2.40	2.45	2.50	2.60
	10y ACGB	**2.66**	**2.80**	**2.95**	**3.05**	**3.10**	**3.10**
	3y Swap	2.22	2.00	2.10	2.15	2.20	2.20
	10y Swap	**2.81**	**2.95**	**3.10**	**3.20**	**3.25**	**3.25**
Canada	2y Govt	0.66	0.70	0.60	0.50	0.40	0.40
	5y Govt	0.94	1.00	0.90	0.80	0.70	0.70
	10y Govt	**1.52**	**1.50**	**1.40**	**1.40**	**1.35**	**1.35**
	2y Swap	1.00	1.04	0.94	0.84	0.74	0.74
	5y Swap	1.29	1.35	1.25	1.15	1.05	1.05
	10y Swap	**1.78**	**1.76**	**1.66**	**1.66**	**1.61**	**1.61**

Source: BofA Merrill Lynch Global Research

Global FX Forecasts

Table 8: Quarterly forecasts – G10 currencies

	Spot	Dec-16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
G3										
EUR-USD	1.08	1.08	1.05	1.02	1.02	1.05	1.06	1.07	1.08	1.10
USD-JPY	108	108	112	115	117	120	117	115	112	110
EUR-JPY	117	117	118	117	119	126	124	123	121	121
Dollar Bloc										
USD-CAD	1.35	1.36	1.38	1.40	1.41	1.43	1.43	1.41	1.40	1.40
AUD-USD	0.76	0.74	0.73	0.72	0.71	0.70	0.70	0.71	0.73	0.75
NZD-USD	0.71	0.70	0.69	0.68	0.68	0.67	0.67	0.68	0.70	0.71
Europe										
EUR-GBP	0.87	0.88	0.91	0.89	0.88	0.88	0.88	0.87	0.86	0.85
GBP-USD	1.24	1.23	1.15	1.15	1.16	1.19	1.20	1.23	1.26	1.29
EUR-CHF	1.07	1.08	1.09	1.10	1.11	1.12	1.12	1.13	1.13	1.15
USD-CHF	0.99	1.00	1.04	1.08	1.09	1.07	1.06	1.06	1.05	1.05
EUR-SEK	9.86	9.50	9.40	9.30	9.20	9.15	9.10	9.00	8.90	8.90
USD-SEK	9.14	8.80	8.95	9.12	9.02	8.71	8.58	8.41	8.24	8.09
EUR-NOK	9.08	9.00	8.90	8.80	8.70	8.60	8.50	8.50	8.40	8.40
USD-NOK	8.41	8.33	8.48	8.63	8.53	8.19	8.02	7.94	7.78	7.64

Forecast as of Nov-15-2016. Spot exchange rate as of Nov-15-2016. The left of the currency pair is the denominator of the exchange rate. Source: BofA Merrill Lynch Global Research

Table 9: Quarterly forecasts – EM currencies

	Spot	Dec-16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18
Latin America										
USD-BRL	3.43	3.60	3.65	3.70	3.80	3.90	3.90	3.90	3.90	3.90
USD-MXN	20.48	21	21.25	21.5	21.75	22	22.25	22.5	22.75	23
USD-CLP	670	670	685	700	715	730	740	750	760	770
USD-COP	3,124	3,150	3,200	3,250	3,300	3,350	3,400	3,450	3,500	3,550
USD-ARS	15.60	15.80	16.00	17.00	17.50	18.00	18.50	19.00	19.50	20.00
USD-VEF	9.99	10	31.1	31.1	84.8	84.8	84.8	84.8	84.8	84.8
USD-PEN	3.44	3.45	3.47	3.50	3.52	3.55	3.60	3.65	3.70	3.70
USD-UYU	28.70	29	30	31	32	33	34	35	36	37
Emerging Europe										
EUR-PLN	4.41	4.30	4.25	4.20	4.20	4.20	4.10	4.05	4.05	4.00
EUR-HUF	310	310	310	305	300	300	300	295	295	290
EUR-CZK	27.03	27	27	27	26.5	26	26	26	26	25.5
USD-UAH	25.91	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8
USD-RUB	65.47	65	63	65	65	65	65	65	65	65
USD-ZAR	14.15	14.5	14.5	14.5	14.5	14.5	14.3	14.5	14.8	15
USD-TRY	3.27	3.15	3.1	3.15	3.2	3.2	3.2	3.25	3.25	3.3
EUR-RON	4.51	4.5	4.5	4.45	4.4	4.4	4.4	4.35	4.35	4.3
USD-EGP	15.47									
USD-ILS	3.84	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.8	3.8
USD-AED	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
USD-SAR	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
USD-QAR	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64
Asian Bloc										
USD-KRW	1,170	1200	1200	1220	1250	1270	1270	1230	1210	1190
USD TWD	31.85	32.1	32.4	32.7	33.1	33.4	33.4	32.8	32.5	32.3
USD-SGD	1.41	1.44	1.45	1.49	1.5	1.51	1.51	1.51	1.51	1.5
USD-THB	35.36	36	36.5	37.5	37.8	38.2	39	39	38	37
USD-HKD	7.76	7.76	7.77	7.78	7.79	7.80	7.80	7.80	7.80	7.80
USD-CNY	6.85	7.00	7.05	7.10	7.15	7.25	7.35	7.35	7.30	7.20
USD-IDR	13369	13700	13900	14200	14400	14600	14500	14500	14400	14200
USD-PHP	49.07	50.5	51	52	53	53.5	54	54	53	52
USD-MYR	4.34	4.41	4.45	4.55	4.65	4.71	4.68	4.68	4.6	4.5
USD-INR	67.69	68.25	68.1	68.5	69	70	69.5	69	68.5	68

Forecast as of Nov 15 2016. Spot exchange rate as of Nov 15 2016. The left of the currency pair is the denominator of the exchange rate. Source. BofA Merrill Lynch Global Research

Options Risk Statement

Potential Risk at Expiry & Options Limited Duration Risk

Unlike owning or shorting a stock, employing any listed options strategy is by definition governed by a finite duration. The most severe risks associated with general options trading are total loss of capital invested and delivery/assignment risk, all of which can occur in a short period.

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For detailed information regarding the risks involved with investing in listed options: http://www.theocc.com/about/publications/character-risks.jsp.

Valuation & risk

Brazil (BRAZIL)

We are Marketweight Brazil's EXD with currently wide spreads compensating for the risks. The political crisis concerns investors and growth has been weaker than expected. However, spreads are quite high compared to LatAm investment grades. There are positive and negative tail risks for growth, as a resolution to the political paralysis could bring confidence back up quickly and improve the economic backdrop. With this positive tail risk, and a stronger fiscal adjustment in 2016, economic recovery could start in 2Q16. On the downside, pressures on GDP could increase if the political scenario deteriorates further, with the government failing to approve fiscal measures and/or Brazil shifting to a heterodox policy.

Colombia (COLOM)

Spreads, which have widened this year adequately compensate investors for the risk, in our view, and leads us to our Marketweight view. Downside risks are a rapid inflation acceleration from pass-through effects, which would be a difficult problem for macroeconomic policy. Also oil price weakness raises risk of recession. Fiscal and external difficulties generate incentives to relax the fiscal rule. Upside risks are a rise in commodity prices and stronger than expected growth.

Mexico (MEX)

Mexico's tight spreads fairly reflect the better quality of Mexican debt compared to most of LatAm, in our view. We forecast Mexico's activity growth to remain in the 2-3% range. Downside risks are lower growth in the US, lower oil prices and slower domestic oil production. A disorderly normalization of US monetary policy is a risk to Mexico's financial stability as well. Upside risks are higher oil prices and stronger US growth.

Turkey (TURKEY)

We are Overweight as Turkey Eurobonds lagged peers due to heightened political noise during the summer. Since Moody's downgraded the sovereign, all negative impact of the attempted coup seems to be priced and we think that bonds offer value vs peers. Downside risks are stronger outflows than expected and heightened political noise. Upside risks include a generalized rally on the back of more positive global backdrop.

Analyst Certification

We, David Woo, Adarsh Sinha, Arko Sen, Claudio Irigoyen, Jane Brauer, Kamal Sharma, Mark Capleton, Paul Ciana, CMT and Ralf Preusser, CFA, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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Important Disclosures

Credit opinion history

Brazil / BRAZIL

Sovereign	Date^	Action	Recommendation
Brazil / BRAZIL	12-Nov-2015	Initial	Marketweight

Table reflects credit opinion history as of previous business day's close. ^First date of recommendation within last 36 months. The investment opinion system is contained at the end of the report under the heading "BofA Merrill Lynch Credit Opinion Key."

Colombia / COLOM

Sovereign	Date^	Action	Recommendation
Colombia / COLOM	12 Nov 2015	Initial	Marketweight

Table reflects credit opinion history as of previous business day's close. ^First date of recommendation within last 36 months. The investment opinion system is contained at the end of the report under the heading "BofA Merrill Lynch Credit Opinion Key."

Mexico / MEX

Sovereign	Date^	Action	Recommendation
Mexico / MEX	12-Nov-2015	Initial	Marketweight
	03-Dec-2015	Restricted	NA
	03-Dec-2015	Coverage Resumed	Marketweight
	21-Mar-2016	Restricted	NA
	21-Mar-2016	Coverage Resumed	Marketweight
	08-Aug-2016	Restricted	NA
	10-Aug-2016	Coverage Resumed	Marketweight

Table reflects credit opinion history as of previous business day's close. ^First date of recommendation within last 36 months. The investment opinion system is contained at the end of the report under the heading "BofA Merrill Lynch Credit Opinion Key."

Turkey / TURKEY

Sovereign	Date^	Action	Recommendation
Turkey / TURKEY	12-Nov-2015	Initial	Marketweight
	23-Feb-2016	Downgrade	Underweight
	17-May-2016	Upgrade	Marketweight
	27-Sep-2016	Upgrade	Overweight

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

--X

VIRGINIA L. GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.

--X

15-cv-07433-RWS

Defendant's Response in Opposition to Plaintiff's Omnibus Motion *in Limine*

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

--X

VIRGINIA L. GIUFFRE,

Plaintiff,

v.

GHISLAINE MAXWELL,

Defendant.

--X

15-cv-07433-RWS

Declaration of Laura A. Menninger in Support of
Response in Opposition to Plaintiff's Omnibus Motion *in Limine*

I, Laura A. Menninger, declare as follows:

1. I am an attorney at law duly licensed in the State of New York and admitted to practice in the United States District Court for the Southern District of New York. I am a member of the law firm Haddon, Morgan & Foreman, P.C., counsel of record for Defendant Ghislaine Maxwell in this action. I respectfully submit this Declaration in support of Ms. Maxwell's Response in Opposition to Plaintiff's Omnibus Motion *in Limine*.

2. Attached as Exhibit A is a true and correct copy of a statement on behalf of Ms. Maxwell dated January 2, 2015.

3. Attached as Exhibit B is a true and correct copy of an article by Sharon Churcher titled "Teenage girl recruited by paedophile Jeffrey Epstein reveals how she twice met Bill Clinton," DAILY MAIL, dated March 5, 2011.

4. Attached as Exhibit C (filed under seal) are true and correct copies of [redacted]

5. Attached as Exhibit D (filed under seal) are true and correct copies of [redacted]

6. Attached as Exhibit E (filed under seal) are true and correct copies of [redacted]

7. Attached as Exhibit F (filed under seal) is a true and correct copy of [redacted]

8. Attached as Exhibit G is a true and correct copy of an article by Sharon Churcher titled "The Prince, a paedophile and the sex slave teen" The Daily Telegraph, dated February 28, 2011.

9. Attached as Exhibit H (filed under seal) is a true and correct copy of [redacted]

10. Attached as Exhibit I is a true and correct copy of an article titled "Buckingham Palace issues second denial of underage sex claims against Prince Andrew," Fox News.com.

11. Attached as Exhibit J is a true and correct copy of an article titled "Prince Andrew denies sex abuse claims" CNN.com.

12. Attached as Exhibit K is a true and correct copy of an article by Tom Leonard titled "Prince Andrew risks ambassador job as underage sex case girl reveals meeting him" DAILY MAIL, dated March 2, 2011.

13. Attached as Exhibit L is a true and correct copy of an article by Wills Robinson titled "Jeffrey Epstein 'sex slave' Virginia Roberts was a 'money-hungry sex kitten', ex friends claim" DAILY MAIL, dated March 1, 2015.

14. Attached as Exhibit M (filed under seal) are true and correct copies of [redacted]

15. Attached as Exhibit N (filed under seal) is a true and correct copy of [redacted]

16. Attached as Exhibit O (filed under seal) is a true and correct copy of [redacted]

17. Attached as Exhibit P (filed under seal) are true and correct copies [redacted]

18. Attached as Exhibit Q (filed under seal) is a true and correct copy of [redacted]

19. Attached as Exhibit R is a true and correct copy of a press release in the *Edwards, et. al v. Dershowitz* matter, dated April 8, 2016, Bates stamped GM_00523-4.

20. Attached as Exhibit S is a true and correct copy of an Order Denying Motion to Join Under Rule 21, *Doe v. United States,* No. 08-80736-Civ-Marra/Johnson (S.D. Fla. Apr. 7, 2016).

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 17, 2017.

s/ Laura A. Menninger
Laura A. Menninger

CERTIFICATE OF SERVICE

I certify that on March 17, 2017, I electronically served this *Declaration of Laura A. Menninger in Support of Defendant's Response in Opposition to Plaintiff's Omnibus Motion in Limine* via ECF on the following:

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/s/ Nicole Simmons

Nicole Simmons

EXHIBIT A

From: <ross@acuityreputation.com>
Date: 2 January 2015 at 20:38
Subject: Ghislaine Maxwell
To: Rossacuity Gow <ross@acuityreputation.com>
bcc: martin.robinson@mailonline.co.uk,
P.Peachey@independent.co.uk,
nick.sommerlad@mirror.co.uk,
david.brown@thetimes.co.uk,
nick.alway@bbc.co.uk,
jo-anne.pugh@bbc.co.uk

To Whom It May Concern,
Please find attached a quotable statement on behalf of Ms Maxwell.

No further communication will be provided by her on this matter.
Thanks for your understanding.
Best
Ross

Ross Gow
ACUITY Reputation

Jane Doe 3 is Virginia Roberts - so not a new individual. The allegations made by Victoria Roberts against Ghislaine Maxwell are untrue. The original allegations are not new and have been fully responded to and shown to be untrue.

Each time the story is re told it changes with new salacious details about public figures and world leaders and now it is alleged by Ms Roberts that Alan Derschowitz is involved in having sexual relations with her, which he denies.

Ms Roberts claims are obvious lies and should be treated as such and not publicised as news, as they are defamatory.

Ghislaine Maxwell's original response to the lies and defamatory claims remains the same. Maxwell strongly denies allegations of an unsavoury nature, which have appeared in the British press and elsewhere and reserves her right to seek redress at the repetition of such old defamatory claims.

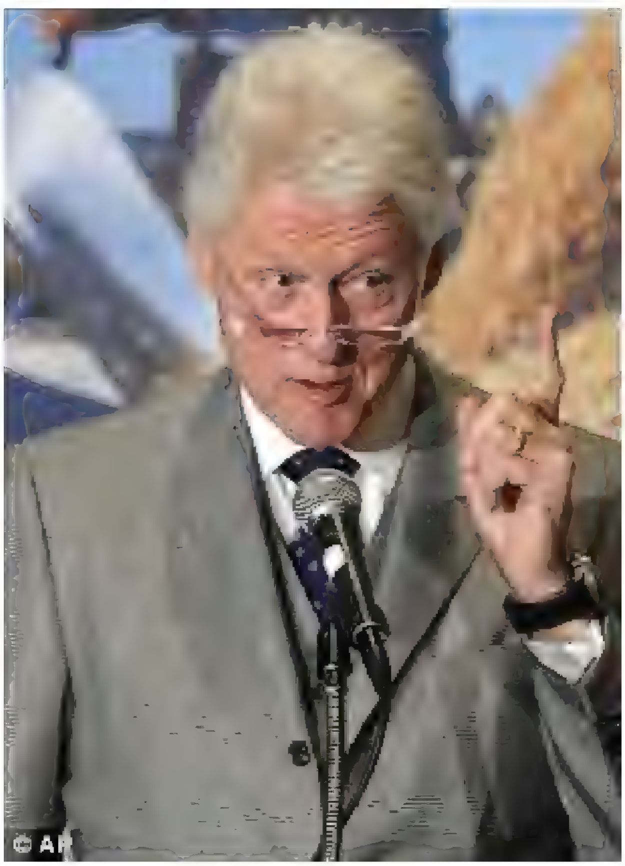
Sent from my BlackBerry® wireless device

EXHIBIT B

Teenage girl recruited by paedophile Jeffrey Epstein reveals how she twice met Bill Clinton

By Sharon Churcher and Polly Dunbar for MailOnline
Updated: 19:53 EST, 5 March 2011

As a New Yorker from humble beginnings, Jeffrey Epstein played on his blue-collar credentials and enormous wealth to extend tentacles of influence throughout America's liberal political elite.During the outcry over the Epstein case, it emerged that another man with a notorious appetite for young women, Bill Clinton, travelled with Epstein to a number of destinations, including three times on the billionaire's private aircraft.On one occasion, Epstein flew the former President, Hollywood actor and staunch Democrat Kevin Spacey and another actor friend of Mr Clinton's, Chris Tucker, to Africa, to 'discuss AIDS policy'.



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Claims: Virginia Roberts says she twice met ex-president Bill Clinton, pictured last month, but was never 'lent out'

Epstein, who has donated more than £75,000 over the years to candidates from the Democratic Party, also flew with Mr Clinton in November 2003 to destinations including Russia, Oslo, Hong Kong, Shanghai and Beijing.

Yet Virginia Roberts stresses that she was never 'lent out' to Mr Clinton.

On one occasion, she adds, Epstein did invite two young brunettes to a dinner which he gave on his Caribbean island for Mr Clinton shortly after he left office. But, as far as she knows, the ex-President did not take the bait. 'I'd have been about 17 at the time,' she says. 'I flew to the Caribbean with Jeffrey and then Ghislaine Maxwell went to pick up Bill in a huge black helicopter that Jeffrey had bought her.

Share this article

Share'She'd always wanted to fly and Jeffrey paid for her to take lessons, and I remember she was very excited because she got her licence around the first year we met.

'I used to get frightened flying with her but Bill had the Secret Service with him and I remember him talking about what a good job she did.'I only ever met Bill twice but Jeffrey had told me that they were good friends.

'I asked, "How come?" and he laughed and said, "He owes me some favours." Maybe he was just joking but it constantly surprised me that people with as much to lose as Bill and [Prince] Andrew weren't more

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careful.'Bill must have known about Jeffrey's girls. There were three desks in the living area of the villa on the island.

Speaking out: Virginia, now aged 26, in her new home in Australia

'They were covered with pictures of Jeffrey shaking hands with famous people and photos of naked girls, including one of me that Jeffrey had at all his houses, lying in a hammock.'We all dined together that night. Jeffrey was at the head of the table. Bill was at his left. I sat across from him. Emmy Tayler, Ghislaine's blonde British assistant, sat at my right. 'Ghislaine was at Bill's left and at the left of Ghislaine there were two olive-skinned brunettes who'd flown in with us from New York.

'I'd never met them before. I'd say they were no older than 17, very innocent-looking. 'They weren't there for me. They weren't there for Jeffrey or Ghislaine because I was there to have sex with Jeffrey on the trip.'Maybe Jeffrey thought they would entertain Bill, but I saw no evidence that he was interested in them. He and Jeffrey and Ghislaine seemed to have a very good relationship. Bill was very funny.

'Bill must have known about Jeffrey's girls. There were three desks in the living area of the villa on the island... covered with photos of naked girls' 'He made me laugh a few times. And he and Jeffrey and Ghislaine told blokey jokes and the brunettes listened politely and giggled. 'After dinner I gave Jeffrey an erotic massage. I don't remember seeing Bill again on the trip but I assume Ghislaine flew him back.'According to prison records, when Epstein was serving his jail term, his visitors included a long-time – and highly controversial – Clinton acquaintance, Arnold Prosperi.

'In the final hours of the Clinton presidency, in January 2001, Prosperi was facing three years in prison after being convicted of tax fraud. Mr Clinton commuted his sentence to house arrest. 'Clinton, Prosperi and Epstein make an odd threesome on the face of it,' says a law enforcement source.'Was Prosperi visiting Epstein as some kind of intermediary for Bill?

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'Maybe Bill wanted to know if Epstein knew anything that could embarrass him. Or did Bill commute Prosperi's sentence as some kind of favour for Epstein?' Virginia disclosed that Mr Clinton's vice-president Al Gore and his wife, Tipper, were also guests of Epstein on his island.

Guests: Virginia says she also met former Vice President Al Gore, pictured right with Mr Clinton

Last summer, the Gores abruptly announced that they were ending their supposedly fairytale marriage and, just weeks later, it emerged that Mr Gore – the famously sanctimonious global-warming disciple – had been accused of trying to force sex on a woman with whom he had booked a therapeutic massage at an Oregon hotel. 'I had no clue that anything was up,' Virginia says. 'The Gores seemed like a beautiful couple when I met them. All I knew was that Mr Gore was a friend of Jeffrey's and Ghislaine's. Jeffrey didn't ask me to give him a massage. 'There might have been a couple of other girls there on that trip but I could never have imagined this guy would do anything wrong. I was planning to vote for him when I turned 18. I thought he was awesome.'Virginia said that yet another American liberal icon, President Obama's Middle East peace envoy Senator George Mitchell, frequently visited Epstein's New York residence. Mr Mitchell, aged 77 – who previously led America's Northern Ireland peace initiative – 'was very close to Jeffrey,' Virginia recalled. 'He is very clean-cut. You wouldn't think of him being part of Jeffrey's crew.'

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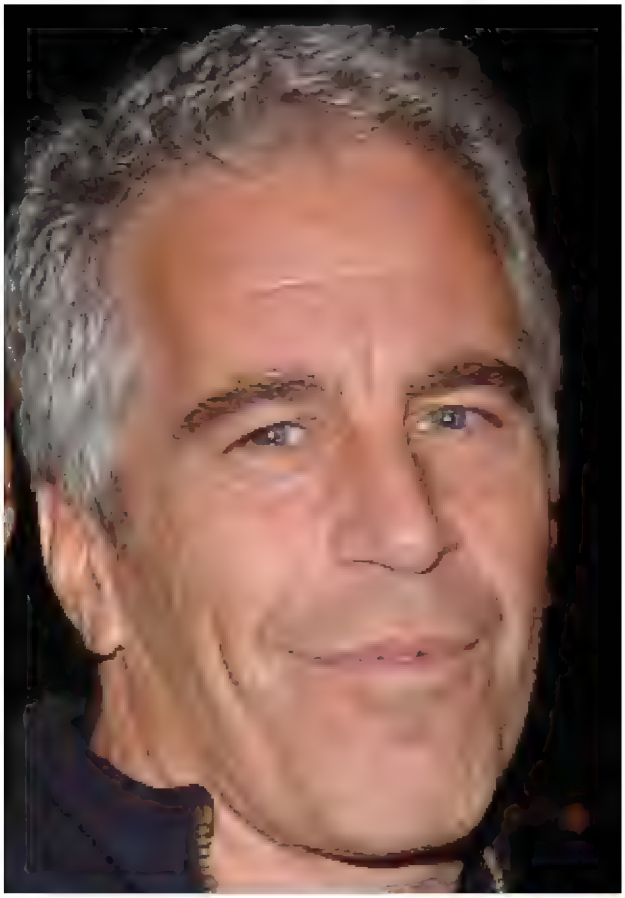


© Richard Young /
Features

Scandal: U.S. authorities want to interview Jeffrey Epstein (left) and may wish to quiz his friend, Prince Andrew

Epstein's contacts book contains a work and a home telephone number for the senator. Another acquaintance was Israel defence secretary Ehud Barak, whose spokesman told The Mail on Sunday: 'Mr Barak did attend several small functions in Mr Epstein's home in New York that were usually attended by leading businessman, university presidents, Nobel Prize Laureates and prominent public figures.'Epstein's many Hollywood pals include Matt Groening, creator of The Simpsons.
'Jeffrey once had me give Matt a foot massage when he was flying on the jet with us,' Virginia says. 'He laughed and did drawings of Bart and Homer for my little brother and my dad.'I also met Naomi Campbell at a birthday party of hers on a yacht in the South of France. She is a friend of Ghislaine's but she was a real bitch to me.
'She was very fake. She turned away from me when we were introduced by Ghislaine and Jeffrey.'Donald Trump was also a good friend of Jeffrey's. He didn't partake in sex with any of us but he flirted with me. He'd laugh and tell Jeffrey, "You've got the life." 'Palm Beach Police say Epstein seemed utterly unfazed by the allegations against him when they began their long and detailed investigation.

'Jeffrey's crew: Middle East peace envoy George Mitchell, right, pictured with President Barack Obama and U.S. Secretary of State Hilary Clinton, frequently visited Epstein¿s New York residence, Virginia also claims

But he also took his defence very seriously indeed. Epstein engaged his friend, the Harvard law professor Alan Dershowitz – whose celebrity clients have included Mike Tyson, Patty Hearst, Claus von Bulow and O.J. Simpson – to run his legal defence. He also employed a firm of private investigators to

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investigate the backgrounds of the girls.Detectives painstakingly built a case which they believed showed that Epstein systematically paid teenage girls to recruit other teenage girls to his sex ring. However, as the investigation continued, they found that Epstein's team had already spoken to key witnesses, suggesting that the financier would reward those who helped him.In addition, Epstein's defence team agreed to the unusual move of suggesting that the alleged victims sue Epstein in the civil courts. The result was a plea bargain in which Epstein admitted a single charge of soliciting an underage girl for prostitution – a deal which infuriated many police officers who worked on the case.More than 20 of Epstein's girls are said to have sued him for damages. At least 17 have settled out of court.Mr Clinton, Mr Gore and Mr Mitchell were all contacted about their friendship with Epstein but declined to comment.

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EXHIBIT C

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EXHIBIT F

EXHIBIT G

The Daily Telegraph

News

The Prince, a paedophile and the sex slave teen

Sharon Churcher and Chelsea White, DailyTelegraph
February 28, 2011 6:00am

A MOTHER of three living in Australia has revealed she was a teenage prostitute flown all over the world by a convicted sex offender to meet Prince Andrew.

The revelations have rocked Buckingham Palace as the woman, Virginia Roberts, 27, confessed she was the minor identified in FBI and subsequent civil proceedings against wealthy financier and registered sex offender Jeffrey Epstein.

A photo of Epstein and the Duke of York, Prince Andrew, together last week compelled Ms Roberts to come forward.

First employed as a 15-year-old as Epstein's masseuse, she alleges he groomed her to become a prostitute, paying her for sex with him and his influential friends.

While Ms Roberts said there was never any sexual relationship between the Prince and herself, she claims that as a 17-year-old she met the Prince on three occasions - at one of which she was told to sit on his knee while he touched another woman's breast.

Pictures: Prince Andrew and Virginia Roberts

Latest from *Mail on Sunday*

Ms Roberts told London newspaper *The Mail on Sunday* she was first flown to England on a private jet to meet the Prince in March 2001.

The 17-year-old was told to dance with the Prince and even posed for a photograph.

For her time with Epstein and the Prince on that trip, Epstein paid her $US15,000.

When she next met the Prince in the US, a 21-year-old woman who was working for Epstein was sitting on Prince Andrew's knee. Ms Roberts said she was instructed to do the same while the Prince touched the older woman's breast as a "joke".

The FBI case revealed sexual allegations by at least 20 girls, however, Epstein struck a deal with prosecutors and served 13 months' jail for soliciting child prostitution.

Ms Roberts stayed working as Epstein's "masseuse" until she met an Australian martial arts expert named Robert.

The pair married, causing an enraged Epstein to cut off the then 19-year-old.

Ms Roberts said she was coming to grips with her exploitation. Three years ago she was contacted by the FBI who found photos and secret videos of her during their investigations.

The case forced Ms Roberts to deal with her abuse and also reveal it to her husband.

"I couldn't bring myself to tell him much. No man wants to know his wife has been traded out," she told *The Mail*.

While Epstein's plea deal meant her identity was hidden, Ms Roberts said after seeing a picture of the pair shopping she had to go public. "I am appalled. To me, it's saying 'We are above the law'. But Jeffrey is a monster." Both Epstein and Prince Andrew refused to comment.

Originally published as Prince Andrew and the sex slave teen

REDACTED
EXHIBIT H

EXHIBIT I

Buckingham Palace issues second denial of underage sex claims against Prince Andrew

www.foxnews.com

June 6, 2012: In this file photo, Britain's Prince Andrew leaves King Edward VII hospital in London after visiting his father Prince Philip. (AP)

Buckingham Palace officials have again denied claims made by a woman who alleged that she was forced to have sex while underage with Prince Andrew, Duke of York.

The second denial comes after two Sunday papers in Britain published interviews with the woman in which she claimed that she was forced by American financier Jeffrey Epstein to have sex with Prince Andrew at least three times between 1999 and 2002. The woman alleges that the encounters took place in London, New York, and on a Caribbean island owned by Epstein.

A Palace spokesman has said that the allegations are "false and without any foundation."

"It is emphatically denied that the Duke of York had any form of sexual contact or relationship with (the woman)," the statement continued. The denials are unusual because royal officials typically do not comment on allegations against members of the royal family.

The woman's claims are part of a lawsuit in a Florida court relating to how prosecutors handled a sexual abuse case against American financier Jeffrey Epstein. The woman, identified in court papers only as "Jane Doe No. 3," is one of two new accusers asking a West Palm Beach, Florida, judge to allow them to join the existing lawsuit against Epstein. The royal is not named as a defendant in the case, and no criminal charges or formal allegations have been made against him.

The women have objected to how U.S. prosecutors handled Epstein's case, and want authorities to reconsider a plea deal that allowed Epstein to avoid much more serious federal charges and potentially longer prison time. Epstein served 13 months of an 18-month sentence after pleading guilty to a single charge of soliciting prostitution before being released in 2009.

It was not the first time Prince Andrew has faced media scrutiny over his friendship with Epstein. In July 2011 the royal stepped down from his role as a U.K. trade ambassador after he was photographed with Epstein in New York.

Prince Andrew is the second son and third child of Queen Elizabeth II and Prince Philip, Duke of Edinburgh. He is fifth in line to the British throne behind his older brother Prince Charles, nephew Prince William, grandnephew Prince George, and nephew Prince Harry.

The Sunday Mirror reported that Prince Andrew was on a skiing holiday in Switzerland, where he had been staying with his ex-wife Sarah Ferguson and their daughters, Princess Beatrice and Princess Eugenie.

In a further bizarre twist to the story, prominent attorney Alan Dershowitz, who is also named in the court documents, told the BBC that he is planning legal action against the woman.

"If she believes she has been hurt by me and Prince Andrew, she should be suing us for damages," the former Harvard Law professor said. "I welcome that lawsuit. I welcome any opportunity that would put her under oath and require her to state under oath these false allegations."

The Associated Press contributed to this report.

EXHIBIT J

Prince Andrew denies sex abuse claims - CNN.com

edition.cnn.com

Story highlights

- Prince Andrew addresses crowd at Davos, backs palace statement
- Court documents show attorneys sent a letter asking to interview him under oath
- Buckingham Palace has strenuously denied claim that he had sex with Virginia Roberts

"Firstly, I think I must, want, for the record to refer to the events that have taken place in the last three weeks. And I just wish to reiterate and to reaffirm the statements which have already been made on my behalf by Buckingham Palace," he said Thursday at the World Economic Forum.

Earlier this month, Buckingham Palace issued a statement which said, "It is emphatically denied that the Duke of York [Andrew] had any form of sexual contact or relationship" with the woman. "Any claim to the contrary is false and without foundation."

Andrew is a son of Queen Elizabeth II and a brother of Prince Charles, the next in line for the British throne.

The prince is accused of having sex with the woman when she was 17, details of which are is a sworn affidavit in Florida court dated January 19. The woman said that she and the Prince had sex "three times, including one orgy."

The court documents showed that her lawyers had sent a letter to Buckingham Palace asking to interview the prince under oath.

In her sworn affidavit, the woman described Buckingham Palace's denial that sexual contact ever took place between the pair as "false and hurtful to me."

Interview request

The woman, identified by Buckingham Palace as Virginia Roberts, first named the prince in a civil motion filed December 30 in the U.S. District Court in southern Florida in which she claims she was forced to have sex with several men. She is referred to as Jane Doe No. 3 in the legal filings.

In the letter the woman's lawyers sent to Buckingham Palace, attorneys Paul Cassell and Bradley Edwards asked to interview Prince Andrew "under oath regarding interactions that you had with Jane Doe No. 3 beginning in approximately early 2001. Jane Doe No. 3 was then 17 years old."

The letter includes a picture of the woman and Andrew which was taken around that time, they say. The lawyers also want to discuss subsequent interactions with their client in New York City later that year, the letter says.

"The interview could be conducted at a time and place of your choosing, and with your cooperation, I believe the interview could be completed in two hours or less," it says.

New court pleadings involving the relationship between Jane Doe No. 3 and the prince are being prepared, the letter adds, but their filing will be delayed if Andrew accepts the interview request by January 19.

The attorney for her legal team confirmed to CNN that Buckingham Palace had refused to accept the letter to Prince Andrew and that it was returned to them.

Buckingham Palace didn't respond Thursday when asked by CNN about the letter.

But the woman's allegations have previously been firmly rejected by Buckingham Palace.

"It is emphatically denied that the Duke of York had any form of sexual contact or relationship with Virginia Roberts. Any claim to the contrary is false and without foundation," the palace said early this month.

Statement: I just called him 'Andy'

Prince Andrew is named in the court filing in Florida as one of a number of prominent people who allegedly had sexual contact with teenage girls through self-made billionaire Jeffrey Epstein, who pleaded guilty some years ago in Florida to a state charge of prostitution solicitation.

CNN was unable to reach Martin Weinberg, Epstein's attorney, on Thursday.

In her first sworn statement to the court, Jane Doe No. 3 gave more details of the alleged encounters.

"Epstein made me have sex with Prince Andrew several times," she said, according to the court document.

"I had sex with him three times, including one orgy. I knew he was a member of the British Royal Family, but I just called him 'Andy.' "

One day when she was in London, she said, Epstein told her she would be meeting a "major prince."

She continued: "Epstein told me 'to exceed' everything I had been taught. He emphasized that whatever Prince Andrew wanted, I was to make sure he got."

'Sexual interests in feet'

When the prince arrived, she was introduced, she said, and "we kissed formally, cheek to cheek." The group went for dinner and to a nightclub where she was served alcohol before returning to the townhouse. The picture referred to in the letter, of the prince with Roberts, was taken there, she said.

After the pair were left alone, she said, "We went to the bathroom and bedroom, which were just steps away from where the picture was taken. We engaged in sexual activities there. Afterwards, Andy left quickly with his security."

She said she had reported back to Epstein on the encounter next day, telling him, "It went great."

"I told Epstein about Andy's sexual interests in feet. Epstein thought it was very funny. Epstein appeared to be collecting private information about Andy," she added.

Roberts also gave details of two more alleged occasions when the pair had sex. One was in Epstein's New York mansion in spring 2001, she said, when she was 17.

The third and last occasion was at an orgy involving nine girls on Epstein's private island in the U.S. Virgin Islands, her statement said.

"I was around 18 at the time. Epstein, Andy, approximately eight other young girls, and I had sex together."

The other girls, who appeared to be under 18, were "European looking and sounding" and didn't really speak English, she said. She said she "felt disgusted" after the orgy.

'Voluntarily tell the truth'

Roberts rejected the palace's denial of the allegations and said she hoped Andrew would agree to be interviewed under oath. "I did have sexual contact with him as I have described here -- under oath," she said.

"Given what he knows and has seen, I was hoping that he would simply voluntarily tell the truth about everything."

Roberts and another woman are seeking to join two other women who are arguing in federal court for the U.S. government to reexamine its case involving Epstein.

The investment banker agreed to a state plea deal in 2007 and began serving an 18-month sentence in 2008, according to court documents. He pleaded guilty to solicitation of prostitution and procurement of a minor for prostitution.

CNN's Max Foster contributed to this report.

EXHIBIT K

Prince Andrew risks losing ambassador job as girl in underage sex case reveals meeting him

By TOM LEONARD
UPDATED: 08:0 EDT 2 March 2011

Share 127

- **The Duke of York, 51, pictured with his arm around the bare midriff of Virginia Roberts**
- **Mother-of-three spent four years as millionaire's personal masseuse**
- **Epstein trained her as a prostitute for him and his friends'**

Serious doubts are being cast on Prince Andrew's suitability to represent Britain following revelations that he spent time with a girl of 17 while she was being sexually exploited by one of his billionaire friends.

The Duke of York, 51, was pictured with his arm around the bare midriff of Virginia Roberts, a vulnerable teenager hired to work as an 'erotic masseuse' and perform sexual favours for American businessman Jeffrey Epstein and his friends.

Later, she claims, Epstein's friend Ghislaine Maxwell told her: 'You did well. He had fun.'

First meeting: Prince Andrew puts his arms around 17-year-old Virginia, centre

Andrew, who works for the Government as an ambassador for foreign trade, remains close to Epstein, 58, and stayed at his New York mansion as recently as December – despite the financier admitting to child sex crimes in 2008 and being placed on the US sex offender register.

But the full extent of the prince's proximity to Epstein's offences was not known until Miss Roberts broke her silence this weekend. In a civil writ against the businessman, she alleged that her duties included being 'sexually exploited by Epstein's adult male peers including royalty'.

peers including royalty'.

RELATED ARTICLES


Pictured: Prince Andrew and the 17-year-old girl his sex...


Sordid friends and why he isn't fit for the job: Duke of...

Here, Tom Leonard reveals the astonishing background to the case.

The new Gatsby

Even by the rags-to-riches-to-rags mythology of New York, Jeffrey Epstein's ascent and subsequent humbling has been breathtaking.

The son of a parks department employee, he was plucked from obscurity as a Manhattan private school maths teacher by a pupil's father who got him a job on Wall Street in 1976.

He rose rapidly at the investment bank Bear Stearns but left in 1981 to set up on his own, managing the fortunes of clients with $1billion or more.

Enigmatic and mysterious about his business activities, (some compare him to the fictional millionaire The Great Gatsby) he has only ever identified one of his clients – his mentor and main patron Leslie Wexner, whose business empire includes the upmarket Victoria's Secret lingerie chain.

How rich Epstein has become is a matter of conjecture but even his rich friends talk about his wealth with awe. His 52,000 sq ft, nine-floor, 40-room mansion on East 71st Street is supposedly the biggest private residence in Manhattan.

The pavement outside is heated from beneath to melt the snow.

He also owns a 7,500-acre ranch in New Mexico, a mansion in Palm Beach, a house in Westminster, an apartment in Avenue Foch, Paris, and Little St James, one of the US Virgin Islands.

His fleet of aircraft includes a Gulfstream jet, helicopter and a Boeing 727 on which he famously flew Bill Clinton and Kevin Spacey on an Aids mission to Africa.

He is a noted patron of science and – say awed observers – has a brilliantly acute mind. One says: 'You spend time in Jeffrey's company and you come away enriched, and not diminished.'


A new life: Virginia, now a mother-of-three, in Australia

Epstein's friends include not only Mr Clinton but Donald Trump, former Israeli prime minister Ehud Barak, top White House economist Larry Summers and a host of Nobel Prize-winning scientists.

The Maxwell Connection

Despite his wealth, Epstein was for years a rare sighting on Manhattan's money-obsessed social scene. That ended in 1992 after he met Ghislaine Maxwell, glamorous and well-connected daughter of the disgraced British tycoon Robert Maxwell.

Some believe she was attracted by his resemblance to her similarly dominant and flamboyant father, but their romance reportedly ended because she wanted to marry and he wanted to see other women.

Bankrolled by Epstein, however, she established herself as a leading New York socialite and repaid the favour by putting Epstein in touch with her own well-heeled friends in Britain.

She introduced him to Prince Andrew in early 2000, quite probably during a holiday at the Mar-a-Lago Club in Palm Beach, owned by Donald Trump.

Epstein joined them on four other breaks over the year, including a beach holiday in Phuket, Thailand, another holiday in Florida and two occasions in Britain.

The first was a June engagement at Windsor Castle to celebrate the Queen's birthday, the second a weekend house party at Sandringham six months later which the prince arranged to celebrate Miss Maxwell's 39th birthday.

In between, she took him to an infamous 'hookers and pimps' party at a New York nightclub hosted by the former lingerie model Heidi Klum in a black latex S&M outfit.

Troubled teenager: Virginia on the billionaire's Zorro ranch in New Mexico in 2001

The prince was also at a Manhattan cocktail party thrown that year by Miss Maxwell which was filled with young Russian 'models' – some of the other guests were 'horrified', said an onlooker.

If the prince got the chance to party with a super-rich, never-married playboy who loved to surround himself with beautiful young women, the quid pro quo for Epstein was less obvious.

American friends noticed his delight in introducing 'Andrew' and waiting for them to make the royal connection. There have even been unsubstantiated rumours – most probably started by Epstein and on which Buckingham Palace would not comment – that he advised the Queen on her finances.

Murray Gell-Mann, a Nobel Prize-winning physicist and recipient of Epstein largesse, said he was certainly given the impression by Epstein that she was a client.

Young girls in Palm Beach

Epstein's world began to implode in March 2005 when the mother of a 14-year-old girl went to police in Palm Beach accusing him of sexually assaulting her daughter.

The teenager told police she was taken to Epstein's mansion by an older girl and paid $300 after stripping to her knickers and massaging the man while he abused himself.

When police searched the mansion they found hidden cameras, photos of naked young girls on the walls and genitalia-shaped soap in the bathroom.

At least 40 girls aged 13 to 17 have come forward with similar stories, some saying Epstein sexually assaulted them during the massage.

According to Brad Edwards, a lawyer for some of the accusers, Epstein was molesting under-age girls every day he was in Palm Beach.

Police, who had wanted to pursue possible sex-trafficking charges, were furious and blamed Epstein's high-placed friends when he was allowed to strike a plea bargain under which he admitted two minor charges and was jailed for just 13 months.

'If it you or I did this, we'd be in prison for life,' said Mr Edwards. However, the girls have been allowed to take civil action and Epstein has so far made 40 hefty out-of-court settlements. Several girls said Ghislaine Maxwell had procured them.

Virginia's story

Of all the allegations made by anonymous girls against Epstein, one stood out as particularly earth-shattering.

Jane Doe 102, as she was known, claimed she had not only been abused by Epstein but had jetted around the world with him and was 'sexually exploited by [his] adult male peers, including royalty, politicians, academicians, businessmen and/or professional and personal acquaintances'.

She has now been identified as Virginia Roberts, a blonde, blue-eyed mother of three now living in Australia.

At the age of 15, she was working as a changing room assistant at the Mar-a-Lago club in Palm Beach.

She said she was approached by Ghislaine Maxwell, who offered her the chance to work for a wealthy 'gentleman' who needed a travelling masseuse.

Conviction: Jeffrey Epstein

They visited Epstein's pink mansion where, according to court papers, she was ordered to strip and straddle his naked body.

'My face was red with embarrassment but I felt under immense pressure to please them,' she told the Mail on Sunday.

'The whole time it was going on, they were promising me the world, that I'd travel with Jeffrey on his private jet and have a well-paid profession.'

Epstein paid her $200 for what he called the 'erotic massage' and told her to return the next day. She spent the next four years with Epstein, for three of which she was under Florida's age of consent - 18.

'Basically, I was training to be a prostitute for him and his friends who shared his interest in young girls,' she says.

That stage of his alleged abuse started after two years when he asked her to 'fly to his Caribbean island and make a friend of his 'feel how you make me feel'.

She says she was given to men, aged from their 40s to their 60s, either on the island or on Epstein's New Mexico ranch.

Pampering a prince

Virginia says she met Prince Andrew three times. First, when she accompanied Epstein on a six-week trip to Europe and North Africa in 2001 they went to Ghislaine Maxwell's London house.

The following day, Andrew arrived and Miss Maxwell served tea and biscuits to the four of them.

Miss Maxwell invited the prince to guess Virginia's age and he correctly said '17', at which Miss Maxwell joked that Jeffrey would 'soon have to trade her in'.

After dinner and a trip to Tramp nightclub where she danced with the prince, they returned to Miss Maxwell's house. They all went upstairs and Virginia asked Epstein to take a picture of her with Andrew to 'show my mom'.

She adds: 'Ghislaine and Jeffrey left us after that, and later Andrew left.' The following morning, Maxwell told her: 'You did well. He had fun.'

On the last leg of the trip, Epstein paid her $15,000 which she described as 'amazing money, more than I'd ever made on a trip with him before'.

She says she met Andrew a second time at Easter 2001, finding him sitting in a leather armchair at Epstein's Manhattan home.

Miss Maxwell had given him the prince a Spitting Image puppet of himself and another member of Epstein's entourage, Johanna Sjoberg, was sitting on his knee.

Miss Sjoberg, who was 21, herself described the incident to the Mail on Sunday three years ago. She said Miss Maxwell made Virginia sit on Andrew's other knee and then she 'put the puppet's hand on Virginia's breast, then Andrew put his hand on my breast'.

She added: 'It was a great joke. Everybody laughed.' The 'joke' earned Virginia $400 from Epstein.

Her final encounter with the prince was on Epstein's Caribbean island, by which time she was 18.

There is no suggestion that there was ever any sexual contact between her and the prince or that Andrew knew Epstein had paid her to have sexual contact with his friends.

By now, she says, Epstein was hinting she was 'too old' for him although he and Miss Maxwell once disgusted her by suggesting she had a child by him.

'They said I would have to sign a contract relinquishing rights to the child and consenting to Jeffrey having as many relationships as he liked,' she says. 'It was a smack in the face.'

For her 19th birthday, Epstein flew her to Thailand to take a massage course. She met an Australian martial arts expert there and married him ten days later.

Counselling: Virginia at her mother's home at Palm Beach in 1998

Epstein's plea bargain spared Virginia the ordeal of having to testify against him in court.

But she says she is 'appalled' by the light sentence he received. 'To me it's saying, "We are above the law". Jeffrey is a monster.'

An offender not a predator

Friends insist Epstein is 'looking for a new beginning' but it has not started with any show of remorse from the notoriously arrogant tycoon.

Stopped by a reporter in New York last week, he insisted: 'I'm not a sexual predator, I'm an offender... it's the difference between a murderer and a person who steals a bagel.'

This particular bagel thief has been put in the highest re-offending risk category in the US sex offenders' register.

But while Leslie Wexner, his billionaire client, has dispensed with his services, other less wealthy friends are more than happy still to fraternise with the convicted paedophile.

They include Prince Andrew, who spent five days staying at Epstein's Manhattan mansion in December.

He was guest of honour at a party thrown by Epstein and attended by Woody Allen, CBS News presenter Katie Couric and several other broadcasters, all of them light heartedly pestering for invitations to Prince William's wedding.

Organiser: Ghislaine Maxwell looks on as Andrew put his arm around Virginia. Robert Maxwell's daughter invited her to work as Epstein's personal masseuse soon after her 15th birthday

Rosa Monckton, the jeweller and former confidante of Diana, Princess of Wales, has been a friend of Epstein since they met at a dinner party in London in the 1980s.

She said she was not surprised that Prince Andrew was still willing to associate with him.

'It shows he's a good friend,' she says. 'Jeffrey is an extraordinarily loyal friend, and if somebody's loyal to you, you're loyal back. Whatever Jeffrey did, he's been punished for.'

As for Ghislaine Maxwell, she is still close to Epstein although, according to a member of staff at her New York home yesterday, she had conveniently 'gone away until next week'.

Epstein himself is picking up the reins of a business without its main client (Mr Wexner). Friends confide that it is a difficult time for him'.

Brad Edwards, the lawyer representing some of his accusers in Florida, is sceptical over whether Epstein will be able to get over his hankering for the sexual ministrations of poor, easily-exploited young girls – whatever his friends say. 'To me, it's a tough habit to break,' he says.

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Tracy, Brampton, Canada, 6 years ago

He is the Queen's favourite child - he will stay where he is, acting as he does, until she is no longer around to get upset at criticism. Maybe Charles or Will can get rid, but not now

Click to rate 60 8

gsi4, Miami, 6 years ago

Why is he not banned from entering the UK? They are banning a radio talk show host who is ultra conservative ... not a child abuser at all, just a talk show host. He's banned but you let this filthy pig into your country. One of you should make a complaint!!!

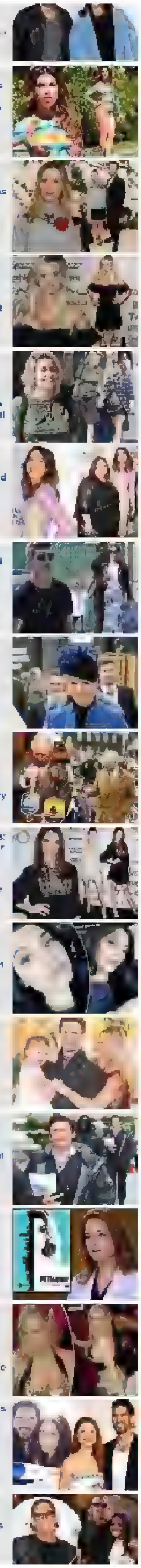
Click to rate 77 9

Mirza Cali, London, England, 6 years ago

Andy is dumb, a school leaver who became Britain's Trade Envoy is a joke in itself. Get rid of this baboon. He is not fit even for a manual job let alone representing this great nation. Whose idea it was to make him a trade envoy? It is a sheer madness on part of the British Government. There are many well qualified respectable people and one of them could serve responsibly without any fuss. This idiot takes his valet and an ironing board wherever he goes to represent this country as a trade envoy mainly to seek freebies from rich Arabs and blows all trade deals by talking nonsense as one of the retired foreign office staff wrote a scathing article and pointed out the way Andy talks and operate his mission abroad. Having read this article in the Daily Mail not long ago I thought this man is not worth to serve as his country's trade envoy

Click to rate 94 4

Samanta, ...



Guillaume Canet
The French actress starred with Brad Pitt in the film Allied

On top of the world! Elisabetta Canalis wows in her new swimwear line with the help of one of Los Angeles' most famous homes
George Clooney's ex

Downton Abbey's Laura Carmichael looks funky in floral sweater as she cozies up to ex co-star Dan Stevens for Beauty and The Beast fashion launch

Holly Madison puts on a very busty display as she joins star-studded grand opening of TAO Hollywood development
The 37-year-old looked gorgeous

Paris and her prom date! Jackson is all smiles as she walks hand-in-hand with BFF Melissa Lauren who she took to last year's formal dance

This Is Us co-stars Mandy Moore and Chrissy Metz light up red carpet in contrasting outfits at Beverly Hills gala
Actresses were beaming

Robin Thicke picks up son Julian accompanied by girlfriend April Love Geary
Helping his son's hand as they left the campus together

Hats off to her! Princess Anne's daughter Zara Tindall makes an elegant appearance in blue at Cheltenham for the FOURTH day in a row

Shouldn't that be a Guinness? Prince Charles shuns traditional St Patrick's Day tipple for a pint of ale as he visits a brewery in Wiltshire

Make way for the minis! Katie Holmes flaunts her lean legs in plush dress as Hailey Baldwin sparkles in sequins at star-studded opening of TAO in LA

Kylie Jenner proudly shows off her bling on Snapchat ... just before Kendall had $200k worth of jewelry stolen
Flashed a set of massive rings

'We're all very excited!' Jessica Hall of Kendra On Top reveals she is expecting baby number two with husband
Pregnant by her husband Kyle Clarkson

Hugh Jackman wraps up in puffa jacket as he braves the chilly New York City weather to film The Greatest Showman
He's one of Hollywood's biggest stars

SPOILER ALERT: Grey's Anatomy's Dr April Kepner enjoys rendezvous with Dr Jackson Avery in major twist
Dramatic development

Letting it all hang out! Coco Austin dances in low-cut animal print jumpsuit at St. Patrick's Day party
Plunging neckline revealed her cleavage

Dancing With The Stars pro Anna Trebunskaya reveals she is expecting baby number two with boyfriend Nevin Millan
Showed off her test

'Let's do it!' Rachel Lindsay sparkles in behind the scenes shots shared by The Bachelorette creator Mike Fleiss

But his invitation to the Royal wedding will probably not be withdrawn

Click to rate 54 2

Why doesn't he go back to dear old Sandra? she might suck his toes for him, and she'll get a front seat at "you know what"

Click to rate 23 2

Keith, East Sussex

And of course he'd no idea Fergie was offering his services for money

Click to rate 79 4

DB1

There is no suggestion that there was ever any sexual contact between her and the prince or that Andrew knew Epstein had paid her to have sexual contact with his friends. That being the case then this is really not a journalistic story is it? Or is guilt by association now a crime?

