Global Macro Research

# Top of Mind

December 7, 2016 Issue 53

## The Return of Reflation

**From the editor:** Perhaps the most widely agreed theme to emerge since the US election is the reflation story, now super-charged by the prospect of greater fiscal stimulus and/or protectionism. We take stock of how much has changed on the inflation front (little so far; Trump's potential policies just reinforce already-rising inflation). We ask Joshua Schiffrin (GS inflation trader) and Mihir Worah (PIMCO's CIO for Real Return and Asset Allocation) how much further breakevens can run (both: a lot, with Schiffrin in particular believing that we are at the start of a secular shift) and what assets they find attractive in these reflationary conditions (Schiffrin: not bonds; Wohar: TIPS). We then dig into the implications for risk assets; in short, the recent exuberance can extend if growth holds, but stretched valuations leave equities vulnerable to sharp rate moves.

Source: www.istockphoto.com.

### Inside



Click here for a video summary

"This does not look like the final stages of a move, but rather the beginning of something that is going to play out over a much longer timeframe in markets…I don't think prices today reflect how dramatically the information set has changed."
**Joshua Schiffrin**

"When higher-than-expected inflation is more likely than lower-than-expected inflation, TIPS become the preferred risk-free asset. So I think we have seen an important shift in big-picture asset allocation in favor of TIPS as inflation has risen."
**Mihir Worah**

"I think recent discussions about a high-pressure economy owe more to the fact that these questions are becoming more relevant now that we are closer to the inflation target, rather than to any major change in how the Fed is thinking about policy."
**Jan Hatzius**


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# Macro news and views

## We provide a brief snapshot on the most important economies for the global markets

### US

**Latest GS proprietary datapoints/major changes in views**

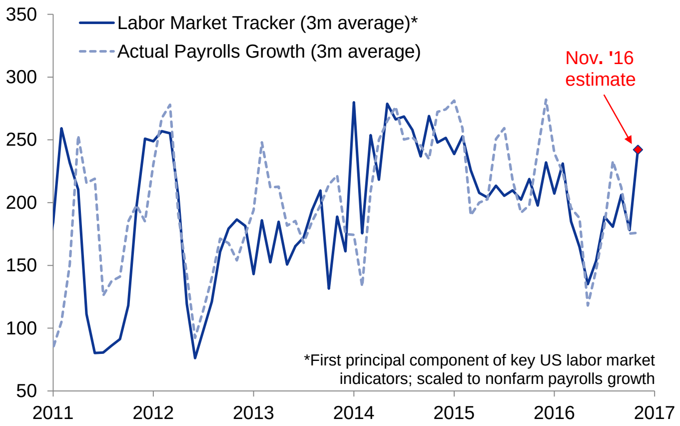
- We raised our estimate of the net fiscal easing under the incoming administration to 1.0% of GDP vs. 0.8% of GDP, incorporating an assumption of a larger tax cut in 2018.
- Following the solid November jobs report, we raised our subjective odds of a December hike to >95% from 90%.

**Datapoints/trends we're focused on**

- Further labor market tightening expected in the coming quarters, even with unemployment now at 4.6%—just below our 4.7% estimate of the structural rate.

#### Labor market momentum

GS labor market tracker and actual payrolls growth, 3m avg., thous.




*Source: Goldman Sachs Global Investment Research.*

### Japan

**Latest GS proprietary datapoints/major changes in views**

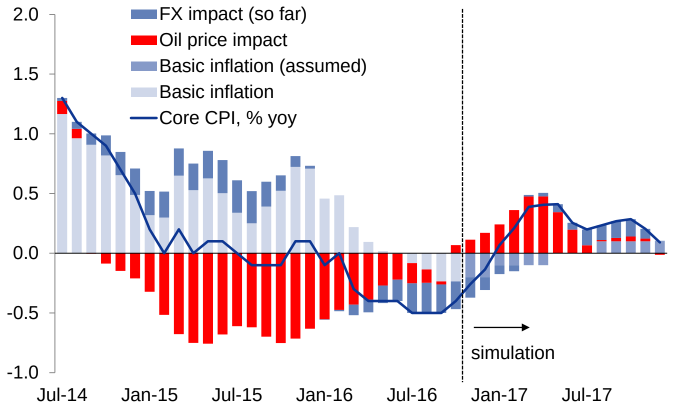
- No major changes in views.

**Datapoints/trends we're focused on**

- An expected uptick in core CPI (which includes energy) in 1Q17 due to higher oil prices; however, we think core inflation is unlikely to rise much higher than 0.5%.
- Signs that manufacturing is finally on the path to recovery from the negative inventory cycle seen since the VAT hike.
- Steady, albeit small, increases in basic wages even as the nominal wage per person remains flat yoy.

#### Oil on the boil

Estimated decomposition of Japan core CPI, pp contribution




*Source: Goldman Sachs Global Investment Research.*

### UK and Euro Area (EA)

**Latest GS proprietary datapoints/major changes in views**

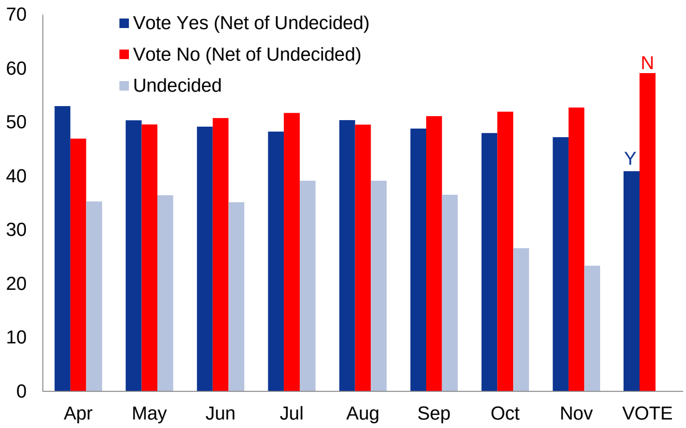
- Following Italy's rejection of constitutional reforms in a referendum on Dec. 5, we see a 25% chance of early elections in 2017. We also believe that the odds of a state-led restructuring of ailing Italian banks have increased.

**Datapoints/trends we're focused on**

- The strong UK composite PMI in November, suggesting no let-up in the momentum seen in official Q3 activity data.
- Reduced scarcity concerns for the ECB, as the rates sell-off has made more government bonds eligible for purchase.

#### A rejection of Renzi's reforms

Avg. of Italian polls weighted by sample size, and final results, %




*Source: Sondaggi Politico-Elettorali, Ministero dell'Interno, GS Research.*

### Emerging Markets (EM)

**Latest GS proprietary datapoints/major changes in views**

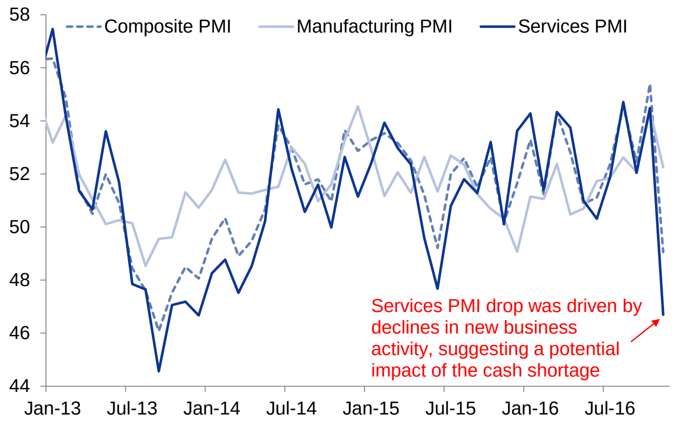
- No major changes in views.

**Datapoints/trends we're focused on**

- A sharp drop in India's services PMI in November, suggesting adverse effects from the cash shortage created by the government's recent currency reform.
- Indications from Brazil's central bank that its pace of rate cuts will accelerate to 50bp at the January meeting.
- A terms-of-trade headwind for EM net oil importers from the OPEC cut, though the impact of rising rates will matter more.

#### The de-monetization drag

India PMIs



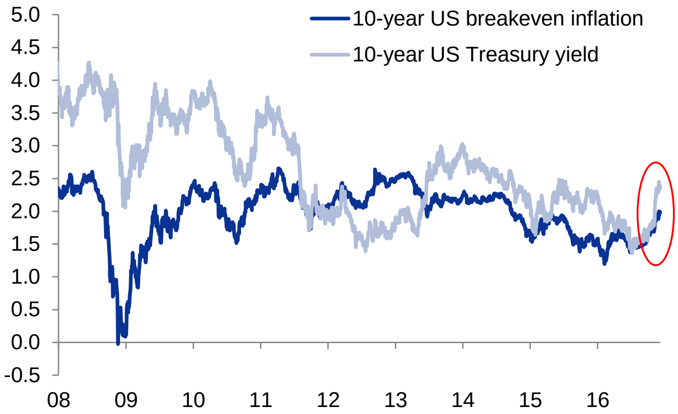

*Source: Haver Analytics, Nikkei/IHS Markit.*

# The return of reflation

Perhaps the most widely agreed theme to emerge from the US election is the reflation story, now super-charged by the prospect of greater fiscal stimulus and/or trade protectionism. Indeed, it is nothing short of shocking how quickly the narrative of low inflation, low rates, and ever-dovish monetary policy has swung in the opposite direction, raising 10-year US breakeven inflation to nearly 2% and helping drive 10-year Treasury yields up by more than 50bp. What higher US inflation means for asset opportunities and risk management is Top of Mind.

**Large repricing—or long-awaited correction**

10-year US breakeven inflation and 10-year US Treasury yield, %




*Source: Bloomberg.*

Given the swift re-pricing of inflation expectations, it's worth taking stock of how much has really changed in recent weeks. As GS Chief Economist Jan Hatzius reminds us, US inflation had already been rising over the course of this year, with the Fed's preferred measure, core PCE, reaching 1.7% in the latest reading. The possibility of more inflationary policies under the Trump administration has therefore reinforced a trend that was already in train, helped by factors like the tightening US labor market and a broad shift in policy focus toward fiscal easing.

On net, Hatzius sees inflation reaching the Fed's 2% target by the end of 2017, a pick-up he thinks will be consistent with good US growth. In his view, the prospect of 1970s-style stagflation remains remote, and the Fed will allow only a moderate overshoot of its inflation target, despite recent buzz about the FOMC letting the economy "run hot." See more on the pros and cons of a high-pressure economy from GS Senior Economist David Mericle on pg. 7.

While existing inflationary pressures have been reinforced, the sizable move in the bond markets has only brought 10-year US Treasuries back to where they were a year ago, and inflation pricing remains low relative to the macro backdrop we forecast for next year. Accordingly, Francesco Garzarelli and Rohan Khanna of GS Global Markets research see upside in inflation from here, recommending long 10-year inflation in the US and Europe as a top trade for 2017.

GS Senior US Government Bond and Inflation trader Joshua Schiffrin generally agrees that breakevens have substantially more room to run. In fact, he believes that we are in the early stages of a longer-term inflation re-pricing motivated by a rare rethink of monetary and fiscal policy. He does not find bonds particularly attractive in this environment (preferring equities or hard assets instead). But among bonds, he favors TIPS to nominal Treasuries, given that almost all of the potential policy outcomes under Trump suggest more inflation, while the same can't be said for growth. That said, he sees a big push by the incoming administration to increase nominal growth, and believes a stronger dollar would be an output of the positive growth story rather than a threat to it, absent an extremely large dollar move (Hatzius agrees). In his view, the biggest risk to the reflation story is infighting between the new administration and Republican deficit hawks that could block a sizable fiscal package. A resurgence of China concerns could be another fly in the ointment.

We then sit down with Mihir Worah, PIMCO's CIO for Real Return and Asset Allocation, to discuss portfolio allocation and risk management in a more inflationary world. He also expects higher rates and inflation under Trump, but argues that multi-asset portfolios should still include some long-duration assets. With the risk of inflation at 3-4% now arguably on par with that of inflation at 0-1% for the first time in several years, he considers TIPS the preferred "risk-free" asset today, and sees a major shift in asset allocation toward inflation-protected bonds. Reinforcing his conviction in TIPS are his doubts that the new administration can provide a longer-term boost to growth and real yields. Worah also believes that real estate and commodities still provide inflation protection, but takes a is more cautious on equities, which he warns will likely only do well with moderate inflation, and could take a hit should real rates move considerably (unless earnings come to the rescue).

Indeed, Senior Portfolio Strategist Christian Mueller-Glissmann has found that risk assets' performance in past periods of rising inflation and bond yields has historically been mixed. Provided that growth optimism drives the increase in yields this time, he thinks equities and other risky assets can still perform well. But with bonds becoming a less reliable hedge for risk-off moves, he recommends investors increase their cash buffers.

Lastly, GS Chief US Equity Strategist David Kostin and Chief Global Equity Strategist Peter Oppenheimer share more detail on equities' capacity to withstand higher rates. They recently upgraded their index targets but agree that stretched valuations leave equities vulnerable to further sharp rate moves. They also address the other pressing question among equity investors: whether the inflation-driven rotation from defensive, bond-proxy sectors into cyclicals has further to go. Their answer: The trend is likely to continue, but finding value will be more difficult, as the P/E gap between cyclicals and defensives has closed. Recommendations include being overweight banks and underweight consumer staples in Europe, and buying stocks of firms with relatively low labor costs in the US. In short, most of the inflationary exuberance for equities may be behind us, but narrower opportunities remain.

Finally, for those who could use a refresher on inflation measures and markets, we offer up our usual package of reference materials—see more on pgs. 6 and 10.

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# Interview with Jan Hatzius

Jan Hatzius is Chief Economist at Goldman Sachs. Below, he discusses his outlook for inflation to reach the Fed's 2% target by the end of next year, and argues that recent discussions about running a "high-pressure economy" do not reflect material changes in the FOMC's policy views.

**Allison Nathan: How has the US election outcome changed the narrative about US inflation?**

**Jan Hatzius:** The basic story that core inflation would move much closer to the Fed's target was already on track prior to the election. The combination of a tighter labor market, rising healthcare costs, and fading pass-through from commodity and currency effects were all pointing to higher inflation. In fact, the core numbers had been coming in just a touch higher than we thought they would; we are now forecasting core PCE inflation to reach 1.8% by year-end vs. the 1.6% we had expected heading into 2016.