Click to rate 8 27

David

British businesses will probably fall apart without the leadership that this wonderful man provides. He truly is a prince among men

Click to rate 9 15

Mike

At 17 she knew what she was doing - basically a prostitute and she is still trying to get money and sell her story. It takes two to tango. She seems to have no shame

Click to rate 11 32

Alison

As a trained, qualified and insured professional masseur, it makes me very angry to hear what these girls did described as "massage"! None of them knows the first thing about massage, they were prostitutes who touched men with no idea or intention other than to sexually excite. No wonder we have to battle such prejudice when newspapers still use the term massage to describe their activities

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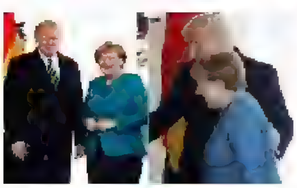

Trump's warm welcome for Merkel: President greets German chancellor for face to face talks - after he accused her of ruining her country...

Trump and Merkel are holding talks at the White House today. They'll have a joint press conference this afternoon where the topic of

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Frantic search for stolen Secret Service agent's laptop that has 'sensitive' documents on it including Trump Tower floor plans and...

A Secret Service agent's laptop was reportedly stolen from her vehicle parked in her driveway in Brooklyn, New York Thursday morning

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Trump says North Korea is 'behaving very badly' – after secretary of state draws new red line threatening pre-emptive strike if Kim's regime...

Trump's secretary of state had already said it may be necessary to take pre-emptive military action if the threat from Pyongyang's weapons

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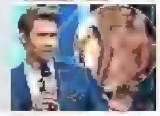
Inching towards nuclear war? It's terrifying. North Korea's use of missiles threatens a new global flashpoint which could suck in

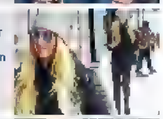
She's a Dallas attorney

Hostess with the mostest! Tyra Banks returning as host of America's Next Top Model... after being named as Nick Cannon's replacement on AGT

Chad Michael Murray wears a smart blue suit as he talks about going nude on his new TV series Sun Records
Wore a form-fitting suit to plug the show



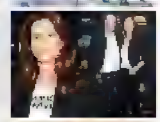
Gorgeous Candice Swanepoel goes hell for leather in NYC after revealing Vogue shoot in Brazil
Victoria's Secret Angel looked amazing



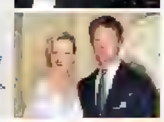
Mommy and me time! Ashlee Simpson and daughter Jagger are coordinating denim divas as they run errands around town
Headed out together

She's a boho babe! Malin Akerman goes hippie chic as she steps out with son Sebastian days after going public with new actor beau Jack Donnelly

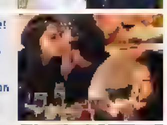
Taking a bite out of cancer! Cindy Crawford goes casual for launch of charity burger with husband Rande
Accompanied by her husband Rande Gerber



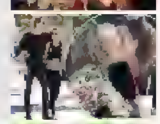
'Anti-marriage' Wonderbra model Eva Herzigova announces engagement to father of her three children
The Czech-born beauty is now tying the knot



Smoking hot romance! Adriana Lima lights up before packing on PDA with bad boy NY Mets pitcher Matt Harvey... after splitting with Julian Edelman



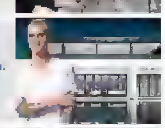
The royal treatment! Prince Albert of Monaco's daughter Jazmin Grace Grimaldi packs on PDA with boyfriend Ian Mellencamp in LA



Fabulous at 50! Halle Berry shows fit physique in tank-top and leggings while picking up skin care supplies
Oscar-winning actress looking fantastic

All business! Jessica Biel leaves her kid-friendly Hollywood eatery in chic ensemble of black sweater and white pencil skirt
At Au Fudge restaurant

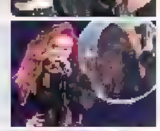
An eight-car garage, infinity pool, FIVE bedrooms and a very SEXY ensuite bathroom: Inside the mansion Justin Bieber is renting during his Sydney stay



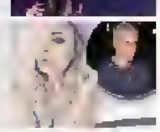
Mane attraction! Vanessa Hudgens shows off new extensions during horseback riding lessons in LA
But kept them in check

Making friends? Justin Bieber enjoys a pleasant exchange with an Iggy Azalea lookalike fan dressed in a netted crop top and black bra in Sydney

Jesy Nelson fiercely denies feud with Little Mix bandmate Perrie Edwards... as it's claimed she ditched girls' night for date with new love Chris Clark



It looks like Justin has a thing for yummy mommies! Meet model Sarah Fitzgerald... the married mom Bieber partied with during cruise



She's not great mans!

EXHIBIT L

Jeffrey Epstein 'sex slave' Virginia Roberts was a 'money-hungry sex kitten', ex friends claim

www.dailymail.co.uk

Jeffrey Epstein 'sex slave' lived a lavish lifestyle and enjoyed her role as his 'travelling masseuse', former friends claim

- **Virginia Roberts claims she was recruited to Epstein's harem in 1999**
- **Named Prince Andrew and Alan Dershowitz as men she had to 'service'**
- **Her friends say there was no indication she was being held captive**
- **Asked other women if they knew anyone 'slutty' to bring to Epstein**
- **Would allegedly use cash she gained from sex to live a luxury lifestyle**

By Wills Robinson For Dailymail.com

Published: 12:49 EDT, 1 March 2015 | Updated: 07:09 EDT, 2 March 2015

Shocking: Virginia Roberts' friends claim she was a money-hungry sex kitten' who enjoyed her lavish lifestyle

The woman who has accused Jeffery Epstein of keeping her as a sex slave was actually a money-hungry sex kitten' who enjoyed her lavish lifestyle, former friends have claimed.

Virginia Roberts is currently in the midst of a lawsuit claiming she was recruited to join Epstein's harem of underage women in 1999, naming Prince Andrew and attorney Alan Dershowitz as two of the men she was made to 'service'.

But those who used to be close to the 31-year-old say she relished her role as his 'travelling masseuse' and never acted like she was being held captive.

Philip Guderyon, who used to date Roberts and would drive her to Epstein's Pal Beach, Florida, mansion told the New York Daily News: 'She was like the head b***h. She'd have like nine or 10 girls she used to bring to him.

'She never looked like she was being held captive,' he added. 'She and the other girls would walk out of there smiling, with their little bathing suits on, like they had just come from the beach.

'She'd have like $4,000. And then I'd take them all to the mall and they'd get their nails done.'

He also said while making thousands of dollars from the relationship, she would buy fancy clothes and drive around in Epstein's Mercedes.

Crystal Figueroa, whose brother dated Roberts in the early 2000s, told the Daily News Roberts would ask if she knew anyone 'slutty' so they could be sent to Epstein.

In 2001 she was sharing a Palm Beach apartment with Anthony Valladares. He told the Daily News that she bragged about going to the 'millionaire's house' for a day or two, before returning with cash.

He did say that she tried to get out of the sex business, but was dragged back in.

Last month it was revealed Roberts accused two male acquaintances she was raped, bringing her credibility into question.

Roberts' lawyers says the latest allegations do not contend the fact she was used for underage sex.

Attorney Sigrid McCawleysaid : 'To say that our client acquiesced in this abuse, or that the abuse was OK because she was paid for it — leaves out the fact that this is why we have laws in the United States to protect minor children who are groomed and sexually trafficked by adults.'

Epstein served 13 months in a Florida prison after pleading guilty in 2008 to soliciting a minor for prostitution.

Allegations: The 31-year-old is currently in the midst of a lawsuit claiming she was recruited to join Epstein's harem of underage women in 1999, naming Prince Andrew and attorney Alan Dershowitz as two of the men she was made to 'service'

The scandal resurfaced in January when Roberts named Prince Andrew in a lawsuit, accusing him of using her for underage sex.

According to court records connected with Roberts' current lawsuit, she maintains that she was recruited to join Epstein's harem in 1999 by his friend, the socialite Ghislaine Maxwell.

She says during the three years she worked for Epstein, she was made to entertain his friends and named Prince Andrew and Dershowitz as two men she had sex with.

Both men have denied having sex with Roberts, and Dershowitz is trying to get his name removed from the suit, claiming Roberts made the entire story up.

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FOR IMMEDIATE RELEASE **Contact:** Richard A. Simpson, RSimpson@wileyrein.com
April 8, 2016

Lawyers Acknowledge Mistake In Filing Sexual Misconduct Charges Against Professor Dershowitz

Professor Alan M. Dershowitz released the following statement regarding resolution of the case styled *Bradley Edwards, et al. v. Alan M. Dershowitz*, Case No. CACE 15-000072 (Cir. Ct., Broward Cnty., Fla.).

STATEMENT OF ALAN M. DERSHOWITZ

I am pleased that the litigation has concluded and I am gratified by the Joint Statement issued today by Jeffrey E. Streitfeld on behalf of the parties, in which "Edwards and Cassell acknowledge that it was a mistake to have filed sexual misconduct accusations against Dershowitz and the sexual misconduct accusations made in all public filings (including all exhibits) are hereby withdrawn." Mr. Streitfeld's announcement and the Joint Statement are copied below.

ANNOUNCEMENT BY JEFFREY E. STREITFELD, FLORIDA SUPREME COURT CERTIFIED CIRCUIT CIVIL MEDIATOR (Streitfeldlaw.com)

It is my pleasure to report that Bradley J. Edwards, Paul G. Cassell, and Alan M. Dershowitz have resolved their disputes and have agreed to settle the claims raised in an action pending in the Broward County, Florida Circuit Court. Since being appointed by Circuit Court Judge Thomas Lynch IV last fall, it has been a privilege to act as the mediator and assist the parties and their counsel toward this agreed resolution. I want to extend my appreciation for the professionalism exhibited by the parties and their counsel with whom I worked directly: Jack Scarola, Rick Simpson, Tom Scott, and Ken Sweder. As part of their agreement, the parties have issued the attached Joint Statement.

JOINT STATEMENT OF BRAD EDWARDS, PAUL CASSELL AND ALAN DERSHOWITZ REGARDING SETTLEMENT

Brad Edwards, Paul Cassell and Alan Dershowitz have today settled their pending defamation claims in which Edwards and Cassell sued Dershowitz and Dershowitz counterclaimed against Edwards and Cassell. The case was about Dershowitz's public claims that Edwards and Cassell, as the attorneys for Virginia Roberts, had failed to perform the necessary due diligence before filing the allegations of their client, not whether the acts of alleged misconduct in fact occurred. Edwards and Cassell vigorously denied the contention that they had acted improperly and asserted that it defamed them. Dershowitz countersued Edwards and Cassell, alleging they had falsely accused him of sexual contact with Roberts—a claim he vigorously denied and that Dershowitz asserted defamed him. Edwards and Cassell maintain that they filed their client's allegations in good faith and performed the necessary due diligence to do so, and have produced documents detailing those efforts. Dershowitz completely denies any such misconduct, while not disputing Roberts's statements that the underlying alleged misconduct may have occurred with someone else. Dershowitz has produced travel and other records for the relevant times which he relies on to establish that he could not have been present when the alleged misconduct occurred. He has also produced other evidence that he relies upon to refute the credibility of the allegations against him.

The parties believe it is time to take advantage of the new information that has come to light on both sides during the litigation and put these matters behind them.

Given the events that have transpired since the filing of the documents in the federal court and in this action in which Dershowitz was accused of sexual misconduct, including the court order striking the allegations in the federal court filings, and the records and other documents produced by the parties, Edwards and Cassell acknowledge that it was a mistake to have filed sexual misconduct accusations against Dershowitz; and the sexual misconduct accusations made in all public filings (including all exhibits) are hereby withdrawn. Dershowitz also withdraws his accusations that Edwards and Cassell acted unethically.

Neither Edwards, Cassell, nor Dershowitz have any intention of repeating the allegations against one another.

####

Editor's note: Wiley Rein LLP represents Alan M. Dershowitz in this matter.

EXHIBIT S

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

CASE NO.:08-CV-80736-KAM

JANE DOE 1 and JANE DOE 2,

Petitioners,

vs.

UNITED STATES OF AMERICA,

Respondent.

_______________________________/

ORDER DENYING PETITIONERS' MOTION TO JOIN UNDER RULE 21 AND MOTION TO AMEND UNDER RULE 15

This cause is before the Court on Jane Doe 3 and Jane Doe 4's Corrected Motion Pursuant to Rule 21 for Joinder in Action ("Rule 21 Motion") (DE 280), and Jane Doe 1 and Jane Doe 2's Protective Motion Pursuant to Rule 15 to Amend Their Pleadings to Conform to Existing Evidence and to Add Jane Doe 3 and Jane Doe 4 as Petitioners ("Rule 15 Motion") (DE 311). Both motions are ripe for review. For the following reasons, the Court concludes that they should be denied.

I. Background

This is an action by two unnamed petitioners, Jane Doe 1 and Jane Doe 2, seeking to prosecute a claim under the Crime Victims' Rights Act (CVRA), 18 U.S.C. § 3771. (DE 1). Generally, they allege that the respondent Government violated their rights under the CVRA by failing to consult with them before negotiating a non-prosecution agreement with Jeffrey Epstein, who subjected them to various sexual crimes while they were minors. (Id.). Petitioners initiated this action in July 2008. (Id.).

On December 30, 2014, two other unnamed victims, Jane Doe 3 and Jane Doe 4, moved to join as petitioners in this action pursuant to Federal Rule of Civil Procedure 21. (DE 280). Petitioners (Jane Doe 1 and Jane Doe 2) support the Rule 21 Motion. (Id. at 11). Jane Doe 3 and Jane Doe 4 argue that they "have suffered the same violations of their rights under the [CVRA] as the" Petitioners, and they "desire to join in this action to vindicate their rights as well." (Id. at 1). The Government vehemently opposes joinder under Rule 21. (DE 290). The Government argues that Rule 15 is the proper procedural device for adding parties to an action, not Rule 21. (Id. at 1).

"[O]ut of an abundance of caution," Petitioners filed a motion to amend their petition under Rule 15, conforming the petition to the evidence and adding Jane Doe 3 and Jane Doe 4 as petitioners. (DE 311 at 2). The Government opposes the Rule 15 Motion as well. (DE 314). Among other things, the Government argues that amending the petition to include Jane Doe 3 and Jane Doe 4 should be denied because of their undue delay in seeking to join the proceedings, and the undue prejudice that amendment will cause. (Id.).

After considering the parties' submissions and the proposed amended petition, the Court finds that justice does not require amendment in this instance and exercises its discretion to deny the amendment.

II. Discussion

"The decision whether to grant leave to amend a complaint is within the sole discretion of the district court." Laurie v. Ala. Ct. Crim. Apps., 256 F.3d 1266, 1274 (11th Cir. 2001). "The court should freely give leave when justice so requires." Fed. R. Civ. P. 15(a)(2). Justice does not require amendment in several instances, "includ[ing] undue delay, bad faith, dilatory motive on the part of the movant, . . . undue prejudice to the opposing party by virtue of allowance of the amendment, [and] futility of amendment.'" Laurie, 256 F.3d at 1274 (quoting Foman v. Davis, 371 U.S. 178, 182 (1962)). In addition to considering the effect of amendment on the parties, the court must consider "the importance of the amendment on the proper determination of the merits of a dispute." 6 Wright & Miller, Fed. Prac. & Fed. P. § 1488, p. 814 (3d ed. 2010). Justice does not require amendment where the addition of parties with duplicative claims will not materially advance the resolution of the litigation on the merits. See Herring v. Delta Air Lines, Inc., 894 F.2d 1020, 1024 (9th Cir. 1989).

A. Rule 21 Motion

Jane Doe 3 and Jane Doe 4's first attempt to join in this proceeding was brought under Rule 21. (DE 280). "If parties seek to add a party under Rule 21, courts generally use the standard of Rule 15, governing amendments to pleadings, to determine whether to allow the addition." 12 Wright & Miller, Fed. Prac. & Fed. P., p. 432 (3d ed. 2013); see also Galustian v. Peter, 591 F.3d 724, 729-30 (4th Cir. 2010) (collecting cases and noting that Rule 15(a) applies to amendments seeking to add parties); Frank v. U.S. West, Inc., 3 F.3d 1357, 1365 (10th Cir. 1993) ("A motion to add a party is governed by Fed. R. Civ. P. 15(a) . . . .").

Rule 21, "Misjoinder and Non-joinder of Parties," provides the court with a tool for correcting the "misjoinder" of parties that would otherwise result in dismissal. Fed. R. Civ. P. 21. Insofar as Rule 21 "relates to the addition of parties, it is intended to permit the bringing in of a person, who through inadvertence, mistake or for some other reason, had not been made a party and whose presence as a party is later found necessary or desirable." United States v. Com. Bank of N. Am., 31 F.R.D. 133, 135 (S.D.N.Y. 1962) (internal quotation marks omitted).

In their Rule 21 Motion, Jane Doe 3 and Jane Doe 4 do not claim that they were omitted from this proceeding due to any "inadvertence" or "mistake" by Petitioners; rather, they seek to join this proceeding as parties that could have been permissively joined in the original petition under Rule 20 ("Permissive Joinder of Parties"). As courts generally use the standards of Rule 15 to evaluate such circumstances, the Court will consider the joinder issue as presented in the Rule 15 Motion.[1] The Court will consider the arguments presented in the Rule 21 Motion as if they are set forth in the Rule 15 Motion as well. Because the arguments are presented in the Rule 15 Motion (and because the Court is denying the Rule 15 Motion on its merits, as discussed below), the Rule 21 Motion will be denied.

The Court also concludes that portions of the Rule 21 Motion—and related filings—should be stricken from the record. Pending for this Court's consideration is a Motion for Limited Intervention filed by Alan M. Dershowitz, who seeks to intervene to "strike the outrageous and impertinent allegations made against him and [to] request[] a show cause order to the attorneys that have made them." (DE 282 at 1). The Court has considered Mr. Dershowitz's arguments, but it finds that his intervention is unnecessary as Federal Rule of Civil Procedure 12(f) empowers the Court "on its own" to "strike from a pleading an insufficient defense or any redundant, immaterial, impertinent, or scandalous matter." Fed. R. Civ. P. 12(f).

Petitioners' Rule 21 Motion consists of relatively little argumentation regarding why the Court should permit them to join in this action: they argue that (1) they were sexually abused by

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[1] The Court notes that, regardless of which motion it considers, the same standard governs the addition of parties under Rule 21 and Rule 15. See Goston v. Potter, No. 08-cv-478 FJS ATB, 2010 WL 4774238, at *5 (N.D.N.Y. 2010) (citing Bridgeport Music, Inc. v. Universal Music Grp., Inc., 248 F.R.D. 408, 412 (S.D.N.Y. 2008)).

Jeffrey Epstein, and (2) the Government violated their CVRA rights by concealing the non-prosecution agreement with them. (DE 280 at 3; see id. at 7-8). However, the bulk of the Rule 21 Motion consists of copious factual details that Jane Doe 3 and Jane Doe 4 "would prove" "[i]f allowed to join this action." (Id. at 3, 7). Specifically, Jane Doe 3 proffers that she could prove the circumstances under which a non-party introduced her to Mr. Epstein, and how Mr. Epstein sexually trafficked her to several high-profile non-party individuals, "including numerous prominent American politicians, powerful business executives, foreign presidents, a well-known Prime Minister, and other world leaders." (Id. at 3-6). She names several individuals, and she offers details about the type of sex acts performed and where they took place. (See id. at 5).[2]

At this juncture in the proceedings, these lurid details are unnecessary to the determination of whether Jane Doe 3 and Jane Doe 4 should be permitted to join Petitioners' claim that the Government violated their rights under the CVRA. The factual details regarding with whom and where the Jane Does engaged in sexual activities are immaterial and impertinent to this central claim (i.e., that they were known victims of Mr. Epstein and the Government owed them CVRA duties), especially considering that these details involve non-parties who are not related to the respondent Government. These unnecessary details shall be stricken.

The original Rule 21 Motion (DE 279) shall be stricken in its entirety, as it is wholly superseded by the "corrected" version of the Rule 21 Motion (DE 280). From the corrected Rule 21 Motion, the Court shall strike all factual details regarding Jane Doe 3 between the following sentences: "The Government then concealed from Jane Doe #3 the existence of its NPA from

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[2] Jane Doe 4's proffer is limited to sexual acts between Mr. Epstein and herself. (See DE 280 at 7-8).

Jane Doe #3, in violation of her rights under the CVRA" (id. at 3); and "The Government was well aware of Jane Doe #3 when it was negotiating the NPA, as it listed her as a victim in the attachment to the NPA" (id. at 6). As none of Jane Doe 4's factual details relate to non-parties, the Court finds it unnecessary to strike the portion of the Rule 21 Motion related to her circumstances. Regarding the Declaration in support of Petitioners' response to Mr. Dershowitz's motion to intervene (DE 291-1), the Court shall strike paragraphs 4, 5, 7, 11, 13, 15, 19 through 53, and 59, as they contain impertinent details regarding non-parties. Regarding the Declaration of Jane Doe 3 in support of the Rule 21 Motion (DE 310-1), the Court shall strike paragraphs 7 through 12, 16, 39, and 49, as they contain impertinent details regarding non-parties. Jane Doe 3 is free to reassert these factual details through proper evidentiary proof, should Petitioners demonstrate a good faith basis for believing that such details are pertinent to a matter presented for the Court's consideration.

As mentioned, Mr. Dershowitz moves to intervene "for the limited purposes of moving to strike the outrageous and impertinent allegations made against him and requesting a show cause order to the attorneys that have made them." (DE 282 at 1). As the Court has taken it upon itself to strike the impertinent factual details from the Rule 21 Motion and related filings, the Court concludes that Mr. Derschowitz's intervention in this case is unnecessary. Accordingly, his motion to intervene will be denied as moot.[3] Regarding whether a show cause order should

[3] This also moots Mr. Dershowitz's Motion for Leave to File Supplemental Reply in Support of Motion for Limited Intervention. (DE 317). Denying Mr. Dershowitz's motion to intervene also renders moot Petitioners' motion (DE 292) to file a sealed document supporting its response to Mr. Dershowitz's motion. It will accordingly be denied as moot, and DE 293 (the sealed response) will be stricken from the record.

issue, the Court finds that its action of striking the lurid details from Petitioners' submissions is sanction enough. However, the Court cautions that all counsel are subject to Rule 11's mandate that all submissions be presented for a proper purpose and factual contentions have evidentiary support, Fed. R. Civ. P. 11(b)(1) and (3), and that the Court may, on its own, strike from any pleading "any redundant, immaterial, impertinent, or scandalous matter," Fed. R. Civ. P. 12(f).

B. Rule 15 Motion

Between their two motions (the Rule 21 Motion and Rule 15 Motion), Jane Doe 3 and Jane Doe 4 assert that "they desire to join in this action to vindicate their rights [under the CVRA] as well." (DE 280 at 1). Although Petitioners already seek the invalidation of Mr. Epstein's non-prosecution agreement on behalf of all "other similarly-situated victims" (DE 189 at 1; DE 311 at 2, 12, 15, 18-19), Jane Doe 3 and Jane Doe 4 argue that they should be fellow travelers in this pursuit, lest they "be forced to file a separate suit raising their claims" resulting in "duplicative litigation" (DE 280 at 11). The Court finds that justice does not require adding new parties this late in the proceedings who will raise claims that are admittedly "duplicative" of the claims already presented by Petitioners.

The Does' submissions demonstrate that it is entirely unnecessary for Jane Doe 3 and Jane Doe 4 to proceed as parties in this action, rather than as fact witnesses available to offer relevant, admissible, and non-cumulative testimony. (See, e.g., DE 280 at 2 (Jane Doe 3 and Jane Doe 4 "are in many respects similarly situated to the current victims"), 9 ("The new victims will establish at trial that the Government violated their CVRA rights in the same way as it violated the rights of the other victims."), 10 (Jane Doe 3 and Jane Doe 4 "will simply join in motions that the current victims were going to file in any event."), 11 (litigating Jane Doe 3 and

Jane Doe 4's claims would be "duplicative"); DE 298 at 1 n.1 ("As promised . . . Jane Doe No. 3 and Jane Doe No. 4 do not seek to expand the number of pleadings filed in this case. If allowed to join this action, they would simply support the pleadings already being filed by Jane Doe No. 1 and Jane Doe No. 2."); DE 311 at 5 n.3 ("[A]ll four victims (represented by the same legal counsel) intend to coordinate efforts and avoid duplicative pleadings."), 15 (Jane Doe 3 and Jane Doe 4 "challenge the same secret agreement—i.e., the NPA that the Government executed with Epstein and then concealed from the victims. This is made clear by the proposed amendment itself, in which all four victims simply allege the same general facts.")). As the Does argue at length in their Rule 15 Motion, Jane Doe 1's original petition "specifically allege[s] that the Government was violating not only her rights but the rights of other similarly-situated victims." (DE 311 at 2). The Court fails to see why the addition of "other similarly-situated victims" is now necessary to "vindicate their rights as well." (DE 280 at 1).

Of course, Jane Doe 3 and Jane Doe 4 can participate in this litigated effort to vindicate the rights of similarly situated victims—there is no requirement that the evidentiary proof submitted in this case come only from the named parties. Petitioners point out as much, noting that, regardless of whether this Court grants the Rule 15 Motion, "they will call Jane Doe No. 3 as a witness at any trial." (DE 311 at 17 n.7). The necessary "participation" of Jane Doe 3 and Jane Doe 4 in this case can be satisfied by offering their properly supported—and relevant, admissible, and non-cumulative—testimony as needed, whether through testimony at trial (see DE 280 at 9) or affidavits submitted to support the relevancy of discovery requests[4] (see

[4] The non-party Jane Does clearly understand how to submit affidavits. (See DEs 291-1, 310-1).

id. at 10). Petitioners do not contend that Jane Doe 3 and Jane Doe 4's "participation in this case" can only be achieved by listing them as parties.

As it stands under the original petition, the merits of this case will be decided based on a determination of whether the Government violated the rights of Jane Doe 1, Jane Doe 2, and all "other similarly situated victims" under the CVRA. Jane Doe 3 and Jane Doe 4 may offer relevant, admissible, and non-cumulative evidence that advances that determination, but their participation as listed parties is not necessary in that regard. See Herring, 894 F.2d at 1024 (District court did not abuse its discretion by denying amendment where "addition of more plaintiffs . . . would not have affected the issues underlying the grant of summary judgment."); cf. Arthur v. Stern, 2008 WL 2620116, at *7 (S.D. Tex. 2008) (Under Rule 15, "courts have held that leave to amend to assert a claim already at issue in [another lawsuit] should not be granted if the same parties are involved, the same substantive claim is raised, and the same relief is sought.").[5] And, as to Jane Doe 4 at least, adding her as a party raises unnecessary questions about whether she is a proper party to this action.[6]

Petitioners also admit that amending the petition to conform to the evidence—by including references to the non-prosecution agreement itself—is "unnecessary" as the "existing petition is broad enough to cover the developing evidence in this case." (DE 311). The Court

[5] The Court expresses no opinion at this time whether any of the attestations made by Jane Doe 3 and Jane Doe 4 in support of their motion will be relevant, admissible, and non-cumulative.

[6] The Government contends that Jane Doe 4 is not a true "victim" in this case because she was not known at the time the Government negotiated the non-prosecution agreement, and accordingly she was not entitled to notification rights under the CVRA. (See DE 290 at 10). Any "duplicative" litigation filed by Jane Doe 4 would necessarily raise the issue of whether she has standing under the CVRA under these circumstances.

agrees, and it concludes that justice does not require amending the petition this late in the proceedings.

III. Conclusion

Accordingly, it is hereby **ORDERED AND ADJUDGED** as follows: the Rule 21 Motion (DE 280) is **DENIED**; the Rule 15 Motion (DE 311) is **DENIED**; Intervenor Dershowitz's Motion for Limited Intervention (DE 282) and Motion for Leave to File Supplemental Reply in Support of Motion for Limited Intervention (DE 317) are **DENIED AS MOOT**; Petitioners' Motion to Seal (DE 292) is **DENIED AS MOOT**; the following materials are hereby **STRICKEN** from the record:

- DE 279, in its entirety.
- DE 280, all sentences between the following sentences: "The Government then concealed from Jane Doe #3 the existence of its NPA from Jane Doe #3, in violation of her rights under the CVRA" (DE 280 at 3); and "The Government was well aware of Jane Doe #3 when it was negotiating the NPA, as it listed her as a victim in the attachment to the NPA" (DE 280 at 6).
- DE 291-1, paragraphs 4, 5, 7, 11, 13, 15, 19 through 53, and 59.
- DE 310-1, paragraphs 7 through 12, 16, 39, and 49.
- DE 293, in its entirety.

DONE AND ORDERED in chambers at West Palm Beach, Palm Beach County, Florida, this 6th day of April, 2015.

KENNETH A. MARRA
United States District Judge

From: Richard Kahn [redacted]
Sent: 4/4/2017 5:28:21 PM
To: jeffrey E. [jeevacation@gmail.com]
Subject: Fwd: White House exploring VAT (Washington Post)
Attachments: image002jpg01D2AD4706F2BBA0.jpg; image001jpg01D2AD460BC6CE60.jpg

Importance: High

Richard Kahn
HBRK Associates Inc.
575 Lexington Avenue 4th Floor
New York, NY 10022
tel [redacted]

Begin forwarded message:

From: "Ens, Amanda" <[redacted]>
Subject: White House exploring VAT (Washington Post)
Date: April 4, 2017 at 1:26:22 PM EDT
To: "Rich Kahn"<[redacted]>
Reply-To: "Ens, Amanda" <[redacted]>

David Woo just sent this – please let me know if you'd like an update on his Washington/market views

More sign that VAT is making its way into the discussion....
As you all know, I have been arguing that VAT make tremendous economic sense
A VAT has all the virtues of a BAT without any of its drawbacks
The fact that this is being discussed makes me think that we are getting to a more serious stage of the negotiation over tax reform
This news is bullish for Trump trades, at least for the medium-term

White House explores two new tax ideas — a value-added tax and carbon tax — as leading proposal to raise revenue falters

Washington Post
April 4

By Damian Paletta and Max Ehrenfreund

President Trump's administration is exploring the creation of two controversial new taxes — a value-added tax and a carbon tax — as part of a broad overhaul of the tax code, according to an administration official and one other person briefed on the process.

The value-added tax, which is popular in many other countries, would serve as a kind of national sales tax, one that consumers would pay when they make purchases and that businesses would pay for supplies, services and raw materials. A carbon tax would target the emissions of carbon dioxide and other greenhouses gases in the burning of gasoline, coal and other fossil fuels.

The study of the new options — which would represent major changes to American economic policy — comes as the administration looks to tax reform as its next major battleground for implementing its agenda. Trump wants to cut taxes sharply, but his advisers are looking for ways to raise revenue so as not to create a giant hole in the deficit.

Administration officials stressed that no final decision has been made and they are reviewing different alternatives. Two officials and a third person confirmed the consideration of the value-added tax, while one official and the third person confirmed the consideration of the carbon tax.

The search for new options reflects a recognition of the political challenges facing a proposal known as a border-adjustment tax that the White House and some Republicans had begun to rally around. The proposal, effectively a tax on imports, would not only raise needed revenue but also serve to fulfill Trump's pledge to protect American companies from unfair export competition.

The tax would create incentives for companies to manufacture and produce goods domestically. But the proposal is unpopular with many other Republicans, who have said it would raise costs for consumers on things such as automobiles, electronics and clothing.

A value-added tax and a carbon tax have long been favored tools among economists, including some on the right, to raise revenue in a way that supports economic growth. But the prospect of any new taxes has long drawn skepticism from Republicans.

Amanda Ens
Director
Bank of America Merrill Lynch
Merrill Lynch, Pierce, Fenner & Smith Incorporated
One Bryant Park, 5th Floor, New York, NY 10036
[redacted]

<!--[if !vml]--><![endif]-->

From: Ens, Amanda [redacted]
Sent: 4/7/2017 12:24:59 PM
To: jeffrey E. [jeevacation@gmail.com]; Richard Kahn [redacted]
Subject: EU BANKS: BIG EQUITY OUTFLOWS BUT REMAIN UPBEAT ON REFLATION TRADE: SALES TOP PICKS = SOC GEN, INTESA, NORDEA
Attachments: image001.gif; image001jpg01D2AF7627BB3E30.jpg; image012png01D2AF7627BB3E30.png; image014jpg01D2AF762A2ADEA0.jpg; image015jpg01D2AF762A2ADEA0.jpg; image016jpg01D2AF762A2ADEA0.jpg; image017jpg01D2AF762A2ADEA0.jpg; image018jpg01D2AF762A2ADEA0.jpg

Importance: High

We remain positive on banks that can make acceptable returns in the current environment and are geared into the upside when rates begin to recover... **ING, KBC, Intesa, Unicredit, SocGen, Erste, BKIR are all Buy rated**.

Global Equities
Specialist Sales – European Financials
Bank of America Merrill Lynch

MAR disclosure

EU BANKS: BIG EQUITY OUTFLOWS BUT REMAIN UPBEAT ON REFLATION TRADE

Spec Sales Comment:

Big Equity outflows but we see this is a pause not a reversal
BofAML latest flow show data this morning shows the largest equity outflows in 40 weeks and first outflows YTD (click here). Our BofAML Bull & Bear Indicator is now at 7.1, the highest level since Jul'14 and not far from "sell" signal. So is this just a pause for breath in the reflation trade? BofAML strategists think so. In our updated thoughts this morning we think reflation is real so stay long equities, short rates, selectively long USD (click here).

Chart 12: BofAML B&B Indicator (scale from 0 to 10)

Source BofA Merrill Lynch Global Investment Strategy

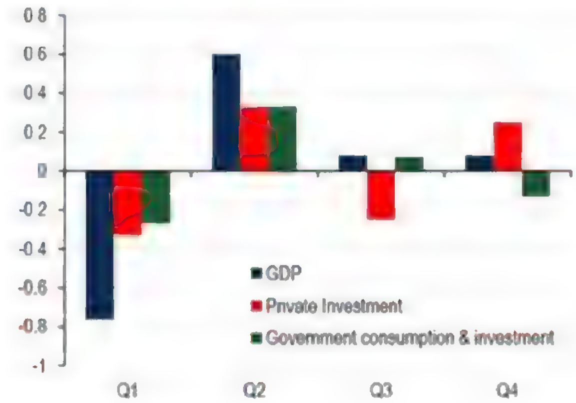
Why do we remain bullish the reflation trade?
The main reasons for equity investor concern in recent weeks = the gap between hard and soft data, plus the delay in the Trump fiscal package

Chart 1: The gap between hard and soft data is a concern to investors

Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 2: Mediocre US Q1 data partly down to seasonal adjustments

Residual seasonality in GDP growth from 1985 to 2015

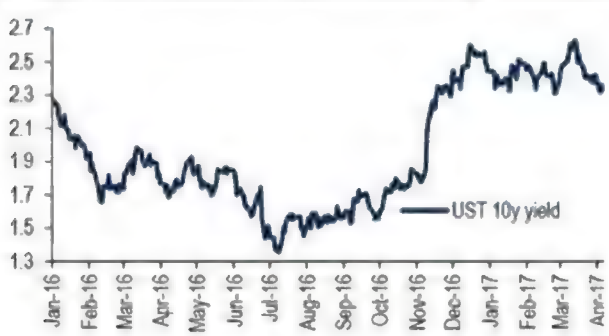


Source: Cleveland Federal Reserve

We continue to believe in the reflation theme because:

1. **Strength in the global economy is genuine** - European PMIs are at 6 year highs, Chinese and Japanese PMIs continue to improve too. In fact ~90% of PMIs globally are above 50 and 60% have increased in the last 3 months.
2. **Earnings revisions and Global Wave point to continued upturn** - earnings revisions now above 1.0 for the first time since 2011.
3. **We expect Trump to deliver on tax, even if it is smaller than hoped for** - should such a package be put together it would likely support the Trump trade once again after the failure to reform Obamacare
4. **Bond markets are being too sanguine about the likely pace of Fed tightening** - the Fed funds curve is once again well below the dot plot. We continue to see upside in yields if and when the market becomes more convinced that the soft data is right.

Chart 7: Bond yields have pulled back from FOMC highs



Source: Bloomberg

Chart 8: As the market refuses to price the dot plot

Source: BofA Merrill Lynch Global Research, Bloomberg

European Banks holding up better than US Peers on pull back

In Banks, the reoccurring feedback from investors has been that clients have rotated out of US banks and into European banks. This conflicts with our latest Fund Manager Survey which suggested allocation to European Banks fell the most of any sector MoM in the first two weeks of March, however, its true European Banks have quickly reversed the performance gap to US peers. The spread between the SX7E and S5BANKX Index is back to pre-US election levels.

What the EU banks bulls are saying:

EUR rates are going higher it's just a matter of timing, positive EPS revisions continue, EU is starting to see pockets of volume growth and asset yield recovery, credit spreads have been tightening YTD and attractive valuations of EU banks vs. US peers (EU banks on 12.0x 2017E P/E vs. US Banks on ~14x and some EU banks still on a large discount vs 10-year historical median P/B valuations).

What the EU banks bears are saying:
EU macro declining, US lead re-flation trade cooling (tax, deregulation, healthcare headwinds) and toppy multiples/high ownership of EU banks going into Q1 results. They believe the pressure will be off Draghi to act on the deposit rate if the macro starts to reverse which may cause people to push back the assumed timing of European rate hikes and tapering. The French election is also a big risk factor which is clearly holding back some global investors from buying into Europe.

Rates Update
Consensus has started to factor in the higher rate outlook in Europe. The bears are pointing out that these probabilities have fallen a lot this week while the bulls argue it's just a matter of timing.

I monitor market expectations for ECB normalisation in rates using the World Interest Rate Probability (WIRP) function on Bloomberg. It's been very volatile recently. I currently see the market is pricing a 16.6% probability of a EUR rate hike before the end of 2017 (row 6, column 2 below). a 32.7% probability in the next 12 months (row 9, column 2) and a 67.6% probability in the next 18 months.

Euro Zone Instrument OIS: Eurozone OIS - Deposit R Current Rate -0.40
1) Overview 2) Future Implied Probability
Current Implied Probabilities Add/Remove Rates
Dates ● Meeting ● Calculation Calculated 04/27/2017 Based on rate -0.40

Meeting	Prob Of Hike	Prob of Cut	-0.6	-0.5	-0.4	-0.3	-0.2	BPS
04/27/2017	0.0%	2.4%	0.0%	2.4%	97.6%	0.0%	0.0%	-0.2
06/08/2017	0.0%	3.3%	0.0%	3.3%	96.7%	0.0%	0.0%	-0.3
07/20/2017	2.1%	3.2%	0.0%	3.2%	94.6%	2.1%	0.0%	-0.1
09/07/2017	7.2%	3.1%	0.0%	3.1%	89.7%	7.1%	0.1%	0.4
10/26/2017	8.8%	3.0%	0.0%	3.0%	88.2%	8.6%	0.2%	0.6
12/14/2017	16.6%	2.8%	0.0%	2.7%	80.6%	15.6%	1.0%	1.5
01/25/2018	21.6%	2.6%	0.0%	2.6%	75.8%	19.6%	1.9%	2.1
03/08/2018	29.4%	2.3%	0.0%	2.3%	68.2%	25.4%	3.7%	3.1
04/26/2018	32.7%	2.2%	0.0%	2.2%	65.1%	27.5%	4.8%	3.6
06/14/2018	41.4%	1.9%	0.0%	1.9%	56.7%	32.5%	7.8%	5.0

Historical Analysis for Meeting 04/27/2017 Add/Remove Series

As a reminder our research team estimate that euro area banks could see as much as €26bn in earnings uplift from a return of ECB rates to zero. This would represent a 25% uplift to profits - a big prize when it happens (click here for report).

What to buy in banks if you share our view on sustained reflation?
We remain positive on banks that can make acceptable returns in the current environment and are geared into the upside when rates begin to recover... **ING, KBC, Intesa, Unicredit, SocGen, Erste, BKIR are all Buy rated**.
Top picks:

Buy Soc Gen, PO €55
- Still fourth worst performer in the SX7E YTD due to French election overhang.
- Yet reported a strong set of Q4 results, beating on P&L, capital and dividend which comforts our view that the stock is set for re-rating.
- Continues to tick a number of boxes offering a dividend yield of 5.1% in 2017E, an attractive valuation of 0.79x 2017e TNAV, solid capital position and has strong EPS momentum.
- Our EPS (2017 and 2018) is 10% above consensus with further upside from CIB, Russia recovery and Corporate Center
- Stronger capital position allows for growth (organic and bolt-on M&A)

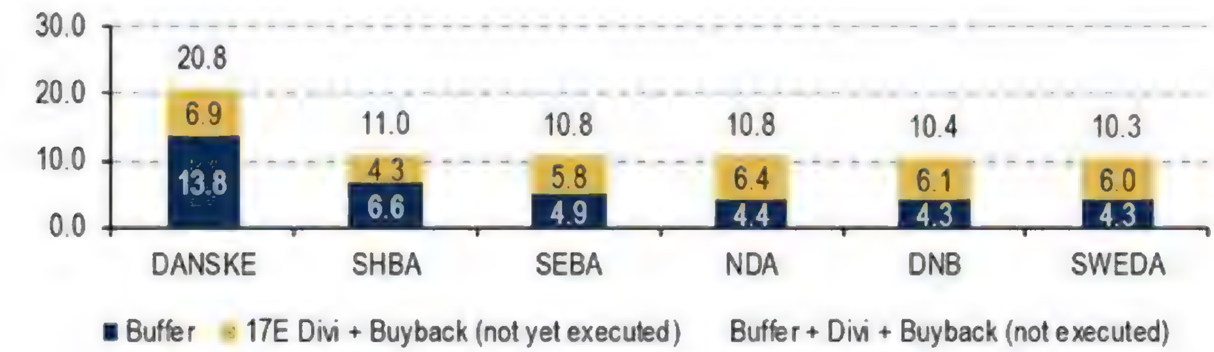
Buy Intesa, PO €2.80
- On NPEs, capital, profitability, operating trends, and cash payouts, Intesa stands above other Italian banks in our view.

- ISP will pay a dividend (confirmed) equivalent to an 8.0% yield vs. a 4.0% European banks average and on our estimates
- Italian banks are trading at a PNAV discount to ISP but their profitability is half that of ISP's and their capital is lower
- ISP retains the lowest (gross/net) Italian NPE ratio and in 4Q16 NPE were down yoy by 8% gross/10% net.
- Shares have suffered from the uncertainty related to a possible tie-up with insurer Generali - still the seventh worst performing bank in the SX7E YTD

Also remain very bullish on market exposed Nordic banks
This morning we reiterate our preference for Nordic banks (click here for report) with more market exposed revenues and reiterate our **Buy ratings on Danske Bank, Nordea, DNB and SEB** ahead of Q1 results. We expect to see good fee /trading income in Q1 on the back of strong AUM and continued high activity levels.

The relative P/E premium of Nordic banks vs. the sector is now 7% vs. a long term average of 11%. We also note that Nordic banks are expected to continue to deliver close to 4% better ROTE (2017-19E) and have a lower beta.

Chart 1: Danske Bank remains best capital return story (Capital buffers as % of market cap)



Source: BofA Merrill Lynch Global Research estimates

Please let me know if you would like to discuss in more detail or meet any of our analysts on the above reports.

Kind regards,

Russell Quelch
European Financials Specialist Sales
Bank of America Merrill Lynch

[redacted]

Global Financials Specialist Sales Team:
Russell Quelch - European Banks – London [redacted]
Juliette Nichols – European Insurance, Div Fins and Real Estate – [redacted]
Scott Smith – US Financials – New York [redacted]

The power of global connections™

with president at his estate

By Annie Linskey | GLOBE STAFF APRIL 07, 2017

WASHINGTON — For former Harvard Law professor Alan Dershowitz and his wife, their recent dinner at the Mar-a-Lago club in Florida was a chance to dine and catch up with old friends. Then President Trump showed up.

"Everyone stood up and clapped," recalled Dershowitz, who lives in South Florida during the Massachusetts winters.

Toward the end of the evening, Trump stopped by the table for an extended chat, but not about the Trump-branded chocolate cake. The mogul-turned-president wanted to discuss the prospects for Israeli and Palestinian peace with Dershowitz, who is well-known for his hawkish, pro-Israel views.

"He pulled me aside," Dershowitz recalled. "He wanted to talk to me privately about the Middle East."

The March 18 encounter provides a window into the free-wheeling and unconventional policy making employed by Trump, who prizes spontaneity. As a business tycoon, he liked to keep an open schedule that allowed for impromptu meetings; it's a style difficult to replicate in the White House but can work among the handpicked people who frequent Mar-a-Lago.

In this instance, Dershowitz was a guest of Trump's buddy and Mar-a-Lago member Chris Ruddy, the CEO of the conservative news source Newsmax. The former professor soon found himself immersed in a Washington power-player schmooze-fest. The mood at the club was light and fun. Vice President Mike Pence stopped over and complimented Dershowitz on his frequent cable TV appearances. Commerce Secretary Wilber Ross said "hi." A singer crooned "Don't Cry for Me Argentina."

When Trump came over, Dershowitz, a Democrat mostly known for his lefty views, shared his perspective on the National Security Agency, the fate of the Ninth Circuit Court of Appeals, Trump's travel limits on immigrants from majority-Muslim countries, and, most critically, peace between Israel and its Arab neighbors.

The Israeli paper Haaretz later reported that Trump asked Dershowitz to contact Prime Minister Benjamin Netanyahu of Israel and convey the president's belief that peace could be achieved now. In his interview with the Globe, Dershowitz wouldn't confirm or deny the account.

The atmosphere at Mar-a-Lago raises questions. Critics have pointed to Trump's club as an example of how access to the president can be purchased. The club jacked up its initiation fee to $200,000 from $100,000 after Trump became president. Members have a front row seat to history. Thursday night Chinese President Xi Jinping and his wife dined there as part of a summit with Trump. He also feted Japanese Prime Minister Shinzo Abe at the club .

For Dershowitz, it helped greatly that he was at Mar-a-Lago as a guest of Ruddy. Ruddy, it turned out, had seen Trump that day at the golf course and mentioned that Dershowitz and his wife would be among the guests at his table of six.

In Ruddy's re-telling, when Dershowitz's name came up that afternoon on the links Trump offered praise for him because he'd gone on TV and defended Trump's

Dershowitz wouldn't repeat what Trump told him privately but felt comfortable recounting the parts of the their conversation that occurred in front of other dinner guests.

Trump “clearly had subjects he wanted to talk about. It was his agenda,” Dershowitz said. “He told me he thought in the Middle East, they are ready for a deal.”

Trump explained that he’d spoken to Palestinian leader Mahmoud Abbas and sensed that he was ready for a peace deal, Dershowitz said.

“I responded by saying, ‘the Palestinians say that to every new president,’ ” Dershowitz said, offering Trump a dose of skepticism.

“He said ‘Now I think they’re really ready,’ ” Dershowitz added. “I said, ‘You have to test them. ... You have to test them, it’s not enough to just hear ‘they’re ready.’

“He shook his head in apparent agreement,” Dershowitz said.

Dershowitz said Trump made it clear he was aware that the former professor is “very friendly” with Netanyahu.

And the Israeli media is reporting that Dershowitz was tapped to be a back channel sorts between Netanyahu and Trump. This chatter prompted some to wonder whether Trump’s son-in-law Jared Kushner, who’d been tasked to be the point person on a possible peace deal, was on the outs.

But Dershowitz said that’s not the case. “The president said, ‘I know you know Jared from Harvard. Be in touch with him.” ”

And Dershowitz added that he doesn’t have a role, formal or informal, in working on behalf of the administration to jump start peace talks. “This was as a one off,” he said.

Middle East, ask me."

Comments

Annie Linskey can be reached at annie.linskey@globe.com.

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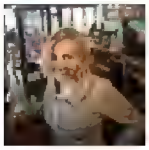

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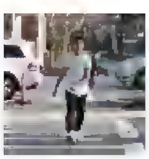

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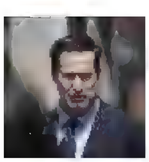

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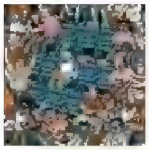

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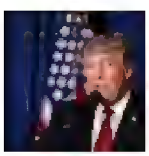

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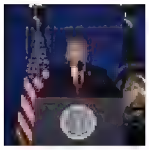

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Hess Corp.

Inflection point: adding Hess to BofAML's US 1 'best ideas' list

Bank of America Merrill Lynch

Reiterate Rating: BUY | PO: 80.00 USD | Price: 49.97 USD

Equity | 11 April 2017

Short interest ratio: catalyst for recovery

Over the past six months Hess has been one of the most volatile stocks in the sector, facing headwinds from a significant increase in short interest that has exaggerated volatility. From discussions with investors, the arguments against Hess seem to begin and end with a combination of declining production and an expanding balance sheet – all part of the deliberate portfolio choices that favored completing major projects at the expense of short cycle production. We expect this to end in 2Q17 with a rebound in oil and gas production starting in 2H17 and critically, an inflection in free cash flow that we expect will return Hess to free cash flow with the flexibility to re-up investment in the Bakken. We thus would view Hess as a dangerous 'short' for investors seeking to hedge other portfolio risks.

Inflection point on multiple levels right around the corner

We believe Hess' investment case is approaching an inflection point on multiple levels. We expect oil and gas production to trough in 2Q17, with a rebound of 60,000 boepd or 22%, by 4Q17 marking the single biggest sequential change in production of any company in the sector. This is likely to kickstart an extended period of growth in 2018/19 but with the contribution from Guyana driving a step change in Hess' growth trajectory through 2025. Near term, we think Hess is also poised for an inflection in free cash flow that is reasonably $1bn annualized, with $700mm irrespective of oil prices. Versus consensus operating cash flow of ~$1.9bn in 2017, this stands out as the biggest swing in free cash of any company in the sector.