The election outcome has reinforced our view. We are currently assuming that Congress will pass a fiscal package worth 1.0% of GDP. That would likely lead to higher inflation alongside higher growth, especially given that we are basically at full employment. However, there are some risks to our base case from the political opposition to deficit-financed fiscal stimulus. And in any case, we would not expect major changes to fiscal policy before the middle of next year.

Trump's stance on trade could also pose upside inflation risk since he will probably face considerable pressure to deliver on some of his protectionist campaign proposals. Tariffs are one area where he could take action; we estimate a 10% increase in US tariffs on average would add 0.6pp to the level of core PCE. That's not enormous, but at relatively low levels of inflation, it makes a difference.

**Allison Nathan: Aside from policies specific to the next administration, what factors do you expect to drive inflation higher over the next year?**

**Jan Hatzius:** We are generally expecting more of the same. Further tightening in the labor market should continue to support wage growth; much of this will likely show up in weaker profit margins, but some of it will show up in price inflation. Healthcare inflation is also likely to continue to increase, especially in the PCE index where healthcare cost increases have lagged relative to the CPI. And the pass-through from declining commodity prices and a stronger dollar is likely to further diminish; these lagged effects are probably still taking ¼pp or so off of core PCE, but their impact should continue to unwind. The major inflation component that will probably move sideways or in the opposite direction is rents, which have been accelerating but are likely to stabilize or slow somewhat going forward. All told, we now expect both core and headline PCE inflation to reach 2.0% by year-end 2017.

In all of these discussions, though, I think it is important to remember that the confidence interval around inflation forecasts is quite large. The standard error for one-year forward consensus expectations for core inflation is about 0.3pp. People seem to have forgotten about that, probably because the misses recently have not been that big.

**Allison Nathan: Do you see any chance that core inflation could rise to the 3-4% range in the near-to-medium term?**

**Jan Hatzius:** We are expecting PCE inflation to overshoot the Fed's target slightly in 2018-2020, but anything much above 2½% would likely trigger a more aggressive monetary tightening. This would weaken the economy but ultimately probably limit the size of the overshoot. So sustained inflation in the 3-4% range seems very unlikely to me.

**Allison Nathan: How concerned are you that we end up worse off a year from now—with higher inflation but not much more growth?**

**Jan Hatzius:** Given that we are practically at full employment but still below the inflation target, having higher inflation and lower growth compared to today's levels is almost inevitable. But if we see further progress in the labor market and moderate gains in inflation—of ¼pp or so—I think we would be better off. The fact that our growth outlook is better for next year than what we've seen for much of 2015-2016 helps that. In any case, I think we are extremely far from any more concerning scenario akin to the stagflation of the 1970s driven by sharp spikes in oil prices.

**Allison Nathan: How important are commodity prices to the inflation story today?**

**Jan Hatzius:** For headline inflation it is an overwhelming part of the story, but core inflation is much more important for the Federal Reserve and increasingly for central banks around the world. That said, energy prices do seem to have a large influence on inflation expectations. In particular, we have found a strikingly strong correlation between the level of gasoline prices and long-term survey-based inflation expectations. To a large extent, people seem to set their five- to ten-year inflation expectations based on what they last paid at the pump. That is very curious because if you make the logical assumption that gasoline prices are mean-reverting, people should expect more inflation when gasoline prices are low and less inflation when they are high. Instead, people seem to be more backward-looking in forming their inflation expectations.

**Allison Nathan: Does that explain why survey-based inflation expectations reached a historical low earlier this fall even as inflation was rising?**

**Jan Hatzius:** I do think this fixation on past oil price moves explains part of it. But we have also found that survey-based inflation expectations were falling largely because people had begun adjusting expectations that were historically too *high*. For example, for most of the last 15 years, the five-to-ten year expected inflation rate in the University of Michigan survey was around 3%. This fell to the 2.4-2.6% range, largely as people who previously expected inflation of 3% or more reduced their expectation to closer to 2%. Some of the swings in breakeven inflation seem to be reflecting a similar trend, as they have been driven by markets pricing lower chances of below-target inflation and higher chances of above-target inflation, rather than any major shift in modal expectations. When all is said and done, we think underlying inflation expectations look fairly secure around the Fed's target.

**Allison Nathan: What do you make of the recent discussions that the Fed should run a high-pressure economy, allowing inflation to rise beyond its target? Does this idea make sense, and is it gaining traction among influential policymakers?**

**Jan Hatzius:** It certainly makes sense to treat the inflation target as symmetric, which means spending approximately half the time above the target and approximately half the time below the target. But I think the Fed leadership has held this view for a long time, and I don't detect a meaningful shift in their stance. The market has focused on a speech that Fed Chair Janet Yellen made in October in which she put a little more emphasis on the high-pressure economy and the potential ways in which that could have some positive effect, but she also put a decent amount of emphasis on the caveats. I think recent discussions about a high-pressure economy owe more to the fact that these questions are becoming more relevant now that we are closer to the inflation target, rather than to any major change in how the Fed is thinking about policy.

**Allison Nathan: Would/should the Fed aim to overshoot its inflation target?**

**Jan Hatzius:** I don't think they would actively target an inflation overshoot. I think the Fed still views any losses inflicted by below-target inflation for seven consecutive years as bygones. They are unlikely to try to make up for past shortfalls by running a significantly higher inflation rate, which would effectively constitute a regime shift from inflation targeting to price-level targeting. Such a change in regime is always somewhat costly and risky, and my view is that making such a switch now is unlikely to yield much benefit. Five years ago, I think it would have been a different story. At that time, committing to an overshoot to make up for past undershoots would likely have been very expansionary and probably would have accelerated the recovery in the labor market. It is much harder to make that case today when we are already effectively at full employment. And, again, if the Fed didn't find price-level targeting compelling then, it is very unlikely that it would now.

**Allison Nathan: How will the Fed manage the process of normalizing monetary policy without lowering inflation expectations? Does this risk confusion?**

**Jan Hatzius:** So far the market seems to be going along with the idea that the Fed will raise rates in December—a hike is basically baked in at this point—but that the pace of following hikes will be slow. This is a sensible idea for the Fed to pitch because it lowers the risk of disruption from the next rate hike. The issue is not so much that this strategy might cause confusion in the near term, but that it might set expectations for the future that the Fed won't end up being able to meet. Right now, the market is still pricing in very few hikes; in fact, we think the rate path implied by the markets would lead to a significant overshoot of the FOMC's objectives. If the Fed needs to normalize rates more quickly than the market expects, such moves could prove more disruptive than desired.

**Allison Nathan: How much risk does a strengthening dollar pose to the inflation outlook?**

**Jan Hatzius:** It is again becoming a bigger risk, but it's important to remember that the inflation rate depends on the change in the dollar, not the level. At the moment, the year-on-year change in the broad trade-weighted dollar is about +5%, compared with about +15% in late 2015.

**Allison Nathan: Could the still-weak inflation in other major economies—like the Euro area and Japan—hold back US price pressures?**

**Jan Hatzius:** I don't think the direct risk is that high; people tend to overestimate the extent to which inflation rates are linked internationally. Of course, both global commodity prices and currency fluctuations can have a significant impact. But as I've mentioned, these factors are not as important for core inflation as they are for headline inflation, and it's core that counts.