Adding Hess to US 1 'best ideas' list

After a year of waiting, we believe the inflection point in Hess' investment case is just around the corner, with the broader sector pullback positioning the shares with amongst the highest upside in the sector as implied by our price objectives. At current levels, Hess 'discounts' strip oil prices. Under our base case, which assumes a rebound in oil prices towards $70 from 2020 fair value is reasonably ~$80 per share. If *non-producing* asset value from Guyana is included we estimate this would be closer to $90. BofAML's US1 list is a collection of the firm's best investment ideas managed with the goal of providing superior investment performance over the long term. For Hess, we believe the combination of catalysts, short interest and absolute value can drive a period of strong relative outperformance vs peers. For this reason, Hess replaces DVN as the energy stock on BofAML's US 1 list.

Estimates (Dec)

(US$)	2015A	2016A	2017E	2018E	2019E
EPS	(3 92)	(4 94)	(3 75)	(1 46)	(0 76)
GAAP EPS	(10 77)	(19 92)	(3 75)	(1 46)	(0 76)
EPS Change (YoY)	NM	-26.0%	24.1%	61.1%	47.9%
Consensus EPS (Bloomberg)			(3 03)	(2 09)	(0 45)
DPS	1 00	1 00	1 00	1 00	1 00

Valuation (Dec)

	2015A	2016A	2017E	2018E	2019E
P/E	NM	NM	NM	NM	NM
GAAP P/E	NM	NM	NM	NM	NM
Dividend Yield	2 0%	2 0%	2 0%	2 0%	2 0%
EV / EBITDA*	17 2x	NM	9 9x	6 4x	5 4x
Free Cash Flow Yield*	-13 2%	-8 7%	-3 8%	-0 3%	3.7%

* For full definitions of *iQmethod* SM measures, see page 11.

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Refer to important disclosures on page 12 to 14. Analyst Certification on page 10. Price Objective Basis/Risk on page 10. 11731481

Timestamp: 11 April 2017 05:30AM EDT

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Stock Data

Price	49.97 USD
Price Objective	80.00 USD
Date Established	8-Dec-2016
Investment Opinion	B-1-7
52-Week Range	45.12 USD - 65.56 USD
Mrkt Val (mn) / Shares Out (mn)	15,656 USD / 313.3
Average Daily Value (mn)	198.56 USD
BofAML Ticker / Exchange	HES / NYS
Bloomberg / Reuters	HES US / HES.N
ROE (2017E)	-8.6%
Net Dbt to Eqty (Dec-2016A)	26.1%

*iQprofile*SM Hess Corp.

iQmethod SM – Bus Performance*

(US$ Millions)	2015A	2016A	2017E	2018E	2019E
Return on Capital Employed	-8.5%	-21.0%	-3.6%	-0.9%	0.1%
Return on Equity	-5.4%	-9 0%	-8 6%	-3 7%	-2.1%
Operating Margin	-1,197 3%	-247 2%	-25 4%	-5.0%	0.5%
Free Cash Flow	(2,061)	(1,359)	(592)	(50)	574

iQmethod SM – Quality of Earnings*

(US$ Millions)	2015A	2016A	2017E	2018E	2019E
Cash Realization Ratio	NM	NM	NM	NM	NM
Asset Replacement Ratio	1.0x	0.6x	0 9x	0.9x	0.9x
Tax Rate	18 8%	41 0%	16 2%	21 9%	8 4%
Net Debt-to-Equity Ratio	19.2%	26 1%	34 9%	40 7%	40 5%
Interest Cover	-10.1x	-31.1x	-3.8x	-1.0x	0.1x

Income Statement Data (Dec)

(US$ Millions)	2015A	2016A	2017E	2018E	2019E
Sales	286	4,182	4,379	5,704	6,359
% Change	-98 1%	1,363 2%	4.7%	30 3%	11.5%
Gross Profit	(2,606)	4,182	4,379	5,704	6,359
% Change	NM	NM	4 7%	30 3%	11.5%
EBITDA	1,155	(5,482)	2,005	3,097	3,646
% Change	-84 3%	NM	NM	54 5%	17.7%
Net Interest & Other Income	(340)	(332)	(289)	(297)	(304)
Net Income (Adjusted)	**(1,113)**	**(1,531)**	**(1,174)**	**(456)**	**(246)**
% Change	**NM**	**-37.6%**	**23.3%**	**61.1%**	**46.0%**

Free Cash Flow Data (Dec)

(US$ Millions)	2015A	2016A	2017E	2018E	2019E
Net Income from Cont Operations (GAAP)	(3,056)	(6,132)	(1,126)	(408)	(246)
Depreciation & Amortization	3,955	3,413	2,857	2,962	3,188
Change in Working Capital	80	(47)	0	0	0
Deferred Taxation Charge	(1,319)	2,200	(228)	(128)	(13)
Other Adjustments, Net	2,321	1,361	357	323	369
Capital Expenditure	(4,042)	(2,154)	(2,453)	(2,798)	(2,725)
Free Cash Flow	**-2,061**	**-1,359**	**-592**	**-50**	**574**
% Change	**-98.0%**	**34.1%**	**56.4%**	**91.6%**	**NM**

Balance Sheet Data (Dec)

(US$ Millions)	2015A	2016A	2017E	2018E	2019E
Cash & Equivalents	2,716	2,732	1,974	1,974	1,974
Trade Receivables	847	768	768	768	768
Other Current Assets	841	776	776	776	776
Property, Plant & Equipment	26,352	19,941	18,886	18,299	17,412
Other Non-Current Assets	3,439	4,404	4,404	4,404	4,404
Total Assets	**34,195**	**28,621**	**26,807**	**26,220**	**25,334**
Short-Term Debt	86	112	112	112	112
Other Current Liabilities	2,542	2,139	2,088	2,036	1,982
Long-Term Debt	6,544	6,694	6,694	7,105	6,844
Other Non-Current Liabilities	4,622	4,085	4,085	4,085	4,085
Total Liabilities	**13,794**	**13,030**	**12,979**	**13,338**	**13,023**
Total Equity	**20,401**	**15,591**	**13,828**	**12,883**	**12,311**
Total Equity & Liabilities	**34,195**	**28,621**	**26,807**	**26,220**	**25,334**

* For full definitions of *iQmethod* SM measures, see page 11.

Company Sector

Oils

Company Description

Hess Corp (HES) is a mid-sized oil and gas company with 1.0bn boe of proved reserves at the end of 2015. E&P operations are focused in the US onshore, deepwater GOM, North Sea, West Africa oil, and Asian natural gas.

Investment Rationale

Our house view is that oil should rebound long term to $75 WTI / $80 Brent. Investment case anchored by exploration prospects led by Guyana. Added to this, it has a strong balance sheet, low risk production visibility in the Bakken and a stable international base. As such, we view HES' valuation as attractive and maintain our Buy rating.

Stock Data

Average Daily Volume	3,973,678

Quarterly Earnings Estimates

	2016	2017
Q1	-1.72A	-1.21E
Q2	-1.11A	-1.19E
Q3	-1.12A	-0 72E
Q4	-1.01A	-0 63E

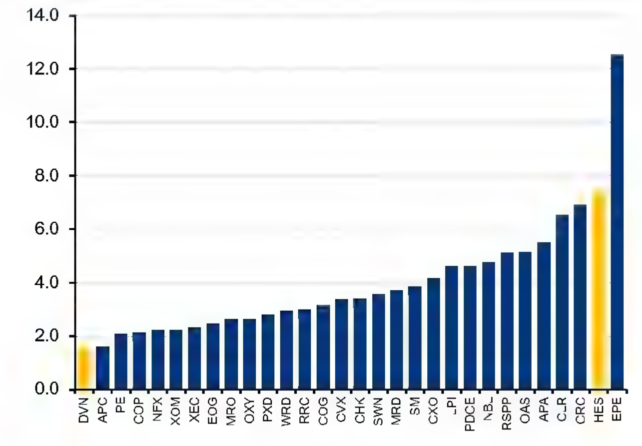
Adding Hess to BofAML US1 list

Inflection point

Over the past six months Hess has proven to be one of the most volatile stocks in the sector, facing extraordinary headwinds from a significant increase in short interest that has exaggerated volatility of what is already one of the more highly levered oil stocks in the sector. From discussions with investors, the arguments against Hess begin and end with a combination of declining production and expanding balance sheet – all part of the deliberate portfolio choices that favored completing major projects at the expense of short cycle production.

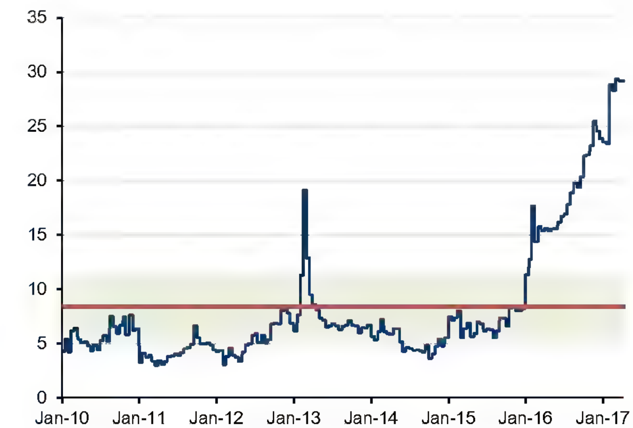
This cycle ends in 2Q17 with an expected rebound in oil and gas production starting in 2H17 and critically, an inflection in free cash flow that by our estimates should return Hess to free cash flow with the flexibility to re-up investment in the Bakken. We thus view Hess as a dangerous short for investors seeking to hedge other portfolio positions.

Exhibit 1: Short interest ratio (days to cover) US oils



Source: Bloomberg, BofA Merrill Lynch Global Research estimates

Exhibit 2: Hess short interest ratio (mm shares)



Source: Bloomberg, BofA Merrill Lynch Global Research estimates

In our view, any meaningful reduction in short interest could drive an outsize response to the improving operating outlook that we expect to start in 2H17 and can be summarized as follows:

- By our estimates, oil and gas production troughs in 2Q17 as Bakken production stabilizes before recovering through year-end. With start-up of the first of two major projects (NMB[1]) and incremental production in the US GoM, we anticipate growth in oil and gas production of ~60,000boepd or 22% between 2Q17 & 4Q17.

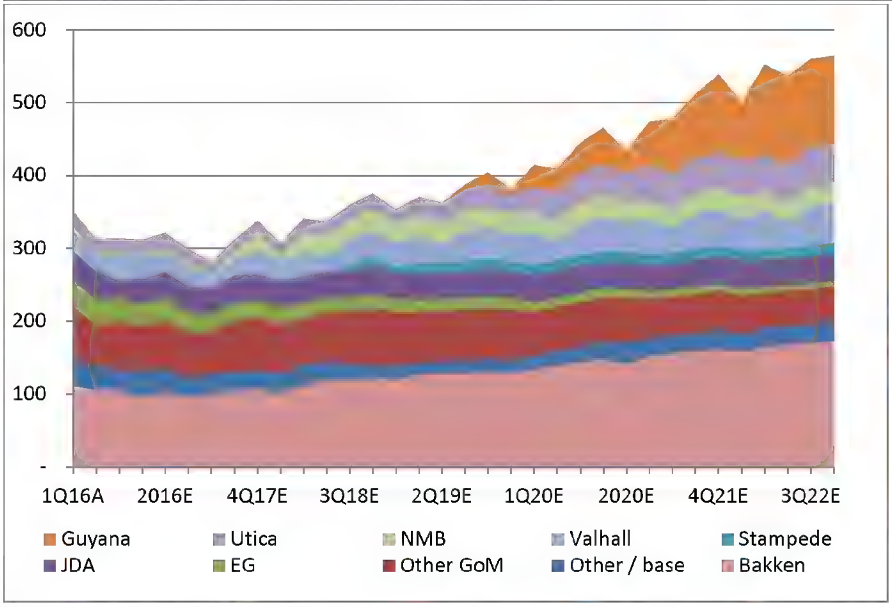
- Planned increase in Bakken rig count points to an exit rate of ~105–110 kboepd up from 90-95 kboepd in 1Q17 for an intra-year growth rate of ~16% underpinned by a step up to 6 rigs from 2 at the start of the year. We expect Bakken growth to continue in 2018 and 2019 at ~16% yoy with upside from larger completions.

Management guidance suggests exit rate production in 2017 of ~335,000 boepd; start-up of the second of Hess' major projects (Stampede) adds 15,000 boepd from 1H18 (est); along with a resumption of growth by resurgent operator Aker BP at Valhall (Hess 64%) we expect top line growth of 15% in 2018 with a FY contribution and continued Bakken ramp contributing to ~10% growth in 2019 including first oil from Guyana.

[1] North Malay Basin, adding 20,000 boepd starting in Sep 2017

In other words, 2Q17 marks the low point in oil and gas production, with momentum accelerating in 2H17 to kick start a multi-year period of growth.

Chart 1: Hess production outlook: inflection point from 2Q17

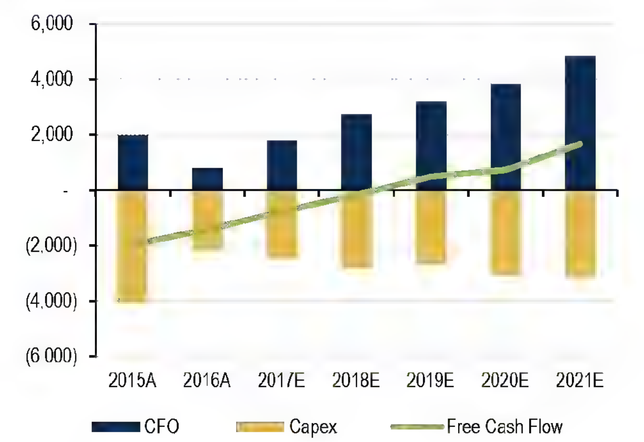


Source: BofA Merrill Lynch Global Research estimates

Critically, Hess has multiple levers to pull that reverse production declines as cash becomes available from completion of NMB and Stampede.

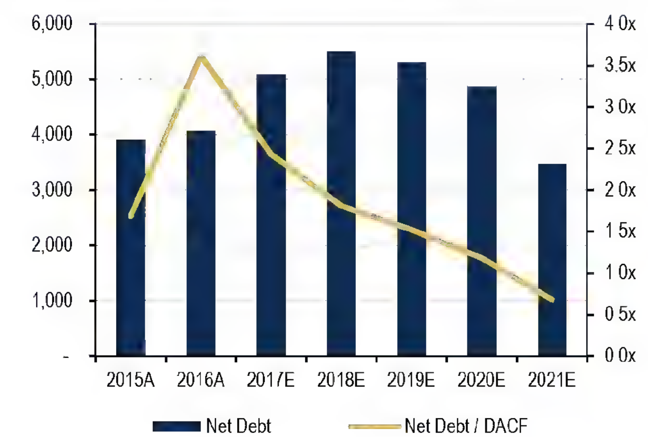
Planned spending to complete NMB and Stampede is ~$700mm in 2017; with completion we expect this to drop closer to $200mm in 2018 so that before any contribution from operating cash flow from these projects we expect Hess 'apples to apples' capex to move lower in 2018 driving an inflection in free cash flow.

Exhibit 3: Free cash flow turns positive in 2018



Source: BofA Merrill Lynch Global Research estimates

Exhibit 4: with an accelerating decline in net debt



Source: BofA Merrill Lynch Global Research estimates

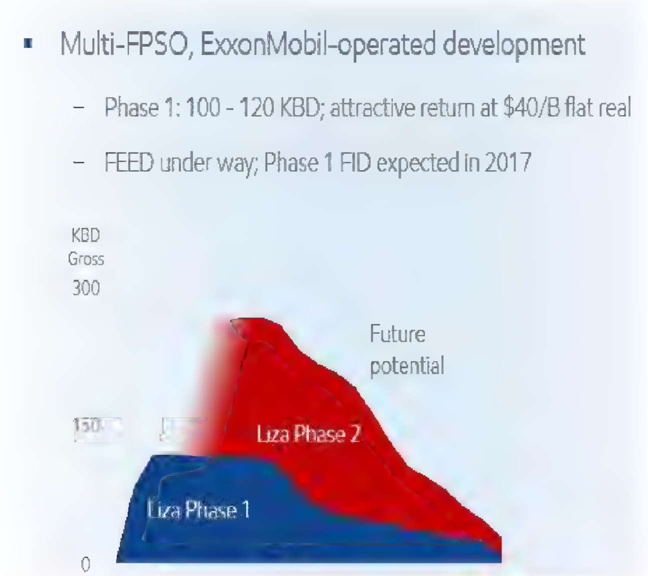
Our assumptions include a likely project sanction of the first phase 'early production system' at the Liza discovery in 2Q17. However, based on discovered oil to date that we believe now easily exceeds 2bn barrels, we believe Hess is on the cusp of a multi-year period of growth that is material for a company of its size. Critically, we believe most commentators have not yet included the cash flow contribution from Guyana in Hess' estimates given visibility that barely looks past 2018. However, with first oil now likely in 2H19, we view final investment decision (FID) – and an exploration program that yields one well result every 6-8 weeks as a catalyst to rerate Hess over time.

Liza area moving towards 2bn boe

Operator Exxon recently confirmed the latest exploration test in Guyana 'Snoek' as the latest discovery in the Liza development area, with ~82ft of net pay and in line with pre drill expectations we are led to believe is in the 200-300mm boe range. Recall from our discussions with management, Snoek was characterized as a smaller but distinct target, updip of Liza, but lower risk.

The well was drilled in 26 days to a depth of ~17,000ft in 5,128ft of water 5 miles south west of Liza #1, as shown in the graphic below; the Stena Carron drill ship has now relocated to the next well test, the 'Liza #4' appraisal, where we anticipate results by end April but with the possibility of a drill stem test in a success case that may push the well result into mid-May.

Exhibit 5: Liza targeting



Source: Exxonmobil

Exhibit 6: Exxon operated blocks in Guyana

Source: Exxonmobil

Critically, 'Snoek' reinforces management's prior characterization of the Stabroek block as moving towards a 'DHI play' meaning the risk profile of incremental exploration improves - a critical factor for the next well in queue, the Payara #2 appraisal that will also target a deeper test (Pacuma) scaled with a pre drill target of ~1bn boe. The next prospect, Liza lookalike named 'Turbot will likely be spud around mid-year.

From our discussions with Hess and the operator we summarize our understanding as follows:

- Operator XOM had previously framed the discovered potential in the Liza / Payara at 1.5bn – 2.0bn boe, subject to completion of two planned additional appraisal wells. Quoting EVP Mark Albers and CEO Darren Woods

'The success at Payara combined with the additional oil pay discovered with Liza-3 brings the total discovered resource on the block to somewhere between 1.4 billion oil equivalent barrels and 2 billion oil equivalent barrels.'

' to clarify, what we have found – not potential upside, but what we have found is 1.4 billion to 2 billion BOE. The upside is multi-billion barrel unrisked potential'.

- Snoek and with Liza deep previously likely moves recoverable resource closer to the upper end of this range 2bn boe before Liza #4 and Pacuma, providing line of sight for at least a 4 FPSO development starting in 2019.

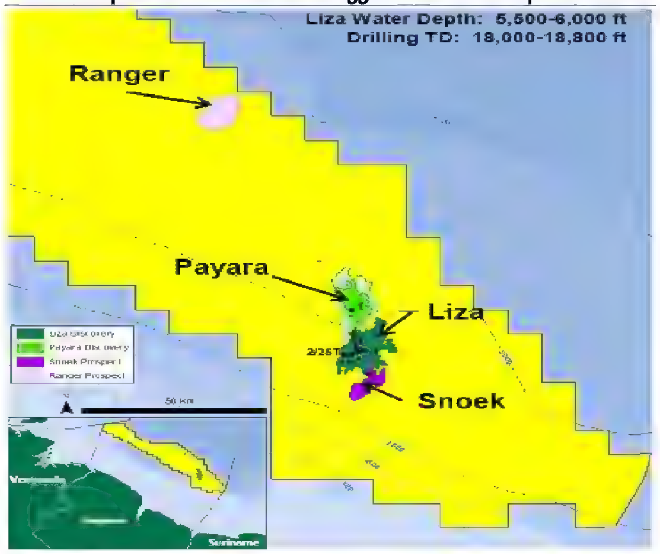
- After Liza 4, the Stena Carron drillship will move back to Payara to drill an appraisal well which will also test a deeper prospect 'Pacuma tail'. Where pre-drill prospect size is scaled at about 1bn boe. The next prospect (Turbot) will then be spud south east of Payara. Note is that if Payara 2 is successful, this would likely add another 'boat' with capacity of 150,000 boepd.

The graphics below characterize Hess view of Payara and Snoek. We assume the 1bn boe Pacuma prospect is the light green area below Payara.

Exhibit 7: Initial characterization of Payara

Source: Hess

Exhibit 8: Updated characterization suggests a similar footprint to Liza



Source Hess

Again quoting ExxonMobil management:

'Just as we progressed rapidly at Liza, we'll move quickly to develop Payara if the delineation well is successful.'

Recall that Hess management has suggested Payara will 'definitely be commercial'. However at this early stage we assume no value for Payara in our assessed value of Hess' not least as any attempt at precision is obviously premature. But with discussions with management suggesting scenarios through appraisal where Payara is a lookalike to Liza, we believe a 'plus three year' development scheme is a reasonable basis to frame option value in a success case.

Under our $70 Brent base case, the theoretical NPV would be around $10/sh. This is on top of the approximate $12-14/ share value we estimate is reasonable for Hess from the existing Liza discovery. Note we continue to assume about 400,000 bpd gross development scenario–reviewed again below to reflect the latest project proposal submitted to the Guyana Government which now targets first production in 2H19.

Note we assume negligible value for natural gas revenue in this latest iteration, thus the range of $12-$14 for Liza mentioned above and $22-$24 for Liza / Payara. The table below assumes gas valued at $1 / mmcfe.

Table 1: Notional multi-phase development at Guyana: about $22/sh to Hess

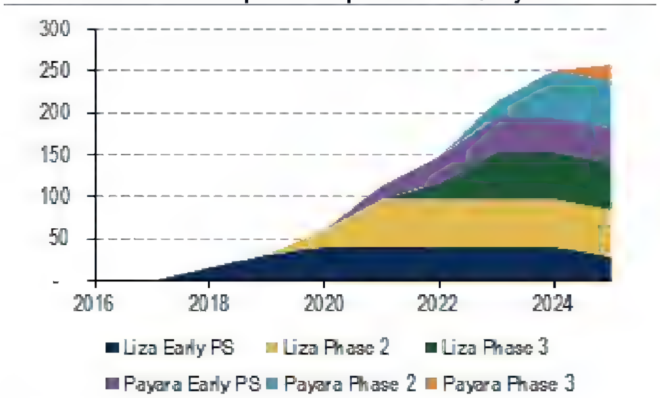
	Gross Barrels (mmboe)	Full Project NPV $MM	Hess 30% Interest NPV	NPV net to Hess
	(mmboe)	$mm	$mm	$/sh
Liza				
Early Production System	425	4,258	1,277	$3.9
Phase 1	600	4,932	1,480	$4.6
Phase 2	600	3,821	1,146	$3.5
Liza Total	**1,625**	**13,010**	**3,903**	**$12.0**
Payara (spec)				
Early Production System	425	3,392	1,018	$3.1
Phase 1	600	3,668	1,100	$3.4
Phase 2	600	2,682	805	$2.5
Payara spec Total	**1,625**	**9,742**	**2,923**	**$9.0**
Guyana Total	**3,250**	**22,753**	**6,826**	**$21.1**

Source: BofA Merrill Lynch Global Research estimates, Hess shares fully diluted 324.2mm shares after prefernce convert

Note that at current strip oil prices of ~$55 Brent, this is closer to $14.4/sh of which Payara is ~$6/sh or $2.0bn. On a 'risked' basis, we believe this is a reasonable development scenario representative of any incremental discovery that resembles Liza recalling that the partners have identified over 20 additional drilling prospects. On the assumption of a 'plus three year' development scenario after Liza, the potential impact on incremental production and cash flow is significant for Hess while the cumulative impact also becomes significant for XOM.

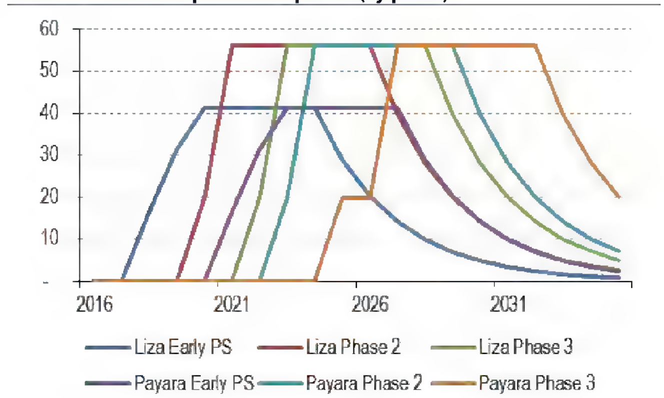
The charts below show our latest assessment of how a compound timeline for a Liza / Payara development could look, if Payara as a project does indeed prove to be a look alike to Liza.

Exhibit 9: Hess theoretical production profile for Liza / Payara



Source: BofA Merrill Lynch Global Research estimates

Exhibit 10: Hess net production profile (by phase)



Source: BofA Merrill Lynch Global Research estimates

Critically, Guyana is now being described as a 'DHI play' meaning seismic and core have been sufficiently calibrated as to provide direct hydrocarbon indicators and hence de-risking future exploration tests. This appears confirmed again by the latest 'Snoek' success.

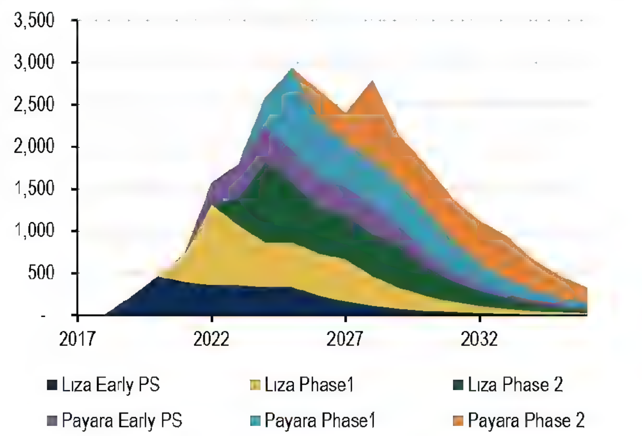
XOM's development plan calls for an FPSO (floating production and storage offloading vessel) with production capacity of about 150,000 boepd for every 450mm barrels of recoverable reserves, with plateau production extending up to 10 years. We suggest management's commentary supports gross production capacity from current discovered resource of at least 600,000 boepd.

Impact on cash flow

While the impact on production is significant, we suggest the impact on cash flow is transformational for Hess. Referencing the charts below:

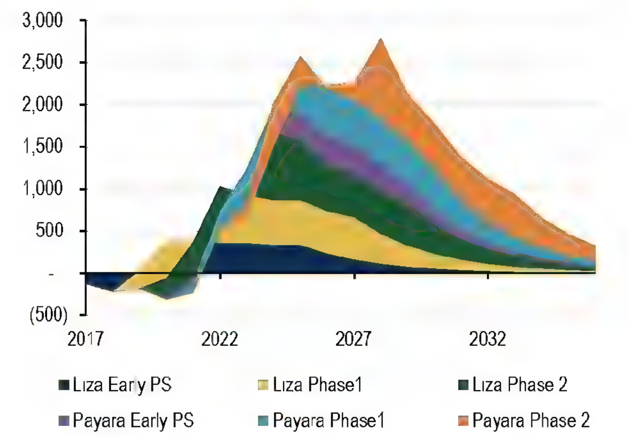
- Under our base case that assumes $70 oil from 2020, we estimate operating cash flow net to Hess would reach over $2.5bn;
- Net free cash flow peaks at over $2bn with a net cash outflow at any point in the development of ~$300mm.

Chart 2: Hess operating cash flow contribution: Guyana ($70 base case)



Source: BofA Merrill Lynch Global Research

Chart 3: Hess free cash flow contribution: Guyana ($70 base case)



Source: BofA Merrill Lynch Global Research

While first oil in 2019 is only the early stage of development, it is enough in our view to provide visibility on multiple compression perceived absent from Hess' investment case given its focus on short cycle development. However, after the low point in production in 2Q17 we suggest Hess has both – short cycle, comprising not only the Bakken but tie back opportunities across established infrastructure in Norway and the US GoM – and long cycle in the shape of a transformational opportunity in Guyana, that becomes tangible with a likely FID in 2Q17.

Impact on valuation

In our view, an imminent inflexion point in free cash flow comes with a step change in value recognition for Hess. Momentum from a >20% jump in production in the six months of the second half of 2017 carries growth through 2018, with Guyana accelerating for a decade from 2019. At our base case we suggest this leaves Hess 'discounting' current strip oil prices at current levels of ~$50 / share.

The table below sets our PO at our target mid cycle multiple of 5.5x EV/DACF; note this does not include any value for non-producing Guyana resource value that we estimate at ~$6/share.

Table 2: At strip oil prices, Hess looks fairly valued based on a target multiple of 5.5x EV/DACF

	2015	2016	2017e	2018e	2019e	2020e	2021e
Shares Outstanding	284	310	313	313	323	324	324
Market Cap	13,119	13,334	13,415	13,415	13,415	13,415	13,415
Non-producing Guyana NAV				-	-	-	-
Net Debt	3,914	4,074	5,136	6,224	6,985	7,798	7,866
Preference shares		557	557	557			
EV	17,033	17,965	19,108	20,196	20,400	21,213	21,281
DACF	2,321	1,127	1,847	2,378	2,625	3,030	3,795
Forward EV / DACF	**15.1x**	**9.7x**	**8.0x**	**7.7x**	**6.7x**	**5.5x**	

Source: BofA Merrill Lynch Global Research

Under our base case, which assumes a rebound in oil prices towards $70 from 2020, we see fair value as reasonably around $80 per share. If non-producing asset value is included (around $3bn or ~$9/sh), we estimate this would be closer to $90.

Table 3: At our base case, we see fair value closer to $80 based on a target multiple of 5.5x EV/DACF

	2015	2016	2017e	2018e	2019e	2020e	2021e
Shares Outstanding	284	310	313	313	323	324	324
Market Cap	22,341	22,684	22,814	22,814	22,814	22,814	22,814
Non-producing Guyana NAV				-	-	-	-
Net Debt	3,914	4,074	4,832	5,243	4,983	4,441	3,020
Pref		557	557	557			
EV	26,255	27,315	28,203	28,614	27,797	27,255	25,834
DACF	2,321	1,127	2,150	3,045	3,602	4,291	5,132
Forward EV / DACF	**23.3x**	**12.7x**	**9.3x**	**7.9x**	**6.5x**	**5.3x**	

Source: BofA Merrill Lynch Global Research

BofAML US 1 list

The BofAML US1 list is a collection of the firm's best investment ideas managed with the goal of providing superior investment performance over the long term. Since the presidential election, the 'trump tax rally' that has arguably lifted the broader S&P500 on the expectation of lower corporate taxes has left most US oils lagging given the absence of any benefit from lower taxes. For Hess, we believe the catalysts are still ahead while the relative performance hurdle associated with the election has passed. For this reason, Hess replaces DVN as our energy stock on the BofAML US1 list.

Earnings updates

Marking to market for 1Q17 we update earnings as follows:

Table 4: HES Earnings Estimates

	Q1	Q2	Q3	Q4	FY	BBG Consensus
2015A	(0.98)	(0.52)	(1.03)	(1.40)	(3.92)	(3.92)
2016E	(1.72)	(1.11)	(1.12)	(1.01)	(4.94)	(4.98)
Previous	(1.72)	(1.11)	(1.12)	(1.01)	(4.94)	n/a
2017E	(1.21)	(1.19)	(0.72)	(0.63)	(3.75)	(3.03)
Previous	(1.37)	(1.19)	(0.72)	(0.63)	(3.91)	n/a
2018E	(0.40)	(0.40)	(0.35)	(0.30)	(1.46)	(2.09)
Previous	(0.40)	(0.41)	(0.35)	(0.31)	(1.47)	n/a

Source: BofA Merrill Lynch Global Research

Price objective basis & risk

Hess Corp. (HES)

Our price objective of $80 / share is based on a 5-year outlook which assumes a 5.5x DACF multiple and a commodity deck of $67.50 WTI and $70 Brent to which we add $10 / sh for Liza in offshore Guyana. The multiple is based on a finite timeline to delivery which is supported by core NAV.

The risks to our price objective are: 1) the oil and gas price environment, (2) slowdowns in development drilling that leave production below expectations, and (3) news flow around HES' exploratory and appraisal drilling activities that could impact the stock.

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I, Doug Leggate, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

US - Large Cap Oils Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Anadarko Petroleum Corp.	APC	APC US	Doug Leggate
	Chevron Corp.	CVX	CVX US	Doug Leggate
	ConocoPhillips	COP	COP US	Doug Leggate
	Continental Resources Inc	CLR	CLR US	Doug Leggate
	Devon Energy Corp	DVN	DVN US	Doug Leggate
	EOG Resources	EOG	EOG US	Doug Leggate
	Hess Corp.	HES	HES US	Doug Leggate
	Marathon Oil Corp.	MRO	MRO US	Doug Leggate
	Marathon Petroleum Company	MPC	MPC US	Doug Leggate
	Occidental Petroleum Corp.	OXY	OXY US	Doug Leggate
	Pioneer Natural Resources	PXD	PXD US	Doug Leggate
	Range Resources Corp	RRC	RRC US	Doug Leggate
	Tesoro Corp	TSO	TSO US	Doug Leggate
	Valero Energy Corp	VLO	VLO US	Doug Leggate
NEUTRAL				
	Chesapeake Energy Corp	CHK	CHK US	Doug Leggate
	Delek US Holdings, Inc.	DK	DK US	Doug Leggate
	ExxonMobil Corp.	XOM	XOM US	Doug Leggate
	HollyFrontier Corp	HFC	HFC US	Doug Leggate
	Noble Energy	NBL	NBL US	Doug Leggate
	Phillips 66	PSX	PSX US	Doug Leggate
UNDERPERFORM				
	Apache Corp	APA	APA US	Doug Leggate
	Cabot Oil & Gas Corp.	COG	COG US	Doug Leggate
	PBF Energy	PBF	PBF US	Doug Leggate
	Southwestern Energy Corp.	SWN	SWN US	Doug Leggate

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Business Performance	Numerator	Denominator
Return On Capital Employed	NOPAT = (EBIT + Interest Income) * (1 – Tax Rate) + Goodwill Amortization	Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization
Return On Equity	Net Income	Shareholders' Equity
Operating Margin	Operating Profit	Sales
Earnings Growth	Expected 5-Year CAGR From Latest Actual	N/A
Free Cash Flow	Cash Flow From Operations – Total Capex	N/A
Quality of Earnings		
Cash Realization Ratio	Cash Flow From Operations	Net Income
Asset Replacement Ratio	Capex	Depreciation
Tax Rate	Tax Charge	Pre-Tax Income
Net Debt-To-Equity Ratio	Net Debt = Total Debt, Less Cash & Equivalents	Total Equity
Interest Cover	EBIT	Interest Expense
Valuation Toolkit		
Price / Earnings Ratio	Current Share Price	Diluted Earnings Per Share (Basis As Specified)
Price / Book Value	Current Share Price	Shareholders' Equity / Current Basic Shares
Dividend Yield	Annualised Declared Cash Dividend	Current Share Price
Free Cash Flow Yield	Cash Flow From Operations – Total Capex	Market Cap. = Current Share Price * Current Basic Shares
Enterprise Value / Sales	EV = Current Share Price * Current Shares + Minority Equity + Net Debt + Other LT Liabilities	Sales
EV / EBITDA	Enterprise Value	Basic EBIT + Depreciation + Amortization

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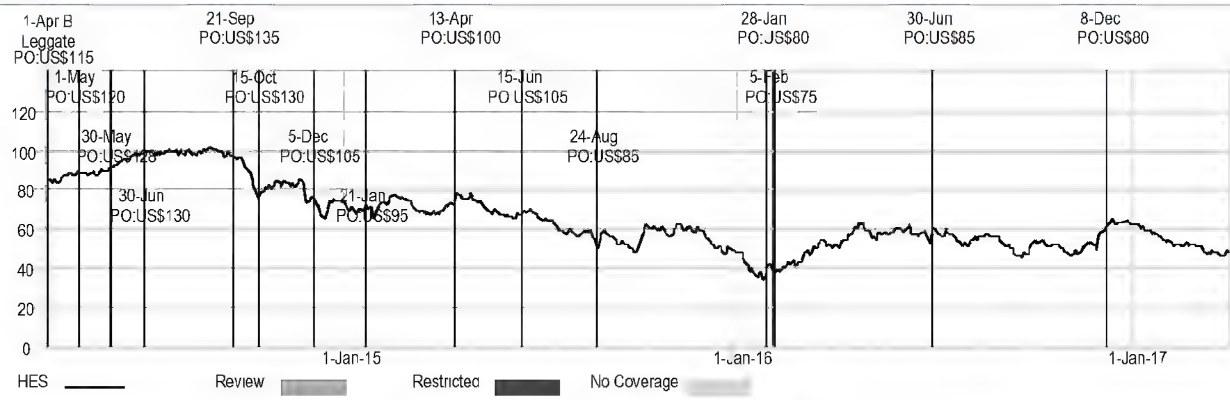
Important Disclosures

HES Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Equity Investment Rating Distribution: Energy Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	109	49.77%	Buy	84	77.06%
Hold	52	23.74%	Hold	43	82.69%
Sell	58	26.48%	Sell	34	58.62%

Equity Investment Rating Distribution: Global Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1578	51.33%	Buy	979	62.04%
Hold	690	22.45%	Hold	434	62.90%
Sell	806	26.22%	Sell	381	47.27%

* Issuers that were investment banking clients of BofA Merrill Lynch or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

* Ratings dispersions may vary from time to time where BofA Merrill Lynch Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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1Q Internet Sector Preview

Bank of America Merrill Lynch

Earnings Preview

Equity | 06 April 2017

1Q Preview; Expectations building on a strong 2H

Our early sector preview highlights our estimates vs. Street, early 1Q data points, and some opportunities for 1Q results for 30 stocks in our coverage group (more detailed company previews to follow). For large-caps, Street 2017 EPS estimates are down 8% YTD while the average stock price is up 9% YTD; suggesting macro and 2H optimism is driving stocks, which could continue throughout earnings season. 1Q was not without potential pressures, including ramping competition in several sectors and delayed tax refunds. A key theme for the group, in our view, is advertising & listing ranking revenue initiatives at eCommerce sites (AMZN, EBAY, EXPE), and we are constructive on all three stocks. Per our Internet sentiment ranking screen (page 7), FB, WIX, TREE have best sentiment while TWTR and TRIP have weakest.

A few early checks positive, mixed eCommerce data

Our early ad checks suggest robust overall demand, aided by somewhat easy comps vs 1Q'16, with Instagram momentum a standout. eCommerce is more mixed, with some concerns on consumer spending due to delayed tax refunds, but optimism that spending will rebound in March/April. In travel, there are modest concerns on pressure on US inbound travel, a bigger negative for Expedia than Priceline. FX spot rates for both the Euro and the Pound have depreciated 1% vs. the US$ since end of Jan.

Many key upcoming events for stocks in 2Q

Top events in 2Q include Facebook's F8 developer conference on April 18-19, Google's Marketing Next keynote on 5/23, an AWS event in San Francisco on April 18-19, expected closing Verizon's acquisition of Yahoo, Netflix's release of several key franchise including *House of Cards, Orange is the New Black, Sense8, Glow*, and *Unbreakable Kimmy Schmidt*, consumer wide release of Pandora Premium, Expedia's new HomeAway disclosures and, possibly, Amazon's new revenue disclosures.

We expect meet/beat EPS for several companies

We are above the Street on 2017 EPS for 16 of the 25 stocks discussed within and, of those, we are most confident in Facebook & Priceline for 1Q upside potential. We expect Facebook to benefit from robust traffic, Instagram momentum, and greater adoption of audience targeting tools. We also think Priceline can beat 1Q given strong booking trends into the quarter and a modest recovery in European travel. We are below the Street on 2017 EPS for AMZN, TRIP, and YHOO. Expedia is a top eComm/travel idea for 2Q/3Q on potential for accelerating room nights, HomeAway optimism, and less uncertainty on near-term estimates.

GOOG, AMZN & ZG interesting 1Q sentiment stocks

For large cap's, we believe GOOGL has had high recent interest given controversy around Youtube ad placements. We are not sure if Google will provide clarity on the issue on their call, but we do expect advertisers to return by 3Q and any overhang to be resolved. For Amazon, the company had new revenue disclosures in its 10-K filing, and there is growing optimism on advertising being a positive bottom-line driver. In SMID Internet, Zillow has more controversy going into 1Q as investors are once more concerned about potential regulation by the CFPB limiting the ability of agents and mortgage brokers to co-market on the platform. We remain positive on the stock due to its dominant position in online real estate and our belief that the high ROI of the ad unit (our survey suggested >6x return) will ensure that agents buy Zillow placements regardless of mortgage broker incentives. Additionally, we see earnings upside potential.

Refer to important disclosures on page 62 to 64. Analyst Certification on page 59. Price Objective Basis/Risk on page 53. 11729935

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Table 1: Key 1Q metrics for Large Cap Internet (>$5bn Market Cap)

Company	Ticker	Key 1Q Metric	BofAML Estimate
Alphabet	GOOGL	Website revenue (ex-FX) growth vs 22.3% in 4Q	21.6%
Amazon	AMZN	AWS revenue growth vs. 47% in 4Q	43% y/y
eBay	EBAY	US GMV growth trends	3.5% y/y
Expedia	EXPE	Room night growth vs. 15% in 4Q	16%
Facebook	FB	Ad revenue growth (ex-FX) vs. 54% reported in 4Q	52%
Netflix	NFLX	1Q intl sub guidance	3.9mn
Priceline	PCLN	1Q room night growth vs. 31% in $Q	26% y/y
Snap	SNAP	Global DAU's vs. 158mn in 4Q	166mn
TripAdvisor	TRIP	Update on ad spend targets, 2017 guidance	18% S&M y/y growth
Twitter	TWTR	MAUs and y/y trend vs 319mn (+4% y/y) in 4Q	322mn MAUs (+4% y/y)
Yahoo	YHOO	Any update on acquisition timing and ongoing breach investigations	N/A
Zillow	ZG	Mortgage Revenue	$18.1mn

Source: BofA Merrill Lynch Global Research estimates

Table 2: Key 1Q metrics for Small Cap Internet (<$5bn Market Cap)

Company	Ticker	Key 1Q Metric	BofAML Estimate
BankRate	RATE	1Q revenue	$117mn
Quotient	QUOT	1Q transactions	731mn
Care.com	CRCM	US paying families	266,607 (4% y/y)
Fitbit	FIT	1Q unit sales and gross margin	3mn/39%
GoPro	GPRO	1Q unit sales and gross margin	800K/35%
GrubHub	GRUB	Gross food sales growth	26%
Match.com	MTCH	Paid Member Growth	17%
OnDeck Capital	ONDK	1Q origination growth and marketplace take rate	12% / 3%
Pandora	P	Ad revenue per listening hour growth	10%
LendingTree	TREE	Variable marketing margin growth	29% y/y
Trivago	TRVG	Qualified referral growth	56% y/y
Wayfair	W	2Q revenue growth guidance	25% y/y
Wix	WIX	Premium subscribers growth	36%
Yelp	YELP	1Q Local advertising account adds	4k (17% y/y)
Zynga	ZNGA	Online Games DAUs	17.9

Source: BofA Merrill Lynch Global Research estimates

1Q Internet Summary Previews

We are publishing updates on 1Q industry data points and write ups on our early outlook and top 1Q earnings focus items for select stocks in our Internet coverage group (more detailed previews with various channel checks for large cap stocks to follow.) Our commentary is designed to highlight 1Q data points, stock trading opportunities and potential issues for 1Q results, and our estimates vs. consensus.

For 1Q EPS estimates, we are above the street for well over 50% of our companies under coverage, and only below on QUOT, P, RATE, and TRIP. For large caps, we have highest confidence in EPS upside for Facebook and Priceline.

Table 3: 1Q17 BofAML Estimates vs. The Street

Large Cap Stocks (>$5bn Market Cap)

Ticker	1Q17 Metric	BofA ML	Street	BofA ML vs Street
AMZN	Revenue	$35,335	$35,255	
	EPS	$2 34	$2 28	Ahead
EBAY	Revenue	$2,210	$2,206	
	EPS	$0 49	$0 48	Ahead
EXPE	Revenue	$2,134	$2,140	
	EPS	$0 07	$0 06	Ahead
FB	Revenue	$7,905	$7,798	
	EPS	$1 14	$1.11	Ahead
GOOGL	Revenue	$20,219	$19,891	
	EPS	$9 53	$9 45	Ahead
NFLX	Revenue	$2,710	$2,644	
	EPS	$0 45	$0 45	In-line
PCLN	Revenue	$2,415	$2,441	
	EPS	$9 08	$8 75	Ahead
SNAP	Revenue	$163	$158	
	EPS	($0 18)	($0 21)	Ahead
TRIP	Revenue	$379	$377	
	EPS	$0 23	$0 27	Below
TWTR	Revenue	$535	$510	
	EPS	$0 03	$0 01	Ahead
YHOO	Revenue	$821	$815	
	EPS	$0 14	$0 14	In-line
ZG	Revenue	$239	$236	
	EPS	$0.06	$0.05	Ahead

Small Cap Stocks (<$5bn Market Cap)

Ticker	1Q17 Metric	BofA ML	Street	BofA ML vs Street
RATE	Revenue	$117	$116	
	EPS	$0 14	$0 15	Below
CRCM	Revenue	$43	$43	
	EPS	$0 04	$0 02	Ahead
FIT	Revenue	$282	$278	
	EPS	($0 19)	($0 19)	In-line
GRUB	Revenue	$153	$153	
	EPS	$0 25	$0 24	Ahead
GPRO	Revenue	$205	$207	
	EPS	($0 39)	($0 44)	Ahead
TREE	Revenue	$127	$125	
	EPS	$0 93	$0 91	Ahead
MTCH	Revenue	$293	$308	
	EPS	$0 14	$0 13	Ahead
QUOT	Revenue	$72	$72	
	EPS	$0 01	$0 03	Below
P	Revenue	$319	$318	
	EPS	($0 49)	($0 35)	Below
TRVG	Revenue	€241	€241	
	EPS	€0 02	€0 02	In-line
WIX	Revenue	$91	$90	
	EPS	($0 05)	($0 13)	Ahead
W	Revenue	$944	$933	
	EPS	($0 49)	($0 60)	Ahead
YELP	Revenue	$201	$198	
	EPS	$0.18	$0 16	Ahead

Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Our 2017 estimates vs. street

Of the 25 Internet stocks listed below in our coverage, we are above the Street on 2017 EPS on 16 stocks and below the street on 9.

Table 4: 2017 BAML Estimates vs. The Street

Large Cap Stocks (>$5bn Market Cap)				
Ticker	Metric	BofA ML	Street	BofA ML vs. Street
AMZN	Revenue	$164,532	$165,158	
	EBITDA	$18,246	$19,382	
	EPS	$10 90	$12 60	Below
EBAY	Revenue	$9,458	$9,398	
	EBITDA	$3,520	$3,494	
	EPS	$2 03	$2 01	Anead
EXPE	Revenue	$10,097	$10,010	
	EBITDA	$1,857	$1,835	
	EPS	$5 54	$5 38	Anead
FB	Revenue	$38,546	$37,774	
	EBITDA	$24,358	$23,775	
	EPS	$5 67	$5 43	Anead
GOOGL	Revenue	$88,636	$87,691	
	EBITDA	$43,457	$43,264	
	EPS	$41 82	$41 12	Anead
NFLX	Revenue	$11,627	$11,221	
	EBITDA	$1,218	$1,053	
	EPS	$1 44	$1 41	Anead
PCLN	Revenue	$12,518	$12,447	
	EBITDA	$4,784	$4,747	
	EPS	$75 35	$74 11	Anead
SNAP	Revenue	$1,007	$1,034	
	EBITDA	($580)	($617)	
	EPS	($0 59)	($0 57)	Anead
TRIP	Revenue	$1,647	$1,649	
	EBITDA	$346	$339	
	EPS	$1 22	$1 23	Below
TWTR	Revenue	$2,301	$2,352	
	EBITDA	$639	$564	
	EPS	$0 33	$0 27	Anead
YHOO	Revenue	$3,369	$3,574	
	EBITDA	$848	$891	
	EPS	$0 65	$0 67	Below
ZG	Revenue	$1,062	$1,048	
	EBITDA	$215	$211	
	EPS	$0 48	$0 44	Anead

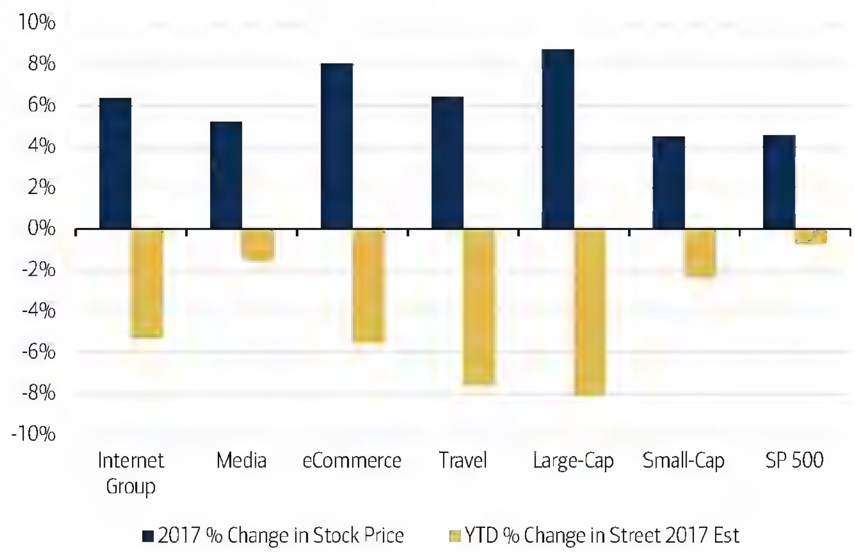
Small Cap Stocks (<$5bn Market Cap)				
Ticker	Metric	BofA ML	Street	BofA ML vs Street
RATE	Revenue	$508	$505	
	EBITDA	$126	$126	
	EPS	$0 68	$0 70	Below
CRCM	Revenue	$172	$172	
	EBITDA	$20	$19	
	EPS	$0 43	$0 36	Ahead
FIT	Revenue	$1,625	$1,580	
	EBITDA	($156)	($120)	
	EPS	($0 37)	($0 36)	Below
GRUB	Revenue	$650	$645	
	EBITDA	$184	$181	
	EPS	$1 13	$1 10	Ahead
GPRO	Revenue	$1,307	$1,266	
	EBITDA	$66	$48	
	EPS	$0 09	($0 08)	Ahead
TREE	Revenue	$525	$515	
	EBITDA	$96	$96	
	EPS	$3 91	$4 00	Below
MTCH	Revenue	$1,285	$1,325	
	EBITDA	$462	$459	
	EPS	$0 95	$0 88	Ahead
QUOT	Revenue	$312	$288	
	EBITDA	$44	$46	
	EPS	$0 18	$0 09	Ahead
P	Revenue	$1,629	$1,621	
	EBITDA	($17)	($38)	
	EPS	($0 21)	($0 49)	Ahead
TRVG	Revenue	€1,105	€1,088	
	EBITDA	€44	€40	
	EPS	€0 05	€0 06	Below
WIX	Revenue	$420	$416	
	EBITDA	$74	$64	
	EPS	$0 31	$0 36	Below
W	Revenue	$4,169	$4,237	
	EBITDA	($48)	($59)	
	EPS	($1 55)	($1 65)	Ahead
YELP	Revenue	$895	$889	
	EBITDA	$166	$161	
	EPS	$0 99	$1 04	Below

Source. BofA Merrill Lynch Global Research, Bloomberg, as of 4/4 2017

Stock price performance above estimate revisions

Internet sector stocks are up 6% YTD, on average, while EPS estimates for profitable companies in our coverage cluster are down 5% YTD. For large-caps over $5bn in market cap., street 2017 EPS estimates are down 8% YTD while the average stock price is up 9% YTD; suggesting macro expectations and stock rotation are having a larger impact on stock movement than earnings estimates. eCommerce leads the group, up 8% YTD with Travel up 6% and Media behind at 5%. Small Caps are lagging Large caps YTD at 4% vs. 9%.