I think the bigger question from a policy perspective is the short-term rate implications of a world in which the US is basically at full employment and has higher inflation than Europe or Japan. In particular, if the Fed is the only major central bank hiking rates, how will financial conditions respond in the US and globally? This is a critical question for the US in particular given the importance of financial markets in the transmission of US monetary policy. There is some evidence that the impact of Fed hikes on financial conditions is greater in a divergent world, but to understand *how much* greater, more work still needs to be done. That is the much more important issue in terms of the spillover of inflation trends from the rest of the world to the US and vice versa.

**Allison Nathan: The Fed has recently been inclined to take a dovish stance during episodes of international market turbulence. How might that change as US inflation accelerates, or if it overshoots?**

**Jan Hatzius:** Even in an environment characterized by higher inflation, it's absolutely legitimate to respond to changes in financial conditions—owing to developments abroad or at home—by adjusting policy. Again, even if an external event has limited spillovers to the real US economy, it can have important effects on US financial conditions that should be considered when setting policy. That said, decision-making is likely to only get tougher for the Fed as the luxury of feeling like they can wait because inflation remains well below target diminishes.

# CPI vs. PCE inflation

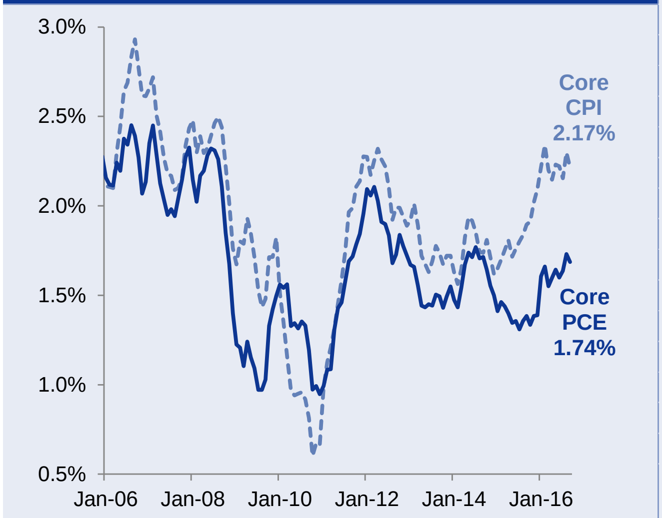
US inflation has been accelerating, but the pace of the pickup has differed for the two main inflation measures, the **core Consumer Price Index (CPI)** and the **core Personal Consumption Expenditures (PCE) deflator**. The current gap between the two is 0.4pp, compared to an average over the last ten years of 0.2-0.3pp. Divergence between the indexes can result from effects related to the indexes' formulas, scope, and sources (described below), as well as related differences in the weights used for the indexes' components.

While weighting differences—particularly for shelter and medical care—play a role in the current CPI-PCE gap, our recent work has shown that the bigger issue may be differences in how the indexes measure price changes for healthcare. In fact, if the gap between the CPI and PCE healthcare inflation were in line with its historical average, the difference between core CPI and core PCE would be just 0.2pp.

| Effect | CPI | PCE |
|---|---|---|
| **Formula** | The CPI measures price change in a constant basket of goods (a "fixed-weight" index). The basket is currently updated every two years (though the weights move slightly each month with relative price changes). | The PCE measures price change in a basket of goods that evolves on a monthly basis as household expenditure patterns change. Since consumers shift their spending over time to buy relatively more products with low inflation, the PCE will tend to report lower inflation than the CPI. This means the PCE is likely a closer representation of actual price changes in the economy—one reason the Fed prefers it to the CPI. |
| **Scope** | The CPI covers out-of-pocket expenditures by urban consumers (and is therefore often used for purposes such as indexing wage or benefit contracts). For example, unlike the PCE deflator, the CPI excludes the portion of healthcare consumption paid for by employers, non-profit organizations, and the government. | The PCE covers price changes for all types of goods and services consumed by households or non-profit organizations, including those paid for by employers or by the government. For example, the low level of inflation in publicly administered reimbursement rates through Medicare, which were reduced under the Affordable Care Act, directly affects the PCE but not the CPI. |
| **Source** | The CPI is based on price data collected by Department of Labor analysts. | The PCE deflator is a composite price index, based from details in the CPI and PPI indexes, as well as series constructed by the Department of Commerce. |

**Core CPI vs. Core PCE**

% yoy




*Source: BLS, BEA, Haver Analytics.*

**Component Shares of Price Index (%)**

| | Core CPI | Core PCE |
|---|---|---|
| **Food and beverages** | 1.2 | 7.6 |
| **Housing** | 48.8 | 24.4 |
| Rent of primary residence | 9.9 | 4.5 |
| Owners' equivalent rent | 30.8 | 13.0 |
| Other housing | 8.2 | 6.8 |
| **Transportation** | 15.2 | 8.2 |
| **Apparel** | 4.1 | 4.1 |
| **Medical care** | 10.8 | 26.3 |
| **Recreation** | 7.2 | 9.5 |
| **Education** | 4.0 | 3.0 |
| **Communication** | 4.8 | 2.6 |
| **Other goods and services** | 4.0 | 14.4 |
| Financial services | 0.3 | 5.3 |
| PCE items out of CPI scope | -- | 3.6 |
| All other | 3.7 | 5.6 |

*Note: PCE figures should be considered approximations. Red items denote major differences between CPI and PCE. Source: Department of Labor, Department of Commerce, Goldman Sachs Global Investment Research.*

**Zach Pandl**

# Why run a high-pressure economy?

## David Mericle discusses the pros and cons of letting the US economy run hot, a debate that could impact the pace of Fed tightening

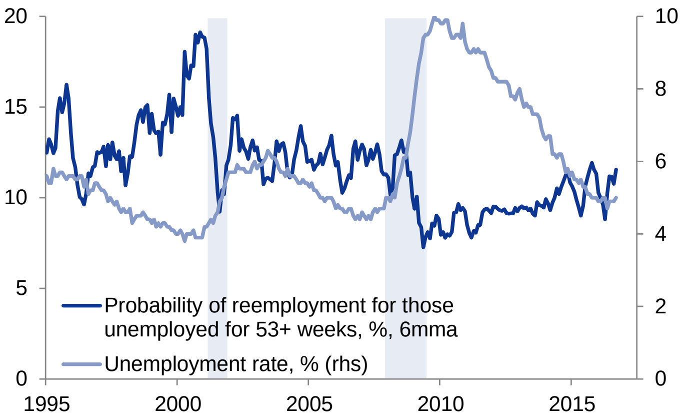
Two hints from recent Fed communication revealed an emerging internal debate about the merits of running a "high-pressure economy." The minutes to the September FOMC meeting noted that the Committee had weighed the costs and benefits of "a more pronounced undershooting of the longer-run normal rate of unemployment." Shortly thereafter, Chair Yellen raised the question of whether such a policy could aid supply-side recovery by bringing workers back into the labor force, boosting investment, or even raising productivity growth by encouraging innovation. While we think the Fed is almost certain to hike in December, the debate over the merits of running a high-pressure economy could have important implications for the pace of tightening next year and beyond.

### Reasons for running hot

There are two major motivations for allowing the economy to run hot. The first is to help low-wage workers and disadvantaged groups, for whom a very tight labor market might provide opportunities not usually available. The evidence supporting these benefits is fairly compelling. Data from the Economic Policy Institute show that the late 1990s—when the unemployment rate dipped to 4%—was a period of much faster than usual wage growth for low-wage workers, and surveys of employers from the period showed that they became more willing to hire various groups of stigmatized or disadvantaged workers as the labor market became very tight. Indeed, the probability of re-employment for the long-term unemployed spiked. This is important because the number of long-term unemployed remains quite elevated today.

**A boost for the disadvantaged**

Probability of reemployment for the long-term unemployed, %, 6-month moving average, vs. unemployment rate, % (rhs)




*Shading indicates NBER recession. Source: Department of Labor, Goldman Sachs Global Investment Research.*

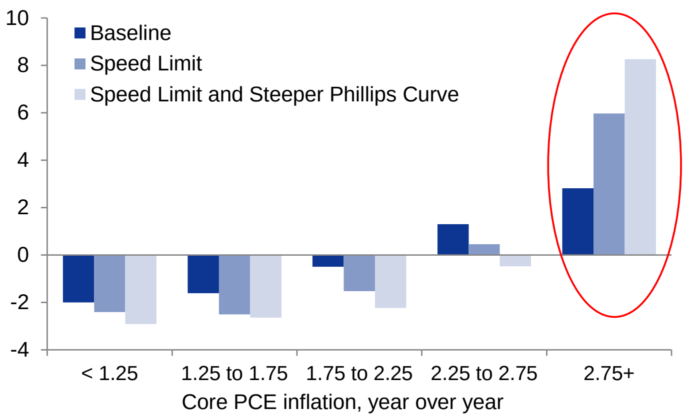
The second motivation is to aid the recovery of aggregate supply by increasing either the size of the labor force or productivity. While the labor force participation rate does respond to the business cycle, much of the cyclical recovery has likely already occurred. Of course, at this point, much of the gap between actual GDP and pre-crisis projections reflects disappointing productivity growth. Could labor scarcity motivate firms to invest in capital or in labor-saving and other cost-reducing technologies? Prior periods of low unemployment in the late 1960s and late 1990s saw productivity growth and R&D investment that were solid, but not strikingly stronger than in surrounding years. Overall, it is hard to have great confidence in the productivity benefits of a high-pressure economy.

### High pressure means price pressure

What about the potential costs? The most straightforward is the risk of a large inflation overshoot. By our estimates, a so-called "whites of the eyes of inflation" policy whereby the Fed wouldn't hike until core PCE reaches 2% would boost the likelihood of a large inflation overshoot by about 3pp relative to the Fed's baseline policy path. However, if we also assume that the Fed is constrained later on by a speed limit of 25bp of tightening per quarter or that the Phillips curve turns out to be steeper, the "whites of the eyes" policy raises the likelihood of a large inflation overshoot by 6-8pp. These are not dramatic effects, but they do imply that the potential inflation costs of a deliberate overshoot are not negligible.

**Potential for price shocks**

Impact of "whites of the eyes" policy on likelihood of core inflation outcomes over the next 10 years, pp




*Source: Goldman Sachs Global Investment Research.*

Inflation risks are not the only potential cost. Fed officials have also expressed concern about contributing to other economic and financial imbalances. In particular, targeting a high-pressure economy would be considerably more likely to produce an unsustainably tight labor market. And many Fed officials take seriously the historical lesson that engineering a soft landing after the labor market overheats is difficult.

### A live debate

Fed officials who believe that there is a clear trade-off between running a high-pressure economy and the expected duration of the expansion are unlikely to be persuaded by the potential benefits. But for others, the policy might look like a tempting trade-off between low-probability risks and low-probability benefits. We see this as a live debate on the FOMC that could have important implications for the pace of tightening, especially if inflation accelerates more than expected.

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# Interview with Joshua Schiffrin

Joshua Schiffrin is a senior trader at Goldman Sachs in US Government Bond Trading and US Inflation Trading. He has worked in the firm's inflation business since 2003 and was its first dedicated Treasury Inflation-Protected Securities (TIPS) market maker. Below, he argues that the recent sell-off in government bonds is just the beginning of a longer-term secular shift.

*The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs Research.*

**Allison Nathan: In the midst of the sharp recent shifts in inflation and bond pricing, what are clients most focused on?**

**Joshua Schiffrin:** The election of Donald Trump caught so many clients by surprise that they are now scrambling to figure out what the new world landscape will be under his administration. Everybody is going back to the drawing board and questioning their old assumptions. The key question is whether the sharp move in the Treasury and inflation markets is a short-term shift that is nearing its end and will soon stabilize, or the start of a bigger secular shift that's going to play out over the next five-to-ten years.

**Allison Nathan: Where do you stand on that? Do you think the recent shift is a mini-cycle that is coming to an end or the start of a longer-term shift?**

**Joshua Schiffrin:** Taking a step back, this does not look like the final stages of a move, but rather the beginning of something that is going to play out over a much longer timeframe in markets. I think this is one of these moments in the market that comes around very infrequently, marked by a big rethink about policy approaches. Even before the election, central banks were rethinking the wisdom of depressing term premium in the bond market to ever-lower levels in the hopes of spurring aggregate demand, and increasingly acknowledging the negative effects of flat yield curves on the banking system. In the US in particular, the degrees of freedom for how Fed policy may operate could be quite large, as it now seems likely that there will be a new Fed chair in early 2018.

At the same time, administrations around the world are increasingly considering whether they should be doing more from a fiscal perspective. Japan is in the process of enacting a fiscal package. The UK has eased back on austerity. And while we are waiting for details from the new US administration, it seems pretty clear that there will be an about-face with respect to tax policy, spending policy, and regulation. So policymakers are shifting gears dramatically from a world in which monetary policy was bearing the sole burden of stimulating the economy to one in which fiscal policy will be playing a greater role.

That dramatic shift, combined with rising anti-globalization or protectionist sentiment and OPEC's move to defend the oil price, has very quickly shifted the fat tail of the distribution from the low-growth/disinflation end to the high-growth/inflation end.

**Allison Nathan: What's your view on inflation? How big are the upside risks? Could core inflation rise to 3.0% anytime soon?**

**Joshua Schiffrin:** I think core CPI will end next year at around 2.3%, marginally higher than it is today. And core PCE will be around 1.9%, very close to the Fed's target. In my view, 3.0% core inflation is unlikely next year just because inflation is a lagging indicator. But by 2018-2020, when the economy would likely be feeling the boost from the new administration's tax cuts and spending measures, there is greater likelihood of exceeding the Fed's target, particularly if the Fed is slow to tighten. Letting the economy run hot at a time when there is higher nominal GDP growth and no spare capacity is the exact formula that would result in 2.5-3.0% core CPI.

**Allison Nathan: How likely is a scenario in which inflation picks up faster than growth?**

**Joshua Schiffrin:** That will depend on the actual policy mix under the new administration, which remains unclear. A big infrastructure spending plan and a large tax cut would likely be positive for both growth and inflation over a longer term. But if the policy mix is more focused on protectionist measures, that might mean higher growth in the near term but slower growth in the long run—as well as persistently higher inflation—because it would suggest lower productivity growth. To me, it seems clear that the new administration has a strong intent to push up nominal growth, but whether that comes through higher inflation or higher real growth is to be determined.