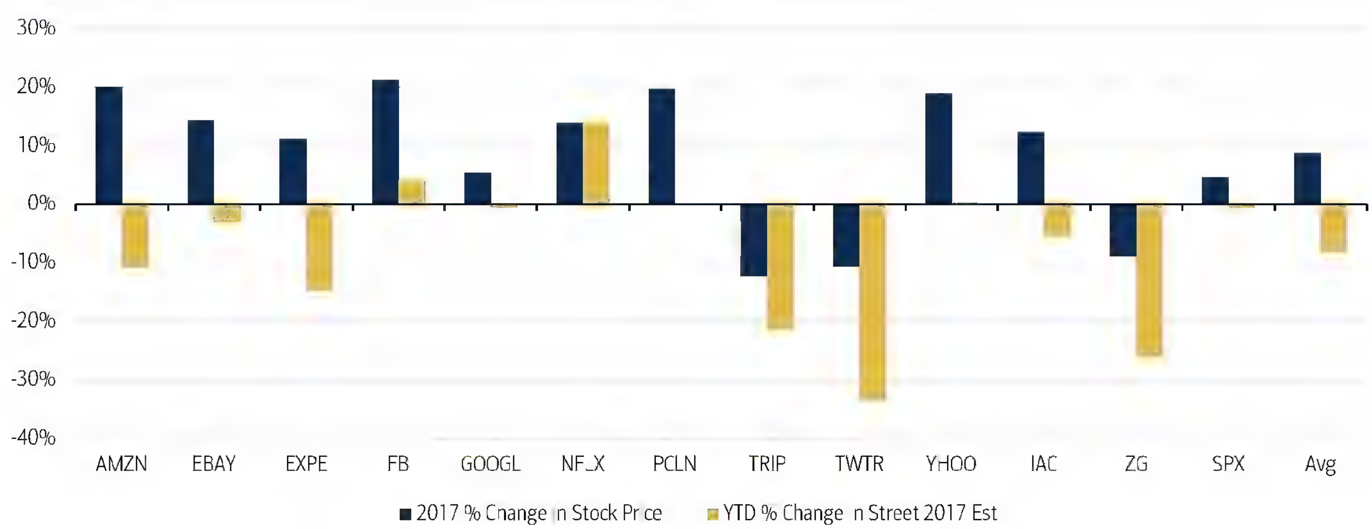
Chart 1: YTD Stock Price Performance vs. YTD 2017 Estimate Revisions By Sector



Source: Excludes companies with negative earnings, Bloomberg, as of 4/4/2017

Nine of the twelve large caps in our group are up YTD and four of these companies have had positive stock returns despite negative EPS estimate revision (AMZN, EXPE, EBAY & IAC). TRIP is the worst performing large cap YTD, down 12%. Only FB and NFLX have had positive 2017 EPS estimate revisions, with GOOGL, YHOO and PCLN holding flat.

Chart 2: YTD Stock Price Performance vs. YTD 2017 EPS Revisions For Larger-Cap Internet Stocks ($5bn+)

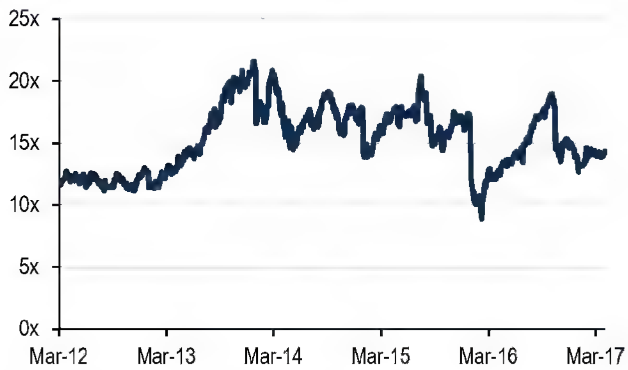


Source: Bloomberg consensus estimates, as of 4/4/2017

Sector Valuations

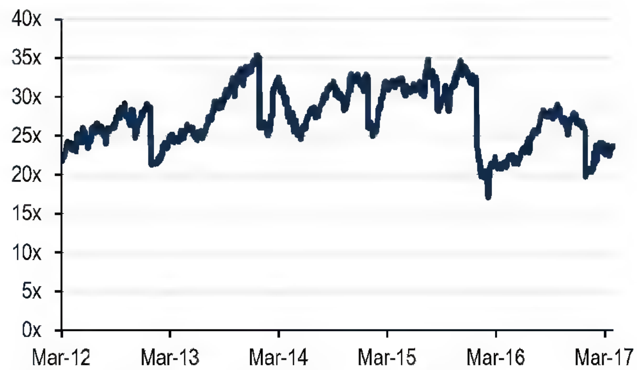
Internet sector trading multiples for EV/EBITDA and P/E are tracking up slightly YTD, (excluding NFLX). On a y/y basis, the group P/E is at 24x vs. 22x last year, while the group EV/EBITDA is at 14x vs. 13x a year ago.

Chart 3: Internet Sector Historical 2-Yr Forward Avg. EV/EBITDA



Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Chart 4: Internet Sector Historical 2-Yr Forward Avg. P/E



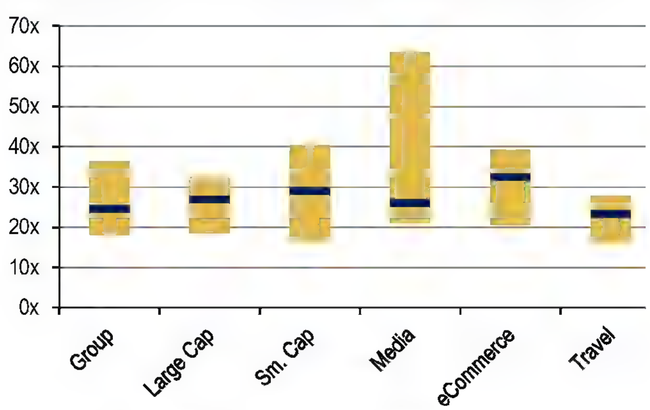
Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Large cap receiving a premium; Small caps at the low-end of historical range

Excluding NFLX and YHOO, large cap stocks in the Internet group are trading at 26x 2018 EPS below the small cap group at 28x 2018 EPS, with both Large and Small caps trading slightly above their average for the past 5 years (see chart below). The media sector is trading at a steep discount to travel and eCommerce.

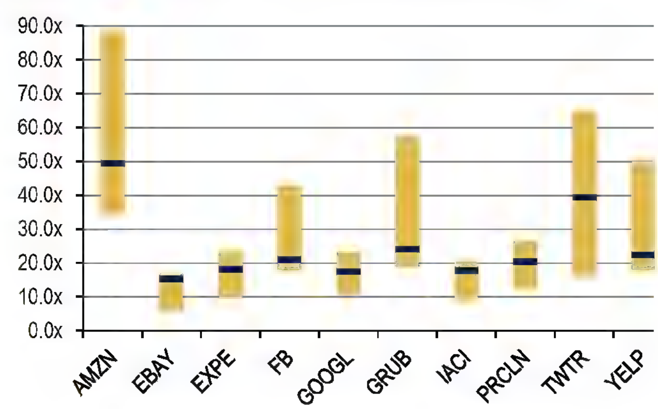
- The eCommerce sector is currently trading slightly above the midpoint of its five year range at 32x 2018 EPS. AMZN and WIX are well above at 49.5x and 74x respectively while EBAY is trading below at 15x.
- The Media sector is trading well below the midpoint of its recent range (excluding NFLX), at 25x 2018 EPS. GOOG (18x), FB (21x), and YELP (23x) are below the sector average while TWTR (40x) is above.
- The Online Travel sector is currently trading slightly above the mid-point of its five year range at 23x but below the internet sector average. TRIP (29x) is trading above the average while EXPE (18x) and PCLN (21x) are below.

Chart 5: Historical 2-Year Forward P/E Multiple By Sector (ex NFLX)



Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Chart 6: Historical 2-Year Forward P/E Multiple (select stocks)



Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Currency still a slight headwind for 1Q results but improving

We expect FX to remain a y/y headwind for 1Q results; the Euro is down about 6% y/y but up 1% from where it was when most Large-cap internet companies reported 4Q results in late January (~$1.06). The GBP at $1.22 is down slightly (1.4%) over the same period. Our currency strategist is forecasting the Euro to end 2017 at $1.05 and the GBP to end at $1.19. FX pressure will ease after 1Q if rates hold, unless a company has high exposure to Japan.

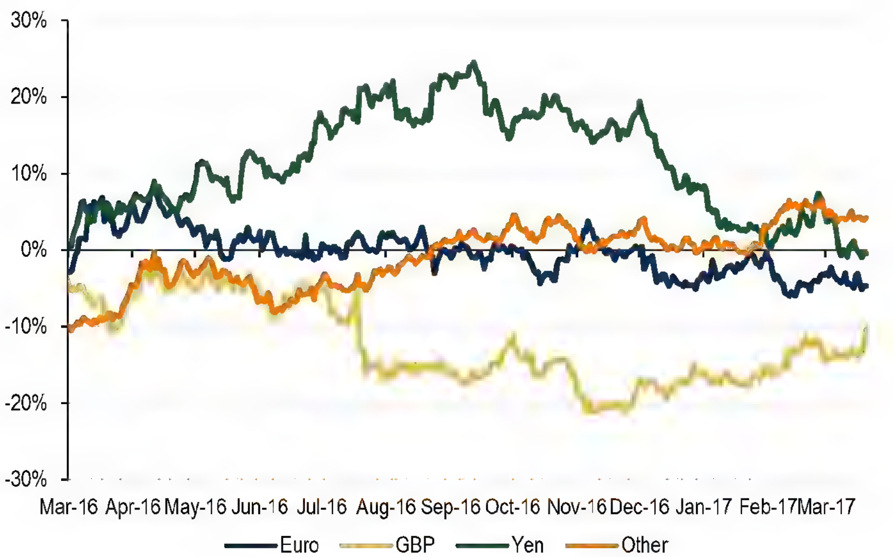
Table 5: Percent change y/y

	Euro	GBP	Yen	Other*
4Q15	-12.3%	-4.5%	-8.1%	-14.4%
1Q16	-2.0%	-5.4%	1.1%	-11.0%
2Q16	2.0%	-4.9%	9.4%	-6.3%
3Q16	0.3%	-13.9%	19.3%	-2.9%
4Q16	-1.5%	-17.4%	15.1%	0.0%
1Q17	-3.5%	-14.5%	2.5%	3.3%
2Q17E	-5.6%	-15.4%	-3.9%	-0.3%
3Q17E	-4.5%	-9.2%	-9.9%	-0.9%
4Q17E	-1.2%	-3.5%	-8.1%	0.2%

Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

International revenues a percent of total revenues is highest at PCLN (87% of gross profit), GOOG (53%), FB (53%), TRIP (43%), EBAY (57%), and EXPE (42%). Higher operating margins in UK/Europe than US and lower Intl. taxes can increase this exposure.

Chart 7: Spot Rate % Change Y/Y (USD vs. FX Spot Rate)



Source: Bloomberg, Other Includes the following *Asian (KRW, AUD, HKD), Europe (RUB, SEK, CHF) Americas (BRL, MXN, CAD), as of 4/4/2017

Sentiment Ranking Update

We are updating our sentiment ranking index on 25 stocks in our Internet coverage universe (as of 4/4/17). We have aggregated six different indicators we think are relevant to gauge sentiment and have generated an overall "sentiment" score for each company. This sentiment analysis is intended to be informative and should not be used to form an investment opinion; for example our model does not factor in valuation or management quality. Of our company coverage universe, we have excluded four game publisher companies as well as two recent IPO's from this analysis as data may not be comparable.

Table 6: 1Q16 change in sentiment ranking

Ticker	Rank	Pre 4Q Δ	Score	Pre4Q Δ
FB	1	+3	4	+4
W X	2	-1	4	+2
TREE	3	-1	8	-1
AMZN	4	+5	8	+4
NFLX	5	-2	9	-1
GOOGL	6	NA	9	+1
PCLN	7	+1	9	+2
CRCM	8	+9	11	+3
EXPE	9	+5	12	+2
IAC	10	+5	12	+2
RATE	11	-4	13	-2
EBAY	12	+4	13	+1
ONDK	13	+5	14	+1
ZG	14	-9	14	-5
YHOO	15	+6	14	+3
GPRO	16	+8	14	+5
YELP	17	-7	16	-4
W	18	-5	16	-3
P	19	NA	16	NA
GRUB	20	-9	16	-4
MTCH	21	+1	17	+1
QUOT	22	-10	17	-4
FIT	23	+2	19	+1
TRIP	24	-1	20	-2
TWTR	25	-5	21	-5

Source BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Investor sentiment categories

We assembled data that measures investor sentiment across six categories. These metrics include latest short interest (as a % of float), change in short interest as a % of float over the last 90 days, current stock performance over the last 90 days, current average sell side ratings, forward year EPS estimate revisions over last 90 days, and expected FY17 revenue growth. While there are no perfect indicators of average investor sentiment, we believe these metrics provide a helpful framework of investor sentiment in our sector. In our analysis, Facebook, WIX, and LendingTree had the highest sentiment in 1Q, while Fitbit, Trip and Twitter had the lowest sentiment. Care.com had the most improved ranking, moving up 9 points to 8th, while Quotient had the biggest decline moving down 10 spots in our ranking to 22nd.

Methodology

Our methodology consisted of: 1) gathering financial data across six categories that we believe are relevant to measuring investor sentiment, 2) ranking companies on each attribute using a scale of 1 to 29, with 1 highest and 29 the lowest, and 3) ranking the companies based on the avg. score of the six metrics.

Highest sentiment: FB, WIX, and TREE; Lowest: FIT, TRIP, and TWTR

Based on our sentiment ranking index, Facebook, Wix, and LendingTree have top investor sentiment pre 1Q earnings. Facebook moved into first place from fourth due to the lowest short interest as % of float, second highest FY17 revenue growth, sixth highest sell side FY16 EPS estimate revisions, and third best stock performance in the last 90 days. Wix came in second place with top stock performance in the last 90 days, top expected FY17 revenue growth and second best sell-side FY16 EPS estimate revision, despite ranking ninth for current sell side ranking and seventh for short interest ratio. LendingTree placed third with best current sell side ranking and best change in short interest ratio.

Fitbit had third worst investor sentiment with the worst stock performance in the last 90 days, the worst expected FY17 revenue growth and the second largest change in short interest in the period. TripAdvisor, had the second lowest sentiment with the third worst sell side ranking and fifth worst sell side EPS estimate revision. Twitter, our lowest sentiment stock pre 1Q earnings, had second to worst sell side ranking and expected FY17 revenue growth, along with third to worst sell side estimate revisions and was below average in all of our categories.

Score Ranking vs. Investment Rating

Our sentiment analysis is independent of our investment rating system, and our investment rating may or may not factor in positive or negative sentiment. This scorecard analysis includes only data currently up to the last 90 days, and our investment rating opinion takes into consideration potential stock price fluctuations, attractiveness for investment relative to other stocks within our Coverage Cluster, business model quality, and valuation. Please see our Fundamental Equity Rating Opinion Key at the end of the report for more details.

Table 7: Combined Metric List

Company	Short Interest % float	Δ short interest % of float	Performance 90 days	Sell Side Ranking	EPS Estimate Revisions	Expected FY17 Rev. Growth
FB	1%	0%	21%	4.7	4%	37%
WIX	2%	-1%	67%	4.4	62%	43%
TREE	23%	-20%	21%	5.0	-6%	34%
AMZN	1%	0%	20%	4.8	-10%	21%
NFLX	6%	-1%	14%	4.1	15%	27%
GOOGL	1%	0%	6%	4.7	0%	19%
PCLN	3%	0%	20%	4.6	0%	16%
CRCM	3%	0%	42%	3.5	28%	6%
EXPE	8%	-2%	11%	4.6	-12%	14%
IAC	1%	0%	12%	4.4	-5%	-1%
RATE	2%	0%	-13%	4.2	2%	16%
EBAY	2%	0%	14%	3.6	-3%	5%
ONDK	12%	3%	1%	3.3	34%	30%
ZG	11%	-2%	-9%	3.9	-26%	24%
YHOO	6%	1%	19%	3.8	0%	2%
GPRO	36%	3%	4%	2.3	74%	7%
YELP	10%	0%	-14%	3.7	-2%	25%
W	38%	2%	17%	3.9	-22%	25%
P	30%	2%	-7%	3.9	2%	17%
GRUB	18%	7%	-11%	4.1	-5%	31%
MTCH	27%	5%	-4%	4.2	1%	8%
QUOT	8%	0%	-13%	4.8	-56%	5%
FIT	26%	-4%	-29%	3.1	NA	-27%
TRIP	16%	5%	-12%	2.9	-21%	11%
TWTR	11%	3%	-11%	2.5	-55%	-7%

Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4.4.2017

Table 8: Combined metric rankings

Company	Short Interest % float	Δ short interest % of float	Performance 90 days	Sell Side Ranking	EPS Estimate Revisions	Expected FY17 Rev. Growth	Average
FB	1	8	3	4	6	2	4
WIX	7	6	1	9	2	1	4
TREE	20	1	4	1	17	3	8
AMZN	4	9	5	2	18	10	8
NFLX	10	7	10	13	5	6	9
GOOGL	2	12	13	5	12	11	9
PCLN	8	11	6	7	10	14	9
CRCM	9	14	2	20	4	19	11
EXPE	12	5	12	6	19	15	12
IAC	3	10	11	8	16	23	12
RATE	6	15	23	10	8	13	13
EBAY	5	13	9	19	14	20	13
ONDK	17	21	14	21	3	5	14
ZG	15	4	18	14	22	9	14
YHOO	11	18	7	17	11	22	14
GPRO	24	3	15	25	1	18	14
YELP	14	16	24	18	13	8	16
W	25	19	8	15	21	7	16
P	23	20	17	16	7	12	16
GRUB	19	25	20	12	15	4	16
MTCH	22	24	16	11	9	17	17
QUOT	13	17	22	3	24	21	17
FIT	21	2	25	22	N/A	25	19
TRIP	18	23	21	23	20	16	20
TWTR	16	22	19	24	23	24	21

Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Alphabet (Buy, $1,025 PO)

Stock view: Expect solid 1Q revs., but loss of non-GAAP reconciliation a concern

New concerns have been raised on the YouTube advertiser pullback, but with the cuts in spending surfacing primarily in the back half of March, we anticipate only modest impact to 1Q revenue, with more significant potential impact to 2Q17 (see Advertiser boycott raising concerns on 1Q/2Q revenues). Looking beyond the YouTube issues, our early 1Q ad checks were mostly positive, with Merkle highlighting modest revenue growth acceleration, better than the 70bps of ex-FX Website revenue deceleration in 1Q17 (vs 4Q16) we've assumed in our model. Overall, we expect in-line to slightly better 1Q results driven by mobile and PLA strength (and perhaps some maps ads), but see risk of moderate Street estimate cuts for 2Q/3Q revenue on YouTube concerns. For most companies, we would expect management to help clear up the advertiser controversy on the call with some added financial disclosure or guidance, but predicting what Alphabet will say on the topic is more difficult.

1Q results will be the first quarter that Google reports GAAP EPS without a non-GAAP EPS reconciliation. With higher than usual SBC in 1Q due to changes in grant timing, it is possible Google misses Street GAAP EPS. We are leaving our revenue unchanged but lowering GAAP EPS to $7.26 from $7.36 based on higher SBC. Also, unusual charges are more likely to be controversial for Google without a non-GAAP EPS reconciliation.

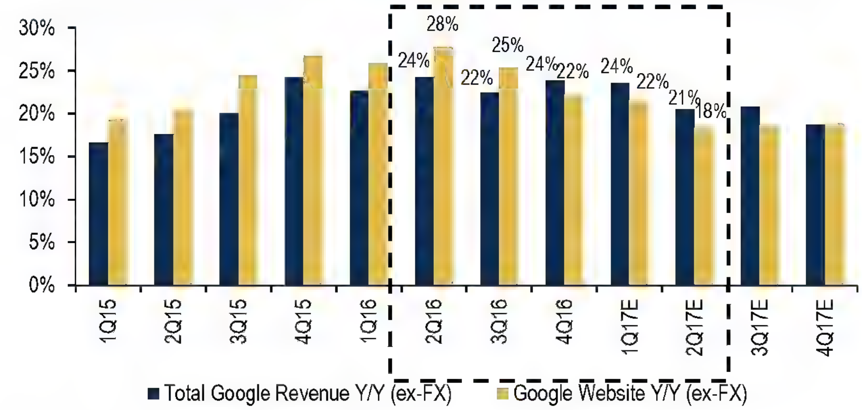
Core margins remain a key focus, as has been the case since 3Q16 when core Google non-GAAP operating margins contracted 95bps y/y. We expect core margins to remain down y/y driven primarily by segment mix, and our model assumes 2017 core margins are down 50bps in 2017 (to 46.1%) and another 20bps in 2018 (to 45.9%). For 1Q17, we assume 45.8% core Google non-GAAP operating margin, up 30bps q/q and down 75bps y/y. Our recent deep dive analysis suggests segment mix alone drives a natural 220bps margin headwind, which we think can be partially offset with 1) upside in high margin search growth from monetization growth (clicks and pricing); 2) leverage in individual segments from scale; and 3) cost cutting measures across the business (see Digging into the Alphabet revenue mix and margin drivers).

We continue to like the stock, but recognize that potential estimate trimming on YouTube concerns, further margin contraction, SBC pressure on GAAP EPS and challenging 2Q17 comps could continue to drag on near-term sentiment. Looking ahead, we are optimistic on 2H17 based on the potential for new ad format ramps, easing comps, and potential YouTube relief (we assume the advertiser boycott eases exiting 2Q). Alphabet trades at 22x GAAP (17x ex-Other Bets, cash), in-line with the S&P and in-line to below the 5-year average (23.5x), which we view as attractive.

Key theme/metric(s) for 1Q: Website growth, core margins

We believe the key metrics for the quarter will be ex-FX Website growth and core margins. For ex-FX website growth, we currently model 70bps of deceleration in 1Q17 (vs 4Q16), and we think deceleration could persist through 2Q17, after which the y/y growth comps ease considerably.

Chart 8: Google ex-FX Y/Y growth trends



Source: Company reports, BofA Merrill Lynch Global Research

For core margins, we assume y/y contraction through 3Q17, after which we model a slight uptick in 4Q17. For the year, we assume core Google margins contract 50bps to 46.1%. In terms of blended Alphabet non-GAAP operating margins, we assume 70bps of y/y contraction to 40.7% in 2017, but won't be surprised if better cost discipline (particularly in Other Bets) drives more stable y/y trends.

Table 9: Core Google non-GAAP operating margin forecast

	1Q16	2Q16	3Q16	4Q16	1Q17E	2Q17E	3Q17E	4Q17E	1Q18E	2Q18E	3Q18E	4Q18E
Core Google non-GAAP operating margin	46.5%	47.9%	46.5%	45.5%	45.8%	46.5%	45.6%	46.4%	45.6%	46.5%	45.4%	46.3%
Y/Y Change	1.4%	1.6%	-1.0%	-1.5%	-0.7%	-1.4%	-0.9%	0.9%	-0.2%	-0.1%	-0.2%	-0.1%

Source: Company, BofA Merrill Lynch Global Research

Biggest 1Q issues/risks:

- **Deceleration in Google Website revenue:** There could be modest revenue pressure due to YouTube boycott impact, and/or ad shift to Facebook. One SEM suggested a modest uptick in advertising spend on maps, which could be a positive in 2017.

- **TAC to distribution partners:** Rising TAC rate (Apple, Samsung) could mitigate potential gross revenue upside in the higher margin mobile search segment.

- **Growth investments could drag on margins:** Investments in Google Cloud, hardware, and YouTube could be higher than we expect, which could negatively impact core Google margins and raise concerns on long-term sustainable margin levels.

- **YouTube/Display Network commentary:** While we do not expect full resolution on the YouTube/Display Network issues, management's tone will likely impact expectations for timing of a fix, corresponding costs, magnitude of the boycott losses, and time to recover lost ad spend.

- **Stock comp timing shift could cause some GAAP lumpiness:** Shift in timing of annual stock-based comp grants could impact 1Q EPS, but should be offset with lower relative cost in 2H17.

Top 1Q data point:

Our early 1Q checks (pre quarter end) have been mostly positive, but most checks did not contemplate a potential impact of the YouTube & Display Network pullback. ComScore PC click data has suggested Google PC queries are down 3% q/q QTD, slightly worse than the 2% q/q decline in 1Q16.

Estimate vs Consensus

Our revenue and EBITDA estimates of \$20.2bn/\$9.9bn are slightly above the Street at \$19.9bn/\$9.8bn. Our model assumes currency to be a 2% headwind on y/y international revenue in 1Q17 (similar to 4Q16) and a 3% headwind in 2Q17. Our 1Q17 non-GAAP EPS of \$9.53 is slightly above consensus at \$9.45, and on a GAAP basis, our 1Q estimate for \$7.26 is slightly below the Street at \$7.42. For 2017, we are above on revenue, EBITDA, and non-GAAP EPS, but slightly below on GAAP EPS.

Table 10: Alphabet Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofA ML est.	\$20,219	\$21,009	\$88,636	\$104,228
Growth Y/Y%	*23%*	*20%*	*21%*	*18%*
Street	\$19,891	\$20,867	\$87 691	\$102,632
BofA ML vs Street	Above	Above	Above	Above
EBITDA				
BofA ML est	\$9,897	\$10,428	\$43,457	\$50,670
Street	\$9,788	\$10,384	\$43,264	\$50,252
BofA ML vs Street	Above	Above	Above	Above
EPS				
BofA ML est.	\$9 53	\$10 02	\$41 82	\$48 45
Street	\$9 45	\$10 09	\$41 12	\$48 56
BofA ML vs Street	Above	Below	Above	Below
GAAP EPS				
BofA ML est.	\$7 26	\$7 75	\$32 66	\$37 81
Street	\$7.42	\$8 06	\$33 31	\$39 16
BofA ML vs Street	Below	Below	Below	Below

Source BofA Merr ll Lynch Global Research, Bloomberg, as of 4/4/2017

Given the recent YouTube & ad network concerns, it's possible stock sees a lift on in-line EPS if commentary on content fixes and advertiser pullback is constructive. We are comfortable with our \$1,025 price objective, based on 21x core Google GAAP EPS plus cash. Our PO multiple is within the five year range of 12-24x forward P/E. Easing comps and potential new ad format ramps (Google's advertiser conference is May 23) could be positive 2H drivers.

Amazon (Buy, $1,100 PO)

Stock view: Positive on retail, but street increasingly focused on advertising

For Amazon's retail business, sentiment remains positive despite some modest 4Q revenue weakness vs expectations. We expect the retail business to remain strong in 1Q with stable growth as core drivers (Prime, delivery infrastructure advantage) remain intact. The lack of early tax refund support is a potential 1Q risk, but we would expect any delayed spending to bounce back in March or 2Q. Continued store closures by traditional retailers should aid the online shift throughout 2017. Finally, it appears Amazon has become stepped up advertising on its site, with more sponsored listings, which could be a source of revenue upside in 2017. Amazon had new revenue disclosures in its 10-K, and the ad revenue line significant accelerated in 2016.

For AWS, we expect some additional q/q revenue deceleration and q/q declines in margins. We note that AWS growth in 4Q was below our estimates, and the effects of 4Q's late price cuts should drive additional deceleration in 1Q. Microsoft and Google are well capitalized competitors that are significantly increasing cloud investment (see Battle in Seattle for industry update), so the Street sentiment could shift more cautiously on Amazon on a slight miss.

Margins continue to be a risk, but top line trends seem to be the biggest driver of sentiment and advertising optimism has grown. Amazon's current investment cycle began in earnest in 3Q'16, and we expect the elevated pace of investment to persist through 3Q'17. Margins may see y/y declines given: 1) Ongoing investments in fulfillment center build out (given fulfilled unit growth of 40% in 2016), 2) Digital content and related marketing, 3) Prime benefits (Now and Fresh), 4) Alexa/Echo, and 5) India. We think the Street is constructive on these initiatives, and will move past lower y/y margins concerns if top line growth is stable in 1Q.

Key theme/metric(s) for 1Q: AWS growth and 2Q profit outlook

We forecast 43% y/y AWS growth in 1Q, down from 47% in 4Q, partially due to the lingering effects of price cuts that went into effect on December 1st. This implies 4% q/q growth v. 9% last quarter. Increased investments in logistics/fulfilment, AWS, marketing, Prime content and others could set Amazon up for disappointing margin guidance vs. the Street's expectations. However, we think the Street will focus on revenue trends and ultimately view the investments as a long-term positives.

Biggest 1Q issues/risks:

- 2Q GAAP operating income outlook given increased investments in logistics, India, Prime Instant Video content, as well as expected AWS deceleration
- Gross profit growth trends given expense issues and tougher growth comps in 1H17
- AWS margin trends given AWS price cuts and aggressive competition
- International segment performance given investments in India

1Q traffic data points mixed

comScore's US data indicates that Amazon PC user growth has been down 2% y/y in 1Q through February vs. 4Q at -5% y/y. Mobile user growth is up 8% y/y vs. up 9% in 4Q. Amazon's total mobile and PC minutes were down 5% y/y in 1Q through February vs. up 18% y/y in 4Q; mobile minutes were down 7% y/y in 1Q vs. +18% y/y in 4Q.

1Q items/news:

- **Logistics investments:** Amazon announced a $1.5bn air hub in Northern Kentucky that will host Amazon's own cargo airline.
- **AWS outage:** AWS had a large outage in early March. Investors will likely focus on the competitive implications of the outage.

- **Walmart continuing to acquire eCommerce assets and launching free 2-day shipping**: Investors will likely focus on Amazon's results relative to Wal-mart.

- **Amazon Business:** Amazon Business announced a multi-year agreement with a public sector co-op, worth $500mn/year with a 5 year contract and 6 option years (see Now we're in Business: Amazon announces new B2B contract with public sector co-op).

- **Prime Now expansion:** Prime Now launched 1-hour delivery in Milwaukee and Boston during the quarter. Amazon also launched the ability for Alexa users to make Prime Now orders.

- **Upcoming 2Q events:** AWS Summit SF (April 18-19), new Prime Instant Video content rollout (*Manchester by the Sea*, Bosch season 3, I Love Dick).

- **Souq.com acquisition:** Amazon has an agreement to acquire Souq.com, the leading eCommerce platform in the Middle East. Terms were not disclosed, though press reports indicate that Amazon had bid $650mn for the company before Emaar Malls made a public bid of $800mn. The deal is expected to close in 2017.

- **Physical store rollout:** Amazon has launched or planned to open 10 AmazonBooks stores, is beta testing its AmazonGo grocery store concept (though public opening was delayed due to technology issues), and there are press reports that Amazon is testing other grocery store formats as well.

- **Google Cloud Conference:** No significant price announcements were made, but Google's conference was much more impressive this year (see What a difference a year makes for Google Cloud).

Souq.com brings Amazon into the Middle East

Amazon announced that it has an agreement to acquire Souq.com, the leading eCommerce platform in the Middle East. Terms were not disclosed, though press reports indicate that Amazon had bid $650mn for the company before Emaar Malls made a public bid of $800mn. This will represent Amazon's largest deal since the $970mn Twitch acquisition in 2014.

Souq.com does not disclose its sales or earnings, making it difficult to assess the acquisition multiple or potential accretion of the deal. An $800mn acquisition implies 0.2% of Amazon's current market cap. Though it is somewhat surprising for Amazon to acquire a company in order to enter a new market, Amazon can leverage logistics, sourcing, customer, and technology investments at Souq.com. The deal is expected to close in 2017. Souq.com offers 8.4mn products across 31 categories, including electronics, health & beauty, fashion, home goods, and baby. The site has 45mn monthly visitors and localized operations in Saudi Arabia, UAE, and Egypt and localized sites for the UAE, Egypt, Saudi Arabia, Kuwait, Bahrain, Oman, and Qatar. Euromonitor estimates that Middle East & Africa GMV is $9bn market in 2016 though other reports peg the market at $20bn, implying roughly 1-2% eCommerce penetration in the region vs. mid-teens in Western markets. Press reports last year indicated that Amazon was exploring entering Australia and Singapore in 2017. The Souq.com acquisition may signal a more aggressive global expansion plan.

Estimates vs. Consensus: Above Street revenue and EPS

We expect 1Q revenue/EPS of $35.3bn/$2.34 vs. Street at $35.3bn/$2.28. Amazon's 1Q revenue guidance is $33.25-35.75 and GAAP operating income of $250-900 (we are at $898mn in operating income). Our 1Q revenue estimate of $35.3bn (+21% y/y vs. 22% in 4Q16) is based on 24% y/y unit growth vs. 24% y/y in 4Q. For 1Q17, we estimate -19% q/q revenue growth vs -19% q/q in 1Q last year. We are below the street for 2Q margins.

Table 11: Amazon Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$35,335	$36,784	$164,532	$194,826
Growth Y/Y%	*21%*	*21%*	*21%*	*18%*
Street	$35,255	$36,815	$165,158	$199,387
BofAML vs. Street	Above	Below	Below	Below
EBITDA				
BofAML est.	$4,153	$4,626	$18,246	$22,022
Street	$4,085	$4,835	$19,382	$24,850
BofAML vs. Street	Above	Below	Below	Below
EPS				
BofAML est	$2 34	$2 86	$10 90	$14 37
Street	$2 28	$3.30	$12 60	$18 16
BofAML vs. Street	Above	Below	Below	Below

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our PO of $1,100 is based on our SOP that values AWS at $127bn or $259 per share and the retail business at $413bn or $841 per share. Our 5.5x AWS multiple is a modest premium to the software/SaaS comp group at 5.0x on 2018 sales, and 0.9x multiple is a premium to a retail general merchandise comp group at 0.7x. We think the premiums are warranted given share gains and superior growth. Our $1,100 price objective implies 2.8x 2018E Price/Sales, a multiple above the high end of Amazon's historical range of 1.0-2.5x. We argue the historical P/S multiple should increase given positive 3rd party sales (3P) that is reported on a net basis, a higher AWS revenue contribution, an increasing advertising contribution, and record gross profit margins.

eBay (Buy, $38 PO)

Stock view: Marketplace growth should improve in 2017

eBay's 4Q results showed signs of Marketplace improvement, with improving mobile and C2C trends and a modest pickup in new buyers. Management expects to put marketing dollars behind this trend to drive Marketplace growth momentum in 2017 (guidance calls for 1 point of acceleration in Marketplace volume in 1Q, with 2 points for the full year). Expectations have risen since the start of the year, and we think eBay needs to deliver 1 point acceleration in US GMV growth vs 1Q to maintain confidence in management's execution. There is also significant interest in eBay's first party ad strategy and potential improvement in transaction take rates (at expense of MS&O revenues).

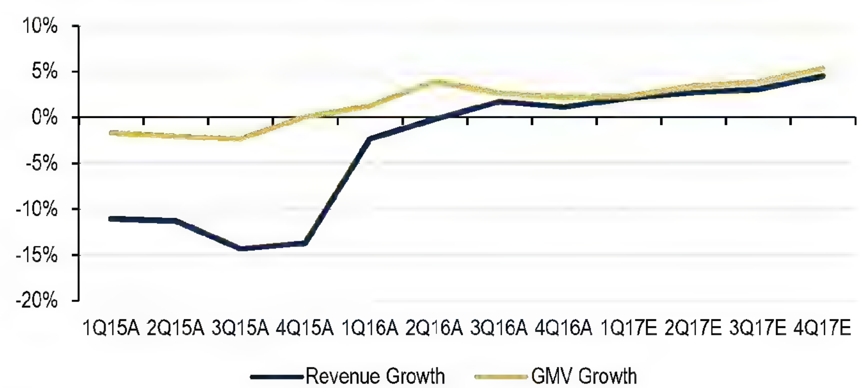
The potential structured data impact also remains top of mind for investors as structured data will provide the backbone for improving customer search and product experiences. As of 4Q'16, there are 180mn+ structured data pages v. 100mn+ pages at the end of 3Q'16. More pages are expected in 2017, which will start to be exposed to core organic traffic. Management appears confident that the impact of structured data would increasingly benefit results and that structured data formats will be much more visible by holiday 2017. Overall, if 1Q results are at/above expectations, we think the stock will reflect even more optimism on structured data improvement.

For margins, we expect continued pressure in 2017 as the company ramps up marketing spend and increases its AI capabilities. If the company can manage to accelerate top line growth through conversion rate improvements, some of the upside may be invested, limiting 2017 earnings flow through (but benefitting growth in 2018). Therefore, we think customer, transaction and revenue trends most important for 2017, but lack of margin flow through could be sentiment headwind for the stock.

Key theme/metric(s) for 1Q: Marketplace growth/outlook

Our model assumes US GMV growth of 3.5% y/y, an 80bps q/q acceleration off an 80ps easier y/y comp, while we anticipate 6.0% y/y Intl ex-FX GMV growth. US acceleration (despite a modest Leap Year headwind) is likely needed to maintain increased management confidence. Our model assumes 8.3% take rate, which is up 10bps y/y and could be aided by the early transition to 1st party advertising on the site. eBay's 1Q revenue guide implies 5% y/y ex-FX growth at the midpoint, while the 2017 revenue guide calls for 7% ex-FX growth, implying revenue growth acceleration during the year.

Chart 9: eBay quarterly GMV and revenue y/y growth



Source BofA Merrill Lynch Global Research estimates, company report

Biggest 1Q issues/risks:

- Overall GMV growth remains muted as structured data changes still early, reducing confidence in future improvement.

- StubHub trends as StubHub GMV comps are tough in 1H'17 (32% y/y growth in 1H'16).

- Marketing expenses are expected to increase, putting pressure on margins and could raise concerns that GMV growth is being "bought".

Early 1Q traffic data points mixed

comScore's eBay desktop unique visitors decreased 6% on average through February vs. down 2% in 4Q. comScore's total eBay mobile and PC minutes declined 20% y/y on average through February in 1Q vs. down 17% y/y in 4Q. comScore indicates mobile minutes decreased 38% vs. down 20% in 4Q.

Estimates vs. Consensus: Expect modest EPS upside

We expect eBay to report broadly in-line revenue/EPS estimates of $2.21bn/$0.49 vs. the Street at $2.21bn/$0.48 (guidance is $2.17bn-$2.21bn and $0.46-$0.48). Our model assumes 11mn shares repurchased in 1Q (about $350mn of repurchase activity). We have adjusted our GAAP EPS for higher amortization of deferred tax asset.

Table 12: eBay Earnings Summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$2,210	$2,340	$9,458	$10,062
Growth Y/Y%	*3%*	*5%*	*5%*	*6%*
Street	$2,206	$2,315	$9,398	$9,925
BofAML vs. Street	Above	Above	Above	Above
EBITDA				
BofAML est.	$855	$843	$3,520	$3,735
Street	$841	$827	$3,494	$3,726
BofAML vs. Street	Above	Above	Above	Above
EPS				
BofAML est.	$0.49	$0.48	$2.03	$2.22
Street	$0.48	$0.47	$2.01	$2.21
BofAML vs. Street	Above	Above	Above	Above

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our $38 price objective is based on 17x our 2018E non-GAAP EPS. O ur 17x P/E multiple is slightly ahead of the retail comp group average of about 16x, reflecting eBay's potential for a Marketplace growth acceleration (to well above average retail growth) in 2017. With 6-8% growth and an 8% FCF yield, we think eBay remains an interesting value stock for retail investors, although GARP focused Internet investors may prefer stronger growth at Google or Priceline.

Expedia (Buy, $146 PO)

Stock view: 1Q faces tough comps, but should clear way for strength into '18

We think 1Q expectations are somewhat muted as Expedia has highlighted several earnings headwinds in early 2017, including incremental cloud migration spend, higher marketing spend and, recently, potential ADR pressure. 1Q'17 earnings will face the toughest room night growth comps, though Expedia expressed optimism on trends through January on the 4Q call. Comps ease during the rest of the year for Expedia, which we see as a positive set up for the stock. We think Expedia will reiterate its 10-15% EBITDA growth outlook and .Expedia remains our top 2017 summer (2Q/3Q) travel idea.

We currently forecast 20% y/y room night growth in 2Q/3Q, though the comp is 1600bps easier vs. 1Q and street growth expectations could be higher. The ongoing benefit of conversion rate improvements, the Easter shift into 2Q (noted as 1% impact in 2Q'16), as well as the benefit of more aggressive marketing spend should aid 2Q growth. Additionally, prior to 1Q'17 earnings, Expedia will begin to disclose HomeAway online bookings and room nights, which we think may drive y/y room night growth 200-300bps higher (we forecast HomeAway room nights up 50% y/y in 2017 vs. core OTA room nights up 18%). We think investors will also view HomeAway disclosure positively if the data indicates that the HomeAway transition remains on track and provide visibility into potential EBITDA acceleration in 2018.

STR data suggests hotel fundamentals deteriorated modestly in the US through initial March readings, but improved slightly in Europe through February. However, Expedia's CEO commented in a recent interview with the *Financial Times* that international tourism to the US (Expedia's key market) has decelerated following the introduction of Trump's travel bans, which may be a downside risk to 1Q bookings and revenues. This mirrors ForwardKeys data from early March that after Trump's executive order, foreign tourism bookings to the US fell, then rebounded when the ban was suspended, but declined again when the ban was re-introduced. A few US hotel operators have indicated little impact from travel bans, so data is mixed.

Key theme/metric(s) for 1Q: room night growth vs industry and Priceline

We expect 1Q organic room night growth to remain steady at 16% y/y, though we note that this does not yet include the contribution from HomeAway, which we think should add 200-300bps to y/y growth. We expect N. America bookings growth of 12% y/y vs. 8% in 4Q, Int'l bookings (FX-neut.) of 14% y/y.

Biggest 1Q issues/risks:

- Room nights may disappoint on tougher 1Q comps, negatively impacting the acceleration thesis
- Expedia's CEO commented in a recent interview with the *Financial Times* that international tourism to the US (Expedia's key market) has decelerated following the introduction of Trump's travel bans, which may pressure hotel ADRs and be a downside risk to 1Q bookings
- Pace of investments, namely cloud IT spend ($110mn in 2017) and marketing ramp
- HomeAway EBITDA trends given marketing spend ramp and pressure on subscription revenues. Street has high expectations for the business.
- Pressure on hotel take rates given agency mix shift and rewards programs

Early 1Q RevPAR data decelerates

According to STR, 1Q US RevPAR through initial March readings decelerated 30bps to 3.0% y/y, and European RevPAR through February accelerated 600bps q/q to 3.6% y/y

(FX-neutral). The STR data reflects a continued gradual deceleration in US RevPAR growth and a more recovery in European RevPAR growth as the region laps terrorist attacks and geopolitical uncertainty.

Table 13: US and European RevPAR Y/Y Change

US	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17**	1Q16	2Q16	3Q16	4Q16	1Q17
Occupancy	-0.3%	-0.8%	-0.4%	2.2%	-0.5%	0.3%	-1.0%	-0.4%	1.6%	-0.3%	2.5%	-0.1%	0.5%	-0.5%	1.6%	-0.5%	0.7%	0.1%	0.7%	0.5%
ADR	2.8%	3.6%	3.2%	2.8%	2.4%	3.5%	3.6%	2.5%	3.9%	1.9%	3.4%	2.4%	3.2%	1.7%	2.6%	3.2%	2.9%	3.3%	2.6%	2.5%
RevPAR	2.4%	2.8%	2.7%	5.0%	1.9%	3.8%	2.5%	2.1%	5.6%	1.6%	5.9%	2.3%	3.8%	1.2%	4.2%	2.7%	3.6%	3.4%	3.3%	3.0%
Europe																				
Occupancy	1.4%	1.5%	0.3%	3.5%	-0.3%	-0.7%	-0.4%	-1.5%	0.8%	-0.4%	4.2%	4.5%	5.1%	2.9%		1.1%	0.8%	-0.4%	2.8%	4.0%
ADR	-4.3%	-2.7%	2.5%	3.2%	0.3%	-4.5%	-0.7%	-4.8%	-1.8%	-8.6%	-5.3%	-5.0%	-2.1%	-3.1%		-1.5%	-0.3%	-2.4%	-6.3%	-2.6%
RevPAR	-2.9%	-1.3%	2.8%	6.8%	-0.1%	-5.1%	-1.1%	-6.2%	-1.0%	-9.0%	-1.3%	-0.7%	2.9%	-3.1%		-0.5%	0.5%	-2.8%	-3.7%	-0.1%
Europe in Euros	**Jan-16**	**Feb-16**	**Mar-16**	**Apr-16**	**May-16**	**Jun-16**	**Jul-16**	**Aug-16**	**Sep-16**	**Oct-16**	**Nov-16**	**Dec-16**	**Jan-17**	**Feb-17**		**1Q16**	**2Q16**	**3Q16**	**4Q16**	**1Q17**
Occupancy	1.4%	1.5%	0.3%	3.5%	-0.3%	-0.7%	-0.4%	-1.5%	0.8%	-0.4%	4.2%	4.5%	5.1%	2.9%		1.1%	0.8%	-0.4%	2.8%	4.0%
ADR	0.0%	-0.2%	-1.7%	-0.1%	-0.9%	-4.4%	-2.7%	-4.6%	-1.6%	-8.5%	-5.4%	-1.5%	-0.9%	0.2%		-0.7%	-1.8%	-3.0%	-5.2%	-0.4%
RevPAR	1.4%	1.2%	1.4%	3.3%	1.2%	5.0%	-3.1%	6.0%	0.9%	8.9%	1.4%	2.9%	4.2%	3.0%		0.4%	1.0%	3.3%	2.4%	3.6%

Source: Smith Travel Research (STR), BofA Merrill Lynch Global Research estimates, Note: **March data is month to date

Estimates vs. Consensus: In-line 1Q revenue and EPS

We expect 1Q revenue/EPS of $2.13bn/$0.07 vs. the Street at $2.14bn/$0.06 driven by 8% core OTA growth, 48% Trivago growth (in USD), 2% Egencia growth, and 16% HomeAway growth. We expect room night growth to remain stable at 16% in 1Q'17 before accelerating on easier comps in 2Q/3Q. Expedia guided 2017 EBITDA growth to 10-15% and our 2017 EBITDA forecast of $1.86bn (15% y/y growth) is modestly above the Street at $1.83bn (14% y/y growth).

Table 14: Expedia Estimate Summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofAML est.	$2,134	$2,555	$10,097	$11,424	$12,931
Growth Y/Y%	*12%*	*16%*	*15%*	*13%*	*13%*
Street	$2,140	$2,507	$10,010	$11,266	$12,429
BofAML est. vs. Street	Below	Above	Above	Above	Above
EBITDA					
BofAML est.	$182	$379	$1,857	$2,141	$2,416
Street	$179	$367	$1,835	$2,212	$2,628
BofAML est. vs. Street	Above	Above	Above	Below	Below
EPS					
BofAML est	$0.07	$0.99	$5.54	$6.84	$7.71
Street	$0.06	$0.94	$5.38	$6.88	$8.55
BofAML est. vs. Street	Above	Above	Above	Below	Below

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our $146 price objective is based on our sum of the parts (SOP) that assumes 9x 2018E EBITDA for the core OTA business (a discount to Priceline at approx. 15x due to slower organic growth and higher taxes on earnings), 8x 2018E EBITDA for Egencia (we expect single digit growth), 60% ownership of Trivago (using our PO), and 15x 2018 EV/EBITDA for HomeAway, plus net cash and long term investments.

Facebook (Buy, $165 PO)

Stock view: Becoming the one-stop social shop

We expect Facebook to report upside to Street 1Q revenue (but less in absolute dollars than in 4Q) driven by robust demand, Instagram momentum, and solid underlying user growth and engagement. Early ad checks in the quarter indicate steady advertiser trends, with some elements of seasonality off a stronger 4Q, and strength at Instagram. We expect pricing tailwinds to begin to pick up as we approach ad inventory supply moderation in 2H17, and a flurry of new product introductions could provide additional sources of ad load inventory over time. Overall, we see 1Q as an in-line to slightly better quarter, and are optimistic on the set-up for the remainder of the year for pricing, expense management, user engagement, and new platforms/feature ramps. Facebook will be hosting its F8 developer conference before earnings in San Jose on April 18-19.

Facebook had another busy quarter of new product launches with a notable trend of Snapchat-like features (Stories, Direct ephemeral messaging) and Video. At this point, we believe the Snap threat is less of a near-term concern. Recent key product/feature releases include:

- **Stories for all:** On the tail of a successful Instagram Stories launch in 8/16, Facebook rolled out WhatsApp Status (2/17), Messenger Day (3/17), and Facebook Stories (3/17).

- **Direct ephemeral messaging:** After introducing ephemeral direct photo/video sharing on Instagram in 11/16, Facebook announced a comparable feature with integrated filters/masks/frames for the core Facebook app in 3/17.

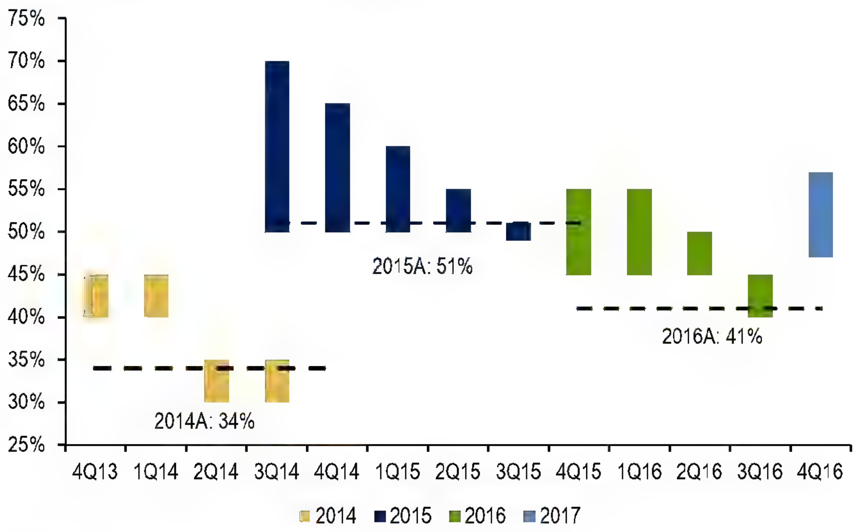
- **Video App for TV:** Announced in February, new app for Apple TV, Amazon Fire TV, and Samsung Smart TV to enable FB video viewing on TV.

- **New ad products:** Instagram Stories ads (1/17) a positive tailwind to Instagram ad load, while vertical video ads (Facebook 9/16, Instagram 11/16) and Collections (3/17) are likely positive for pricing.