**Allison Nathan: If we want to assess how the market is digesting the new landscape, are breakeven inflation rates the right metric? Given that breakevens incorporate liquidity and other risk premia, do you think they are an accurate reflection of inflation expectations?**

**Joshua Schiffrin:** It's always very difficult to disentangle what's driving inflation breakevens and whether they are a true reflection of the market's inflation expectations. The way that I think about it is that the price of breakevens tells you what the investor base is willing to pay for inflation protection. Over the last few years, that price has been telling you that investors simply do not want inflation protection because the inflation breakeven has traded low to realized inflation and low to the Fed's target. That might be because investors believe the chances of very high inflation are much lower than the chances of very low inflation because of the subdued growth environment. It might be because investors perceive the chances of oil prices crashing are much higher than oil prices soaring because of a view that a surge in shale oil production will cap the price. It isn't easy to decompose the drivers, but I do think that the swift rise in breakevens over recent weeks makes them a good barometer for the impact of the new landscape.

**Allison Nathan: Has the shift that you envision been fully priced or is there more to go?**

**Joshua Schiffrin:** I don't think prices today reflect how dramatically the information set has changed. Ten-year Treasury notes have moved roughly 50bp since the election and now yield about 2.4%. Some market participants view that as sizable, but it's basically where Treasuries were at this time last year. That is very hard to justify given how much the facts have changed. I view the recent sell-off as partly a correction of the rallies we saw this year following the surge in growth fears in Q1 and after Brexit, rather than a complete repricing of the new policy landscape. I'd also note that the 2.0% 10-year breakeven today implies inflation over the next 10 years roughly 40bp below the Fed's inflation target even though the Fed is already at or very close to its goal of full employment and the new administration is likely to be implementing inflationary policies by the end of next year. So I think valuations still have a lot of room to catch up. I see 10-year breakevens at about 2.4% by the end of next year; we've completed about 50% of the move I think we should, and that's where the opportunity lies.

**Allison Nathan: What gets us to those higher levels?**

**Joshua Schiffrin:** For breakevens to move towards 2.4%, I think you also need to see the 10-year Treasury yield move to 3.0%. In other words, I think that inflation expectations in the TIPS breakeven market will move in line with inflation expectations reflected in the broader bond market. So the question is: Why is the broader bond market not fully buying into it yet? Again, the market has moved a lot in a short period of time since the election, and I think there is still a bit of disbelief that things have changed so dramatically. But, as I said, I think we are headed in a more inflationary direction, and maybe even quite quickly.

In short, there is no doubt in my mind that we have made a dramatic shift to a Treasury bear market after a long period of a Treasury bull market. Remember, despite our recent experience, 10-year Treasury yields below 2.5% are very rare historically. You simply don't see yields at such low levels when the economy is essentially at full employment, wage pressures are rising, inflation and inflation expectations are increasing, and the odds that new policies boost inflation further have risen. Basically, all of the factors that made the bond market an amazing place to invest for at least the past five years are now moving in the opposite direction. So I think there is strong case for the bond market to move back towards more usual levels of term premium and inflation risk premium relative to history.

**Allison Nathan: What assets look attractive right now?**

**Joshua Schiffrin:** Personally, I don't think any bonds are particularly attractive at the moment, but TIPS are preferable to nominal Treasuries, because, as I said, it is unclear whether the new administration's desired boost to nominal growth will come through real growth or through inflation. A key aspect of TIPS is that growth-friendly tax and spending policies will likely be inflationary, and any less growth-friendly protectionist measures will also be inflationary. I think shorter-duration TIPS—i.e., five-year—offer the most value.

Bottom line, my sense is that the bond market is vulnerable. So whereas the mentality over the last several years was to buy every dip in the bond market—and that has often paid off—today it will likely pay to sell every rally and either be flat or short bonds. In my view, equities, hard assets, or other assets that don't have a fixed cash flow are the better opportunity right now.

**Allison Nathan: What would change your view on the outlook for higher inflation and breakevens?**

**Joshua Schiffrin:** Tremendous infighting between the new administration and congressional Republicans could change my mind. It's important to remember that congressional Republicans have generally been deficit hawks and one of the largest forces against stimulus-type measures over the last several years. So if the Republican party itself cannot agree on the large-scale initiatives regarding tax cuts and infrastructure spending that are currently being advertised, that would be important. Also, if the new administration shifts its focus to geopolitical issues, immigration, and protectionist measures that are perceived to be less market-friendly, it would risk reducing whatever political capital it has to focus on taxes and spending. Such a shift might still be inflationary in the short term, but would likely put a stop to the longer-term pro-growth/pro-inflation trade.

**Allison Nathan: Growth and inflation prospects look weaker for the other major developed economies. Can the can the US really decouple? Won't expected dollar strength be a limiting factor?**

**Joshua Schiffrin:** What's interesting right now is that for the first time in a while, a US story is driving the markets. Until very recently, US growth and inflation were just not that topical relative to the stories of weaker growth and associated central bank action in Europe, Japan, and other places. Given the importance of the US story today, I think you have to look at a stronger dollar as an output of better US growth rather than a limiting factor for it or a reflection of weakness overseas. Considering the potentially very supportive US policy mix, I think a 10% move in the dollar would not be enough to derail the more positive trajectory for US economic growth or to hold back inflationary pressures via cheaper US imports; there would have to be an extremely large dollar move—on the order of 25-30%—to do so. There is also no guarantee that the dollar will continue to strengthen given that we don't know how a new Fed leadership would handle the inflationary implications of much greater fiscal stimulus.

**Allison Nathan: Even if you see this as a US-driven story, are there any global risks that might threaten your outlook?**

**Joshua Schiffrin:** I think the potential fly in the ointment is China. One of the lessons of the last few years is that the equity market, which was unfazed by Brexit and the US election, really cares about China. Every time that China has had a hiccup in recent years, that story dominated the market for several months, with both equities and other risky assets taking a sizable hit. So China is the global risk that will remain important to watch.

# Top of Mind explains... inflation pricing

**Survey-based inflation expectations.** Measures of inflation expectations based on surveys of individuals or professional forecasters conducted by various institutions. A commonly cited survey of US consumers' inflation expectations is conducted by the University of Michigan.

**Market-based inflation expectations.** Inflation expectations derived from financial markets, e.g., from the pricing of inflation-linked securities such as **TIPS (breakeven inflation)** or from **inflation swaps**.

**Treasury Inflation-Protected Securities (TIPS).** A type of US government bond that compensates the investor for inflation. Like US Treasury bonds, TIPS pay interest twice a year and repay their principal at maturity. However, while the interest rate on TIPS is fixed (like that on a US Treasury bond), the principal invested in TIPS is adjusted according to changes in the CPI. As a result, TIPS interest payments fluctuate with inflation.

Take the example of an investor who buys a 30-year TIPS for $1,000 with an annual coupon of 1%. If CPI inflation over the first year following the investment is 2%, the investor's principal will be adjusted to $1020 ($1000 x 1.02), while the annual interest payment would be $10.20 (1% applied to $1020). At maturity, the investor would receive the greater of (a) the inflation-adjusted principal or (b) the original principal.

Since TIPS compensate for the actual value of inflation, they offer a guaranteed real return if held to maturity. Regular US Treasury bonds, on the other hand, guarantee a nominal return, and their inflation-adjusted return will depend on the rate of inflation.

**Breakeven inflation rates.** The difference between the yield on US Treasury bonds and the yield on **TIPS** of the same maturity. Since US Treasury bonds guarantee a nominal yield and TIPS guarantee a real yield, the breakeven rate should reflect investors' expectations for the future rate of inflation. If future inflation matched this rate, holders of regular US Treasury bonds and TIPS would in theory receive the same return and "break even." For example, if a Treasury bond's yield is 3% and an equivalent maturity TIPS' yield is 1%, the breakeven inflation rate would be 2%. If realized inflation ends up higher than 2%, the real yield on the US Treasury bond will be lower than the yield on TIPS, and vice versa.

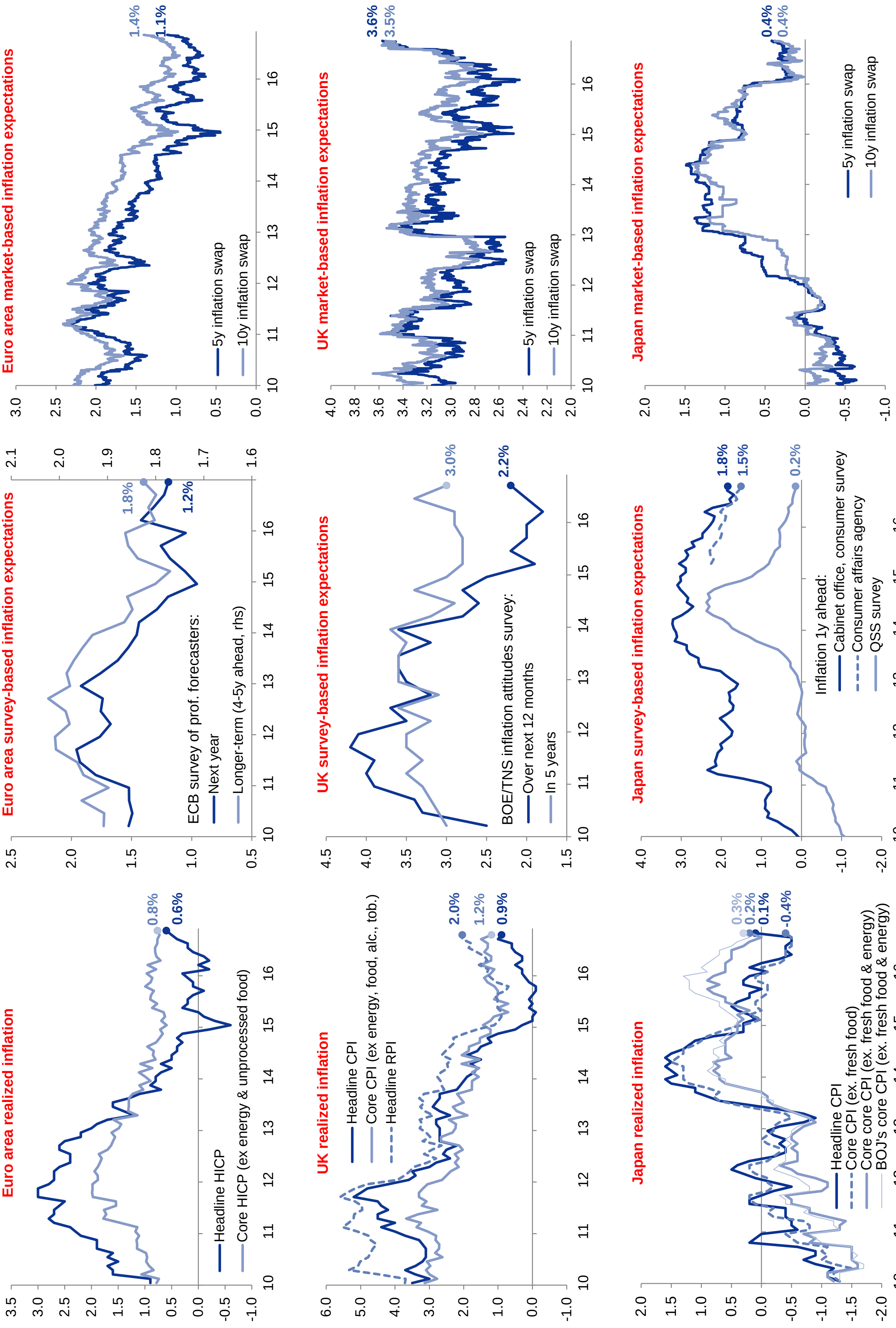
In practice, however, breakevens reflect more than just inflation expectations. They also embed risk premia for factors like the uncertainty around the future rate of inflation and the relatively lower liquidity of the TIPS market. A Treasury investor may demand a premium to compensate for inflation risk, while a TIPS investor would demand a premium for holding an asset that is generally less liquid than a regular Treasury.

**Inflation swaps.** Contracts in which two parties express views on the future rate of inflation on a notional amount of principal. One party (the "payer") makes a payment that varies according to the actual rate of inflation over the period of the contract. The other party (the "receiver") makes a fixed payment based on the expected rate of inflation and some inflation risk premium. The fixed rate is the **inflation swap rate** and provides information on the expected rate of inflation when the contract matures.

**Inflation forwards.** Inflation forwards can be derived from **breakeven inflation** rates or **inflation swap rates** with different maturities. Forward rates are usually quoted as Ay/By, reflecting expected inflation over a period of A years beginning B years from now. For example, the 1y3y forward rate reflects average expected inflation over a one-year period beginning three years into the future.

*Source: Goldman Sachs Global Investment Research.*

# Tracking inflation across other DMs




*HICP is the Harmonized Index of Consumer Prices, a measure of inflation that is comparable across EU countries and European Economic Area members.*

*UK RPI is the Retail Prices Index, which differs in its coverage and construction from the CPI. For example, the RPI includes certain housing-related costs excluded from the CPI. UK inflation swaps are RPI-based.*

*For more on measures of inflation expectations, see pg. 10.*

*Source: Haver Analytics, Bank of England, TNS, Eurostat, Bank of Japan, Japan MIC, Japan Cabinet Office, Nikkei Quick, Goldman Sachs Global Investment Research.*

# Interview with Mihir Worah

Mihir Worah is a managing director at PIMCO and the firm's Chief Investment Officer for Real Return and Asset Allocation. He is a member of the Investment Committee and the Executive Committee, and oversees portfolio management for the US. Prior to joining PIMCO in 2001, he was a postdoctoral research associate at the University of California, Berkeley, and the Stanford Linear Accelerator Center. Below, he argues that the odds of higher-than-expected inflation have grown in light of the US election, making TIPS the risk-free asset of choice for investors.

*The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.*

**Allison Nathan: First things first: How does a theoretical physicist end up as a TIPS trader?**

**Mihir Worah:** It was a long journey, but being a TIPS trader is not that different from my prior job; I used to spend my time thinking about matter and anti-matter, and now I spend it thinking about inflation and deflation.

**Allison Nathan: How do you see US inflation evolving over the next year?**

**Mihir Worah:** We see core inflation holding steady above 2% with a slight change in leadership. This year, core inflation was primarily led by large increases in the cost of shelter, with smaller increases in services inflation and flat or negative changes in core goods inflation. Next year, we think goods and services and wages will move higher, while rents will probably moderate a bit.