While, in many ways, Facebook is duplicating Snapchat's innovation, we are encouraged with the rate of new product introductions and view the Facebook Stories and Direct ephemeral messaging (with filters/masks) as positives for user engagement and potential barriers to competitive risk. While management's focus in the near-term will likely be on new feature adoption, we expect Stories ads within 1-2 quarters and the company is already establishing partnerships for branded masks/filters (see More Stories in the Snap competitive saga). Over time, we would not be surprised to see filter/mask features and ads added to WhatsApp and, possibly, Messenger, which could unlock new monetization potential.

On the expense front, we continue to view management's 2017 expense growth forecast (47-57%) as conservative. History would seem to suggest manage could trim the top of the range on the 2Q earnings call, with more meaningful revisions in 2H17. That said, we won't be surprised if management maintains the outlook on the April call, particularly given the velocity of new feature launches and potential investments in video content.

Chart 10: 2017 expense forecast now reflected in estimates; potential for favorable revisions ahead



Source Company, BofA Merrill Lynch Global Research

Key theme/metric(s) for 1Q

Underlying MAU and DAU trends are still the key metrics for the stock, in our view. We assume MAUs grow 16% y/y to 1.91bn and DAUs 16% to 1.26bn, keeping DAU/MAU at a steady 66%. It's possible (but hard to predict) that management offers an update on Instagram users (600mn MAU, 400mn DAU in 4Q), and more specifically, Instagram Stories (150mn DAU in January). On the messaging front, there could be a Messenger user update (1bn as of 7/16), while a WhatsApp update is less likely (1.2bn as of 4Q16). We expect ad impressions to grow 46% y/y (49% in 4Q) and ad prices to increase 2% y/y (3% in 4Q).

Biggest 1Q issues/risks:

- **Expense trajectory or lack of an expense guidance change could disappoint:** While we continue to anticipate favorable revisions to management's 2017 expense forecast in 2H, near-term adjustments may be less likely given the velocity of new product launches and potential video content investments.

- **1Q ad revenue deceleration possible:** We note that 4Q was particularly strong and it's possible 1Q normalization could result in revenue growth deceleration.

- **Lack of commentary on monetization strategy:** While Messenger/WhatsApp monetization is likely still a 2018 story, lack of constructive commentary on timing could disappoint.

- **User deceleration always a risk:** MAU and DAU growth has surprised to the upside at mid-to-high teens y/y growth, and any meaningful slowdown could raise competitive concerns.

Top 1Q data point: Instagram reaches 1mn advertisers

Mid-quarter data points were somewhat limited in 1Q, though management did give an update on the Instagram monetization efforts. In a March 2017 update, management indicated that Instagram grew to 1mn advertisers, double the number since 9/16, with business profile pages up to 8mn from 5mn in 4Q. Facebook's comparable metrics are 4mn advertisers (as of 9/16) and 65mn business pages (4Q16).

For early advertiser checks, general feedback suggested positive trends, but more 'steady as it goes' than absolute blow out. The stronger 4Q was highlighted as a tough comp, but overall demand remains robust. Instagram feedback was notably positive, with many suggesting the demand is additive (not reallocation from core Facebook).

Estimates vs Consensus

Our 1Q17 and 2Q17 revenue and EBITDA estimates are ahead above the Street. We assume ~800bps of advertising growth deceleration in 3Q and another ~400bps in 4Q, and our 2017 estimates are also slightly above consensus. On that premise, we are comfortable that Street estimates sufficiently reflect potential impact of News Feed ad load deceleration in 2H17.

Table 15: Facebook Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofA ML est	$7,905	$9,303	$38,546	$48,882
Growth Y/Y%	*47%*	*45%*	*39%*	*27%*
Street	$7,798	$8,993	$37,774	$48,103
BofA ML vs Street	Above	Above	Above	Above
EBITDA				
BofA ML est	$4,886	$5,844	$24,358	$30,905
Street	$4,743	$5,638	$23,775	$30,409
BofA ML vs Street	Above	Above	Above	Above
EPS				
BofA ML est	$1.14	$1 37	$5 67	$7 01
Street	$1.11	$1 30	$5 43	$6 75
BofA ML vs Street	Above	Above	Above	Above
GAAP EPS				
BofA ML est	$0 94	$1 17	$4 86	$6 02
Street	$0 86	$1 06	$4 45	$5 76
BofA ML vs Street	Above	Above	Above	Above

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our $165 price objective is based on 24x our non-GAAP 2018E EPS and 27x GAAP EPS, multiples equal to about 1x 2018E revenue growth, mostly in-line with its social and online media peers. Facebook is our top large cap idea for positive estimate revision potential in 2017.

GrubHub (Buy, $49 PO)

Stock view: Marketing ramp should drive diner growth re-acceleration

In recent quarters, GrubHub has been leveraging a series of recent investments, including expanded delivery, more restaurants on the platform, repositioned brand driving more effective advertising, and product optimization, which is driving higher conversion rates. We think GrubHub is well-positioned to continue to leverage these investments to drive growth in 2017 and beyond.

GrubHub's delivery business is reaching scale in more markets, and delivered gross food sales run-rate increased from $500mn in 3Q to nearly $600mn in 4Q (20% of '16 food sales). Delivered orders were 40% higher than in 3Q. We think delivery will continue to drive take rate higher and be EBITDA accretive by YE17 as efficiencies are gained.

Competition remains a key concern for investors and weighs on sentiment. However, we believe that GrubHub's user base is sticky and its repeat order rate (>90%) is defensible. In 2016, as UberEats, Amazon Prime Now, DoorDash, and Postmates invested in expansion, GrubHub's active diner growth and order growth remained solid. Google Trends indicates that over the past 12 months, though competitors have expanded to more cities in the US, GRUB remains the overwhelming leader in the market, with both of its core brands (GrubHub and Seamless) many times the size of any of its competitors.

GrubHub 1Q results may also face a modest growth headwind from warmer weather in key markets like NYC and Chicago. For context, in 4Q15, GrubHub called out warmer weather was a 200bps y/y order growth drag (~$2mn in revenue, $12.7mn in gross food sales). Warmer weather can impact order volume and new diner growth, though new diners can partially shift to 2Q. We forecast 26% y/y gross food sales and 36% y/y revenue growth in 1Q'17.

We think active diner growth will accelerate in 2017 as the company invests more heavily in marketing and it comps out against its "quality over quantity" marketing strategy started in 1Q16. Investors, however, should expect that accelerating active diner growth will be counterbalance by lower order frequency as newer diners to the system tend to order less frequently. At the same time, we expect take rate will continue to expand as the delivery business grows.

Key theme/metric(s) for 1Q: gross food sales growth

We forecast gross food sales growth in 1Q of 26%, a modest deceleration from 27% in 4Q (flat with 4Q less the 1% hit from the lack of Leap Day in 1Q17). Though we think there is likely upside to our forecast given a 500bps easier y/y comp in 1Q vs. 4Q. We expect 1Q active diner growth of 25%, Grubs per Diner decline of 3%, and average order size growth of 5%.

Biggest 1Q issues/risks:

- Despite positive Google Trends data and commentary from management, mounting competition eats away at GRUB's growth and take rate, driving diner acquisition costs higher.
- Warmer weather during 1Q, particularly in GrubHub's core NYC and Chicago markets, may be a headwind to growth.
- RDS (restaurant delivery service) investments weigh on earnings at a rate higher than the $3mn in EBITDA drag that we have in our model for 1Q'17.
- Site and conversion rate improvements turn out to be one-time in nature rather than an ongoing, longer-term focus for management.

- Marketing expense expected to ramp in 2017, which can weigh on earnings, especially if gross food sales comes in weaker than anticipated.

Estimates vs. Consensus: Broadly in-line with consensus in 1Q'17

We expect 1Q revenue/EPS at $153mn/$0.25 vs. the Street at $153mn/$0.24 driven by gross food sales growth and an improving take rate.

Table 16: GrubHub Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$153	$159	$650	$815
Growth Y/Y%	*37%*	*33%*	*32%*	*25%*
Street	$153	$158	$645	$782
BofAML vs. Street	Below	Above	Above	Above
EBITDA				
BofAML est.	$41	$46	$184	$247
Street	$40	$46	$181	$225
BofAML vs. Street	Above	Below	Above	Above
EPS				
BofAML est	$0 25	$0 29	$1 13	$1 55
Street	$0 24	$0 28	$1 10	$1 37
BofAML vs. Street	Above	Above	Above	Above

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our PO is $49, based on 32x our 2018E P/E (vs. high growth internet at 31x). We believe GRUB warrants a premium to eCommerce peers due to the attractive margins of the core business and, relative to the overall small-cap sector, GRUB has more attractive margins and growth potential.

Match.com (Buy, $21 PO)

Stock view: Positive on Tinder monetization growth on new products

Match has continued to build monetization on Tinder and we expect a more widely released Tinder Boost as well as international marketing spend to have a positive impact in 1Q17 results. The incremental revenue increase combined with Core enhancements should drive ARPU forward, though we are still cautious given Core's declining to flat growth and project 1Q17 at $.0.57 (-3% y/y).

Another issue on the horizon for Match group is the high ownership percentage of IAC. Based on our discussions with management, this is a known issue from both Match and IAC's perspective. The high degree of IAC ownership limits the float and has created a disproportionate short interest on the company to obtain higher exposure to IAC's core (ex-Match) properties. Our conversations suggest we can expect further discussion from management on ways forward in 2017, with the most likely outcome, in our view, a spin off IAC's Match ownership to IAC shareholders.

As Tinder expands, one concern we have is that its highly diverse user base could cause an overload of options and limit user's ability to find the type of matches they are looking for. An "elite" version of the app was recently launched called "Select" (per TechCrunch), highlighting the company's focus on making sure users are able to find suitable matches in different ways.

1Q17 should see international marketing spend on Tinder begin to pay off. We expect that paid member count (PMC) will continue to trend up driven by Tinder and other recent platforming initiatives helping to increase conversion on Core mobile and other sites like Plenty of Fish (PoF) and Meetic.

Key theme/metric(s) for 1Q: International PMC growth

Key for the quarter will be international PMC growth and we expect international to grow 25% y/y to 2.3mn and overall PMC growth to be up 17% y/y to 5.9mn as Tinder marketing outside of the US should start paying off. We are still cautious on ARPU and expect modest declines of 3% y/y, we believe there is still upside potential here driven by Tinder Boost, released in September 2016 and Core turnaround efforts. Key issues for the call will be PMC growth, Tinder monetization and Core improvements.

Biggest 1Q issues/risks:

- Decline in margins due to increased marketing of Tinder and Core improvement
- Drop in monetization as more consumers switch to mobile from PC.
- New investment initiatives drive down FY17 earnings projections.

Estimates vs. Consensus: Expect lower revenue, slight beat on profit

We are modeling rev/EBITDA of $293mn/$78.5mn below the Street due to impact of Princeton Review sell off but higher on EBITDA vs. the Street's $307mn/$77mn estimate. We estimate total PMCs of 5.9mn in 1Q and average revenue per users of $0.527 down 3% y/y due to lower monetizing Tinder plans. With the sale of Princeton review closing 3/31 and management moving any income to discontinued operations, we have removed all non-Dating revenue from our model and believe our treatment of these discontinued operations (totally excluded from our estimates) is the reason our estimates are currently below the street.

Table 17: Match estimate summary

	1Q17	2Q17	2017	2018
Revenue				
BofA ML est	$293	$315	$1,285	$1,484
Growth Y/Y%	*20%*	*20%*	*16%*	*15%*
Street	$308	$322	$1,325	$1,484
BofA ML vs Street	Below	Below	Below	Above
EBITDA				
BofA ML est	$79	$112	$462	$562
Street	$77	$113	$459	$544
BofA ML vs Street	Above	Below	Above	Above
EPS				
BofA ML est	$0.14	$0.23	$0.95	$1.14
Street	$0.13	$0.21	$0.88	$1.07
BofA ML vs Street	In-Line	In-Line	Above	Above
Street EBITDA margins	25%	35%	35%	37%

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Netflix (Buy, $154 PO)

Stock view: Easy comps ahead with more content on the way

Heading into 1Q earnings, we expect Netflix to beat subscriber estimates given strong recent content launches, and accelerating subscriber growth in Europe. Key 1Q titles included *A Series of Unfortunate Events*, *13 Reasons Why*, and Marvel's *Iron Fist*. We see few competitive issues this quarter to impact subscriber growth and we think the release of Marvel's Iron Fist likely helped quarter ending subscribers, despite low metacritic scores. Fans of the Defender series still seem to be watching the show with Parrot Analytics indicating viewership was just below Luke Cage its first week (though viewership dropped by half within the first 10 days). In addition, fan ratings came in at 81% on Rotten Tomatoes despite the poor critic reception.

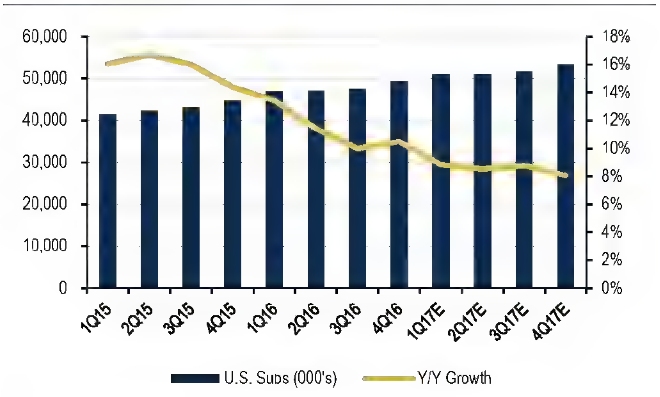
For 2Q, we expect a solid guide as Netflix laps 2Q16's price increases internationally and in the U.S. This should help churn rates for 2Q especially in Europe where we think the bulk of Netflix subscriber growth will originate for 2017. In addition, Netflix has a stronger slate of titles vs. 1Q including key franchises like *House of Cards*, *Orange is the New Black*, *Sense8*, and other new series. Although competition is increasing in the SVOD space with Amazon, Hulu and other making original content, we still see Netflix as ahead of the competition due to: 1) sheer volume of content production with over 1000 hours in 2016, with strong local market content that can be leveraged globally, 2) competitive price points vs competitors; and 3) the largest volume of 4K content which attracts new TV purchases. 4K TVs could drive upside to estimates in FY17 as Netflix is one of the few services with a library of 4K content.

For 1Q contribution margins, we estimate that Netflix will reach a new high at 41.3% U.S. contribution margins somewhat offset by international contribution margins which we expect to close to zero at 1.5%, but still a large improvement over 4Q's 8% loss. We expect Netflix to run its International division at new break even margins through FY17 and begin to gradually lift international margins in 2018. As Netflix reaches Intl profitability, the investor story may focus more on EPS growth in the coming years.

Key theme/metric(s) for 1Q: Net sub adds internationally and 2Q guide

For 1Q we see two critical metrics that we think the Street will focus on; 1) Net Intl. subscriber additions as Netflix laps the launch in 130 countries globally; and 2) 2Q net subscriber guide for Netflix in the U.S. Although 1Q domestic subscriber ads are important, we think the Street would be willing to look past a lower domestic number on stronger international growth. In 2Q Netflix could potentially hit a flat subscriber growth quarter as 2Q is typically seasonally weak, though we note the content slate for 2Q16 has several top franchises with new seasons.

Chart 11: Domestic subscribers



Source: BofA Merrill Lynch Global Research estimates, company report

Chart 12: International subscribers

Source: BofA Merrill Lynch Global Research estimates, company repor

Biggest issues/risks:

- Low reviews scores on Iron Fist effecting fan churn and causing some to question Netflix's ability to continue creating hit series
- Marketing spend in 1Q to drive subscriber growth
- Lower than expected contribution margins as Netflix invests in content.
- Content spending impact on FCF

Top 1Q data points: Traffic gains on PC

In the U.S., comScore reported quarter to date (Jan. and Feb.) average unique desktop visitors up down 2% y/y to 40.5 million compared to 4Q up 22% y/y or 47 million, while mobile unique users were flat y/y at 29.4mn users vs. up 19% y/y in 4Q. We note recent comScore changes heavily impacted the y/y comparable data for several companies including Netflix, in addition Comscore Data is PC only which is likely less relevant given that a large portion of Netflix viewing is through connected TVs/devices.

Estimates vs. Consensus: In-line on revenue, slightly below on EPS

Our 1Q rev/GAAP EPS estimates of $2.71bn/$0.39 are above the Street's estimates of $2.64bn/$0.37. We estimate total domestic subs of 51.1 million, domestic DVD subs of 4 million, and international streaming subs of 48.3 million. Netflix a solid line up of popular content in 2Q, especially May where it has *Sense8* Season 2, *Unbreakable Kimmy Schmidt* Season 3, *War Machine* (Movie), *House of Cards* Season 5 in May, and a remake of Anne of Green Gables and *Orange is the New Black* in June which will likely help U.S. domestic subscriber total stay positive in 2Q. In addition, we expect lower y/y churn rates to potentially help subscriber growth.

Table 18: Netflix estimate summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$2,710	$2,854	$11,627	$13,937
Growth Y/Y%	*38%*	*35%*	*32%*	*20%*
Street	$2,644	$2,760	$11,221	$13,448
BofAML vs. Street	Above	Above	Above	Above
EBITDA				
BofAML est.	$331	$306	$1,218	$1,758
Street	$308	$245	$1,053	$1 710
BofAML vs. Street	Above	Above	Above	Above
GAAP EPS				
BofAML est	$0 39	$0 30	$1 19	$2 04
Street	$0.37	$0.23	$1.09	$1 98
BofAML vs. Street	Above	Above	Above	Above

Source: BofA Merr ll Lynch Global Research estimates, company report

Pandora (BUY, $9 PO)

Stock view: Focus on on-demand product, but questions on growth

Pandora's recently launched on-demand subscription product will likely be the focus of 1Q investor call. Although the product is on limited release, we expect investor to focus on initial reception of the product (positive reviews in media) and whether Pandora is capable of growing the subscription base to 10mn over the next several years. Initially Pandora will not likely see an impact on revenue from premium subscriptions as it is giving current Pandora One subscribers a free six month trail of Pandora Premium which may also impact subscription revenue for 1Q.

From our initial time with Pandora Premium, we found playlist creation smooth and easy to use with Pandora quickly auto-filling play lists after picking a few songs, but Pandora lacks the curated playlist selection found in Apple music and Spotify and we encountered some missing songs/artists from the on-demand platform. The real question will be whether Pandora's platform is 1) good enough to pull exiting on-demand users from other services to Pandora (Pandora indicated roughly 60% of Pandora users are using another on-demand service); 2) can it convince people to upgrade from free Pandora to Pandora Premium; and 3) how will Pandora grow its active listener base from here. Pandora has had a largely stagnate active user base over the last year and we think even with the new on-demand product could face difficulty growing its users, especially as it increases its ad loads in key markets.

Key theme/metric(s) for 1Q: Ad rate growth and sub metrics

Pandora began rolling out Pandora Premium on March 15th, and we think key questions for the call will be; 1) initial reception of Pandora Premium; 2) when it will be fully available to all users; 3) will Pandora Premium driving increased users; and 4) how have ad load changes be received by free users. Pandora is increasing its ad load per hour to increase its RPM rates, but this also risks alienating its already stagnant to declining user base from the platform. 1Q will be the first measure to see if Pandora is able to increase ad loads while maintaining its user base, the first step in stronger monetization of its differentiated ad-supported radio product.

Biggest 1Q issues/risks:

- Investment spending in quarter and outlook for future S&M/R&D spend;
- Outlook for when Pandora will reach profitability again.
- Active listener or listening hour declines due competition;
- Commentary on outlook for Pandora Premium

Top 1Q data points: Triton Internet radio data

Triton media releases Internet radio metrics which give an initial read into the quarter, but is limited to January data, Triton data shows Avg. Active sessions (analogous to listening hour growth) declined 3% y/y which is tracking below our 1% y/y listener hour growth est. of 5.58 billion hours. Session starts were up 4% y/y above our est. of 1% y/y active user growth. We note that Spotify is now tracking more session starts than Pandora implying market share loss to Spotify. Given the leap year, we would expect February to track down Y/Y for monthly active listeners and user growth in February.

Estimates vs. Consensus: Slightly above on revenue, below on EPS

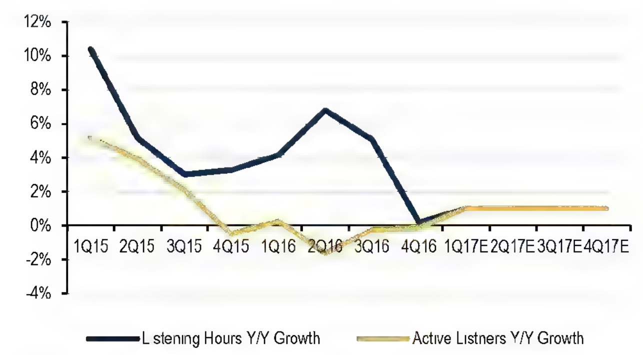
Our rev/Non-GAAP EPS est. of $319mn/($0.49) is slightly above on revenue, but in-line on EPS compared to the Street est. at $318mn/($0.39). We model total listener hours at 5.58bn and total RPM rates of $52. Our FY16 est. are slightly above on revenue, but well above on EPS as we expect losses this year to improve in 2H16 as Pandora builds up subs, but still see Pandora failing to gain much leverage from increased R&D spending and S&M spend. We maintain our $9 PO, based on 1x our 2018 revenue estimate, a discount to peers, but justified in our view as Pandora is likely to have a difficult transition year as it builds it on-Demand service.

Table 19: Pandora estimate summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$319	$397	$1,629	$2,036
Growth Y/Y%			*18%*	*25%*
Street	$318	$390	$1,621	$2,050
BofAML vs. Street	Above	Above	Above	Below
EBITDA				
BofAML est.	$73	$1	$17	$25
Street	-$73	-$16	-$38	$79
BofAML vs. Street	In-line	Above	Above	Below
EPS				
BofAML est.	-$0.49	-$0.04	-$0.21	-$0.19
Street	-$0.35	-$0.14	-$0.49	-$0.03
BofAML vs. Street	Below	Above	Above	Below

Source: BofA Merrill Lynch Global Research estimates, Bloomberg

Chart 13: Listening hours and active users trends are essentially flat.



Source: BofA Merrill Lynch Global Research estimates, company report

Priceline (Buy, $1,920 PO)

Stock view: Expect solid 1Q top-line, but 2Q can be rough for guidance

Priceline's metric trends and commentary, along with 1Q booking and room night guidance, indicate that the company continues to capture strong market share growth in the category, with little impact from hotel direct booking initiatives or competitive OTA marketing spend. We expect a strong 1Q, with perhaps a little less upside than usual due to the late 4Q reporting date.

Looking forward to 2Q, we have our usual caution on guidance as 2Q is the most back-end loaded quarter for bookings and revenues. However, in 2017 the Easter shift is a positive factor and will help 2Q revenues and earnings. We also expect 1Q bookings and room night growth upside to translate into higher 2Q gross profit growth, and management indicated that there is less marketing ROI pressure expected in 1H'17 than in 2H'16. Overall, we expect Priceline's strong business trends to continue, and would use extra conservatism in guidance as a buying opportunity.

Given strong execution and higher exposure to more fragmented International markets, Priceline remains our top long-term idea in Online travel. However, on a near-term basis, we think Expedia could see a bigger stock benefit from an acceleration in room night growth over the summer.

Key theme/metric(s) for 1Q: Room night growth

We expect Priceline to report 26% y/y room night growth (deceleration v. 31% in 4Q), ahead of the company's outlook of 20-25% hotel room night growth. Priceline has a history of guiding 1Q conservatively, looking at Priceline's historical 1Q results for Bookings, revenue and EPS vs guidance suggests modest upside to our bookings growth forecast of 22% and reported 1Q'17 EPS closer to $9.55 (13% upside vs. the midpoint) vs. our estimate of $9.08 and the Street's estimate $8.75.

Table 20: 1Q Bookings Growth, Revenue Growth and EPS Guidance vs. Actuals

	1Q13			1Q14			1Q15			1Q16			1Q17		
	Guidance	Actual	Upside	Guidance	Actual	Upside	Guidance	Actual	Upside	Guidance	Actual	Upside	Guidance	Actual	Upside
Bookings	30-37%	36%	**No**	23-33%	34%	**Yes**	2-9%	12%	**Yes**	12-19%	21%	**Yes**	17-22%	??	
International Bookings FX-Neutral	35-42%	43%	**Yes**	25-35%	38%	**Yes**	17-24%	29%	**Yes**	N/A	N/A		N/A		
Revenue	17-24%	26%	**Yes**	15-25%	26%	**Yes**	4-11%	12%	**Yes**	9-16%	17%	**Yes**	N/A		
EPS	$4 90-$5 30	$5 76	**Yes**	$6 35-$6.85	$7.81	**Yes**	$7 20-7.75	$8 12	**Yes**	$9 00-9 60	$10.54	**Yes**	$8 25-8 65	??	

Source: BofA Merr ll Lynch Global Research estimates, Bloomberg, Priceline

Biggest 1Q issues/risks:

- Concerns on threat of increasing marketing competition with Expedia and TripAdvisor
- Potential pressure on US inbound traffic given the Trump travel ban (unlikely to impact Priceline given high Intl exposure)
- Marketing deleverage – our model assumes 340bps of y/y online marketing deleverage in 1Q
- Pressure on hotel revenue take rates given less hotel participation in commission programs and longer booking windows

Early 1Q RevPAR data mixed

Priceline's Booking.com has roughly 1.2mn properties on its site (>611k hotels and 576k vacation rental properties). According to STR, 1Q US RevPAR through initial March readings decelerated 30bps to 3.0% y/y, and European RevPAR through February accelerated 600bps q/q to 3.6% y/y (FX-neutral). The STR data reflects a continued gradual deceleration in US RevPAR growth and a positive recovery in European RevPAR growth as the region laps terrorist attacks and geopolitical uncertainty.

Table 21: US and European RevPAR Y/Y Change

US	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17**	1Q16	2Q16	3Q16	4Q16	1Q17
Occupancy	-0.3%	-0.8%	-0.4%	2.2%	-0.5%	0.3%	-1.0%	-0.4%	1.6%	-0.3%	2.5%	-0.1%	0.5%	-0.5%	1.6%	-0.5%	0.7%	0.1%	0.7%	0.5%
ADR	2.8%	3.6%	3.2%	2.8%	2.4%	3.5%	3.6%	2.5%	3.9%	1.9%	3 4%	2.4%	3.2%	1.7%	2.6%	3.2%	2.9%	3.3%	2.6%	2 5%
RevPAR	2.4%	2.8%	2.7%	5.0%	1.9%	3.8%	2.5%	2.1%	5.6%	1.6%	5 9%	2.3%	3.8%	1.2%	4.2%	2.7%	3.6%	3.4%	3.3%	3 0%
Europe																				
Occupancy	1.4%	1.5%	0.3%	3.5%	-0.3%	-0.7%	-0.4%	-1.5%	0.8%	-0.4%	4 2%	4.5%	5.1%	2.9%		1.1%	0.8%	-0 4%	2.8%	4 0%
ADR	-4.3%	-2.7%	2.5%	3.2%	0.3%	-4.5%	-0.7%	-4.8%	-1.8%	-8.6%	-5.3%	-5 0%	-2.1%	-3.1%		-1.5%	-0 3%	-2 4%	-6.3%	-2.6%
RevPAR	-2.9%	-1.3%	2.8%	6.8%	-0.1%	-5.1%	-1.1%	-6.2%	-1.0%	-9.0%	-1.3%	-0 7%	2.9%	-3.1%		-0.5%	0.5%	-2 8%	-3.7%	-0.1%
Europe in Euros	**Jan-16**	**Feb-16**	**Mar-16**	**Apr-16**	**May-16**	**Jun-16**	**Jul-16**	**Aug-16**	**Sep-16**	**Oct-16**	**Nov-16**	**Dec-16**	**Jan-17**	**Feb-17**		**1Q16**	**2Q16**	**3Q16**	**4Q16**	**1Q17**
Occupancy	1.4%	1.5%	0.3%	3.5%	-0.3%	-0.7%	-0.4%	-1.5%	0.8%	-0.4%	4.2%	4.5%	5.1%	2.9%		1.1%	0.8%	-0 4%	2.8%	4 0%
ADR	0.0%	-0.2%	-1.7%	-0.1%	-0.9%	-4.4%	-2.7%	-4.6%	-1.6%	-8.5%	-5.4%	-1 5%	-0.9%	0.2%		-0.7%	-1 8%	-3 0%	-5.2%	-0.4%
RevPAR	1.4%	1.2%	-1.4%	3.3%	-1.2%	-5.0%	-3.1%	-6.0%	-0.9%	-8.9%	-1.4%	2.9%	4.2%	3.0%		0.4%	-1.0%	-3.3%	-2.4%	3.6%

Source: Sm th Travel Research (STR), BofA Merrill Lynch Global Research estimates, Note: **March data is month to date

Estimates vs. Consensus: We are above the Street on EBITDA/EPS in 1Q

Our 1Q revenue/EPS of $2.4bn/$9.08 is broadly in line to slightly above the Street at $2.4bn/$8.75. We see upside to the company's 1Q EPS guide of $8.25-$8.65. We estimate 26% y/y hotel room night growth, some deceleration from 31% growth v. 4Q (guidance is 20-25%).

Table 22: Priceline Estimate Summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofAML est.	$2,415	$3,041	$12,518	$14,469	$16,493
Growth Y/Y%	*12%*	*19%*	*17%*	*16%*	*14%*
Street	$2,441	$2,998	$12,447	$14,323	$16,279
BofAML vs. Street	Below	Above	Above	Above	Above
EBITDA					
BofAML est.	$609	$988	$4,784	$5,476	$6,207
Street	$599	$966	$4,747	$5,515	$6,310
BofAML vs. Street	Above	Above	Above	Below	Below
EPS					
BofAML est.	$9 08	$15 45	$75 35	$87 19	$100 07
Street	$8 75	$14 84	$74.11	$86 36	$98 76
BofAML vs. Street	Above	Above	Above	Above	Above

Source: BofA Merr ll Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our price objective is $1,920 based on 22x our 2018 adj. EPS estimate. The 22x multiple is towards the upper end of Priceline's historical multiple range of 13-23x and represents a PEG of 1.4x. We think a 22x forward P/E multiple is appropriate given mid-teens EPS growth, strong booking trends, Priceline's leadership position in the global online travel sector, track record of EPS upside, and increased access to the China via the Ctrip investment.

Snap (Neutral, $25 PO)

Stock view: Long-term potential, but near-term could be lumpy

Snap will report its first earnings as a public company and expectations have a wide range. The 2H16 DAU slowdown has raised concerns in terms of both competitive risk and execution, so user trends could be the most important metric in the quarter. At this point, it's difficult to gauge relative impact of Facebook / Instagram competition, Android technical issues, product cycle lumpiness, and seasonality to the recent slowdown. Nonetheless, our sense is that DAU expectations are around 164-166mn, and we'd expect variability (higher or lower) to have a meaningful impact on stock sentiment.

In terms of the P&L, we expect a slight q/q decline in revenue per normal seasonality and are modeling down 1% q/q (consistent with comments in the prospectus filing). While we can appreciate the momentum of the API roll-out with several new partnerships announced in January, our checks suggest most programs are early stage with limited volume to date. Considering the rest of the P&L, we expect a fairly messy quarter between deal costs, the CEO stock award, and a catch-up RSU stock comp expense. As we do not anticipate non-GAAP profitability until 2H19, we expect traditional P&L metrics will be less of a focus in the coming quarters.

We recently initiated coverage with a Neutral and $25 price target (please see User overhang unlikely to be resolved in a Snap – Initiate at Neutral with $25 PO). Social media sector history suggests a wide range of possible outcomes for Snap and, as such, near-term lumpiness in metrics could result in high volatility for the stock. We also note that lock-up overhang could drag on near-term performance into the first lock-up expiration on 7/29.

Key theme/metric(s) for 1Q: DAUs, ARPU, and competition

We believe the key metric for the quarter will be the DAU number, which we model at 166mn (up 8mn q/q, 36% y/y). We believe DAU headwinds may peak 1H17 as the company is facing an onslaught of competitive products (see More Stories in the Snap competitive saga), technical challenges with Android (from Memories), and seasonality entering the summer. We model ARPU at $1.01 (down 5% q/q), with North America ARPU at $2.03 (down 7% q/q). We won't be surprised to see upside in ARPU driven by ad load growth and higher user engagement, though competitive pricing could potentially offset.

Biggest 1Q issues/risks:

- **DAU deceleration on share loss:** Anything short of 164mn will likely be met with skepticism as investors extrapolate recent trends in considering competitive resilience vs Instagram, Facebook, and others. Management will likely address the Android technical issues impact on DAUs.
- **Aggressive pricing could drive short term growth but have mixed perception:** Twitter noted elevated competition and potentially aggressive pricing surfacing in mid-January, which aligns well with Snap's API update.
- **Lack of visibility into pipeline:** While we don't necessarily expect new product announcements, lack of color/visibility on the product pipeline could disappoint.
- **Results could leave investors looking for more disclosure:** We are not sure what disclosure Snap will provide on results, and important trending info (like average minutes per user) could be lacking.

Top 1Q data points: comScore suggests some gains for Instagram

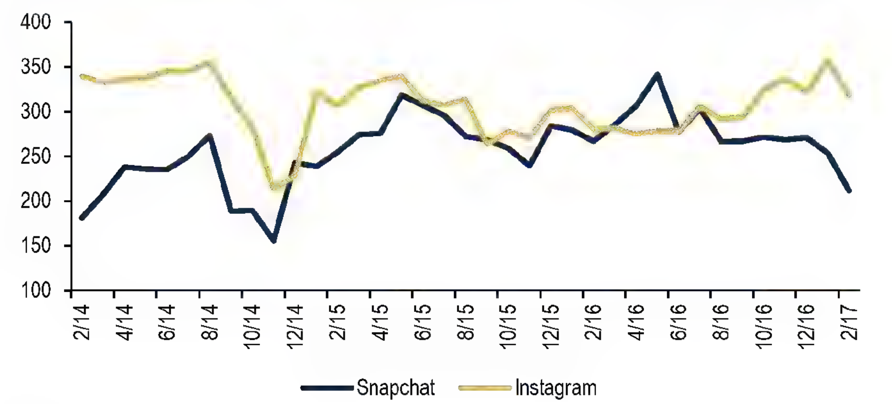
While comScore data is not consistent with reported minutes, it is useful for relative comparisons. The data puts Snapchat minutes per user well above Twitter, but still trailing Instagram and Facebook. Interestingly, after Snapchat passed Instagram in early 2016 in average minutes per user, Instagram recaptured the lead mid-year and has extended it since. While the cause for the shift is not certain, the trends align with the launch of Instagram Stories (August 2016) as well as some technology challenges on the Snapchat front (Android). Regardless of the near-term lumpiness, we believe overall daily engagement puts Snapchat in a strong position to capture emerging online marketing ad budgets.

Table 23: Average minutes per user trend

	Aug-2016	Sep-2016	Oct-2016	Nov-2016	Dec-2016	Jan-2017	Feb-2017
Snapchat	267	267	272	269	271	254	211
Instagram	292	294	325	337	322	357	318
Facebook	769	766	855	826	781	827	700
Twitter	143	149	139	114	108	128	110

Source: comScore, BofA Merrill Lynch Global Research

Chart 14: Instagram vs Snapchat average monthly minutes per visitor



Source comScore

Estimates vs Consensus

Our 1Q revenue estimate of $163mn (down 1% q/q) is slightly above consensus at $158mn (down 5%), but we note the range of estimates is considerable ($130-196mn) and some checks suggest that Snap was aggressive with advertisers in 1Q. For the year, our $1.0bn revenue estimate is mostly in-line with the Street, as is our 2018 estimate at $2.1bn. We do not model positive adjusted EBITDA until 2Q19, and expect investors to focus mostly on user revenue trends.

Table 24: Snap Estimate Summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofA ML est.	$163	$208	$1,007	$2,057	$3,719
Growth Y/Y%	*320%*	*190%*	*149%*	*104%*	*81%*
Street	$158	$206	$1,034	$2,032	$3,303
BofA ML vs Street	Above	Above	Below	Above	Above
EBITDA					
BofA ML est.	-$168	-$158	-$580	-$335	$276
Street	$180	-$194	$617	-$392	$80
BofA ML vs Street	Above	Above	Above	Above	Above
EPS					
BofA ML est.	-$0.18	-$0.15	-$0.59	-$0.37	$0.12
Street	-$0.21	-$0.13	-$0.57	-$0.33	$0.00
BofA ML vs Street	Above	Below	Below	Below	Above

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4 2017

Our \$25 PO is based on our DCF model as we do not expect the company to be profitable until mid- to late-2019 and any earnings-based valuation exercise would require discounting back future earnings. Our DCF assumes approximately \$28bn revenue by 2027 based on 525mn DAUs and \$50+ in ARPU. Our PO implies 15.5x EV / Revenue, above the peer group at 4x, as we believe Snap's early stage of ad monetization and potential future leverage in the business model warrants a premium valuation multiple to the social media group.

TripAdvisor (Underperform, $40 PO)

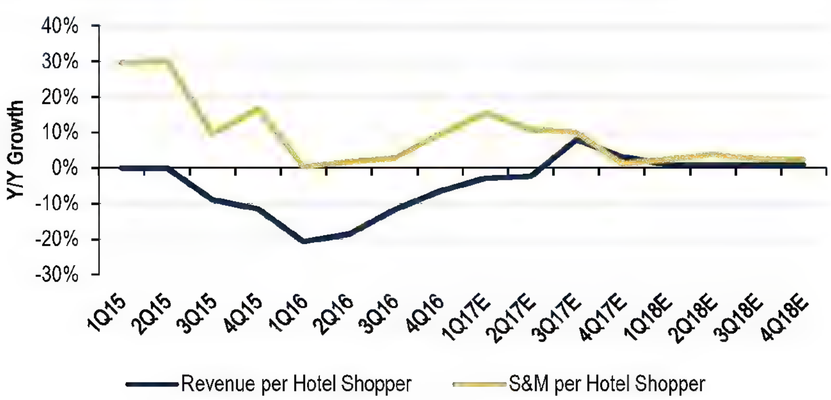
Stock view: EBITDA under pressure, brand ad spend not in Street estimates yet

2016 was a re-platforming year, and with Instant Book fully rolled out globally, the company aims to re-educate visitors on its booking offering. However, we think most TripAdvisor visitors (399mn average monthly unique visitors in 2017 and 148mn average monthly hotel shoppers) still view the site as a review/research portal, and changing customer behavior will be quite difficult, particularly as we do not think TripAdvisor has clarified its value proposition for shoppers.

While we think that TripAdvisor's elevated marketing spend in 2017 will drive a rebound in traffic, we anticipate a poor ROI. Marketing expense continues to ramp as Instant Book rolls out, though traffic growth slows, implying more costly traffic acquisition. In 4Q'16, Sales & Marketing as a % of sales increased to 52.8% vs. 45.6% in 4Q'15, and we think TripAdvisor essentially bought desktop Hotel Shopper traffic, though likely at poor ROI. However, higher marketing spend in 2017 does not yet include potential for a likely return to expensive brand ad campaigns. In our brand ad spend scenario analysis, we expect still more downside to estimates (see Taking a look at TripAdvisor's potential brand ad spend).

The company is encouraged by Revenue per Hotel Shopper growth continuing to improve from down 21% y/y in 1Q. We expect growth continues its improvement trend in 2017. However, if monetization trends decelerate, earnings downside could be significant. We think it will be difficult for TripAdvisor's Hotel revenue to return to growth next year, let alone double-digit y/y growth, given the mobile monetization headwinds. However, if the company invests heavily in traffic acquisition, particularly on higher monetizing desktop, revenue and traffic growth may reaccelerate meaningfully in 2017, though with ongoing pressure on margins.

Chart 15: Quarterly revenue and Sales & Marketing per Hotel Shopper y/y growth



Source: BofA Merrill Lynch Global Research estimates, company report

Key theme/metric(s) for 1Q: Update on ad spend targets, 2017 guidance

TRIP's outlook for 2017 is based on "prioritizing revenue growth as opposed to profit growth," which implies far lower marketing return expectations. However, TRIP notes this expectation for marketing spend does not include potential for a return to brand marketing, which could be an incremental $50-70mn headwind in '17, in our view.

Biggest 1Q issues/risks:

- Marketing spend: TripAdvisor has prioritized revenue growth at the expense of earnings, implying poor marketing ROI. The biggest issue facing TripAdvisor is if it decides to pursue an expensive brand/TV marketing campaign which would further drive further earnings downside.

- Instant Book impact: The Instant Book transition could impact meta rates and total monetization as more hotel shoppers flow through large OTA partners.

- Hotel Shopper growth: Given elevated marketing spend, we expect to see a rebound in hotel shopper and hotel revenue growth. 4Q16 hotel shopper growth accelerated from 3% in 2Q-3Q16 to 8%. We expect hotel shopper growth to decelerate slightly to 6% in 1Q17 on a 200bps tougher y/y comp.

1Q traffic data points: comScore indicates solid mobile and PC user growth

In the US, comScore reported quarter to date through February, average monthly unique visitors of 31mn on PC and 56mn on mobile, up 24% and up 3% y/y, respectively. TripAdvisor total minutes in 1Q through February is up 10%, with mobile minutes up 5% and PC minutes up 17%. In our view, TripAdvisor's elevated marketing spend YTD likely targets higher monetizing PC traffic.

Estimates vs. Consensus: Broadly in-line on Revenue, below on EBITDA/EPS

Our 1Q revenue estimate of $379mn is broadly in line with the Street at $377mn. We are more cautious on EBITDA and EPS at $71mn/$0.23 vs. the Street at $76mn/$0.27.

Table 25: TripAdvisor estimate summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofAML est	$379	$432	$1,647	$1,794	$1,936
Growth Y/Y%	*8%*	*10%*	*11%*	*9%*	*8%*
Street	$377	$433	$1,649	$1,852	$2,095
BofAML vs. Street	Above	Below	Be ow	Below	Below
EBITDA					
BofAML est.	$71	$88	$346	$403	$471
Street	$76	$88	$339	$392	$530
BofAML vs. Street	Below	Above	Above	Above	Below
EPS					
BofAML est.	$0 23	$0 31	$1 22	$1.57	$1 89
Street	$0 27	$0 32	$1 23	$1 48	$2 28
BofAML vs. Street	Below	Below	Be ow	Above	Below

Source: BofA Merr ll Lynch Global Research, Bloomberg, as of 4/4/2017

Our price objective of $40 is based on 25x our 2018 non-GAAP EPS estimate. This multiple represents a modest premium to the group for possibly depressed margins and potential for re-accelerating top-line growth.

Trivago (Buy, $15 PO)

Stock view: Advertising continues to drive growth engine

Trivago's 4Q revenue and EBITDA results highlight the company's rapid revenue growth and potential for solid profitability. Though there are concerns over the company's large marketing spend (80-85% of revenue), we think the Street will view Trivago's results positively given continued revenue ramp while also achieving profitability. The stock remains highly volatile given the limited float. Commentary during 4Q'16 earnings from Trivago's key customers Expedia and Priceline (as well as from TripAdvisor) indicated that paid traffic has been growing faster than free traffic, and that companies in the sector planned to ramp ad spend to drive continued traffic growth, which is a positive for Trivago.

Trivago has best-in-class revenue growth, with 2017 revenue growth expected at 47% (vs. guidance of 45%+), led by 50% qualified referral growth. We also expect Trivago will become more efficient with advertising and start to reap the benefits of past brand advertising, with return on advertising spend (ROAS) improving across regions in 2017, a key driver of modestly improving EBITDA margin from 3.7% in 2016 to 3.9% in 2017.

The company remains in growth mode, led by click revenue growth in ROW and Americas regions, as Trivago is driving brand awareness outside its key European foothold through aggressive brand marketing. The company is adding qualified referrals at an accelerating rate as it expands beyond its core Developed Europe markets and penetrates new markets. We think the company has significant runway for growth and can sustain 30%+ revenue growth through the end of the decade. As the business matures in its new Americas and ROW markets, we expect a better balance between profit and growth. We think EBITDA margins should accelerate as the company leverages '16 and '17 marketing spend, with greater uplift in '18.

Key theme/metric(s) for 1Q: Qualified referral growth

We forecast 56% qualified referral growth in 1Q (920bps deceleration on 730bps tougher y/y comp), led by 38% y/y growth in Developed Europe, 48% in Americas, and 110% in ROW. We expect continued robust marketing spend will drive user growth.

Biggest 1Q issues/risks:

- Weak return on advertising spend (ROAS) may be an earnings headwind. Competition in the company's advertising channels may result in lower ROI trends. The company may also see less efficient advertising in newer, less mature markets.
- A positive update to 2017 guidance may be expected. Trivago currently expects total revenue growth of 45%+ and adjusted EBITDA margin is guided to flat to slightly up vs. 2016's 3.7%.

Estimates vs. Consensus: Expect revenue in-line vs. the Street, EBITDA ahead

For 1Q, we expect revenue/EBITDA of €241mn/(€12mn) vs. the Street at €241mn/(€10mn). We expect 2017 and 2018 revenue and EBITDA to come above the Street and expect there is room for upside to management's 2017 revenue growth and EBITDA margin guidance.

Table 26: Trivago Estimate Summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofAML est.	€241	€281	€1,105	€1,498	€1,984
Growth Y/Y%	*52%*	*57%*	*47%*	*36%*	*32%*
Street	€241	€270	€1,088	€1,497	€2,035
BofAML est. vs. Street	Below	Above	Above	Above	Below
EBITDA					
BofAML est.	€12	€6	€44	€127	€262
Street	€10	€6	€40	€98	€197
BofAML est. vs. Street	Above	Below	Above	Above	Above
EPS					

Table 26: Trivago Estimate Summary

	1Q17	2Q17	2017	2018	2019
BofAML est.	€0 02	€0 00	€0 05	€0 22	€0 48
Street	€0 02	€0 01	€0 06	€0 15	€0 32
BofAML est. vs. Street	Above	Below	Below	Above	Above

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our PO of $15 is based on a 3.5x 2018E EV/Sales multiple. We note that 3.5x is roughly in line with the lead generation peer group average 2018E EV/Sales multiple. We think our EV/Sales multiple is warranted as a balance between Trivago's higher growth and lower profitability. Our price objective is supported by our DCF analysis.

Wayfair (Neutral, $44 PO)

Stock view: Timeline on profitability still an issue, but comps ease in 2Q'17

Wayfair's two issues have been deceleration in U.S. revenue growth and negative operating margins as the company continues to aggressively invest in logistics, international expansion, marketing, and new categories. 1Q customer and order growth comps remain tough, which was one of the drivers of revenue growth guidance below expectations. Wayfair also attributed weak guidance to caution on the retail environment and added investment. Growth comps ease in 2Q/3Q, and there is potential for more stable growth in 2Q guidance to drive improving investor sentiment.

As for margins, management guided to EBITDA margin of (3.5%)-(3.8%), a deceleration from (2.8%) in 1Q'16 due to a lower opex absorption in the quarter on seasonally lower sales. The US is expected to swing back to EBITDA losses in 1Q'17, while Intl losses are expected to remain steady. We forecast EBITDA margin of (2.4%), with (0.2%) EBITDA margin in the US and (19.0%) margin in International. The company continues to expect little to no ad spend leverage given increase International ad spend.

Management historically builds conservativism into its guidance and, until last year, had a track record of beating the upper end of its sales outlook by ~10%. Recently, revenue has been by a low-single digit percentage. Our above consensus 1Q revenue forecast implies 1% upside to the high end of the guidance range, in line with the trend over the past 3 quarters. We think investors expect sales growth above the guidance range as well.

Table 27: Revenue and EBITDA Guidance vs. Actuals

	4Q14	1Q15	2Q15	3Q15	4Q15	1Q16	2Q16	3Q16	4Q16	1Q17E**
Revenue - High End of Guidance	$370,000	$390,000	$440,000	$525,000	$665,000	$700,000	$785,000	$850,000	$960,000	$930,000
Revenue Actual	$408,619	$424,371	$491,752	$593,972	739,790	747,348	786,928	861,525	984,559	943,626**
Revenue Upside	$38,619	$34,371	$51,752	$68,972	$74,790	$47,348	$1,928	$11,525	$24,559	$13,626
Revenue % Upside	10%	9%	12%	13%	11%	7%	0%	1%	3%	1%
EBITDA - High End of Guidance %	-4.5%	-3.5%	-2.5%	-0.8%	-0.8%	-3.0%	-3.2%	-4.3%	-2.8%	-3.5%
EBITDA - High End of Guidance	($16,650)	($13,650)	($11,000)	($3,938)	($4,988)	($21,000)	($25,120)	($36,125)	($26,400)	($32,550)
EBITDA Actual	($7,218)	($12,340)	($4,972)	($1,445)	$2,828	($20,960)	($24,857)	($30,849)	($12,026)	($22,463)**
EBITDA Upside	$9,432	$1,310	$6,028	$2,493	$7,816	$40	$263	$5,276	$14,374	$10,087

Source: BofA Merrill Lynch Global Research, Wayfair

Note: * 1Q17E Actuals are current BofA Merrill Lynch forecasts

Over the past two quarters, Wayfair has expressed caution on the macro environment, though this proved to be somewhat unwarranted in 4Q. According to February 2017 aggregated BAC credit and debit card data, furniture sales were up 1.3% (down 0.4% on rolling 3-month m/m basis), while home goods were down 1.2% y/y and flat on a rolling 3 month m/m basis. Please see the BofA Merrill Lynch US Economics team's report for additional commentary on broader retail trends and a detailed explanation of the methodology and limitations in connection with BAC data. Williams-Sonoma reported disappointing 4Q earnings (March 15th report) and provided modest 1Q guidance that the BofA Merrill Lynch Hardline Retail team called "a little rich," though it is difficult to tell if weak trends are the result of secular home goods weakness or the disruptive impact of eCommerce players like Wayfair.

Key theme/metric(s) for 1Q: 2Q revenue guidance on easier y/y comps

1Q revenue guidance was a disappointment, though comps ease in 2Q'17, and opportunity for more stable US growth could aid stock sentiment. Customer growth in 2Q has a 400bps easier y/y comp vs 1Q17, while order growth has a 1700bps easier y/y comp. Overall, revenue growth faces a 1600bps easier y/y comp. and would expect guidance anywhere near the Street's 2Q estimate at 25% y/y growth to be viewed positively given several quarters of guidance below street estimates.

Biggest 1Q issues/risks:

- Commentary on US customer trends, particularly repeat rates and unit economics (customer acquisition costs).
- AOV trends given street concerns that some customer metrics are benefitting from purchase of lower value items.
- Progress with International investments, especially early results from ad spending in UK, Canada, and Germany.

1Q data points indicate mixed traffic trends

US data indicates that Wayfair PC minutes growth increased 17% y/y in 1Q through February vs. 14% y/y growth in 4Q'16. Wayfair mobile minutes have decreased 24% y/y through February in 1Q vs. up 3% y/y in 4Q'16. US PC user growth decreased 16% y/y in 1Q through February, vs. 4Q at -25% y/y. Wayfair mobile user growth increased 2% y/y in 1Q through February vs. 16% y/y in 4Q.

Estimates vs. Consensus: Expect revenue and EPS upside vs. the Street

For 1Q, we expect revenue/EBITDA of $944mn/($22mn) vs. the Street at $933mn/($32mn). Total revenue guidance of $905-930mn implies 2-year stacked growth of 97-101% vs. 121% in 2016, which seems conservative. We expect the company's revenue to come in above the high end of the sales outlook as Direct Revenue sales were up 30% quarter to date (through nearly 2 months of 1Q'17). Our 1Q revenue growth forecast is based on 48% y/y customer growth (up 9% q/q) and 42% order growth (down 10% q/q). Wayfair expects EBITDA margin of (3.5%)-(3.8%) due to a lower opex absorption in the quarter on seasonally lower sales. The company continues to expect little to no ad spend leverage given increase International ad spend.

Table 28: Wayfair Estimate Summary

	1Q17	2Q17	2017	2018	2019
Revenue					
BofAML est.	$944	$980	$4,169	$5,019	$5,872
Growth Y/Y%	*26%*	*25%*	*23%*	*20%*	*17%*
Street	$933	$987	$4,237	$5,258	$6,585
BofAML vs. Street	Above	Below	Below	Below	Below
EBITDA					
BofAML est.	$22	$19	$48	$10	$64
Street	-$32	-$20	-$59	$23	$134
BofAML vs. Street	Above	Above	Above	Below	Below
EPS					
BofAML est.	($0.49)	($0.46)	($1.55)	($1.00)	($0.47)
Street	($0.60)	($0.45)	($1.65)	($0.94)	$0.04
BofAML vs. Street	Above	Below	Above	Below	Below

Source: BofA Merrill Lynch Global Research estimates, Bloomberg, as of 4/4/2017

Our PO of $44 is based on 0.7x 2018E EV/sales. We continue to focus on EV/Sales given Wayfair's lack of profitability due to US fulfilment investment and Intl. expansion. Our 0.7x target multiple is a discount to Wayfair's eCommerce comp group at 1.3x and at a modest discount to a retail peer comp group at 0.8x. We think the multiple is appropriate given strong revenue growth vs. peers, balanced by lower profitability.

Twitter (Underperform, $14.50)

Stock view: Engagement could be improving, but still trailing peers

On positive note, DAU growth, tweet impressions, and time spent growth have all been accelerating, and we won't be surprised if most metrics show stable growth in 1Q17 given event activity (political, sports, awards shows) in 1Q. However, the NFL season is over, the election surprise is slowing fading, competitive pressure is rising (particularly Instagram), and new monetization initiatives will take time, so we are more cautious on 2Q. The high level of executive churn also raises an element of strategic uncertainty that could continue to weigh on sentiment. While it's possible Twitter could see moderate residual benefit from recent YouTube/Google Display Network boycotts, we continue to believe MAU growth acceleration is key to improving sentiment, and we continue to expect other platforms to grow much faster. The biggest upside driver for 1Q could be conservative guidance, which implied revenues would be down 17% y/y at the midpoint in 1Q.

Longer-term, our primary concerns are user growth, rising competition in video, and lack of positive advertiser feedback. Despite execution on the live streaming initiative in 2016, MAU impact was underwhelming and we see risk of rising costs and/or content loss in 2017. At this point, it's unclear how aggressively management will push live streaming in 2017, and early exploration of potential subscription revenue streams (enhanced Tweetdeck offering beta) could suggest potential strategic shifts. On the advertiser side, we are still hearing limited traction with Twitter's ad platform changes and ROI measurement, and it seems experimental dollars are being moved to Snap.

The biggest risk to our Underperform rating, in our view, is the underlying value of the Twitter platform for users and potential Artificial Intelligence (AI) signals. We remain on the sideline for now, with ever-present M&A potential providing some element of a floor to the stock. We think 3x 2017 revenues plus cash ($12/share in total) is a valuation an acquirer could see as very reasonable given stabilizing DAU trends and value of Twitter data.

Key theme/metric(s) for 1Q: Mgmt focus on engagement, investors on users

MAU growth likely remains the primary focus in terms of metrics investors consider. While DAU growth could continue to growth at high single digits, we do not see much upside potential to low single digit MAU growth (we model 322mn, 4% y/y), which lags in comparison to Facebook's recent17% y/y growth. We expect engagement metrics in general (tweet impressions, DAU growth, time spent) to be solid, though it's possible lack of NFL and fading US election catalysts could have some negative effect. In terms of monetization, our ARPU estimate for $1.67 implies a 14% y/y decline, which reflects both weaker Twitter pricing trends and potential competitive pricing pressures.

Biggest 1Q issues/risks:

- **MAU growth could slip:** We model 4% y/y MAU growth to 322mn, but fading NFL and election tailwinds could lead to weaker user growth trends in 2Q.
- **Competition could impact pricing:** Management noted elevated competition in mid-January (shortly after Snap's ad API update), which may have continued throughout the quarter and impacted pricing more than anticipated.
- **Live streaming pipeline in question:** Amazon recently announced a deal with the NFL to steam game content, replacing Twitter.
- **Ad product wind-down could impact revenue:** Management indicated that it is reevaluating lower return ad formats, and a decision to wind down certain formats (like direct response, promoted tweets) could further impact 2Q guidance.

Top 1Q data points

comScore mobile data indicated US monthly active users were up 2% y/y and down 4% q/q (down 3mn q/q), versus our estimate for +4% y/y, +1% q/q. Total minutes for 1Q17 (2-mo. data) are tracking down 18% y/y, with mobile down 18% and desktop down 23%. Mobile minutes have averaged a 20% y/y decline for the last 4 months.

Estimates vs Consensus

Our 1Q17 rev/EPS estimates for $535mn/$0.03 are slightly above the Street and above the implied midpoint of management's guidance (based on EBITDA and EBITDA margin outlook). Despite our near-term concerns, we believe the outlook was sufficiently conservative. That said, we see risk to current consensus estimates for the year, and we are below Street revenue at $2.3bn for 2017 vs consensus at $2.35bn, though slightly ahead on EBITDA on more moderate cost assumptions. Our 2017 estimates assume a conservative 4% MAU growth for the year.

Table 29: Twitter Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofA ML est.	$535	$544	$2,301	$2,339
Growth Y/Y%	*10%*	*10%*	*9%*	*2%*
Street	$510	$548	$2,352	$2,496
BofA ML vs Street	Above	Below	Below	Below
EBITDA				
BofA ML est.	$120	$152	$639	$689
Street	$94	$135	$564	$650
BofA ML vs Street	Above	Above	Above	Above
EPS				
BofA ML est.	$0 03	$0 08	$0.33	$0 34
Street	$0 01	$0 06	$0 27	$0 37
BofA ML vs Street	Above	Above	Above	Below

Source: BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

Our $14.50 price objective is based on 12x our 2018 EBITDA estimate, which reflects a discount to the online media group (13x). We believe the Twitter platform has slowing user and revenue growth and as such, we expect the stock to trade at a sustained discount to online media peers, with potential M&A adding some offsetting downside support.

Yelp (Neutral, $43 PO)

Stock view: Likely to be some improvement vs last quarter

Yelp is coming off of a quarter with decelerating app unique devices, weak new customer adds, and decelerating sales force growth, and it seems likely that one or two of these metrics will improve. The tone at our recent investor meetings with the CFO seem to suggest that 4Q issues did not signal a break in the model (see On the road with Yelp), and we expect an improvement q/q customer adds. We think the company should be able achieve Street 1Q revenue and EBITDA estimates, though we won't be surprised to see the 2Q17 outlook come in slightly below current Street estimates.

For the full year outlook, while we believe the implied expense growth in the 2017 outlook is somewhat conservative, management appears focused on investing in the business for now and we think upside is more likely to come in 2Q or 3Q. Overall, we remain somewhat cautious on the stock given potential revenue deceleration due to tough comps and a deceleration in sales force growth.

On the cost front, management has been clear in its intention to invest in performance marketing, which could take time to bear fruit. In addition, we believe sales force growth to stabilize/increase going forward, which would seem to suggest potential cost headwinds relative to recent quarters. Finally, while we don't have the specific financials, the addition of Nowait ($40mn acquisition closed 2/28) likely encompasses a moderate bump up in opex with limited revenue to offset.

As we look ahead, we are encouraged with the three transitions within company and we will be looking for progress on the following on the call. The first is connections between consumers and businesses on Yelp through clicks, reservation services, ordering, and Request a Quote. The second is a ramp up in performance marketing as users engage in more measurable events. The third is new customer acquisition via alternative channels, including national customers from outside sales alongside self-serve customers via online channels.

Key theme/metric(s) for 1Q: new account adds, app unique devices growth

Given the miss last quarter and pressure on sales force headcount, local advertising accounts will be important gauge of overall execution. Other key metrics include app unique devices growth, which has been decelerating since mid-2015 from 51% y/y to 20% in 4Q16. Performance marketing could reverse the trend, but it could take some time. Finally, while management continues to highlight a decoupling of sales force growth and topline trends, investors still pay attention to overall sales force growth, particularly given the three consecutive quarters of deceleration from 44% y/y (1Q16) to 11% y/y (4Q17). Management has indicated that sales force growth in 2017 should be in the double digits.

Table 30: Key 1Q metrics

Metrics	4Q16A	1Q17E	2Q17E
Claimed Local Business	3,363	3,552	3,727
y/y Growth	27%	25%	24%
Local Advertising Accounts	138	142	150
y/y Growth	24%	17%	17%
Reviews	121,022	127,135	133,635
y/y Growth	27%	25%	23%

Source: BofA Merrill Lynch Global Research, company reports

Biggest 1Q issues/risks:

- **Local revenue deceleration:** We assume 750bps of y/y growth deceleration in 1Q17 vs 4Q16.

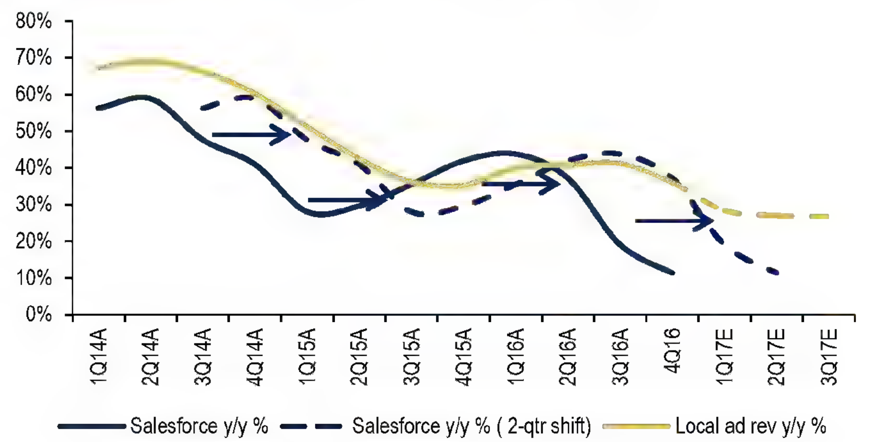
- **Metrics could remain under pressure:** Investors likely will look for stabilization in key metrics such as app unique devices growth and local ad account growth, but it could take time for incremental marketing and sales investments to bear fruit.
- **Stock comp could create overhang:** With Alphabet's decision to only report GAAP profits, Yelp's high stock comp (67% of 2017E EBITDA) could create overhang to the valuation.

Leading indicator data points:

Salesforce growth decelerating

While it possible that Yelp sees improving productivity per salesperson, and the mix shift to national and self-serve reduces reliance on direct sales, the deceleration in salesforce headcount is a negative leading indicator for revenues.

Chart 16: Salesforce growth versus local advertising revenue growth

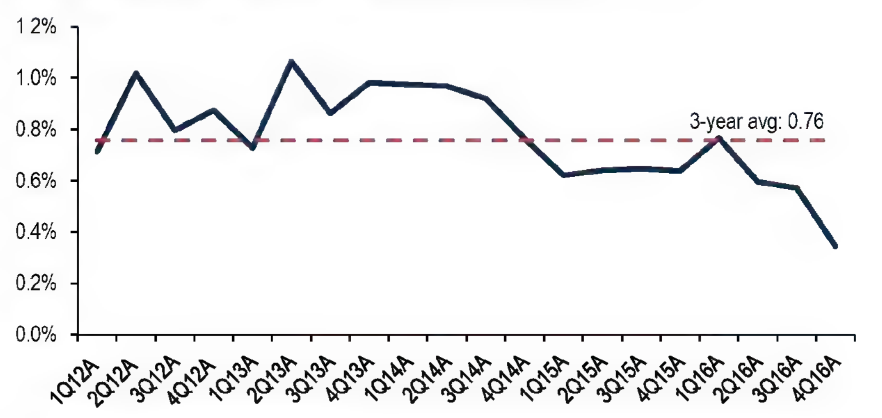


Source: Company, BofA Merrill Lynch Global Research

Accrued sales bonus and commissions tracking lower

We note that 4Q accrued bonuses and commissions are down y/y and reflect only 0.3% of NTM revenue, which would be the lowest ratio seen in recent years. Even on an absolute basis, the total accrued bonuses and commissions of $3.1mn is the lowest since mid-2013. While this is likely due in part to gains in self-serve and perhaps increased sales focus on National accounts, the change is noteworthy, in our view.

Chart 17: Accrued bonuses and commissions as a % of NTM revenue



Source: Company, BofA Merrill Lynch Global Research

In addition, the y/y change in commissions expense disclosed in company filings continued a downward trend to negative territory. Over the course of 2016, the number has gone from +$5.7mn in 1Q16, to +$2.4mn in 2Q16, to -$1.4mn in 3Q16, to down $1.7mn in 4Q16.

We also consider comScore mobile data, which indicated that US monthly active users were up 2% y/y (2-months data) while desktop monthly active users were down 14% y/y. This reflects a moderate deceleration in mobile from 4Q (+4%) and slightly lower declines in desktop (4Q at -16%). Total QTD US minutes are down 6% y/y for mobile (vs +4% in 4Q), though App minutes were flat, and desktop was up 6% y/y (vs +1% in 4Q). The somewhat weaker mobile minutes trend is notable, particularly the lack of growth in

Estimates vs Consensus

Our revenue and EBITDA estimates are slightly above consensus for both 1Q17 and 2Q17, as well as for 2017 and 2018. We expect local ad revenue to grow 28% y/y in 1Q (vs 36% in 4Q) and transaction revenue to grow 17.5% (vs 19% in 4Q). Our 2017 estimates are near the high end of management's 2017 outlook, and we would expect any upside potential to likely surface in the latter half of the year.

Table 31: Yelp Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$201	$218	$895	$1,082
Growth Y/Y%	*26%*	*26%*	*26%*	*21%*
Street	$198	$215	$889	$1,068
BofAML vs. Street	Above	Above	Above	Above
EBITDA				
BofAML est	$31	$40	$166	$221
Street	$27	$37	$161	$217
BofAML vs. Street	Above	Above	Above	Above
EPS				
BofAML est.	$0 18	$0 24	$0 99	$1 28
Street	$0.16	$0.25	$1 04	$1 45
BofAML vs. Street	Above	Below	Below	Below

Source BofA Merrill Lynch Global Research, Bloomberg, as of 4/4/2017

We are more constructive on the stock given more negative sentiment and recent sell-off, but maintain our Neutral rating given the decelerating sales leading indicator metrics and tougher revenue comps. Our $43 price objective is based on 14x 2018E EV/EBITDA, slightly above online media comps, which we believe is warranted given the higher margin potential in the model. We believe our multiple balances premium growth vs peers with medium-term concerns on competition and limited GAAP profitability. We believe the slight premium valuation is sustainable if the company can continue to deliver 20%+ y/y topline growth, which would be above the advertising industry.

Zillow (Buy, $42 PO)

Stock view: controversy sounding the mortgage business

While we still expect Zillow's core business to have a solid quarter on product improvements, the self-serve platform, and its recent Seller Boost product, the controversy surrounding Zillow's mortgage business (which potentially has implications for Zillow's core business and the retail estate industry) has been a key recent driver of the stock. The Consumer Financial Protection Bureau (CFPB) has indicated that it views Zillow's mortgage referral system as potentially violating parts of the Real Estate Settlement Procedures Act (RESPA). RESPA (Real Estate Settlement Procedures Act) is an act designed to product potential homeowners by outlawing kickback and referral fees from real estate services, particularly in relation to mortgage brokers who often receive referrals from real estate agents. Since Zillow's mortgage referrals involve a pre-application and a referral directly to a mortgage agent that than a larger entity like a bank, this could be violating the act. Mortgage brokers often fund some of the real estate agents online advertising expenses and a crackdown on mortgage agents could potentially hurt real estate agents ability to spend dollars on Zillow.

For now it is too early to say how this will develop as there are conflicting views for and against this view with the CFPB not releasing an official stance, but we expect this to be a near term overhang on the stock until a clear view of the CFPB's view and intentions unfold. While a contentious issue, mortgage revenue is still only 8% of total revenue and even a cut back would have a minimal impact to overall revenue growth. As for the impact on real estate agent spend on Zillow, we believe at with only roughly 5% penetration into real estate agents online spend Zillow has plenty of room to grow the core business and the high ROI of the ad unit will ensure agents buy placements on Zillow regardless of mortgage broker involvement and continue to like the stock.

Key theme/metric(s) for 1Q: Mortgage requests and revenue per loan

With the controversy surrounding the mortgage business, we think investors will be extra focused on the mortgage unit and focus on the mortgage revenue per loan request and consumer load requests. Zillow will be releasing new metrics this quarter to replace ARPA and premier agent count, but has yet to indicate what those metrics will be. Key topics for the call will likely include: 1) mortgage business outlook; 2) premier agent advertising spend; 3) rentals business; and 4) progress on FY17 goals.

Biggest 1Q issues/risks:

- If the CFPB decides Zillow violates RESPA, Zillow could face fines and have to retool its mortgage platform.
- New metrics for FY17 could give less visibility into the business as a whole.
- Slower than expected penetration of self-service platform leading to increased S&M costs.
- Potential for a weak 2Q guide if mortgage issues overhang the business as a whole.

Top 1Q traffic data points: comScore suggests usage up in 1Q

comScore desktop data suggests that unique visitors were down 5% quarter to date (Jan. and Feb.) while usage was up 2% QTD. However, on mobile, comScore data suggests usage is up 14% y/y on a bigger unique visitor base to 62mn unique users and usage was up 7%. We note comScore has made several methodology changes which has impacted the consistency of recent months data.

Estimates vs. Consensus: We are above the Street

Over rev/EBITDA estimates of $239mn/$40mn is above the Street at $236mn/$39mn. We estimate that ARPA will be up 29% y/y to $629 and premier agent subscribers will be flat y/y at 91.9K. Overall, we estimate 28% y/y growth, but note that the mortgage issues could potentially impact revenue. For rentals and other we estimate $32mn in revenue, up 75% y/y.

Table 32: Zillow estimate summary

	1Q17	2Q17	2017	2018
Revenue				
BofAML est.	$239	$261	$1,062	$1,307
Growth Y/Y%			*25%*	*23%*
Street	$236	$257	$1,048	$1,258
BofAML vs. Street	Above	Above	Above	Above
EBITDA				
BofAML est.	$40	$51	$215	$313
Street	$39	$46	$211	$298
BofAML vs. Street	Above	Above	Above	Above
EPS				
BofAML est.	$0.06	$0.11	$0.48	$0.89
Street	$0.05	$0.07	$0.44	$0.80
BofAML vs. Street	Above	Above	Above	Above

Source: BofA Merrill Lynch Global Research estimates

Zillow has effectively captured the online U.S. real estate market, allowing them to accelerate monetization and access to a large TAM with $87bn in total real estate commissions paid in 2016 and Zillow powering just 5% of the commissions through its Premier Agent platform. Although there is potential for the mortgage business to create a headwind if the CFPB issued a negative ruling against Zillow, we still like the stock into the quarter, as we prefer business with minimal competition, and believe that the high ROI of the real estate premium platform to real estate agents will ensure agents buy placements on Zillow regardless of mortgage broker involvement. We maintain our $42 PO based on a 6x our 2018E EV/Sales and supported by our DCF valuation. Our multiple is roughly in-line for online real estate lead generation sites in other countries operating in developed countries.

Zynga (Underperform, $2.70)

Stock view: Live events can improve franchises, but still need new titles

Zynga launched Dawn of Titans end of 4Q, and although it progressed into the top 20 grossing games in the U.S. Apple store, it has fallen out of the top 100 at some points during the quarter suggesting that its overall revenue contribution has been fairly low. While this is somewhat disappointing, we think investor expectations for the game are now at reasonable (lower) levels.

Instead of big new title launches, Zynga has indicated it is focused on strengthening its current franchises with better engagement and monetization through live events and new features, and progress in this area is key for the 2017 stock outlook. Zynga Poker (up roughly 80% y/y YTD) appears to be benefiting from the focus on engagement and live events with much stronger monetization, which could offset declines in other titles. Overall, we think it could be hard to get the Street excited on the stock without a strong future title that could drive more than single digit growth.

Key theme/metric(s): DAUs, and live events impact on DAU trends

After launching 10 new games in 2016, Zynga is focusing more heavily on live events to drive engagement with in franchises rather than launching additional titles. This should, if successful, translate into better DAU metrics as consumer engage with a title more often. With Dawn of Titan likely coming below Street expectations, stronger engagement will be necessarily for Zynga to drive a stronger DAU base. For the quarter, we model 17.9mn online game DAUs for 1Q, down slightly q/q, and down 6% y/y.

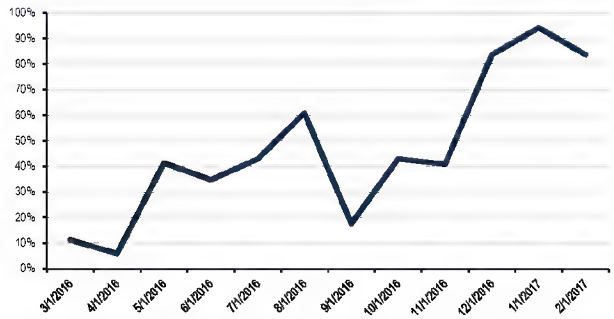
Biggest issues/risks:

- **Dawn of Titans revenues:** Zynga spend several years developing the game and lack of title success could impact sentiment.
- **Expense leverage and cost-cutting benefits do not materialize**: Zynga plans to further improve operational efficiency and potentially cut non-profitable franchises, but this may be hard to do without impacting long term growth opportunities.
- **Lack of new releases**: Zynga gave no indication of when it will release its next title leaving current franchises to carry revenue and earnings.

Top data points: Zynga game bookings tracking in-line to slightly below est.

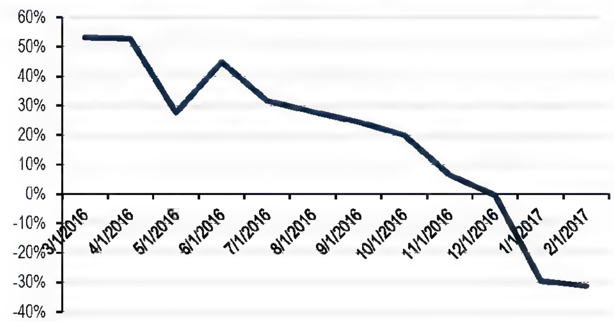
Zynga's largest revenue generating franchises, Zynga Poker was up significantly in 1Q. Zynga Poker appears to be benefiting from live events and is tracking up roughly 89% QTD. Combined slots titles appear a bit more challenged with total revenue down 30% QTD y/y, in part due to lower monetization on Wizard of Oz slots which is tracking down in gross gaming rankings. Overall, QTD (January and February) Zynga online game bookings (ex-ad revenue) is tracking up 7% y/y vs our 1Q est. of bookings up 9% y/y.

Chart 18: Zynga Poker y/y revenue growth



Source: Superdata Research, BofA Merrill Lynch Global Research

Chart 19: Zynga slots y/y revenue growth



Source BofA Merrill Lynch Global Research estimates, company report

Estimates vs. Consensus: Mostly inline to the Street

We are slightly above the street on revenue at $189mn vs. $188mn, but in-line on EBITDA at $20mn. Cost cutting could improve EBITDA and Zynga has restructured some of its workforce and is focusing on driving more engagement with live events in its game franchises. For 2017, we are below the Street on revenue at $779mn vs. $805mn, but above on EBITDA at $101mn vs $99mn.

Table 33: Zynga Estimate Summary

	1Q17	2Q17	2017	2018
Revenue				
BofA ML est.	$189	$196	$779	$786
Growth Y/Y%	*41%*	*41%*	*5%*	*1%*
Street	$188	$200	$805	$875
BofA ML vs Street	Above	Below	Below	Below
EBITDA				
BofA ML est.	$20	$20	$101	$106
Street	$20	$24	$99	$122
BofA ML vs Street	Above	Below	Above	Below
EPS				
BofA ML est.	$0.01	$0.01	$0.05	$0.06
Street	$0.02	$0.02	$0.07	$0.08
BofA ML vs Street	Below	Below	Below	Below

Source: BofA Merrill Lynch Global Research estimates, company report

Zynga is improving profitability while engaging players better with live services but we remain cautious on the company's ability to materially grow its audience and still favor the console gaming group. Zynga should have downside support given roughly $1.50 in cash and assets and strategic franchise value (we estimate Poker/Slots generates over $250mn+ in revenue annually). Our $2.70 PO is based on 11x 2018E EBITDA (which is a premium to the Mobile gaming peer group due to margin expansion potential), plus $1.41/share in cash and assets (building).

Company referenced	Ticker	Price
Alphabet A	GOOGL	848 91
Alphabet C	GOOG	831 41
Amazon com	AMZN	909 28
Bankrate	RATE	9 75
Care com	CRCM	11 68
eBay	EBAY	33 81
Expedia	EXPE	124 97
Facebook	FB	141 85
Fitbit	FIT	5 71
GrubHub	GRUB	33 27
LendingTree	TREE	117 8
Match Group	MTCH	16 45
Netflix	nflx	143 62
ONDK	ONDK	4 62
Pandora	P	11 82
priceline com	PCLN	1761 77
Quotient	QUOT	9 4
Snap	SNAP	20 7
TripAdvisor	TRIP	41 76
Trivago	TRVG	12 81
Twitter	TWTR	14 53
Wayfair	W	40 21
Yahoo!	YHOO	46 38
Yelp	YELP	33 22
Zillow A	ZG	33 49
Zillow C	Z	33 47
ZYNGA	ZNGA	2 78

Source BofA Merrill Lynch Global Research, Prices as of 5 April 2017

Price objective basis & risk

Alphabet (GOOGL / GOOG)

Our price objective is $1025/$1025, representing 17x our core 2018 Google non-GAAP EPS estimate (excluding non-Google losses), plus $118/share in cash, or 21x core Google GAAP EPS plus cash. Alphabet has traded at 12-24x forward P/E over the last five years and we think our 17x multiple is reasonable given shareholder friendly actions that include the non-core revenue and operating loss disclosures, and stock buybacks.

Downside risks to our PO are: 1) Search revenue growth decelerates faster than anticipated due to market maturity, 2) mobile transition drives negative search behavior changes, 3) revenue growth pressure from competitor initiatives, 4) margins disappoint due to revenue mix and investment initiatives, and 5) negative regulatory changes, including EU antitrust. The stock has been subject to heavy volatility in the past based on revenue growth and margin trends and this volatility could increase if economic conditions deteriorate.

Amazon.com (AMZN)

Our PO of $1,100 is based on our SOP that values AWS at $127bn or $259 per share and the retail business at $413bn or $841 per share. Our 5.5x AWS multiple is a modest premium to the software/SaaS comp group at 5.0x on 2018 sales, and 0.9x multiple is a premium to a retail general merchandise comp group at 0.7x. We think the premiums are warranted given share gains and superior growth. Our $1,100 price objective implies 2.8x 2018E Price/Sales, a multiple above the high end of Amazon's historical range of 1.0-2.5x. We argue the historical P/S multiple should increase given positive 3rd party sales (3P) that is reported on a net basis, a higher AWS revenue contribution, and record gross profit margins.

Downside risks to our price objective are a consumer spending slowdown, rich P/E multiple, margin or growth pressure from the digitization of media, more aggressive offline competition, hardware strategy, AWS investments and/or price cuts, Prime Instant Video content costs, and decelerating growth. The stock has been subject to heavy volatility in the past, based on margin trends, and this volatility could increase due to economic uncertainty.

Bankrate (RATE)

Our $13 price objective is based on 9x our 2018E EV/EBITDA, a slight discount to the online lead-gen and marketplace peer group average of 11x. We believe it is reasonable for RATE to trade at a slight discount given RATE's recent challenges to both growth and margins and its position as a turnaround in the space.

Downside risks to our PO are: 1) limited visibility into intra-quarter trends, 2) stock dependent on economic outlook, 3) card issuer spending is volatile and the turnaround is short lived, 4) slower growth in personal loans than expected, 5) higher than expected marketing spending to drive traffic to Bankrate sites, resulting in lower margins, 6) Google changes have a negative impact on marketing margins and EPS, 7) competition with other consumer finance sites, and 8) a large acquisition.

Care.com (CRCM)

Our $9 price objective is based on 1.3x 2018E EV/Sales or 10x 2018E EV/EBITDA, in line with small cap ecommerce and subscription peers. Care.com has category leadership and a large TAM, but we do not believe 7% 2-yr expected revenue growth warrants a premium to peers. At the same time, we believe that the Google Capital investment could provide some downside support on take-out potential.

Downside risks to our PO are 1) need to add more customers each year to grow given high churn, 2) competition from SitterCity and Homestead, and 3) new care offerings (mobile apps, premium nanny, date night payment services etc.) may not see much traction, 4) lower conversion rates on mobile, 5) mobile conversions with 30% fee to Apple and Google Play marketplaces could negatively impact margins, and 6) international expansion may not be successful given different demographics.

Upside risks to our PO are 1) lower marketing spend resulting in higher margins and better leverage in 2016, 2) revenue upside from cross-selling and word of mouth, 3) increase length of stay for paid subscribers, reducing churn, and 4) traction from new care offerings, Care at Work, and international expansion.

eBay (EBAY)
Our $38 price objective is based on 17x our 2018E EPS. Our 17x P/E multiple is slightly ahead of the retail comp group average of about 16x, reflecting eBay's potential for a Marketplace growth acceleration in 2017.

Risks to our price objective are: 1) competition from Amazon and other new Marketplaces in the U.S., competition from Amazon, Alibaba and local incumbents in International markets, and competition from multi-channel retailers that are aggressively investing in the online channel, 2) vulnerability to future Google algorithm changes, 3) decelerating user growth, resulting in eCommerce market share losses, and 4) currency risk including FX volatility impact on cross border trade. The stock has been subject to heavy volatility in the past based on GMV growth and market share trends and this volatility could increase due to economic uncertainty.

Expedia (EXPE)
Our $146 price objective is based on our sum of the parts (SOP) that assumes 9x 2018E EBITDA for the core OTA business (a discount to Priceline at approx. 15x due to slower organic growth and higher taxes on earnings), 8x 2018E EBITDA for Egencia (we expect single digit growth), 60% ownership of Trivago (using our PO), and HomeAway at 15x 2018 EV/EBITDA.

Downside risks to our PO are: 1) economic downturn leading to fewer travel bookings, 2) competition for European traffic lowering the company's growth or margin opportunity, 3) hotels favoring lower-cost alternative distribution channels and limiting Expedia's access to inventory, 4) Google and/or TripAdvisor disintermediation, and 5) the negative impact of terrorism and disease on global travel trends.

Facebook (FB)
Our $165 price objective is based on 24x our non-GAAP 2018E EPS and 27x GAAP EPS, multiples equal to about 1x 2018E revenue growth, mostly in-line with its social and online media peers.

Risks are: 1) high valuation that discounts strong growth, 2) changes in user engagement impacts optimism on revenue opportunities and compresses the stock multiple, 3) privacy issues or pushback on Facebook's policy changes impact revenue generation, 4) risks to executing Messenger & WhatsApp monetization, 5) potential for higher investment to negatively impact margins, and 6) a macroeconomic impact on advertising pricing.

Fitbit (FIT)
Our $6.50 price objective is based on 0.5x EV/S multiple which is below the device manufacturer peer group at 1.8x, but justified in our view given declining revenue and profitability, FCF burn, market saturation, and limited visibility into the next product cycle.

Upside risks are: 1) international product launches and expansion, 2) higher-than-expected ASPs, 3) new product launches domestically, 4) slower-than-expected OpEx ramp, 5) software monetization and 6) corporate wellness program growth.

Downside risks are: 1) integration risk from smartwatches and other wearables cannibalizing the fitness tracker market, 2) fad risk, as fitness trackers could be simply a fitness fad with consumers, 3) competitive risk from competitors out-innovating, and 4) execution risk on channel build and inventory management.

GoPro (GPRO)
Our $8 price objective is based on 10x our 2018E EBITDA, in line with the peer average of 10x, which we believe is appropriate given its slightly higher growth and potential for EBITDA margin expansion after restructuring. GoPro is the leading action camera company in the world but has been challenged by execution issues limiting its ability to drive strong product cycles.

Downside risks to our PO are: 1) new products fail to resonate with consumers, 2) competitive pressure pushing down ASPs, and 3) failure to meet market demand during holidays.

Upside risks to our PO are: 1) better than expected sales on new products, 2) better than expected holiday sales from extra manufacturing capacity, 3) better than expected drone sales, or new product announcements, and 4) new direct sales partnerships internationally

GrubHub (GRUB)
Our PO is $49, based on 32x our 2018E P/E (vs. high growth internet at 31x). We believe GRUB warrants a premium to eCommerce peers due to the attractive margins of the core business and, relative to the overall small-cap sector, GRUB has more attractive margins and growth potential.

Downside risks to our PO are:
Revenue and sales metrics are trailing KPIs for Diners and Restaurant and the potential for diminishing returns on future restaurant and user additions is a risk. GrubHub has significant room for growth in the US ahead, but will need to invest internationally if domestic growth stalls.

LendingTree (TREE)
Our $140 price objective represents 14x 2018E EV/EBITDA, a premium to the lead generation services and marketplace peer group average of 11x due to market position (category leader in mortgage and personal loans) and faster revenue growth.

Risks to achieving our estimates and price objective are: 1) interest rate risks given the demand for leads for mortgage and other loan products, 2) competition with other consumer finance sites and ad networks, 3) potential for search engine disintermediation and traffic competition, 4) potential for recessionary impact on loan products (lower traffic and demand for leads) and credit card markets, 5) premium valuation vs. lead generation and marketplace peers, and 6) acquisition risk.

Match Group (MTCH)
Our PO is $21 based on 12x our estimated 2018 EBITDA of $562mn and our DCF valuation analysis. The basis for our PO is in-line with the eCommerce group, but a premium to the consumer internet subscription services group due to MTCH's combination of market dominance, profitability, and cash flow. We think fundamentals help MTCH stand out from its ecommerce peer group and MTCH should be seen as a more defensible platform that is unlikely to see disruption in its core markets.

Downside risks are: market share losses to an emerging dating business, potential for higher acquisition costs on mobile, lower conversion rates that lead to lower PMC growth, the need to acquire competing sites to maintain growth or market share, and higher-than-expected International investments. The biggest downside risk is lower revenue if Tinder experiences a decline in popularity or public perception.

Netflix, Inc. (NFLX)
Our $154 price objective is based on a peak penetration sum-of-the-parts analysis which discounts back future EPS at peak penetration by 10%. At peak penetration, we assume domestic streams peak at 65mn subscribers in five years while the international segment reaches 200mn seven years later. We assume APRU of $9.99 and 40% contribution margins for the domestic business and a $8.50 APRU and 40% contribution margin for the international business. We also assume a $1.50 price increase domestically over six years and a $3.60 price increase internationally over twelve years which will be 75% incremental to operating income. We assume a US tax rate of 40% and an international tax rate of 25%. At peak penetration, we assume a 15x S&P average multiple.

Downside risks to our price objective are: 1) increasing content costs, 2) potential new competitors in the company's streaming business, 3) execution challenges and competition potentially limiting growth in new markets, 4) U.S. saturation point approaching quicker than expected, and 5) net neutrality repeal causing ISPs to look to recoup higher rents from Netflix's high bandwidth requirements for streaming.

Upside risks to our price objective are: 1) content costs rising slower than expected, 2) total subscriber growth is faster than expected, and 3) international expansion into new large markets (e.g. China).

OnDeck Capital (ONDK)
Our $6 price objective is based on 10x our 2018E EBITDA. This is below the internet ecommerce comparable group (11x) which is justified in our view given OnDeck's double digit revenue growth and potential to expand margins starting in 2018 as it gains scale and operating leverage, but tempered by a slower FY18.

Upside risks to our PO are: 1) faster than expected originations growth, 2) signing of new large strategic partners, and 3) lower than expected operating expenses.

Downside risks to our PO are: 1) higher than expected loss rates from worsening macro environment, 2) credit market freeze shutting down liquidity access, 3) lower effective yield from competition, and 4) increased marketing spend.

Pandora Media, Inc. (P)
Our $9 price objective is based on 1x our 2018 revenue estimate, a significant discount to online media and subscription service peers, but justified in our view as the multiple takes into account the company's difficult transition to a subscription on-demand service and lack of near term profitability balanced by the value of its data and user base.

Upside risks to our PO are: 1) direct licensing agreements for lower royalty rates, 2) international expansion announcements, 3) ad-load increases in key demos, increasing monetization rates, 4) faster than expected launch of on-demand service, and 5) the company is acquired.

Downside risks to our PO are: 1) emerging competition from both other Internet models like Spotify and Apple Music, as well as large, established radio companies like iHeartMedia embracing Internet streaming, 2) slow down in the company's ability to grow monetization, 3) lack of historical or near-term GAAP profitability, and 4) delayed on-demand service launch

priceline.com (PCLN)
Our price objective is $1,920 based on 22x our 2018 adj. EPS estimate. The 22x multiple is towards the upper end of Priceline's historical multiple range of 13-23x and represents a PEG of 1.4x. We think a 22x forward P/E multiple is appropriate given mid-teens EPS growth, strong booking trends, Priceline's leadership position in the global online travel sector, track record of EPS upside, and increased access to the China market via the Ctrip investment.

Risks to our PO are 1) a global economic downturn, especially macro-weakness in Europe, leading to fewer travel bookings and pressure on room rates, 2) competition for traffic lowering the company's growth or margin opportunity, 3) hotels favoring their own distribution channels, 4) FX volatility, 5) increased competition from Expedia, TripAdvisor and potentially Google, and 6) the impact of terrorism/disease on global travel trends. The stock has been subject to heavy volatility in the past based on travel industry trends and this volatility could increase due to greater economic uncertainty, especially with macro-trends in Europe.

Quotient Technology Inc (QUOT)
Our $13 price objective is based on a 16x 2018E EBITDA, a premium to eCommerce peers (11x), which we think is justified given stickiness of the Retailer IQ platform and the slightly higher growth of 14% in FY17 vs. eCommerce group at 11%). Quotient is a lead operator in online couponing, has a strong technological platform, relationships with CPGs and a platform that is slowly spreading across grocers in the U.S.

Downside risks are: 1) further delays in point-of-sale system rollout with retailers, 2) loss of major retailers or CPG, 3) higher-than-expected R&D and S&M costs due to investment, and 4) limited float may contribute to volatility.

Upside risks to our analysis are: 1) additional retailers launching on their point-of-sale system, 2) quicker-than-expected transition to digital couponing, 3) new additional digital coupon retail clients (such as Walmart). and 4) targeted couponing lifting average transaction pricing.

Snap (SNAP)
Our $25 PO is based on our DCF model as we do not expect the company to be profitable until mid- to late-2019 and any earnings-based valuation exercise would require discounting back future earnings. Our DCF assumes approximately $28bn revenue by 2027 based on 525mn DAUs and $50+ in ARPU. Our PO implies 15.5x EV / Revenue, above the peer group at 4x, as we believe Snap's early stage of ad monetization and potential future leverage in the business model warrants a premium valuation multiple to the social media group.

Upside risks to our PO are: 1) greater than expected reacceleration in North America DAU growth, 2) more rapid monetization of existing user base with increased ad load and/or new ad formats, and 3) better traction and monetization in International markets.

Downside risks to our PO are: 1) further deceleration in user growth that would raise concerns on long-term revenue opportunity, 2) pressure on usage due to competing services, and 3) performance into the first lock-up expiration on 7/29/17.

TripAdvisor (TRIP)
Our price objective of $40 is based on 25x our 2018 non-GAAP EPS estimate. This multiple represents a modest premium to the group for possibly depressed margins and re-accelerating top-line growth.

Downside risks to our price objective are: 1) increasing competition (e.g. Yelp), 2) macro-economic factors (e.g. recession in Europe) impacting the travel industry, 3) challenges to the credibility of online reviews, 4) Instant Book transition puts pressure on revenue growth, and 5) mobile monetization headwinds.

Upside risks to our price objective are: 1) improved mobile monetization 2) major OTA sign on for instant booking 3) high non-hotel shopper dollar capture and 4) improved global macro environment.

Trivago NV (TRVG)
Our PO of $15 is based on a 3.5x 2018E EV/Sales multiple. We note that 3.5x is roughly in line with the lead generation peer group average 2018E EV/Sales multiple. We think our EV/Sales multiple is warranted as a balance between Trivago's higher growth and lower profitability. Our price objective is supported by our DCF analysis.

Downside risks to our price objective are: 1) Growing competition, 2) Elevated marketing spend, 3) High Customer concentration, 4) Macro and FX risks, and 5) Potential for loss of hotel inventory.

Twitter (TWTR)
Our $14.5 price objective is based on 12x our 2018 EBITDA estimate, which reflects a discount to the online media group (13x). We believe the Twitter platform has slowing user and revenue growth and as such, we expect the stock to trade at a sustained discount to online media peers, with potential M&A adding some offsetting downside support.

Downside risks to our PO are: 1) decelerating user growth that may raise concerns on long-term revenue opportunity, 2) pressure on usage due to emergence of competing services, 3) new ad initiatives may not perform well, resulting in lower advertiser demand for Twitter ads, 4) monetization of logged-out users and third party application users are slow to materialize, and 5) on a EV/EBITDA basis Twitter is more attractive today than in the past, but stock remains subject to multiple compression.

Upside risks to our PO are: 1) User adds could ramp on new product initiatives in the 2H, and accelerating user growth may increase optimism on long-term revenue opportunity, 2) with new demographic targeting initiatives, Twitter is able to capture more TV dollars (vs online ad dollars) that are incremental with video ads, 3) the NFL broadcasts and other video content (live political, entertainment, etc.) could help Twitter grow users meaningfully in the long term, 4) guidance could prove to be conservative, 5) traction from monetization of logged-out users and 6) potential that Twitter could be acquired.

Wayfair (W)
Our price objective of $44 is based on 0.7x 2018E EV/sales. We continue to focus on EV/Sales given Wayfair's lack of profitability to date. Our 0.7x target multiple is a discount to W's eCommerce comp group and at a modest discount to W's retail comp group. We think the multiple is appropriate given stronger revenue growth vs. peers, balanced by lower profitability and competitive risks.

Downside risks are: 1) GAAP operating losses expected through 2018, making valuation analysis more complex, 2) competition from several well capitalized companies including Amazon, 3) brand complexity (5 brands), 4) category limitations, 5) partner segment revenue headwinds, and 6) execution risk on International expansion.

Yahoo! (YHOO)
Our price objective of $57 is based on our sum-of-parts valuation assumptions. Our $53 estimated asset value represents $39/share from the remaining Alibaba stake (using $122 Alibaba valuation {10% discount rate, mid-term FCF FY18-25E CAGR of 18%, 4% terminal growth} x 384mn shares at 20% discount rate), $6.1 for Yahoo Japan, $0.5 for Excalibur patents, and $6.9 in cash and cash equivalents on Yahoo's balance sheet. We

assume $4.7/share in value for the core business based Verizon's pending acquisition value of $4.83bn less $300mn for potential revisions.

Downside risks to our PO are: 1) Alibaba stock valuation declines, 2) Alibaba valuation discount is higher than expected, 3) Verizon's pending acquisition of Yahoo core assets is delayed/challenged, 4) valuation of Yahoo! Japan falls, and 5) valuation of Excalibur patent portfolio falls.

Yelp (YELP)
Our $43 price objective is based on 14x 2018E EV/EBITDA, slightly above online media comps, which we believe is warranted given the higher margin potential in the model. We believe our multiple balances premium growth vs peers with medium-term concerns on competition and limited GAAP profitability. We believe the slight premium valuation is sustainable if the company can continue to deliver 25% y/y topline growth with y/y margin improvement.

Downside risks are Google and Facebook's ambitions to build a review ecosystem to tap into local ad spending, competition from a variety of online and offline locally focused advertising businesses, Google traffic dependency, and advertiser churn.

Zillow (ZG / Z)
Our $42 price objective is based on a 6x our 2018E EV/Sales and supported by our DCF valuation. Our multiple is roughly in-line for online real estate lead generation sites in other countries operating in developed countries. In addition, this multiple represents a relative discount given Zillow's higher sales growth and a larger US TAM in comparison to its peers in smaller developed markets like Australia and Japan. We are positive on Zillow's long term opportunity to capture the majority of realtor's dollars moving from offline channels to online marketing channels.

Downside risks are: 1) traffic cannibalization between Zillow properties, 2) new lawsuits again Zillow, 3) potential for multiple compression, 4) a U.S. housing market down turn, and 5) lack of profitability support for valuation.

Upside risks are: 1) faster than expected growth and S&M leverage, 2) Zillow Digg monetization, 3) accelerated grow the in rentals market, and 4) new market expansion.

ZYNGA (ZNGA)
Our $2.70 PO is now based on 11x 2018E EBITDA (which is a premium to the Mobile gaming peer group due to margin expansion potential), plus $1.41/share in cash and assets (building).
Downside risks to our price objective are mobile market share losses, challenges in establishing successful new content given employee departures, and player churn due to greater competition given low barriers to entry. Upside risks are successful new title releases that accelerate growth, or potential acquisition of Zynga for its game portfolio.

Analyst Certification

We, Justin Post, Jason Mitchell and Nat Schindler, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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BofA Merrill Lynch is currently acting as financial advisor to eBay Inc in connection with the extension of a dual branded retail credit card with General Electric and committing to purchase the loan portfolio in 2016. Deal announced along with Second Quarter Earnings on July 16, 2014.

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US - Internet Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Alphabet	GOOGL	GOOGL US	Justin Post
	Alphabet	GOOG	GOOG US	Justn Post
	Amazon com	AMZN	AMZN US	Justn Post
	Bankrate	RATE	RATE US	Nat Schındler
	eBay	EBAY	EBAY US	Justin Post
	Expedia	EXPE	EXPE US	Justin Post
	Facebook	FB	FB US	Justin Post
	GrubHub	GRUB	GRUB US	Nat Schindler
	IAC InterActive	IAC	IAC US	Nat Schındler
	LendingTree	TREE	TREE US	Nat Schındler
	Match Group	MTCH	MTCH US	Nat Schındler
	Netflix, Inc.	NFLX	NFLX US	Nat Schındler
	OnDeck Capital	ONDK	ONDK US	Nat Schindler
	pnce ine com	PCLN	PCLN US	Justın Post
	Take-Two Interactive	TTWO	TTWO US	Justin Post
	Trivago NV	TRVG	TRVG US	Nat Schındler
	Wix com	WIX	WIX US	Nat Schındler
	Yahoo!	YHOO	YHOO US	Justin Post
	Zillow	ZG	ZG US	Nat Schındler
	Zillow	Z	Z US	Nat Schındler
NEUTRAL				
	Activ sion	ATVI	ATVI US	Justin Post
	Electronic Arts	EA	EA US	Justın Post
	Quot ent Technology Inc	QUOT	QUOT US	Nat Schındler
	Snap	SNAP	SNAP US	Justin Post
	Wayfa r	W	W US	Justin Post
	Yelp	YELP	YELP US	Justin Post
UNDERPERFORM				
	Care com	CRCM	CRCM US	Justin Post
	Fitbit	FIT	FIT US	Jason Mitchell
	GoPro	GPRO	GPRO US	Jason Mitchell
	Pandora Media, Inc.	P	P US	Nat Schındler
	TripAdvisor	TRIP	TRIP US	Nat Schındler
	Twitter	TWTR	TWTR US	Justin Post
	ZYNGA	ZNGA	ZNGA US	Justin Post
RVW				
	Chegg	CHGG	CHGG US	Nat Schindler

Disclosures

Important Disclosures

Equity Investment Rating Distribution: Electronics Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	29	59.18%	Buy	14	48.28%
Hold	5	10.20%	Hold	2	40.00%
Sell	15	30.61%	Sell	5	33.33%

Equity Investment Rating Distribution: Media & Entertainment Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	40	56.34%	Buy	21	52.50%
Hold	16	22.54%	Hold	6	37.50%
Sell	15	21.13%	Sell	6	40.00%

Equity Investment Rating Distribution: Technology Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	126	59.43%	Buy	70	55.56%
Hold	35	16.51%	Hold	17	48.57%
Sell	51	24.06%	Sell	17	33.33%

Equity Investment Rating Distribution: Global Group (as of 31 Mar 2017)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1578	51.33%	Buy	979	62.04%
Hold	690	22.45%	Hold	434	62.90%
Sell	806	26.22%	Sell	381	47.27%

* Issuers that were investment banking clients of BofA Merrill Lynch or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

* Ratings dispersions may vary from time to time where BofA Merrill Lynch Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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TED2017 program

Monday, April 24, 10:15AM - 12:00PM PDT

TED Fellows Talks, Session 1

Amazing talks and performances from the new class of TED Fellows and returning Senior Fellows. Hosted by Fellows director Tom Rielly.

Monday, April 24, 1:15PM - 3:00PM PDT

TED Fellows Talks, Session 2

Part 2 of the TED Fellows session, featuring cutting-edge work from TED Fellows and Senior Fellows. Unmissable.

Monday, April 24, 5:00PM - 7:00PM PDT

Session 1: One Move Ahead

Hosted by Chris Anderson
Not attending TED2017? Watch Session 1 – Opening Event – broadcast to cinemas! Find showtimes

Huang Yi

Choreographer, dancer, inventor

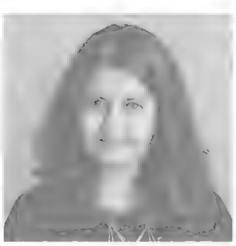
As a child, Huang Yi longed for a robot companion. As an adult, he created a robot to dance with: KUKA.

Taiwanese dancer, choreographer, inventor, and videographer Huang Yi's pioneering work is steeped in his fascination with the partnership between humans and robots. He interweaves continuous movement with mechanical and multimedia elements to create a form of dance which corresponds with the flow of data, effectively making the performer a dancing instrument. Named by *Dance Magazine* as one of the "25 to Watch," Huang is one of Asia's most prolific choreographers.

Harmoniously weaving together the art of dance and the science of mechanical engineering, HUANG YI & KUKA is a poetic work that intertwines modern dance and visual arts with the realm of robotics, revealing humanity through a series of vignettes between live dancers and KUKA, a robot conceptualized and programmed by Huang. "Dancing face to face with a robot is like looking at my own face in a mirror...I think I have found the key to spin human emotions into robots," Huang asserts.

HUANG YI & KUKA is an original production of Huang Yi Studio +, developed at 3LD Art & Technology Center, in association with Sozo Artists. Commissioned by Quanta Arts Foundation.

facebook.com/HuangYiStudio



Anab Jain

Futurist, designer

Superflux co-founder and TED Fellow Anab Jain parses uncertainties around our shared futures to create provocative experiences, tools and tactics that we can adopt today.

In 2009, Anab Jain co-founded the design firm Superflux with Jon Ardern, inspired by influences as far-flung as avant-garde architecture and Andrei Tarkovsky. The challenges Jain explores are some of the biggest -- climate change, biotech, intelligent machines -- and her resulting work "navigates the entangled wilderness of our technology, politics, culture and environment to imagine new ways of seeing, being and acting."

In her work, Jain creates worlds, stories and tools that provoke and inspire us to engage with the precarity of our rapidly changing world. Superflux is building tools, methods and commons that can enable us to mitigate the shock of food insecurity and climate change. Recently they produced a series of civilian drones, and created a vision of a near-future city where these intelligent machines begin to display increasing autonomy with civic society. Among Superflux's previous projects is a headset allowing blind subjects injected with a light-sensitive virus to develop a kind of "super-sight" sensitive to spectrums that ordinary vision cannot detect.

superflux.in @anabjain

Garry Kasparov

Garry Kasparov

Grandmaster, analyst

Garry Kasparov is esteemed by many as the greatest chess player of all time. Now he's engaged in a game with far higher stakes: the preservation of democracy.

When 22-year-old Garry Kasparov became the world's youngest chess Grand Champion, few could predict his turbulent career in chess or as a dissident. His chessboard wizardry was already the stuff of legend when, in 1997, he made headlines when he lost a rematch to IBM's Deep Blue supercomputer, ushering AI into the public sphere.

Kasparov's book *Winter Is Coming* details the rise of Putin's Russia as well as Kasparov's persecution and self-exile, and it serves chilling warnings of reactionary forces gathering in the West. He is the chair of the Human Rights Foundation, succeeding his predecessor Vaclav Havel.

kasparov.com @Kasparov63

Laura Galante

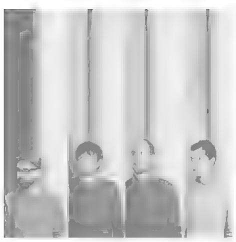
Cyberspace analyst

Laura Galante analyzes how states use cyberspace: a domain where militaries, intelligence services, criminal groups and individuals pursue their interests with far fewer restraints than in the physical world.

At FireEye, Galante's teams have profiled advanced cyber threats, investigated network breaches and portrayed the political, military and financial implications of cyber operations. Part of the original Mandiant Intelligence team, Galante has led strategic analysis, developed intelligence capabilities and offerings, and directed publications including *APT28: A Window into Russia's State Cyber Espionage*; *Red Line Drawn: China Recalculates its Use of Cyber Espionage*; and *Hacking the Street? FIN4 Likely Playing the Market* among others.

In November 2016 she spoke at the UN Security Council's Arria Formula meeting on cybersecurity and international peace and security. She frequently appears on and provides commentary to: CNN, Bloomberg, NPR, BBC, Fox News, the *New York Times*, *The Financial Times*, *The Wall Street Journal*, Reuters, the Associated Press and other global and industry media. Prior to her work at FireEye and Mandiant, Galante led a contractor team analyzing cyber capability development and military doctrine at the US Department of Defense. She supported the 2010 US-Russia bilateral information security talks.

fireeye.com @LauraLGalante



OK Go

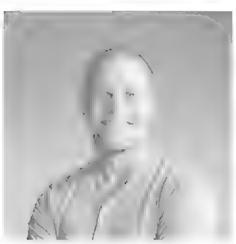
Band

A wildly creative band of music and video makers, OK Go is building a media empire on the back of endless, boundless ingenuity.

With a career that includes award-winning videos, *New York Times* op-eds, a major label split and the establishment of a DIY trans-media mini-empire (Paracadute), collaborations with pioneering dance companies and tech giants, animators and Muppets, and an experiment that aims to encode Hungry Ghosts on actual strands of DNA, OK Go continue to fearlessly dream and build new worlds in a time when creative boundaries have all but dissolved.

The band has been honored with a Grammy, three MTV Video Music Awards (one of them from Japan!), a CLIO, three UK Music Video Awards, two Webby Awards (including one for their collaboration with The Muppets and Sesame Street) and a spot in a Guggenheim installation. Their latest video is "The One Moment," directed by the band's singer, Damian Kulash Jr.

okgo.net @okgo



Tim Ferriss

Human guinea pig, author

Tim Ferriss is author of "The 4-Hour Workweek,' a self-improvement program of four steps: defining aspirations, managing time, creating automatic income and escaping the trappings of the 9-to-5.

Tim Ferris brings an analytical yet accessible approach to the challenges of self-improvement and career advancement through what he calls "lifestyle design." His 2007 book, *The 4 Hour Workweek*, and his lectures on productivity are stuffed with moving, encouraging anecdotes -- often from his own life -- that show how simple decisions, made despite fears or hesitation, can make for a drastically more meaningful day-to-day experience at work, or in life.

Word-of-blog chatter in Silicon Valley may have propelled his book to bestselling success, but Ferriss himself takes a fervid stance against the distractions of technology toys that promote unnecessary multitasking. Following the success of his book, Ferriss has become a full-time angel investor.

Titus Kaphar

Artist

Titus Kaphar's artworks interact with the history of art by appropriating its styles and mediums.

As Titus Kaphar says of his work: "I've always been fascinated by history: art history, American history, world history, individual history -- how history is written, recorded, distorted, exploited, reimagined, and understood. In my work I explore the materiality of reconstructive history. I paint and I sculpt, often borrowing from the historical canon, and then alter the work in some way. I cut, crumple, shroud, shred, stitch, tar, twist, bind, erase, break, tear, and turn the paintings and sculptures I create, reconfiguring them into works that nod to hidden narratives and begin to reveal unspoken truths about the nature of history."

His latest works are an investigation into the highest and lowest forms of recording history. From monuments to mug shots, this body of work exhibited at Jack Shainman gallery December-January 2017 seeks to collapse the line of American history to inhabit a fixed point in the present. Historical portraiture, mug shots, and YouTube stills challenge viewers to consider how we document the past, and what we have erased. Rather than explore guilt or innocence, Kaphar engages the narratives of individuals and how we as a society manage and define them over time. As a whole, this exhibition explores the power of rewritten histories to question the presumption of innocence and the mythology of the heroic.

kapharstudio.com

Rabbi Lord Jonathan Sacks

Religious leader

In a world violently polarized by extremists, Rabbi Lord Jonathan Sacks is proposing and advocating solutions to mounting religious intolerance.

Rabbi Lord Sacks is one of Judaism's spiritual leaders, and he exercises a primary influence on the thought and philosophy of Jews and people of all faiths worldwide. Since stepping down as Chief Rabbi of the UK and Commonwealth in 2013, Rabbi Lord Sacks has become an increasingly well-known speaker, respected moral voice and writer; his 2015 book is *Not in God's Name: Confronting Religious Violence*.

Granted a seat in the British House of Lords in 2009, Rabbi Lord Sacks is a key Jewish voice for universalism and an embrace of tolerance between religions and cultures. He rejects the "politics of anger" brought about by the way "we have acted as if markets can function without morals, international corporations without social responsibility and economic systems without regard to their effect on the people left stranded by the shifting tide." He also sees, as a key idea for faith in our times, that unity in heaven creates diversity on earth.

rabbisacks.org @rabbisacks

Tuesday, April 25, 8:30AM - 10:15AM PDT

Session 2: Our Robotic Overlords

Hosted by Chris Anderson and Helen Walters.

Marc Raibert

Roboticist

Marc Raibert is the founder and CEO of robot maker Boston Dynamics.

Working with his team at Boston Dynamics, Marc Raibert builds some of the world's most advanced robots, such as BigDog, Atlas, Spot and Handle. These robots are inspired by the remarkable ability of animals to move with agility, dexterity, perception and intelligence. A key ingredient of these robots is their dynamic behavior, which contributes to their lifelike qualities and their effectiveness in the real world.

Raibert founded Boston Dynamics as a spinoff from MIT, where he ran the Leg Laboratory, which helped establish the scientific basis for highly dynamic robots. He was a professor of EE&CS at MIT and before that associate professor of CS & Robotics at Carnegie Mellon University. Raibert is a member of the National Academy of Engineering

bostondynamics.com

Noriko Arai

AI expert

Could an AI pass the entrance exam for the University of Tokyo? Noriko Arai oversees a project that wants to find out.

Noriko Arai is the program director of an AI challenge, Todai Robot Project, which asks the question: Can AI get into the University of Tokyo? The project aims to visualize both the possibilities and the limitation of current AI by setting a concrete goal: a software system that can pass university entrance exams. In 2015 and 2016, Todai Robot achieved top 20 percent in the exams, and passed more than 60 percent of the universities in Japan.

The inventor of Reading Skill Test, in 2017 Arai conducted a large scale survey on reading skills of high and junior high school students with Japan's Ministry of Education. The results revealed that more than half of junior high school students fail to comprehend sentences sampled from their textbooks. Arai founded the Research Institute of Science for Education to elucidate why so many students fail to read and how she can support them.

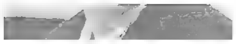
nii.ac.jp/en/faculty/society/arai_noriko researchmap.jp/arai_noriko/english

Stuart Russell

AI expert

Stuart Russell wrote the standard text on AI; now he thinks deeply on AI's future -- and the future of us humans too.

Stuart Russell is a professor (and formerly chair) of Electrical Engineering and Computer Sciences at University of California at Berkeley. His book *Artificial Intelligence: A Modern Approach* (with Peter Norvig) is the standard text in AI; it has been translated into 13 languages and is used in more than 1,300 universities in 118 countries. His research covers a wide range of topics in artificial intelligence including machine learning, probabilistic reasoning, knowledge representation, planning, real-time decision making, multitarget tracking, computer



vision, computational physiology, global seismic monitoring and philosophical foundations.

He also works for the United Nations, developing a new global seismic monitoring system for the nuclear-test-ban treaty. His current concerns include the threat of autonomous weapons and the long-term future of artificial intelligence and its relation to humanity.

eecs.berkeley.edu/~russell

Joseph Redmon

Computer scientist

Joseph Redmon works on the YOLO algorithm, which combines the simple face detection of your phone camera with a cloud-based AI -- in real time.

Computer scientist Joseph Redmon is working on the YOLO (You Only Look Once) algorithm, which has a simple goal: to deliver image recognition and object detection at a speed that would seem science-fictional only a few years ago. The algorithm looks like the simple face detection of a camera app but with the level complexity of systems like Google's Deep Mind Cloud Vision, using Convolutional Deep Neural Networks to crunch object detection in realtime. It's the kind of technology that will be embedded on all smartphones in the next few years.

Redmon is also internet-famous for his resume.

pjreddie.com @pjreddie

Tom Gruber

AI developer

As co-creator of Siri, Tom Gruber helped redefine the role of machine intelligence in our lives and transformed the way we interact with our devices.

By connecting humans and machines with AI, designer, inventor and polymath Tom Gruber is opening up new ways to improve our lives and augment human intelligence

Gruber led the team that revolutionized human-machine interaction with Siri, the intelligent personal assistant that can understand your spoken language and help you get things done. Launched in 2010, Siri is now used billions of times a week in more than 30 countries around the world.

tomgruber.org

Radhika Nagpal

Robotics engineer

Taking cues from bottom-up biological networks like those of social insects, Radhika Nagpal helped design an unprecedented "swarm" of ant-like robots.

With a swarm of 1,024 robots inspired by the design of ant colonies, Radhika Nagpal and her colleagues at Harvard's SSR research group have redefined expectations for self-organizing robotic systems. Guided by algorithms, Nagpal's shockingly simple robots guide themselves into a variety of shapes -- an ability that, brought to scale, might lead to applications like disaster rescue, space exploration and beyond.

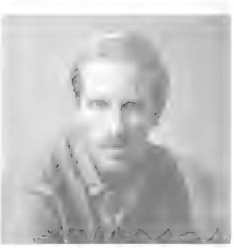
In addition to her work with biologically inspired robots, Nagpal helped create ROOT, a simple robot to teach coding to would-be programmers through a simple user interface suitable for students of all ages.

radhikanagpal.org eecs.harvard.edu/ssr

Tuesday, April 25, 11:00AM - 12:45PM PDT

Session 3: The Human Response

Hosted by Chris Anderson and Kelly Stoetzel.



Rutger Bregman

Historian

Rutger Bregman is the author of the new "Utopia for Realists."

Rutger Bregman is one of Europe's most prominent young thinkers. The 28-year-old historian and author has published four books on history, philosophy and economics. His *History of Progress* was awarded the Belgian Liberales prize for best nonfiction book of 2013. The Dutch edition of *Utopia for Realists* became a national bestseller and will be translated in 16 languages this year. Bregman has twice been nominated for the prestigious European Press Prize for his journalism work at *The Correspondent*. His work has been featured in The *Washington Post* and *The Guardian* and on the BBC.

rutgerbregman.com @rcbregman

Martin Ford

Futurist

Martin Ford imagines what the accelerating progress in robotics and artificial intelligence may mean for the economy, job market and society of the future.

Martin Ford was one of the first analysts to write compellingly about the future of work and economies in the face of the growing automation of everything. He sketches a future that's radically reshaped not just by robots but by the loss of the income-distributing power of human jobs. How will our economic systems need to adapt?

He's the author of two books: *Rise of the Robots: Technology and the Threat of a Jobless Future* (winner of the 2015 Financial Times/McKinsey Business Book of the Year Award) and *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*, and he s the founder of a Silicon Valley-based software development firm. He has written about future technology and its implications for the *New York Times, Fortune, Forbes, The Atlantic, The Washington Post, Harvard Business Review* and *The Financial Times*.

mfordfuture.com @MFordFuture

Jack Conte

Musician, entrepreneur

With his membership platform Patreon, YouTube star Jack Conte may have solved a perennial problem of content creators -- getting paid for digital media.

As a solo artist and member of folk-rock duo Pomplamoose, Jack Conte garnered millions of views for his offbeat "video songs," including his breakout hit "Yeah Yeah Yeah" and "Pedals," a robotic tour-de-force with a set that duplicates the cockpit of the Millennium Falcon.

Despite his success, Conte noted the disconnect between page views and revenue, and realized that if you're a widely viewed artist and you aren't making money, "that's not your fault -- it's technology's fault." His solution is Patreon: a membership platform built on recurring payments from patrons to support creatives with ongoing projects.

patreon.com/jackconte @jackconte

Sara DeWitt

Children's media expert

Like Mister Rogers before her, Sara DeWitt strives to make every child feel special by charting the forefront of new digital mediums where kids spend their time.

Sara DeWitt's vision seems simple: make each digital interaction an opportunity to learn and delight in new discoveries. How does that vision come to light as kids access technology at younger ages than ever before?

Over the past 18 years, DeWitt has worked at the forefront of new platforms in an effort to be everywhere kids are -- now she's at PBS Kids Digital, building award-winning sites, games and apps. As more media outlets try to capture the interest of our youngest audiences, her research on how digital spaces affect skills and social emotional development in kids is more relevant than ever.

pbskids.org @saradewitt

Ray Dalio

Hedge fund chair

Ray Dalio is the founder, chair and co-chief investment officer of Bridgewater Associates, a global leader in institutional portfolio management and the largest hedge fund in the world.

Dalio started Bridgewater out of his two-bedroom apartment in New York City in 1975 and has grown it into the fifth most important private company in the U.S. (according to *Fortune* magazine). Because of the firm's many industry-changing innovations over its 40-year history, he has been called the "Steve Jobs of investing" by *aiCIO* magazine and named one of *TIME* magazine's "100 Most Influential People."

Dalio attributes Bridgewater's success to its unique culture. He describes it as "a believability-weighted idea meritocracy" in which the people strive for "meaningful work and meaningful relationships through radical truth and radical transparency." He has explained this approach in his book *Principles*, which has been downloaded more than three million times and has produced considerable curiosity and controversy.

bridgewater.com principles.com

Anthony D. Romero

Attorney, public-interest activist

Anthony D. Romero is the executive director of the American Civil Liberties Union (ACLU).

The ACLU is dedicated to defending liberty and individual freedom in the US -- which is an interesting mandate to have right now. Anthony Romero has headed the organization since 2001, focusing on building capacity in order to defend the laws that protect Americans' freedoms.

Under Romero's watch, the ACLU launched its national "Keep America Safe and Free' campaign to protect basic freedoms during a time of crisis; launched its unique legal challenge to the patents held by a private company on the human genes associated with breast and ovarian cancer; launched litigation and lobbying efforts to win the freedom to marry for same-sex couples; and filed the first lawsuit against President Trump's Muslim Ban.

aclu.org

T. Morgan Dixon

Health activist

T. Morgan Dixon is the co-founder and CEO of GirlTrek, inspiring nearly 100,000 neighborhood walkers.

T. Morgan Dixon co-leads GirlTrek, the largest public health nonprofit for African-American women and girls in the United States. GirlTrek encourages women to use walking as a practical first step to inspire healthy living, families and communities and knits local advocacy together to lead a civil rights-inspired health movement that seeks to eliminate barriers to physical activity, improve access to safe places to walk, protect and reclaim green spaces and improve the walkability and built environments of 50 high-need communities across the United States.

Prior to GirlTrek, Dixon was on the front lines of education reform. She served as Director of Leadership Development for one of the largest charter school networks in the country, Achievement First, and directed the start-up of six public schools in New York City for St. Hope and the Urban Assembly, two organizations funded by the Bill & Melinda Gates Foundation. As the leader of GirlTrek, Morgan received fellowships from Echoing Green (2013), Ashoka (2014) and The Aspen Institute (2015).

girltrek.org @GirlTrek

Vanessa Garrison

Health activist

As COO of GirlTrek, Vanessa Garrison encourages African American women and girls to get out and take a walk.

Vanessa Garrison is the co-founder and COO of GirlTrek, the largest public health nonprofit for African-American women and girls in the United States. With nearly 100,000 neighborhood walkers, GirlTrek encourages women to use walking as a practical first step to inspire healthy living, families and communities.

Working with partners, GirlTrek has developed a world-class training for African-American women to serve as health professionals in the areas of fitness, mental health, nutrition, and environmental stewardship. Prior to GirlTrek, Garrison worked as a Program Coordinator for Our Place DC, a nonprofit organization that provides services to currently and formerly incarcerated women. In her work with GirlTrek, she's received fellowships from Echoing Green and The Aspen Institute and been named "Health Hero" by Essence Magazine.

girltrek.org @GirlTrek

Tuesday, April 25, 2:15PM - 4:00PM PDT

TED en Español: Conexión y Sentido

Hosted by Gerry Garbulsky, TED en Español showcases powerful ideas in Spanish. Join us in the Community Theater. (English translation will be available.)

Gabriela González

Astrophysicist

Gabriela González is part of the collaboration of more than 1,000 scientists who measured for the first time the gravitational waves that Einstein predicted over 100 years ago.

Over 100 years after Albert Einstein predicted gravitational waves -- ripples in space-time caused by violent cosmic collision, like the merging of two black holes -- the LIGO Scientific Collaboration confirmed their existence using large, hyper-sensitive detectors in different parts of the world. As LIGO's former spokesperson and the person responsible for the collaboration of 90 international scientific institutions that the project entailed, Argentine astrophysicist Gabriela González announced the extraordinary discovery to the world in 2016.

A relentless curiosity about the universe led González to astrophysics as a teenager. Over the course of her 25-year career, she has advanced the field of gravitational wave detection, working on both improving the sensitivity of interferometers and data analysis. She is the recipient of the E. Bouchet and the Jesse W. Beams awards from the American Physical Society, the B. Rossi prize from the American Astronomical Society, and the 2016 Scientific Discovery Award from the US National Academy of Sciences. She was the first woman to receive a full professorship in the physics department at Louisiana State University.

phys.lsu.edu/faculty/gonzalez

Jorge Drexler

Musician, poet

Jorge Drexler is a musician and the first Uruguayan to win an Oscar. His music plays with genre and influence, combining subtle harmonies and regional styles with electronic effects.

Jorge Drexler doesn't lay claim to one identity over another. Born to a German-Jewish exile, Drexler grew up between Uruguay and Israel, traveled widely across Latin America, and eventually settled in Spain. Within his music, you can hear touches of milonga and bossa nova and even Bach, as his lyrics wrangle with notions of nationality and belonging, language, identity and love.

Like both of his parents, Drexler started his career as a physician, but at the age of 30, he decided to pursue music full-time. The release of his fifth album, Frontera, caught the attention of Brazilian director Walter Salles, who tapped him to write the closing song for the 2004 film *Motorcycle Diaries*. Titled "Al Otro Lado del Río" (The Other Side of the River), the song won Drexler an Academy Award for Best Original Song and propelled him into the international spotlight.

Over the course of his 25-year career, Jorge Drexler has produced 12 albums, received 15 Latin Grammy nomination (with two wins in 2014 Record of the Year and Best Singer-Songwriter Album), four US Grammy nominations, 5 ASCAP Latin Awards, and one Academy Award. He has also collaborated with musicians from Shakira to Mercedes Sosa to Neneh Cherry and Jovanotti.

jorgedrexler.com @drexlerjorge

Jorge Ramos

Journalist, news anchor

Jorge Ramos is a journalist and a news anchor. His work covers the issues that affect the 55 million Latinos in the United States and immigrants all over the world.

Jorge Ramos immigrated to the United States from Mexico City, on a student visa at the age of 24. What started as a street beat for a local Spanish-language broadcast in Los Angeles in the 1980s has evolved into a career of remarkable distinction and credibility. Today, Ramos co-anchors Univision's flagship Spanish-language broadcast, "Noticiero Univisión," writes a nationally syndicated column, hosts the Sunday Morning show "Al Punto" and now, the English language program, "America with Jorge Ramos." He is the winner of eight Emmys and the author of eleven books, including *Take a Stand: Lessons from Rebels*, 2016; *A Country for All: An Immigrant Manifesto*; and *Dying to Cross. The Worst Immigrant Tragedy in American History*.

In the absence of political representation in the United States, Jorge Ramos gives a face and voice to the millions of Latinos and immigrants living in the United States. He uses his platform to promote open borders and immigrants' rights and demands accountability from the world leaders he interviews. Nearly 1.9 million viewers tune into his program each night, and in 2015, Time named him one of "The World s 100 Most Influential People."

jorgeramos.com @jorgeramosnews

Isabel Behncke Izquierdo

Primatologist

Isabel Behncke Izquierdo studies the social behavior of primates and the birth of human cultures.

TED Fellow Isabel Behncke Izquierdo writes: I was born and raised in Chile, and was educated in animal behaviour and evolutionary anthropology in Cambridge and Oxford. For my PhD work, I study the social behaviour (and play behaviour in particular) of wild bonobos in DR Congo.

Bonobos are, together with chimpanzees, our living closest relatives; however we know very little about them -- mostly through captive work. In Wamba, a most remote jungle location, I have observed unique aspects of bonobo lives (from imaginary play and laughter to inter-group encounters to accidents and death) that challenge and illuminate our understanding of human evolution. I aim to link the play of adult bonobos to insights on human laughter, joy, creativity and our capacity for wonder and exploration.

Tomás Saraceno

Artist

Tomás Saraceno is an artist who invites us to consider the impossible, like spiders that play music or cities in the sky.

Tomás Saraceno's soaring artworks inspire human dreams and point to a world free of our earth-bound afflictions, whether by suspending its viewers in webs high above gallery floors or by casting solar powered baloons adrift in the stratosphere -- or turning spiders into music-makers.

Part art project and science experiment, his latest work *Aerocene* bypasses the museum in favor of an unprecedented airborne journey. Using only the heat of the sun and wind for its locomotion, *Aerocene* not only shattered solar-powered flight records but also invites others to hack its open-source, interactive design and model its flight behavior.

tomassaraceno.com @tomassaraceno

Ingrid Betancourt

Writer, peace advocate

Ingrid Betancourt was a presidential candidate in Colombia in 2002 when she was kidnapped by guerilla rebels. After six years in captivity and a high-profile rescue, she now writes about what she learned about fear, forgiveness and the divine.

In 2002, the Colombian rural guerilla movement known as the FARC (Revolutionary Armed Forces of Colombia) kidnapped Ingrid Betancourt in the middle of her presidential campaign. For the next six years, Betancourt was held hostage in jungle prison camps where she was ravaged by malaria, fleas, hunger, and human cruelty until her high-profile rescue by the Colombian government in 2008.

But Betancourt's captivity did not diminish her sensitivity to the world. Since her release, the would-be president has become a memoirist and fiction writer. Her first book, *Even Silence Has Its End*, which lyrically recounts her six years in the impenetrable jungle, was published in 2010. In 2016, she published a second work -- this time of fiction -- called *The Blue Line*, about the disappearances in Argentina during the Dirty War from 1976 to 1983.

Betancourt has received multiple international awards for her commitment to democratic values, freedom and tolerance, including the French National Order of the Légion d'Honneur, the Spanish Prince of Asturias Prize of Concord, and the Italian Prize Grinzane Cavour.

She remains a vocal proponent of peace negotiations between the Colombian government and the FARC.

Tuesday, April 25, 5:00PM - 7:00PM PDT

Session 4: Health, Life, Love

Hosted by Chris Anderson, Anna Verghese and Bruno Giussani.
Not attending TED2017? Watch Session 4 – TED Prize – broadcast to cinemas! Find showtimes

Serena Williams

Athlete

With her legendary spirit and unstoppable serve, tennis legend Serena Williams has become one of the world's most enduring athletic superstars.

Serena Williams sits at the top of the tennis world; she's won 23 career Grand Slams, which is the most Grand Slam singles titles in history, with her most recent win at the 2017 Australian Open. In some analysts' eyes, she's quite simply the greatest athlete of all time.

But Williams has extended her influence far beyond the tennis court. Through her activism, high-profile endorsements, TV and film appearances and writing (including a guide to life written with her sister, Venus), Williams inspires millions of fans worldwide.

serenawilliams.com @serenawilliams on Instagram

Gayle King

Journalist

Gayle King is a co-host of "CBS This Morning" and Editor-at-Large of the award-winning O, the Oprah Magazine.

An award winning journalist who has worked across television, radio and print, Gayle King is a co host of *CBS This Morning* and Editor at-Large of *O, the Oprah Magazine*.

King previously hosted *The Gayle King Show*, a live, weekday television interview program on OWN: The Oprah Winfrey Network. The program, which featured a discussion of a broad variety of topics that include politics, cultural developments, was also broadcast on XM Satellite Radio, where it premiered in 2006.

Before moving into print and radio, King worked for 18 years (1982–2000) as a television news anchor for CBS affiliate WFSB-TV in Hartford, Conn., during which period, she also hosted her own syndicated daytime program. Prior to joining WFSB, King worked at several other television stations, including WDAF-TV in Kansas City, Mo. (1978-1981), WJZ-TV in Baltimore, Md. (1976), and WTOP-TV in Washington, D.C. (1975).

King has received numerous awards for her extensive work as a journalist. In addition to three Emmys, she was honored in 2008 with the American Women in Radio & Television Gracie Award for Outstanding Radio Talk Show and in 2010 with both the Individual Achievement Award for Host-Entertainment/Information and the New York Women in Communications' Matrix Award.

cbsnews.com/cbs-this-morning @GayleKing

Atul Gawande

Surgeon, journalist

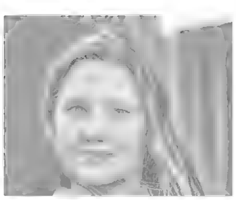
Surgeon by day and public health journalist by night, Atul Gawande explores how doctors can dramatically improve their practice using something as simple as a checklist.

Atul Gawande is author of several best selling books, including *Complications: A Surgeon's Notes on an Imperfect Science*, *Better: A Surgeon's Notes on Performance*, *Being Mortal: Medicine and What Matters in the End* and *The Checklist Manifesto*.

He is also a surgeon at Brigham and Women's Hospital in Boston, a staff writer for *The New Yorker* and a professor at Harvard Medical School and the Harvard School of Public Health. He has won the Lewis Thomas Prize for Writing about Science, a MacArthur Fellowship and two National Magazine Awards. In his work in public health, he is Executive Director of Ariadne Labs, a joint center for health systems innovation and chair of Lifebox, a nonprofit organization making surgery safer globally.

Photo: Aubrey Calo

atulgawande.com ariadnelabs.org

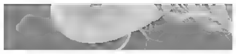


Anna Rosling Rönnlund

Co-founder of Gapminder

Anna Rosling Rönnlund's personal mission: to make it easy for anyone to understand the world visually.

Always with the end consumer at heart, Anna Rosling Rönnlund spends her days making sure everything at Gapminder -- a site she cofounded with Hans and Ola Rosling -- is easy to use and easy to understand. On Gapminder, users can explore data and statistics about the world -- and, just maybe, upend their worldview.



Passionate about the visual side of data, she invented the project Dollar Street, where she uses photos as data to examine stereotypes about countries, incomes and families around the world -- like, for instancee the wide range of things that people use as toothbrushes.

gapminder.org

The Surprise Guest

World figure

A world figure whose identity we can't yet reveal.

Jon Boogz

Movement artist

Jon Boogz is a movement artist, choreographer, and director who seeks to push the evolution of what dance can be.

As a dancer and creator, Jon Boogz seeks to share with audiences of all backgrounds an appreciation of the melding of art forms while inspiring and bringing awareness to social issues. Boogz recently wrote, choreographed, directed and danced in *Color of Reality*, a short film in collaboration with visual artist Alexa Meade and fellow dancer Lil Buck.

First motivated to dance by the work of Michael Jackson, Boogz has choreographed for icons including Mikhail Baryshnikov, Naomi Campbell, Gloria Estefan; for Pharrell's Adidas Originals campaign to creative direct, choreograph, and perform in Movement Art Is: Standing Rock at ComplexCon; and as creative consultant for ads launching campaigns for Apple and Lexus. Boogz's collaborators include TriBeCa Film Festival, DAIS, Lil Buck, and Flying Lotus; his choreography is used in FOX's *So You Think You Can Dance* and Cirque du Soleil's *MJ ONE*; and he was featured at the Geffen Playhouse's "Backstage at the Geffen" with his dance company Control Freakz, Lil Buck, and spoken-word artist Robin Sanders to honor Morgan Freeman and Jeff Skoll.

jonboogz.com @jonboogz

Lil Buck

Dancer, choreographer, educator

A viral video star known for his gravity-defying, elegant street dance moves, Lil Buck is a fertile collaborator across disciplines and media.

International phenomenon Lil Buck began jookin' -- a street dance that originated in Memphis -- at age 13 alongside mentors Marico Flake and Daniel Price. After receiving early hip hop training from Teran Garry and ballet training on scholarship at the New Ballet Ensemble, he performed and choreographed until relocating to Los Angeles in 2009.

Named one of *Dance Magazine*'s "25 to Watch,' his collaboration with Spike Jonze and Yo-Yo Ma performing *The Swan* went viral in 2011. Since then, he has collaborated with a broad spectrum of artists including JR, Damian Woetzel, the New York City Ballet, Madonna, Benjamin Millepied and Spike Lee. Buck is an avid arts education advocate, a recipient of the WSJ Innovator Award and recently launched a capsule collection with Versace.

youtube.com/user/LILBUCKDALEGEND https://twitter.com/lilbuckdalegend

Raj Panjabi

Physician

A billion people around the world lack access to health care because they live too far from a clinic. Through Last Mile Health, 2017 TED Prize winner Raj Panjabi aims to extend health services to all -- by training members of the community.

Raj Panjabi was nine years old when civil war broke out in his native country of Liberia. His family fled, eventually resettling in High Point, North Carolina. Raj dreamed of going to medical school and, as a student in 2005, he returned to Liberia. He was shocked to find a health care system in total devastation. Only 50 doctors remained to treat a population of four million.

With a small team of Liberian civil war survivors, American health workers and $6,000 he'd received as a wedding gift, Panjabi co-founded Last Mile Health in 2007. Initially focused on care for HIV patients, Last Mile Health has grown into a robust organization that partners with the government of Liberia to recruit, train, equip and employ community health care workers who provide a wide range of services to their neighbors in Liberia's most remote regions. In 2016, Last Mile Health workers treated 50,000 patients, including nearly 22,000 cases of malaria, pneumonia and diarrhea in children. While the organization focuses on integrated primary care, its network can be leveraged in a crisis. In the fight against Ebola, Last Mile Health supported government response by training 1,300 health workers in southeastern Liberia.

Panjabi is a physician in the Division of Global Health Equity at Harvard Medical School, Brigham and Women's Hospital and an advisor to the Clinton Global Initiative. He was ranked as one of "The World's 50 Greatest Leaders" by *Fortune* in 2015 and named to *TIME*'s list of the "100 Most Influential People in the World" in 2016. As the winner of the 2017 TED Prize, he has a bold wish to take his work even further.

Wednesday, April 26, 8:30AM - 10:15AM PDT

Session 5: Mind, Meaning

Hosted by Helen Walters.

Michael Patrick Lynch

Philosopher

Michael Patrick Lynch examines truth, democracy, public discourse and the ethics of technology in the age of big data.

Michael Patrick Lynch is a writer and professor of philosophy at the University of Connecticut, where he directs the Humanities Institute. His work concerns truth, democracy, public discourse and the ethics of technology. Lynch is the author or editor of seven books, including *The Internet of Us: Knowing More and Understanding Less in the Age of Big Data*, *In Praise of Reason: Why Rationality Matters for Democracy*, *Truth as One and Many* and the New York Times Sunday Book Review Editor's pick, *True to Life*.

The recipient of the Medal for Research Excellence from the University of Connecticut's College of Liberal Arts and Sciences, he is The Principal Investigator for Humility & Conviction in Public Life, a $7 million project aimed at understanding and encouraging meaningful public discourse funded by the John Templeton Foundation and the University of Connecticut. He's a frequent contributor to the New York Times "The Stone" blog.

michael-lynch.philosophy.uconn.edu

Dan Ariely

Behavioral economist

The dismal science of economics is not as firmly grounded in actual behavior as was once supposed. In "Predictably Irrational," Dan Ariely told us why.

Dan Ariely is a professor of psychology and behavioral economics at Duke University and a founding member of the Center for Advanced Hindsight. He is the author of the bestsellers *Predictably Irrational*, *The Upside of Irrationality*, and *The Honest Truth About Dishonesty* -- as well as the TED Book *Payoff: The Hidden Logic that Shapes Our Motivations*.

Through his research and his (often amusing and unorthodox) experiments, he questions the forces that influence human behavior and the irrational ways in which we often all behave.

predictablyirrational.com @danariely

Mariano Sigman

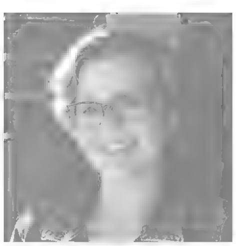
Neuroscientist

In his provocative, mind-bending book "The Secret Life of the Mind," neurologist Mariano Sigman reveals his life's work exploring the inner workings of the human brain.

Mariano Sigman, a physicist by training, is a leading figure in the cognitive neuroscience of learning and decision making. He is the founder of the Integrative Neuroscience Laboratory at the University of Buenos Aires. Sigman was awarded a Human Frontiers Career Development Award, the National Prize of Physics, the Young Investigator Prize of "College de France," the IBM Scalable Data Analytics Award and is a scholar of the James S. McDonnell Foundation. In 2016 he was made a Laureate of the Pontifical Academy of Sciences.

In *The Secret Life of the Mind*, Sigman's ambition is to explain the mind so that we can understand ourselves and others more deeply. He shows how we form ideas during our first days of life, how we give shape to our fundamental decisions, how we dream and imagine, why we feel certain emotions, how the brain transforms and how who we are changes with it. Spanning biology, physics, mathematics, psychology, anthropology, linguistics, philosophy and medicine, as well as gastronomy, magic, music, chess, literature and art, The Secret Life of the Mind revolutionizes how neuroscience serves us in our lives, revealing how the infinity of neurons inside our brains manufacture how we perceive, reason, feel, dream and communicate.

neuro.org.ar @mariuchu



Anika Paulson

Student, musician

Anika Paulson's love for music permeates her understanding of herself, her surroundings and the mysteries that make up the smallest and biggest parts of life.

Whether it's the long trek between high school classes or the exploration of self identity in college, Anika Paulson's escape is always music. A self-proclaimed nervous Minnesotan, music is the measure of her life's tempo. There's no doubt that whatever Paulson decides to do, she will use the power and metaphor of music to guide her future. After all, according to Paulson, whether it's friendships or string theory, everything is music.

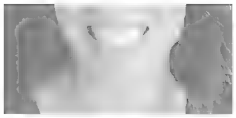
Recently, Paulson completed a TED-Ed Club and was one of 20 students selected to speak at TED-Ed Weekend 2016 at TED's headquarters in New York City.

@_annikap

Lisa Genova

Neuroscientist, novelist

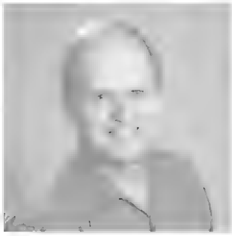
Through her fiction, Lisa Genova beckons us into the lives of people with neurological disease, making their worlds real and relatable.



Lisa Genova wields her ability to tell a story and her knowledge of the human brain to talk about medical conditions like Alzheimer's in warmly human terms. Her writing, often focusing on those who are misunderstood, explores the lives of people living with neurological diseases and disorders. A bestselling author, her work has been transformed into an Oscar-winning film, *Still Alice*, but the real triumph is Genova's ability to help us empathize with a person's journey we otherwise couldn't even begin to understand.

Her newest book, *Inside the O'Briens*, is about Huntington's disease.

lisagenova.com @LisaGenova



Robin Hanson

Economist, social scientist

Does humanity have a future as uploaded minds? In his work, Robin Hanson asks this and other extra-large questions.

In his book, *The Age of Em: Work, Love and Life When Robots Rule the Earth*, Robin Hanson re-imagines humanity's role as our tech becomes smarter. A pioneer in prediction markets, also known as information markets and idea futures, Hanson has been known since the 1980s for taking the very very long view on topics as varied as (a selected list) spatial product competition, health incentive contracts, group insurance, product bans, evolutionary psychology and bioethics of health care, voter information incentives, incentives to fake expertise, Bayesian classification, agreeing to disagree, self-deception in disagreement, probability elicitation, wiretaps, image reconstruction, the history of science prizes, reversible computation, the origin of life, the survival of humanity, very long term economic growth, growth given machine intelligence, and interstellar colonization.

Meanwhile, he has developed new technologies for conditional, combinatorial, and intermediated trading, and studied insider trading, manipulation and other foul play. Hanson is associate professor of economics at George Mason University, and a research associate at the Future of Humanity Institute of Oxford University. His next book is *The Elephant in the Brain*, co-authored with Kevin Simler, due in 2018.

overcomingbias.com @robinhanson

Anil Seth

Cognitive scientist

How can the "inner universe" of consciousness be explained in terms of mere biology and physics? Cognitive neuroscientist Anil Seth explores the brain basis of consciousness and self.

In his groundbreaking research, Anil Seth seeks to understand consciousness in health and in disease. As founding co-director of the University of Sussex's Sackler Centre for Consciousness Science, his research bridges neuroscience, mathematics, artificial intelligence, computer science, psychology, philosophy and psychiatry. He has also worked extensively with playwrights, dancers and other artists to shape a truly humanistic view of consciousness and self.

Seth is the editor and co-author of the best-selling *30 Second Brain*, a collection of brief and engaging neuroscience vignettes. His forthcoming book *The Presence Chamber* develops his unique theories of conscious selfhood within the rich historical context of the mind and brain sciences.

anilseth.com @anilkseth

Wednesday, April 26, 11:00AM - 12:45PM PDT

Session 6: Planet, Protection

Hosted by Chris Anderson.

Kristin Poinar

Glaciologist

Kristin Poinar uses remote sensing and numerical models to study the interaction of meltwater with ice flow, especially on the Greenland Ice Sheet.

Hidden under many meters of ice, a pool of meltwater lies under the Greenland Ice Sheet. Kristin Poinar studies how the meltwater forms and flows in this dynamic glacial system. She asks: How did this water get there, and where does it go? How much water is in there? And how is climate change affecting this system?

Using data from Operation IceBridge flights and from field instruments, she's building a numerical model of how crevasses form and channel water. In fact, a NASA report released in February 2017 revealed a new pathway her team discovered for meltwater to reach the ocean. Using physically based models to constrain the bounds of what is realistic has shaped Poinar's interest in glaciology.

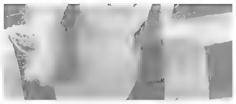
http://science.gsfc.nasa.gov/sed/bio/kristin.poinar @crevassse

Kate Marvel

Climate scientist

Climate scientist Kate Marvel looks at the big picture of environmental change.

Kate Marvel is a scientist at Columbia University and the NASA Goddard Institute of Space studies. She uses computer models and



satellite observations to monitor and explain the changes happening around us. Her work has suggested that human activities are already affecting global rainfall and cloud patterns. Marvel is committed to sharing the joy and beauty of science with wider audiences.

She has advised journalists, artists and policymakers, written a popular science blog and given frequent public talks. Her writing has appeared in *Nautilus Magazine*.

marvelclimate.com @DrKateMarvel

Danny Hillis

Computer theorist

Inventor, scientist, author, engineer -- over his broad career, Danny Hillis has turned his ever-searching brain on an array of subjects, with surprising results.

Danny Hillis is an inventor, scientist, author and engineer. While completing his doctorate at MIT, he pioneered the concept of parallel computers that is now the basis for most supercomputers, as well as the RAID array. He holds over 100 US patents, covering parallel computers, disk arrays, forgery prevention methods and various electronic and mechanical devices, and he has recently been working on problems in medicine as well. He is also the designer of a 10,000 year mechanical clock, and he gave a TED Talk in 1994 that is practically prophetic. Throughout his career, Hillis has worked at places like Disney and now Applied Minds, always looking for the next fascinating problem.

appliedminds.com

Tim Kruger

Geoengineering researcher

Tim Kruger researches geoengineering: techniques to counteract climate change by deliberate, large-scale intervention in the earth system, by reflecting sunlight back into space or by reducing the level of carbon dioxide in the atmosphere.

While our first priority should be to reduce global carbon emissions, research into geoengineering could prove vital in the fight to protect our planet. At the Oxford Geoengineering Programme, Tim Kruger aims to assess the range of proposed geoengineering techniques to determine which, if any, could be both technically feasible and benign environmentally, socially and ethically.

Kruger, an Oxford Martin Fellow, is a co-author of the Oxford Principles, a draft code of conduct for geoengineering. It calls for geoengineering to be regulated as a public good, for public participation in decision-making and for disclosure of research and open publication of results. He is involved in developing a process that uses natural gas to generate electricity in a way that removes carbon dioxide from the atmosphere.

geoengineering.ox.ac.uk linkedin.com

Daan Roosegaarde

Artist

With his futuristic artworks, Daan Roosegaarde illuminates the intersection of technology, humanity and our urban environments.

Daan Roosegaarde builds jaw-dropping artworks that redefine humanity's relationship to city spaces. Along with his team at Studio Roosegaarde, Roosegaarde is devoted to "Landscapes of the Future," city prototypes and urban adornments that fuse aesthetics with sustainability.

From Smog Free Project in Beijing -- a tower that purifies its surrounding atmosphere and harvests pollutants to preserve as jewelry -- to an interactive dance floor that generates electricity from dancers, Roosegaarde's designs revolutionize the role of technology in the built environment.

studioroosegaarde.net @SRoosegaarde

Peter Calthorpe

Urban designer

Through his writing and his realized projects, Peter Calthorpe has spread the vision of New Urbanism, a framework for creating sustainable, human-scaled places.

Peter Calthorpe's 30-year design practice is informed by the idea that successful places -- whether neighborhoods, towns, urban districts or metropolitan regions -- must be diverse in uses and users, must be scaled to the pedestrian and human interaction, and must be environmentally sustainable.

In the early 1990s he developed the concept of Transit Oriented Development (described in his book *The Next American Metropolis: Ecology, Community and the American Dream*) -- an idea that is now the foundation of many regional policies and city plans around the world. His 2010 book is *Urbanism in the Age of Climate Change*. Calthorpe Associates' work in Europe, Asia and the Middle East has demonstrated that community design with a focus on sustainability and scale can be adapted throughout the globe. His current work throughout China is focused on developing standards and examples of Low Carbon Cities in Beijing, Chongqing, Kunming, Zhuhai, Jinan and other major cities.

calthorpe.com

David Titley

Meteorologist

Scientists and retired Navy officer Dr. David Titley asks a big question: Could the US military play a role in combating climate change?

David Titley is a Professor of Practice in Meteorology and a Professor of International Affairs at the Pennsylvania State University. He is the founding director of Penn State's Center for Solutions to Weather and Climate Risk. He served as a naval officer for 32 years and rose to the rank of Rear Admiral. Titley's career included duties as commander of the Naval Meteorology and Oceanography Command; oceanographer and navigator of the Navy; and deputy assistant chief of naval operations for information dominance. He also served as senior military assistant for the director, Office of Net Assessment in the Office of the Secretary of Defense.

While serving in the Pentagon, Titley initiated and led the U.S. Navy's Task Force on Climate Change. After retiring from the Navy, Titley served as the Deputy Undersecretary of Commerce for Operations, the chief operating officer position at the National Oceanic and Atmospheric Administration. Titley serves on numerous advisory boards and National Academies of Science committees, including the CNA Military Advisory Board, the Center for Climate and Security and the Science and Security Board of the Bulletin of the Atomic Scientists. Titley is a fellow of the American Meteorological Society. He was awarded an honorary doctorate from the University of Alaska, Fairbanks.

solutions2wxrisk.psu.edu @dwtitley

Ted Halstead

Policy entrepreneur, climate expert, author

Ted Halstead is breathing new life into US climate policy by mobilizing conservative leaders and CEOs around a breakthrough carbon dividends solution.

When not writing or sailing around the world, Ted Halstead launches cutting-edge think tanks. His first, founded when he was 25, introduced new measures of progress and coordinated the Economists' Statement on Climate Change, signed by 18 Nobel laureate economists. His second, New America, has become one of the most influential think tanks in Washington.

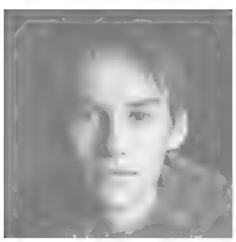
Halstead's newest creation, the Climate Leadership Council, is transforming climate policy and politics by advancing a more effective, popular and equitable climate solution, based on the conservative principles of free markets and limited government. He has published numerous articles in the *New York Times*, *Washington Post*, *Financial Times*, *Fortune*, *Atlantic*, *National Review*, *Los Angeles Times* and *Harvard Business Review*. He has also published two books, including *The Radical Center: The Future of American Politics* (co-authored with Michael Lind).

clcouncil.org @ImTedHalstead

Wednesday, April 26, 5:00PM - 7:00PM PDT

Session 7: Connection, Community

Hosted by Kelly Stoetzel and Bruno Giussani.



Jacob Collier

Musician and artist

Jacob Collier is a one-man audio-visual viral sensation. In his videos, he sings every part, plays every instrument and visualizes every component with a captivating vision.

Jacob Collier is nothing short of prodigious. A two-time Grammy-winning singer, arranger, composer, and multi-instrumentalist, he combines everything from jazz and a cappella to classical and Brazilian music. In 2014, he was discovered by the legendary producer Quincy Jone. Shortly after, Collier began working on his audio-visual live performance vehicle designed and built at MIT.

Since his first video in 2011, Collier has amassed more than 250K international followers and 10 million YouTube views, including on his astounding cover of Stevie Wonder's 'Don't You Worry 'Bout a Thing." In July 2016, Collier released his chart-topping debut album, *In My Room*. Most recently, he's been touring the world with his unique one-man show, helping to score the newest Dreamworks film, *The Boss Baby*, with Hans Zimmer, collaborating on Herbie Hancock's upcoming record and holding masterclasses at universities across the globe.

jacobcollier.co.uk @JCollierMusic

Anna Heringer

Architect

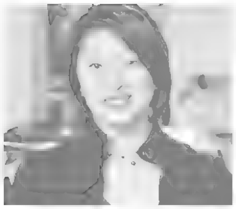
Anna Heringer's sustainable designs lend breathtaking forms to easily-available local materials while developing the skills and consciousness of their builders.

Before she became an architect, a visit to a small village in Bangladesh immediately hooked Anna Heringer on an ancient and yet neglected building material -- earth. With its easy availability, durability and endless recyclability, she realized, there was a reason its use has persisted for thousands of years

Since then, Heringer's love affair with sustainable materials has deepened, resulting in acclaimed projects like woven bamboo hostels in China and the METI Handmade School in Rudrapur, where, along with local workers and schoolchildren, she created a building that drew on locally abundant materials and fostered modern, sustainable building skills in local craftsmen. In the 2014 book, *The Future of Architecture*, she and her coauthors argue for a future that is low-impact and adaptable.

anna-heringer.com @AnnaHeringer

Grace Kim



Architect

Grace H. Kim is an internationally recognized expert in cohousing -- the art and craft of creating communities.

Grace H. Kim is an architect and co-founding principal of Schemata Workshop, an award-winning, 16-person architectural practice with a keen focus on building community and social equity. She brings innovative ideas to her projects that merge client goals and sustainability measures -- such as urban agriculture, modular construction, and a focus on building community.

Kim is also the founder of Capitol Hill Urban Cohousing, a collaborative residential community that includes her street-level office and a rooftop urban farm. She walks the talk of sustainability -- leaving a small ecological footprint while incorporating holistic ideals of social and economic resilience into her daily life.

schemataworkshop.com @GraceKimArch

Devita Davison

Food activist

At FoodLab Detroit, Devita Davison supports local entrepreneurs and imagines a new future for food justice.

Detroit is a legendary food town, and it's thanks to small, locally owned businesses that range from streetside barbecue tents to neighborhood bakeries, shops and delis -- even small farms. At FoodLab Detroit, Devita Davison helps locals with ideas for a food business to take their dreams into delicious reality, by connecting them with business advice, help with compliance and licensing, space in professional kitchens, marketing ideas and more. The nonprofit focuses on entrepreneurs and communities who have been traditionally under-resourced, aiming to build power and resilience for people around the city.

FoodLab's vision is to cultivate, connect and catalyze, to use food as an economic engine, to form a supportive community of entrepreneurs and to make good food a reality for all Detroiters.

On LinkedIn @devitadavison

Karoliina Korppoo

Game designer

Inspired by classic city simulation games, Finnish designer Karoliina Korppoo and her fellow game developers at Colossal Order are infusing a venerable gaming genre with fresh perspectives.

Developed by gaming upstarts Colossal Order and guided by Korppoo as lead designer, *Cities: Skylines* has become the gold standard for city simulation games -- an honor previously held by the genre-defining Sim City.

At the core of Colossal Order's rejuvenated game designs is their dedication to creating an accessible experience for all users, whether through ease of use or by allowing users to suggest their own modifications. As a result, Colossal Order doesn't shy away from game projects that touch on the problems of urbanization, gentrification or the possibilities of servicing a city with nothing but gravel roads.

colossalorder.fi @pelikaroliina

Cathy O'Neil

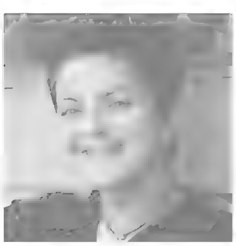
Mathematician, data scientist

Data skeptic Cathy O'Neil uncovers the dark secrets of big data, showing how our "objective" algorithms could in fact reinforce human bias

In 2008, as a hedge-fund quant, mathematician Cathy O'Neil saw firsthand how really really bad math could lead to financial disaster. Disillusioned, O'Neil became a data scientist and eventually joined Occupy Wall Street's Alternative Banking Group.

With her popular blog mathbabe.org, O'Neil emerged as an investigative journalist. Her acclaimed book *Weapons of Math Destruction* details how opaque, black-box algorithms rely on biased historical data to do everything from sentence defendants to hire workers. In 2017, O'Neil founded consulting firm ORCAA to audit algorithms for racial, gender and economic inequality.

mathbabe.org @mathbabedotorg



Luma Mufleh

Refugee activist

Luma Mufleh does something revolutionary: she coaches soccer. A Jordanian immigrant and Muslim of Syrian descent, Mufleh is determined to empower refugee children everywhere.

Luma Mufleh works with refugee children from war-torn countries, including Syria, Iraq, Burundi, Afghanistan, Somalia and Sudan. The CEO and Founding Director of Fugees Family, Inc., a nonprofit organization that empowers refugee children to successfully integrate into the United States, Mufleh started as a soccer coach. Her work grew into something much larger, however.

Now, she's part principal, part tutor, the head of the first accredited private school dedicated to refugee education in the country, which encompases a summer camp and a college prep program -- and she's building a community and support network that could be the national model the United States needs.

fugeesfamily.org @fugeesfamily

David Miliband

Refugee advocate

As president of the International Rescue Committee, David Miliband enlists his expert statesmanship in the fight against the greatest global refugee crisis since World War II.

As the son of refugees, David Miliband has first-hand experience with those fleeing conflict and disaster. In 2013, he abandoned a long political career to take the helm of the International Rescue Committee, an NGO committed to emergency and long-term assistance to refugees (and founded at the call of Albert Einstein in 1933).

As a former UK Secretary of State for Foreign Affairs, Miliband is no stranger to cross-border politics. He is a leading voice against recent anti-refugee and immigration measures in the US, where the IRC currently runs resettlement programs in 29 cities.

rescue.org @DMiliband

Thursday, April 27, 11:00AM - 12:45PM PDT

Session 8: Bugs and Bodies

Hosted by Chris Anderson.

Robert Sapolsky

Neuroscientist, primatologist, writer

Robert Sapolsky is one of the leading neuroscientists in the world, studying stress in primates (including humans).

We all have some measure of stress, and Robert Sapolsky explores its causes as well as its effects on our bodies (his lab was among the first to document the damage that stress can do to our hippocampus). In his research, he follows a population of wild baboons in Kenya, who experience stress very similarly to the way humans do. By measuring hormone levels and stress-related diseases in each primate, he determines their relative stress, looking for patterns in personality and social behavior that might contribute. These exercises have given Sapolsky amazing insight into all primate social behavior, including our own.

He has been called "one of the best scientist-writers of our time" by Oliver Sacks. Sapolsky has produced, in addition to numerous scientific papers, books for broader audiences, including *A Primate's Memoir: A Neuroscientist's Unconventional Life Among the Baboons*, *Why Zebras Don't Get Ulcers: Stress Disease and Coping*, and *The Trouble with Testosterone*.

profiles.stanford.edu/robert-sapolsky

Jun Wang

Genomics researcher

At his new institute/company, iCarbonX, Wang Jun aims to establish a big data platform for genomics.

In 1999, Wang Jun founded the Bioinformatics Department of Beijing Genomics Institute (BGI, now known as BGI Shenzhen), one of China's premier research facilities. Until July 2015, Wang led the institution of 5,000+ people engaged in studies of genomics and its informatics, including genome assembly, annotation, expression, comparative genomics, molecular evolution, transcriptional regulation, genome variation analysis, database construction as well as methodology development such as the sequence assembler and alignment tools. He also focuses on interpretation of the definition of "gene" by expression and conservation study. The Pig Genome Project was completed at BGI under his leadership, as well as the chicken genome variation map and the TreeFam in collaboration with the Sanger Institute. Recently, he and his group finished the first Asian diploid genome, the 1000 genome project, and many more projects.

In late 2015, Wang founded a new institute/company, iCarbonX, aiming to develop an artificial intelligence engine to interpret and mine genomic data and help people better manage their health and defeat disease.

Anne Madden

Microbial researcher

Whether brewing better beer or chronicling the lives of the microbes living in the dust under the couch, Dr. Anne Madden seeks to understand and utilize the microbial world around us.

Along with her colleagues in the Laboratory of Rob Dunn at North Carolina State University, Anne Madden studies ways that our dimly understood microbial neighbors can yield surprising discoveries. She's helped create one of the first single-culture sour beers, discovered a new fungus living inside wasp nests and cataloged the astonishing diversity of some of the microscopic and macroscopic life in our homes -- more than 600 species of arthropods in USA homes at last count.

In addition to her research work at North Carolina State University, Madden is Chief Strategist at the brewing yeast company Lachancea LLC and consults for a variety of industries from bee keeping companies to technology firms. Her work has been featured on numerous media platforms, including *National Geographic* and *Newsweek*.

anneamadden.com @anneamadden

David Brenner

Radiation scientist

David Brenner sees the good and the bad sides of radiation for health care, and his goal is to optimize radiation for situations where the benefits can be large and the risks small.

Radiation is very much a two-edged sword -- used in the right way it has revolutionized modern medicine -- such as through CT scans and as a cure for many cancers. But radiation used in the wrong way can be harmful. To maximize the benefits of the many different types of radiation, we need to understand exactly how they affect us -- from our DNA to the whole person.

Brenner directs the Center for Radiological Research at Columbia University Medical Center. He started his career in theoretical physics -- applying quantum mechanics to radiation therapy. While he has no doubt forgotten everything he knew about quantum mechanics, he has retained his love for applying hard-core physics concepts to solve biological problems. David has designed new "patient friendly" approaches for prostate cancer radiation therapy that are now in common use worldwide, and he is currently very excited about the prospects of beating pancreatic cancer with new types of radiation.

Over the past 6 years, Brenner has also been working towards a safe way to kill drug-resistant bacteria such as MRSA, as well as airborne viruses such as influenza, using a unique type of ultra-violet light.

columbia.edu/~djb3 @CRR_CUMC

Levon Biss

Photographer

With his "Microsculpture" series, Levon Biss photographs the incredible details of insects

Levon Biss is a British photographer who works across many genres, including reportage, sport and portraiture. His passion for nature and photography have come together to create *Microsculpture*. For the project, a unique photographic process composites thousands of images using multiple lighting setups to create the final insect portraits. Each specimen was mounted on an adapted microscope stage, allowing close control over the position of the specimen in front of the camera lens. Most insects were photographed in about 30 sections, each section lit differently with strobe lights to accentuate the microsculpture of that particular area of the body. Each insect portrait is created from more than 8,000 separate images. In between his insect projects, Biss continues to photograph humans.

levonbiss.com @LevonBissPhoto

Mehdi Ordikhani-Seyedlar

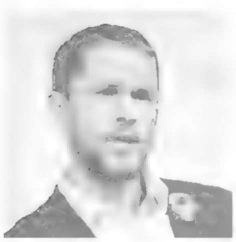
Neuroscientist

Mehdi Ordikhani-Seyedlar is a postdoc at Duke, researching brain signals and their usage in brain-machine interfaces.

Mehdi Ordikhani-Seyedlar began his research on the neuropharmacology of learning and memory when he was studying veterinary medicine in Tabriz, Iran. Subsequently studying in France and Germany, he researched human visual attention, then started his PhD thesis focusing on decoding electrophysiological features of covert and overt attention in humans. He spent 2014 as a visiting scholar at the Nicolelis Lab at Duke University.

With his 2016 PhD from the Technical University of Denmark in hand, Ordikhani-Seyedlar took a postdoctoral position at Duke to develop algorithms to process large-scale neuronal activity and brain-machine interfaces. He hopes to begin May 1.

@mehdi_ordikhani



Richard Browning

Founder, Gravity

Richard Browning is the founder of human propulsion technology startup Gravity, which has invented, built and patented an Iron Man–like personal flight system.

Richard Browning is an ultra-marathon runner, an ex-Royal Marine reservist, former City commodity trader and a pioneering inventor. He's the founder of Gravity, launched in March 2017 with a dream to reimagine an entirely new form of human flight, leaning on an elegant collaboration of mind and body augmented by leading-edge technology.

Gravity has to date been experienced by over a billion people globally with video views alone running at more than 60m within seven days of launch. Browning's vision is to build Gravity into a world-class aeronautical engineering business, challenge perceived boundaries in human aviation, and inspire a generation to dare ask 'what if…'

gravity.co

Elizabeth Blackburn

Molecular biologist

Elizabeth Blackburn won a Nobel Prize for her pioneering work on telomeres and telomerase, which may play central roles in how we age.

Dr. Blackburn is the president of the Salk Institute and a pioneering molecular biologist. She received the Nobel Prize in Physiology or Medicine in 2009 for discovering the molecular nature of telomeres, the ends of chromosomes that serve as protective caps essential for preserving genetic information, and for co-discovering telomerase, an enzyme that maintains telomere ends. Both telomeres and telomerase are thought to play central roles in aging and diseases such as cancer, and her work helped launch entire new fields of research in these areas.

In addition to the Nobel Prize, Blackburn has received nearly every major scientific award including the Lasker, Gruber, and Gairdner prizes. She has served as president of the American Association of Cancer Research and the American Society for Cell Biology, and on editorial boards of scientific journals including *Cell* and *Science*. She coauthored the best-selling book *The Telomere Effect: A Revolutionary Approach to Living Younger, Healthier, Longer.*

salk.edu

Thursday, April 27, 2:15PM - 4:00PM PDT

Session 9: It's Personal

Hosted by Kelly Stoetzel and Helen Walters.

Helen Pearson

Science journalist, editor, author

Helen Pearson's book, "The Life Project," tells the extraordinary story of the longest-running study of human development in the world.

In March 1946, scientists began tracking almost every British baby born in a single week. What they discovered would change how we are born, grow up, raise children, live and die. Helen Pearson's 2016 book, *The Life Project*, is the story of this incredible project and the remarkable discoveries that have come from it. It was named best science book of the year by *The Observer* and was a book of the year for *The Economist*.

As Chief Magazine Editor for the world's leading science journal, *Nature*, Pearson oversees all its journalism and opinion content. Her own stories have won accolades including the 2010 Wistar Institute Science Journalism Award and two best feature awards from the Association of British Science Writers.

nature.com @hcpearson

Susan Pinker

Psychologist, columnist, author

Susan Pinker reveals how in-person social interactions are not only necessary for human happiness but also could be a key to health and longevity.

In her award-winning book *The Sexual Paradox*, Susan Pinker argued that biological differences could play an unexpectedly large role in creating the workplace gender gap. With *The Village Effect*, she tracks another current: how social, face-to-face interactions are critical for the survival of our species, and how technology is isolating us from these life-saving bonds. As she writes: "Neglecting to keep in close contact with people who are important to you is at least as dangerous to your health as a pack-a-day cigarette habit, hypertension or obesity."

In addition to her books, Pinker writes Mind and Matter, a column for the *Wall Street Journal* illuminating surprising advances in human behavior research. Pinker's numerous writings (including her weekly columns "Problem Solving" and "The Business Brain") have appeared in the *Guardian*, the *New York Times* and *Financial Times*, among many others.

susanpinker.com

Adam Alter

Psychologist

What makes us incessantly check our phones? Adam Alter dives into the fascinating psychology that drives our tech addictions.

Adam Alter's academic research focuses on judgment, decision-making and social psychology, with a particular interest in the sometimes surprising effects of subtle cues in the environment on human cognition and behavior.

He is the bestselling author of two books: *Irresistible*, which considers why so many people today are addicted to so many behaviors, from incessant smart phone and internet use to video game playing and online shopping, and *Drunk Tank Pink*, which investigates how hidden forces in the world around us shape our thoughts, feelings and behaviors.

adamalterauthor.com @adamleealter

Jeffrey Schnapp

Cultural historian

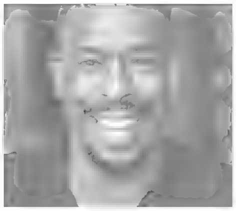
As the founder of metaLAB at Harvard, Jeffrey Schnapp thinks deeply on modern media, design, humanities and movement.

Jeffrey Schnapp is the founder/faculty director of metaLAB (at) Harvard and faculty co-director of the Berkman Klein Center for Internet and Society. Trained as a medievalist, his recent books and work concern the deeply modern, including *The Library Beyond the Book*, co-authored with Matthew Battles, on scenarios for libraries in the digital age, and *FuturPiaggio: Six Italian Lessons on Mobility and Modern Life*.

His pioneering work in media, design, digital arts and humanities as well as his curatorial practice includes collaborations with the Triennale di Milano, the Cantor Center for the Visual Arts, the Wolfsonian-FIU and the Canadian Center for Architecture. He is CEO and co-founder of Piaggio Fast Forward, developing imaginative solutions to the light mobility and transportation challenges.

jeffreyschnapp.com @jaytiesse

Chuck Nice



Comedian, science fan

The co-host of Star Talk Radio, Chuck Nice is a radio and TV veteran with a passion for science communication and comedy.

Chuck Nice is an 18-year veteran of stand-up comedy with a rich history in television and radio. Currently, he co-hosts *StarTalk* with Dr. Neil deGrasse Tyson on Nat Geo, and is the host of *Playing with Science*, a podcast he created under the StarTalk Radio umbrella. In addition, Chuck is the writer and producer of *Like A Damn Adult* for Newsy. He has also hosted his own shows, *Buy It Like a Mega Millionaire* and *Home Strange Home*, on HGTV, and co-hosted ABC's *The View*. His other familiar works include TRU TV's *World's Dumbest*, VH-1's *Best Week Ever*, and *Guys Tell All* on NBC's *Today*. Most weekends, he can be found on stage at one of New York's comedy clubs.

chucknicecomic.com @chucknicecomic

Guy Winch

Psychologist, author

Guy Winch asks us to take our emotional health as seriously as we take our physical health -- and explores how to heal from common heartaches.

Guy Winch is a licensed psychologist who works with individuals, couples and families. As an advocate for psychological health, he has spent the last two decades adapting the findings of scientific studies into tools his patients, readers and audience members can use to enhance and maintain their mental health. As an identical twin with a keen eye for any signs of favoritism, he believes we need to practice emotional hygiene with the same diligence with which we practice personal and dental hygiene.

His recent book, *Emotional First Aid: Healing Rejection, Guilt, Failure, and Other Everyday Hurts*, has been translated in 21 languages. He writes the popular "Squeaky Wheel Blog" on PsychologyToday.com, and he is the author of *The Squeaky Wheel: Complaining the Right Way to Get Results, Improve Your Relationships and Enhance Self Esteem*. His new book, *How to Fix a Broken Heart*, will be published by TED Books/Simon & Schuster in 2017. He has also dabbled in stand-up comedy.

guywinch.com

Anne Lamott

Novelist, essayist

With disarming familiarity, Anne Lamott tackles what most don't like to consider. Her honest writing helps us make sense of life's chaos.

Anne Lamott hooks into our common experience and guides us to an understanding infused with openness. A Christian, an activist and a former alcoholic, Lamott uses humor to weave through loss, parenthood, faith and the cancer diagnosis given to her best friend, in beloved books like *Bird by Bird* and *Help, Thanks, Wow: The Three Essential Prayers* . She says, "Hope begins in the dark ... if you just show up and try to do the right thing, the dawn will come. You wait and watch and work: you don't give up."

Her next book, *Hallelujah Anyway; Rediscovering Mercy,* is set to release in April 2017.

@annelamott facebook.com/AnneLamott

Thursday, April 27, 5:00PM – 7:00PM PDT

Session 10: Tales of Tomorrow

Hosted by Chris Anderson and Juliet Blake.

Cynthia Erivo

Actor, performer

Best known for her role in the Broadway revival of "The Color Purple," Cynthia Erivo is a Tony- and Grammy-winning performer.

Cynthia Erivo made her Broadway debut as Celie in *The Color Purple* — a role that earned her Tony and Grammy Awards. Erivo has performed for the annual Kennedy Center Honors and been featured on stage in *Sister Act* as well as *A Midsummer Night's Dream*. Most recently, Erivo teamed up with John Legend at the 2017 Grammy Awards to perform the Beach Boys' song, "God Only Knows."

The actress stars with Viola Davis in the upcoming Steve McQueen film *Widows*, and as Harriet Tubman in the biopic *Harriet*.

facebook.com/cynthiaerivo @CynthiaEriVo

Manoush Zomorodi

Tech podcaster

Every week on her podcast "Note to Self," Manoush Zomorodi searches for answers to life's digital quandaries.

Manoush Zomorodi is the host and managing editor of *Note to Self*, "the tech show about being human," from WNYC Studios. Through experiments and conversations with listeners and experts, she examines the new questions tech has brought into our lives. Topics include information overload, digital clutter, sexting "scandals" and the eavesdropping capabilities of our gadgets.

In January 2017, Manoush and Note to Self launched "The Privacy Paradox," a 5-part plan to help people take back control over their digital identity. Tens of thousands of listeners have completed the 5-part plan so far, which *Fast Company* calls Manoush's 'challenge to us to stick up for our internet rights." Her book exploring how boredom can ignite original thinking, *Bored and Brilliant: Rediscovering the Lost Art of Spacing Out*, comes out in September 2017.

wnyc.org/shows/notetoself @manoushz

Shah Rukh Khan

Actor, producer, activist

With a fan following that runs into multi-millions, and 24 million followers on Twitter, Shah Rukh Khan is at forefront of the Indian film industry and continues to rule at the box office in India.

One of the world's biggest movie stars, Bollywood star Shah Rukh Khan is also an entrepreneur and inspired philanthropist. He heads the film production company Red Chillies Entertainments, whose *Chennai Express* was the highest-grossing film of 2013, and his recent film *Raees* also topped the box office in India. He's also the proud co-owner of two cricket franchises, the Kolkata Knight Riders and the Trinbago Knight Riders.

In the fall, he will host TED's brand-new TV series in Hindi for Star Plus, titled *TED Talks India: Nayi Soch*, which translates to "new thinking."

As a philanthropist and spokesperson, Khan stands up for causes ranging from the environment and water-supply issues to rural solar power. Khan's nonprofit Meer Foundation, named for his father, focuses on supporting victims of acid attacks through a 360-degree approach that helps with medical treatment, legal aid, rehabilitation and livelihood support.

@iamsrk

Paul Cantelon

Musician and composer

Paul Cantelon is a composer of contemporary classical music and resonant, award-winning film scores -- as well as a violinist, pianist and accordionist.

From his debut at the age of 13, at UCLA's Royce Hall, Paul Cantelon commenced a successful career as a concert pianist, until some years later he was abruptly stopped by a life-altering bicycle accident whilst at the Paris Conservatory.

Out of this crisis, Cantelon reinvented his musical career, which would come to encompass such extremes from playing with the Red Hot Chili Peppers, to his eventual status as a Bafta-nominated film composer known for such scores as Julian Schnabel's *The Diving Bell and the Butterfly'* and Oliver Stone's *W.*

paulcantelon.com

Ashton Applewhite

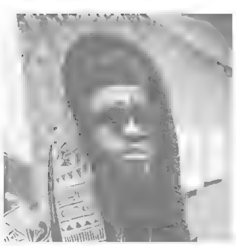
Author, activist

Ashton Applewhite asks us to look at ageism the assumption that older people are alike and that aging impoverishes us. (Is that your experience?)

Ashton Applewhite would like us to think differently about growing older. As she writes: "Aging is a natural, lifelong, powerful process that unites us all. So how come so many of us unthinkingly assume that depression, diapers, and dementia lie ahead? Because of ageism— the last socially sanctioned prejudice."

She's the author of *This Chair Rocks: A Manifesto Against Ageism* and is the voice of the Yo, Is This Ageist? blog. She is also the author of *Cutting Loose: Why Women Who End Their Marriages Do So Well* -- and was a clue on *Jeopardy!* as the author of the mega bestseller series, *Truly Tasteless Jokes*. (Who is Blanche Knott?)

thischairrocks.com @thischairrocks



Laolu Senbanjo

Artist, musician, lawyer, activist

Laolu Senbanjo's motto is: "Everything is my canvas."

A visual artist, musician, human rights lawyer and activist, Laolu Senbanjo puts his mark on everything from canvas, to shoes, to walls and buildings, to clothing and even the body with his Sacred Art of the Ori. Born and raised in Ilorin, Nigeria, his Yoruba heritage is ever-present in his work, which marries modern detail and ornate style to create a vision of Afrofuturism.

His preferred medium is charcoal, "because it's something as natural as life and death," he writes, and he also works in acrylics, inks and even wood. Senbanjo created work for the astonishing "Sorry" video from Beyoncé's *Lemonade*, and he has worked with Angelique Kidjo, Kenneth Cole, Alicia Keys, Usher and many more.

laolu.nyc @afromysterics

Helen Zaltzman

Podcaster

Helen Zaltzman makes The Allusionist, a podcast about "small adventures in language."

In 2007, Helen Zaltzman sat down with collaborator Olly Mann in a suburban London living room and launched Answer Me This! (AMT), an infectiously funny podcast based on listener questions. AMT became a sensation and vaulted her to early celebrity in the comedy podcast pantheon it went on to garner a bouquet of awards, land a BBC5 radio show, and spawn a companion book.

Zaltzman podcast, *The Allusionist*, is a humorous look at linguistics, part of the podcast network Radiotopia.

theallusionist.org @helenzaltzman

David Whyte

Poet, author

David Whyte writes at the intersection of interior and exterior worlds, bringing new territory into view with his distinctly personal style.

A native of Yorkshire, England, David Whyte draws from his diverse background and a deep philosophical curiosity to craft poems that are at once highly relatable, yet altogether new. Whyte explores the human experience, writing about relationships in his poetry as well as his prose. His work spans the worlds of literature, philosophy and organizational leadership, making him a wise voice to listen to in an increasingly complex world.

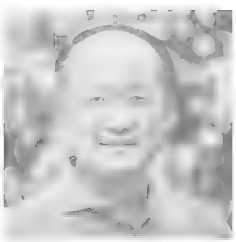
His books include *The Sea in You: Twenty Poems of Requited and Unrequited Love*; *The Three Marriages: Reimagining Work, Self and Relationship*; *River Flow: New & Selected Poems*; and *Consolations: The Solace, Nourishment and Underlying Meaning of Everyday Words*.

davidwhyte.com @whytedw

Friday, April 28, 9:30AM - 12:00PM PDT

Session 11: The Future Us

Hosted by Chris Anderson, Kelly Stoetzel and Helen Walters.



Jim Yong Kim

President of the World Bank Group

Jim Yong Kim is leading the World Bank Group in the global effort to end extreme poverty and promote shared prosperity.

Jim Yong Kim is the 12th president of the World Bank Group. Soon after he assumed his position in July 2012, the organization established two goals to guide its work: to end extreme poverty by 2030; and to boost shared prosperity, focusing on the bottom 40 percent of the population in developing countries. In September 2016, the World Bank Group Board unanimously reappointed Kim to a second five-year term as president.

During his first term, the World Bank Group supported the development priorities of countries at levels never seen outside a financial crisis and, with its partners, achieved two successive, record replenishments of the World Bank Group's fund for the poorest. The institution also launched several innovative financial instruments, including facilities to address infrastructure needs, prevent pandemics and help the millions of people forcibly displaced from their homes by climate shocks, conflict, and violence.

Kim's career has revolved around health, education and delivering services to the poor. In 1987, Kim co-founded Partners In Health, a nonprofit medical organization that works in poor communities on four continents. He has received a MacArthur "genius" grant, was recognized as one of America's "25 Best Leaders" by U.S. News & World Report and was named one of TIME magazine's "100 Most Influential People in the World."

worldbank.org @JimYongKim

Emily Esfahani Smith

Author

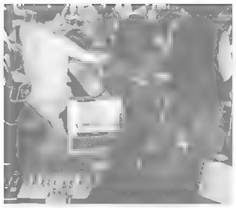
In her book "The Power of Meaning,' Emily Esfahani Smith rounds up the latest research and the words of great thinkers across generations—to argue that the search for meaning is far more fulfilling than the pursuit of personal happiness.

Emily Esfahani Smith is the author of *The Power of Meaning: Crafting a Life That Matters*, a book that explores how we can each find meaning in life. She says: 'In recent decades, there's been a rising tide of despair across the world—people feeling more depressed and alone, and even ending their lives. To be psychologically and spiritually healthy, we need to believe that our lives are meaningful. We all need to discover ways to feel connected to something larger than ourselves -- to feel that our lives make sense. Fortunately, we can all do this -- we can all create meaningful lives."

Smith draws on psychology, philosophy and literature to write about the human experience -- why we are the way we are and how we can find grace and meaning in a world that is full of suffering. Her articles "There's More to Life than Being Happy" and "Masters of Love," originally published in *The Atlantic*, have been read more than 30 million times. Her writing has also appeared in the *Wall Street Journal*, *New York Times* and *TIME*. She is an instructor in positive psychology at the University of Pennsylvania. She is also a columnist for *The New Criterion*, as well as an editor at the Stanford University s Hoover Institution, where she manages the Ben Franklin Circles project, a collaboration with the 92nd Street Y and Citizen University to build meaning in local communities.

emilyesfahanismith.com @EmEsfahaniSmith

Found Sound Nation



Musical collective

Found Sound Nation (FSN) is a collective of artists who use music-making to connect people across cultural divides.

FSN believes that collaborative music creation is a deeply effective way to become aware of the beauty, trauma and hidden potential in our communities. Their process gives voice to the underrepresented, unlocks the creative potential of youth and supports movements for social justice.

Founded by Christopher Marianetti and Jeremy Thal in 2010, FSN began its work as part of the groundbreaking new music organization, Bang on a Can. Over the years, FSN has led audio production workshops for Cine Institute in Haiti, worked extensively with Carnegie Hall in New York, Indonesia and Mexico, and developed music composition workshops with incarcerated youth in theBronx and Brooklyn.

In the field of cultural diplomacy, FSN developed the Dosti Music Project with US Embassies in Pakistan and India to bring together politically divided artists to create and tour original work. Since 2012 FSN has partnered with the US Department of State's Bureau of Educational and Cultural Affairs and Bang on a Can to produce OneBeat, to convene young professional musicians from around the globe each fall to use music as a tool for the betterment of our communities, forming a growing web of interconnected musical change-makers from around the globe.

foundsoundnation.org @foundsoundnat

Elon Musk

Serial entrepreneur

Elon Musk is the CEO and product architect of Tesla Motors and the CEO/CTO of Space Exploration Technologies (SpaceX).

At SpaceX, Musk oversees the development of rockets and spacecraft for missions to Earth orbit and ultimately to other planets. In 2008, SpaceX's *Falcon 9* rocket and *Dragon* spacecraft won the NASA contract to provide cargo transport to space. In 2012, SpaceX became the first commercial company to dock with the International Space Station and return cargo to Earth with the *Dragon*.

At Tesla, Musk has overseen product development and design from the beginning, including the all-electric Tesla Roadster, Model S and Model X, and the rollout of Supercharger stations to keep the cars juiced up. (Some of the charging stations use solar energy systems from SolarCity, of which Musk is the non-executive chair.) Transitioning to a sustainable energy economy, in which electric vehicles play a pivotal role, has been one of his central interests for almost two decades. He co founded PayPal and served as the company's chair and CEO.

elonmusk.com @elonmusk

Noah Feldman

Constitutional law scholar

Noah Feldman studies the intersection of religion, politics and law.

Noah Feldman is a professor and writer who tries to figure out how to make the government follow the rules; what the rules are that the government has to follow; and what to do if the rules are being broken. In his work, he asks questions like: How can a 225-year-old constitutional blueprint still work? Can you design a new and better constitution from scratch in places like Iraq and Tunisia? What rights do we have, really?

Feldman is the Felix Frankfurter Professor of Law at Harvard Law School and a contributing writer for *Bloomberg View*. He served as senior constitutional advisor to the Coalition Provisional Authority in Iraq, and advised members of the Iraqi Governing Council on the drafting of the Transitional Administrative Law or interim constitution. He is writing a biography on James Madison, principal author of the Constitution and fourth president of the US; it's forthcoming in 2017.

Feldman is the author of six other books: Cool War: The Future of Global Competition (Random House, 2013); Scorpions: The Battles and Triumphs of FDR's Great Supreme Court Justices (Twelve Publishing, 2010); *The Fall and Rise of the Islamic State* (Princeton University Press, 2008); Divided By God: America's Church-State Problem and What We Should Do About It (Farrar, Straus & Giroux 2005); What We Owe Iraq: War and the Ethics of Nation building (Princeton University Press 2004) and After Jihad: America and the Struggle for Islamic Democracy (Farrar, Straus & Giroux 2003. He most recently co-authored two textbooks: Constitutional Law, Eighteenth Edition (Foundation Press, 2013) and First Amendment Law, Fifth Edition (Foundation Press, 2013).

Julia Sweeney

Actor, comedian, playwright

Julia Sweeney creates comedic works that tackle deep issues: cancer, family, faith.

Julia Sweeney is a writer, director, actress, comedian and monologist. She is known for being a cast member on *Saturday Night Live* from 1990 to 1995, where she created and popularized the androgynous character, Pat. She is also well known for her comedic and dramatic monologues. *God Said Ha!* is a monologue about serious illness, her brother s lymphoma and her own cancer, and her family's crazy reactions to this crisis as they soldiered their way through struggle, confusion and death. This play was performed all over the U.S. and on Broadway at the Lyceum Theater. It was made into a film produced by Quentin Tarantino, and the comedy album from the show was nominated for a Grammy.

Sweeney's second monologue, *In the Family Way*, played in theatrical runs in New York and Los Angeles. It was ultimately fashioned into a book, a memoir titled *If It's Not One Thing, It's Your Mother*. Sweeney's third monologue, *Letting Go of God*, chronicled her journey from Catholicism to atheism. It was made into a film that played on Showtime.

juliasweeney.com @JuliaSweeney

Bank of America Merrill Lynch

Want a cheap call on EU equity? Monetise correlation through EU bank dispersion

20 June 2017

US

Extract alpha from summer SPX range as policy and positioning "collar" equities

With the Federal Reserve last week appearing more emboldened to normalize monetary policy, risk asset bears have come out in force. While we agree that a changing Fed reaction function is likely not supportive of substantial equity upside, we think the "Yellen put" still exists, albeit with a lower strike. Hence, we see monetary policy as providing a near-term "collar" (long put/short call) on a US equity market already prone to getting trapped in record-tight trading ranges. Further impetus for a summer range-trade should come from (i) fiscal policy, as gridlock caps equity upside but policy hope floors the downside, and (ii) positioning, where the risk of continued "fragility events" (potentially exacerbated by stretched quant fund/short vol positioning) meets cashed-up investors still accustomed to buying dips. As a risk-limited range trade, we like buying in-the-money down and out puts on the S&P. For example, an SPX Sep 2475 put that knocks out at 2300 (6% OTM) indicatively costs 70bps (spot ref 2451), a 60% discount to the 2475 / 2300 put spread.

Europe

Long EU banks dispersion: Buy Dec17 call on a basket, sell worst-of call

We recommend positioning for greater dispersion in EU bank sector returns via buying a Dec17 105% call on an equally-weighted basket of Santander, BNP, ING, Intesa and Deutsche Bank, part-financed by selling a worst-of call on the same basket for 1.8% (net) indic., as: 1) improving macro/earnings, sensitivity to rates and regulatory headwinds are likely to lead to greater differentiation within banks, 2) the entry point is attractive given historically low implied vol (13th 8y+ percentile) and high implied correlation (81% bid vs latest 6M realised correl of 66%), 3) historical risk-reward at current pricing is attractive (avg. P&L of +8.4% when positive vs -1.8% when negative), and 4) the trade can be considered as a cheap call on EU equities as it has a similar payoff profile but with greater benefit relative to its cost.

Asia

Buy depressed China vs. US risks through corridor variance spreads

As global central banks have taken on more hawkish tones, the uncertainty surrounding policy tightening will be more positive for EM volatility than for DM volatility. Additionally, our strategists have a more bearish outlook for the Chinese banking sector (which makes up a majority of the HSCEI index) amid rapidly rising leverage, complex shadow banking, and excessive home price inflation. Since we believe the global synchronized monetary tightening will impact HSCEI volatility more than SPX volatility, we recommend owning HSCEI-SPX 70/110% corridor variance at 5 vol points, a 3 vol point discount to a vanilla variance spread. The entry point is attractive as the HSCEI-SPX 18-month variance swap spread has fallen back to the lower-end of its 5-year trading range, the trade has a positive carry, and it benefits during China risk-off events.

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Refer to important disclosures on page 28 to 29. Analyst Certification on page 27. 11756528

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Equity Derivatives
Global

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See Team Page for List of Analysts

Table 1: 3M volatility (weekly changes)

	Implied	Realized
S&P500	9.8 (-0.2)	7.1 (-0.2)
ESTX50	13.4 (0.3)	11.5 (0.2)
FTSE	10.0 (-0.4)	9.7 (0.2)
DAX	12.6 (0.3)	10.7 (0.5)
NKY	13.8 (-0.2)	12.3 (-0.2)
HSI	12.4 (0.1)	10.1 (0.2)
KOSPI	12.2 (0.3)	10.5 (0.1)
EEM US	15.6 (0.5)	11.8 (-1.1)
TOP40	16.9 (1.2)	11.1 (0.3)
RDX	25.9 (0.9)	20.6 (-1.1)
IBOV	22.9 (-1.7)	25.5 (-0.7)
ISE30	20.2 (0.4)	13.5 (0.1)

Source: BofA Merrill Lynch Global Research

BofAML GFSI™ X-Asset Risk Landscape

Stress now below normal for all asset classes

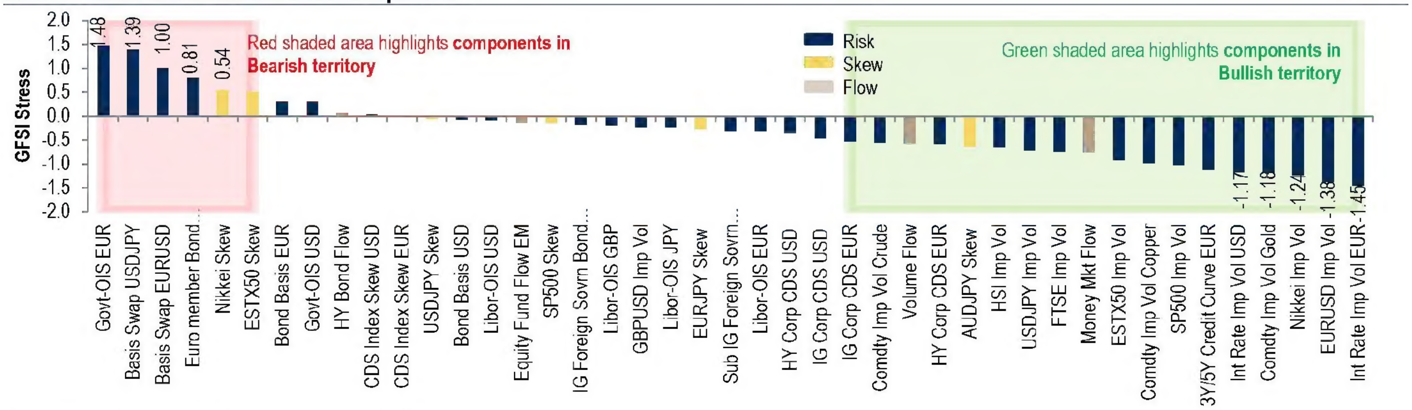
The indicator was little changed last week, finishing at -0.23.

- **Stress is now in benign territory across all five asset classes**: Stress in across all asset classes (except equity) declined last week. Notably, rates stress turned negative (benign territory) and stresses across all five asset classes are now negative.

- **Stress in Equity skew rose** as ESTX50 and (to a lesser extent) S&P500 skew steepened; indeed the gain in ESTX50 skew was the greatest across GFSI sub-components (Chart 2) and also historically significant (Chart 5).

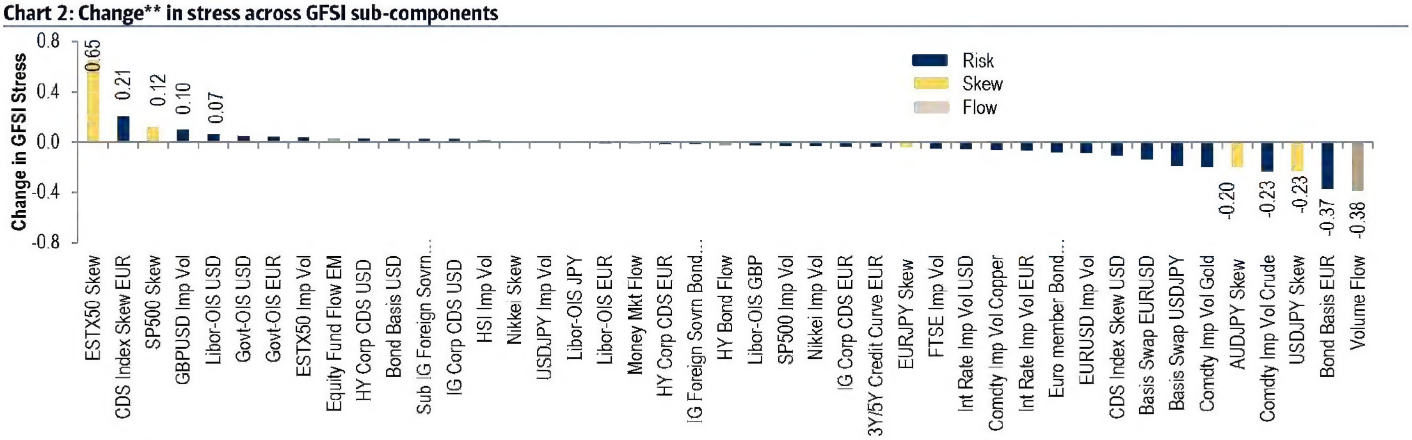
- **Commodity-related stresses fell** the most across asset classes (Chart 3), led by declines in Crude and Gold vol (Chart 2), reversing some of the gains after geopolitical tensions in the Middle East rose in recent weeks.

Chart 1: Latest* stress across GFSI sub-components



Source: BofA Merrill Lynch Global Research. *Latest as of 16-Jun-17.

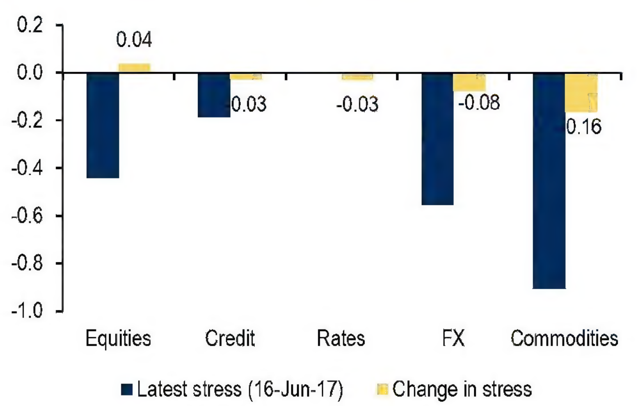
Chart 2: Change in stress across GFSI sub-components**



Source: BofA Merrill Lynch Global Research. **Latest as of 16-Jun-17. Change vs 1 week prior (9-Jun-17).

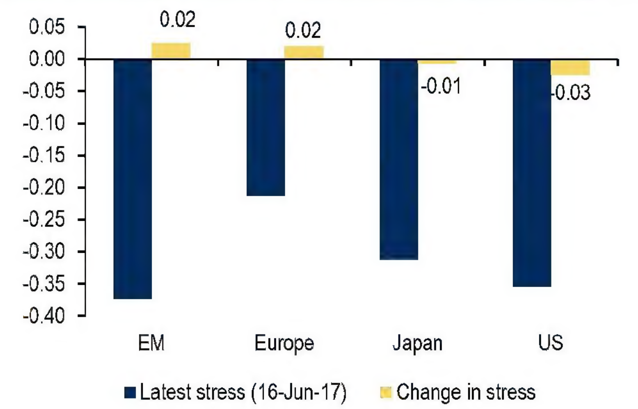
The GFSI Risk Allocator (using Bull, Bear & Neutral weights of 2, 0, 1) suggested a 17.4% overweight position on 16-Jun (vs 13.0% OW as of 9-Jun). The percentages of Bullish, Bearish and Neutral GFSI components (as used in the Risk Allocator) as of 16-Jun were 34.8%, 17.4% and 47.8% respectively.

Chart 3: Stress in commodities fell the most last week (driven by a drop in crude oil vol) while stress in equities rose marginally (led by equity skew)



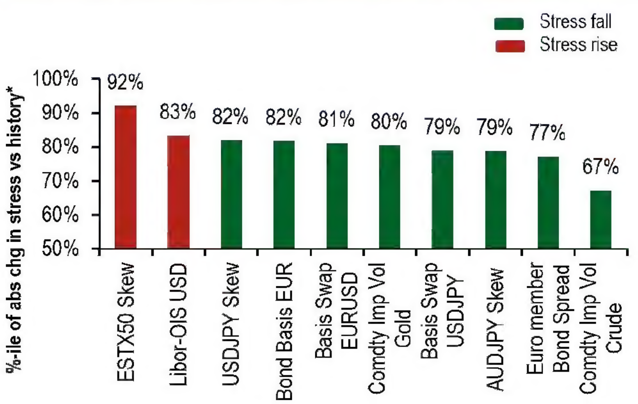
Source: BofA Merrill Lynch Global Research. 1wk change (9-Jun-17 to 16-Jun-17).

Chart 4: EM and the US are the least stressed GFSI regions globally



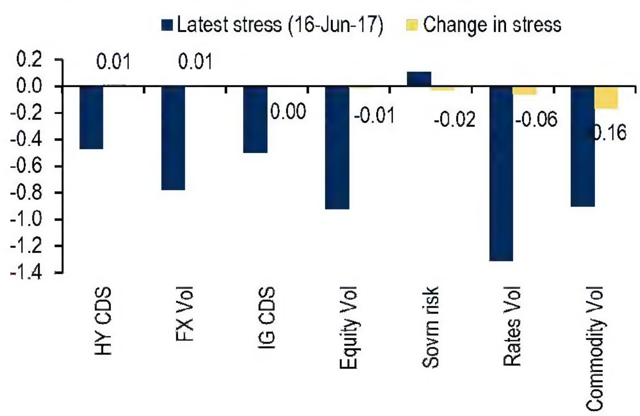
Source: BofA Merrill Lynch Global Research. 1wk change (9-Jun-17 to 16-Jun-17).

Chart 5: Top 10 movers in stress (1-week abs chg %-ile vs history*)



Source: BofA Merrill Lynch Global Research. * %-ile of weekly move in stress vs all historical weekly moves (earliest 3-Jan-00). Bar colours represent rise (red) or fall (green) in stress. 1wk change (9-Jun-17 to 16-Jun-17).

Chart 6: Global volatility & credit spread stress in the GFSI



Source: BofA Merrill Lynch Global Research. 1wk change (9-Jun-17 to 16-Jun-17).

Volatility in the US

Risk-limited alpha in a "collared" market: SPX ITM KO puts

US equities vulnerable...to a summer range-trade

The Federal Reserve last week appeared more emboldened to normalize monetary policy, not only raising interest rates by 25bps but also reiterating its intention to hike four more times by the end of 2018 and stating that it "expects to begin implementing a balance sheet normalization program this year" - all despite recent softness in inflation data. Breakeven rates of inflation narrowed following the Fed communications due to tighter monetary conditions in the face of slowing US economic data, and risk asset bears responded in force, suggesting that Janet Yellen had "broken up" with investors and that it would be prudent to sell "before it's too late".

We agree that the changing reaction function of the Fed is likely not supportive of further substantial US equity upside and may be viewed as the Fed now providing a short call option on the S&P 500. However, in our view, it is premature to conclude from last week's developments that the "Yellen put" is dead. We see its strike as declining but would not underestimate Yellen's dovish inclinations in a shock or the capacity for the Fed to still remain credibly on hold as long as the US economy is not "running hot".

In short, we see monetary policy as now providing a "collar" (long put / short call) on a US equity market that has already shown a propensity over the past year for getting trapped in record tight trading ranges.[1] Other factors may also conspire to create a summer range-trade for US equities, namely (i) fiscal policy, where gridlock likely caps equity upside but lingering policy hope floors the downside, and (ii) positioning, where the risk of continued "fragility events" (potentially exacerbated by stretched quant fund/short vol positioning) meets cashed-up investors still accustomed to buying dips.

Tug of war between fragile market/stretched positioning and cashed-up dip-buyers

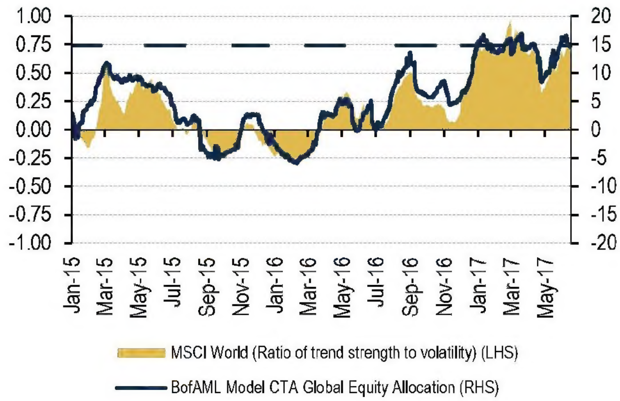
As we have noted recently, US equities have displayed a historically unusual tendency to jump rapidly from calm to stress and back ("fragility"), with the recent Tech sell-off and rebound the latest example. For example, in the past year, the S&P 500 has seen 5sigma declines (3 in total—Brexit, Sep-16, May-17) occur 20x more frequently than over the prior 90 years or so. The increased frequency of these "fragility events" is in part due to vol failing to remain high post a spike as equity market participants continue to aggressively "buy the dip" and in the process reset vol lower.

Historically low vol alongside consistently upward trending equity markets and low cross asset correlations could be creating stretched positioning across markets. For example, upward trending equities on historically low vol may be pushing CTA equity positioning to near record levels (Chart 7). Risk parity portfolios could be increasing their leverage due to low vol as well as low cross asset correlation (Chart 8). And lastly, inverse VIX ETPs have seen increased open interest as performance has swelled on the back of continued declines in vol and attractive term structure risk premia (Chart 9).

Should vol spike again alongside a reversal in equity price momentum and a rise in cross asset correlations, then unwinds from these strategies could exacerbate market fragility. However, this must be weighed against an investor base that has plenty of cash on hand (Chart 10) and their potentially fickle but still-intact tendency to view any equity market dip as an alpha opportunity.

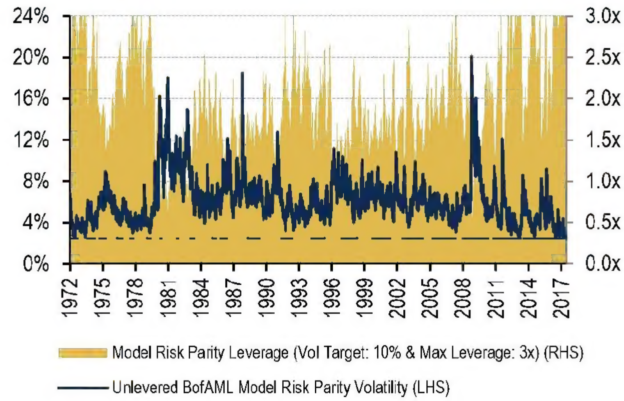
[1] For example, the Dow Jones Industrial Average traded in its tightest trading range in over 110 years in Jan-17; this followed a record in the S&P 500 ending Sep-16 for the longest stretch of trading within a range of 1.77% since 1928.

Chart 7: A combination of upward trending global equity markets and very low volatility have conspired to push trend following (CTA) equity positioning to near record levels. Consequently, the beta of CTA strategies to global equities is also at extreme levels



Source: BofA Merrill Lynch Global Research. Based on daily data form 2-Jan-2015 to 16-Jun-2017. CTA = Commodity Trading Advisor

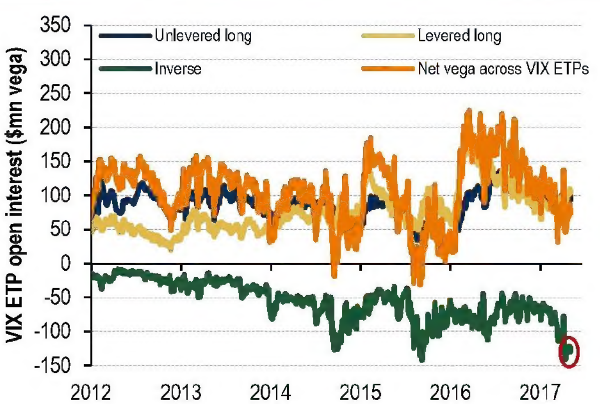
Chart 8: Owing to low cross asset vol and strong diversification, the volatility of risk-balanced multi-asset portfolios has fallen to historically low levels. Consequently, leverage levels across multi-asset & other portfolios that target fixed vol have likely hit their caps



Source: BofA Merrill Lynch Global Research. Based on daily data from 3-Jan-72 through 16-Jun-17. Equity, fixed income, and commodity components within the hypothetical risk parity investment are represented by the S&P500, 10-Year US Treasury Bonds, and the S&P GSCI Index, respectively. Risk parity allocations are determined and rebalanced monthly using prior 12-month realized volatility and correlations.

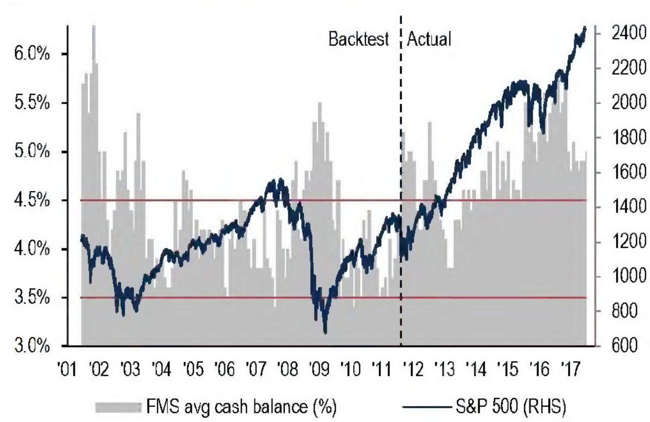
It is important to note that not all CTA, risk parity, or vol control strategies operate similarly and there is model risk in estimating the exact size of these trading flows.

Chart 9: The vega outstanding in inverse VIX ETNs has also reached a record high at ~$125mn vega



Source: BofA Merrill Lynch Global Research. Daily data from 13-Feb-12 through 16-Jun17.

Chart 10: Global FMS average cash balances (%) remain elevated, suggesting dry powder for investors still conditioned to buy equity dips



Source: BofA Merrill Lynch Global Fund Manager Survey, Bloomberg. As a reminder, the FMS Cash Rule works as follows: when average cash balance rises above 4.5% a contrarian buy signal is generated for equities. When the cash balance falls below 3.5% a contrarian sell signal is generated.

Extract risk-limited alpha from SPX range via cheap in-the-money knockout puts

As a risk-limited range trade, we like owning down-and-out puts on SPX that are already in-the-money. For example, the SPX Sep 2475 put with a 2300 knock-out (continuous observation) indicatively costs 70bps (spot ref 2451) and offers a 60% discount to the vanilla 2475/2300 put spread, which is itself historically cheap (Chart 12).

If SPX stays above the 2300 barrier at all points in time before expiry, the structure is equivalent to a 2475 put option. If the barrier is instead breached, the maximum loss will be equal to the (low) upfront premium. The 2300 barrier is about 6% out-of-the-money, hence "allows" for the elusive 5% correction not seen since Brexit (on a closing basis). However, investors can mitigate the risk of breaching the barrier by either moving it farther down (e.g., a 2245 barrier would indicatively raise the cost from 0.7% to 1%), or by only observing it on a close-to-close basis (in turn sacrificing part of the discount).