We also see headline inflation continuing to converge to above 2% on our view that oil prices will stabilize around $50/bbl. As a reminder, headline inflation was 0% on a year-over-year basis in September 2015; it is 1.6% today as oil prices have risen, and we expect it to increase to 2.3-2.4% over the course of 2017.

**Allison Nathan: Has the election of Donald Trump impacted your outlook on inflation?**

**Mihir Worah:** A lot of policy details need to be fleshed out under the new administration. But no matter what your expectations for medium-term core inflation were heading into the election, they have to be higher under a Trump administration, for two reasons. First is the straightforward reason that more protectionist trade trends, especially in terms of tariffs, are likely to increase the price of US imported goods. And the second, perhaps more important, reason is the increased prospect of fiscal stimulus, whether it be implemented via tax cuts or infrastructure spending. Any near-term boost to growth from fiscal stimulus is likely to boost inflation as well, especially since the US economy is operating close to or at full capacity; fiscal stimulus with a 10% unemployment rate is very different from fiscal stimulus with a sub-5% unemployment rate.

**Allison Nathan: We've seen a sharp increase in inflation expectations recently. Has the speed of this re-pricing surprised you and does it have farther to go?**

**Mihir Worah:** The speed of the repricing has not been particularly surprising. Coming into this year, the 1.5% breakeven inflation rate implied by ten-year TIPS was too low, in our view. The move in the ten-year breakeven rate since the election has been sharp—from about 1.75% to 1.95%—but the TIPS market is still saying that the Fed is unlikely to achieve its inflation target over the next ten years. So despite the sharp re-pricing, we think there is still more to go. In the reasonable inflation environment before the Global Financial Crisis, ten-year breakevens averaged 2.3-2.4%. Again, there is still a lot to clarify on the policies of the new administration, but knowing what I know today, I think it's likely that we can get back to at least the 2.25-2.35% range over the next twelve months.

**Allison Nathan: What is the chance that we see inflation break out to the 3-4% range?**

**Mihir Worah:** The probability of that is low, but it has definitely gone up and is now something investors have to worry about. Especially post the election, I think a big and important change has occurred in that the right tail of inflation is now as likely as the left tail of deflation or low inflation. So while our base case assumes core inflation rises to the 2.0-2.5% range over the next year or two, I think 3-4% inflation is as likely as 0-1% inflation over that period.

**Allison Nathan: What do you expect to see from the Fed and how does this factor into your views?**

**Mihir Worah:** A December hike is pretty much baked in at this point. We continue to expect two or three more hikes next year and our confidence in that expectation has grown as inflation has risen. That said, the Fed has consistently told us that given the previous undershoot of its inflation target, it would let the economy run hot for a while and tolerate a modest overshoot in inflation above 2%. I still think the Fed will allow a modest overshoot, but if the tail of 3-4% inflation begins to look more likely, the Fed would likely hike more aggressively than the market is currently pricing.

**Allison Nathan: If you take off your portfolio manager hat and put on a policymaker hat, what is the right rate of inflation for the economy?**

**Mihir Worah:** I don't think it is 2%. Academics came up with the 2% inflation target during the period of the Great Moderation that began in the mid-1980s, when economic outputs could be controlled and interest rates were at normal levels. But in today's world of persistent low growth and lower-than-historical interest rates, I think the 2% target leaves you bumping up against the zero bound for interest rates too often. So I think the right rate of inflation today is probably closer to

3%. However, the key is to keep inflation predictable and steady, which is more important than zeroing in on any one number.

**Allison Nathan: Could weak inflation in the Euro area and/or Japan hold back US inflation?**

**Mihir Worah:** I see these other economies as having a small influence. There is certainly something to be said for a global output gap. No country is immune from it. But the US is relatively more immune because it is a large, more or less closed economy, so global trends have less of an impact on the US than on smaller, more open economies such as the UK or some of the emerging market (EM) countries. And as I mentioned, there is the possibility that new or higher tariffs on US imported goods would counter some of these low inflation pressures in the other developed markets.

**Allison Nathan: Should TIPS be the first choice for investors looking for an inflation hedge, considering that they are first and foremost a long-duration Treasury bond, leaving investors with duration risk?**

**Mihir Worah:** Yes, TIPS are long-duration treasury bonds, but multi-asset portfolios still need some long-duration assets. Some investors might argue that interest rates are going up and they don't need them, but no one has a crystal ball; even if you have confidence in your base case of rising interest rates, everything has a probability distribution and any prudent investor needs some long-duration assets in their portfolio.

So the real question is what the long-duration asset should be. When lower-than-expected inflation or deflation is a likely outcome, nominal Treasury bonds are the risk-free assets that investors should hold. But when higher-than-expected inflation is more likely than lower-than-expected inflation, TIPS become the preferred risk-free asset. So I think we have seen an important shift in big-picture asset allocation in favor of TIPS as inflation has risen.

The other factor to consider is what's driving the repricing of government bonds. If bond yields are moving higher because of a view that real growth is going to be persistently higher over the next 10 or 15 years, then both TIPS and nominal bond yields will suffer. But if bond yields are moving up because inflation expectations are rising owing to expectations for relatively short-term fiscal stimulus and more protectionist trade policy—without a persistent impact on real growth—then TIPS should outperform nominal bond yields.

Since the election, more than half of the repricing of government bonds has owed to rising inflation expectations and only a much smaller part has owed to an increase in real interest rates. And I think these trends are likely to continue. It's clear to me that the policies the new administration is discussing will raise inflation; it's much less clear to me whether they will persistently increase growth. As a result I don't see long-dated real rates rising too much.

**Allison Nathan: Equities are also considered to be an inflation-protected security. How do you rate them as an inflation hedge today?**

**Mihir Worah:** There is a range of inflation outcomes in the middle of the distribution where equities act like a real asset. As long as inflation stays around the 2.0-2.5% range and growth is decent, equities will be fine. But equities don't provide a hedge against either much higher-than-expected or much lower-than-expected inflation. They are also a long-duration real asset with sensitivity to real interest rates. So unless you get top-line earnings growth, equity prices will just go up and down with long-term real interest rates. And today's exceptionally high equity valuations have been largely driven by the boost they received from ever-lower long-term rates, so if real rates move up by, say, 50-75bp, the equity market is likely to take a hit unless earnings (or earnings expectations) grow sharply and persistently.

**Allison Nathan: Commodity investments have tended to perform well during past periods of inflation but often because rising commodity prices have driven the inflation. Do commodity investments make sense as an inflation hedge when there are other drivers of inflation besides commodities?**

**Mihir Worah:** A little bit of allocation to commodities continues to make sense. When commodities drove inflation higher in the past, this owed to massive commodity supply/demand imbalances, such as the large supply disruptions in the late 1970s or the surging demand from China and other EMs in the mid-2000s. We don't expect price increases on that order to repeat themselves, and generally think supply and demand are about matched across most commodities today. As a result, we don't expect commodities to drive inflation.

That said, to the extent that there is some additional infrastructure spending in the developed markets and some wage growth that enables more consumer spending, you should once again start to see the demand for commodities grow, which should allow commodity prices to at least keep pace with inflation. At the same time, if there are unexpected commodity supply disruptions, for example, arising from geopolitical tensions in the Middle East, equity markets could be down and oil prices up. So a small amount of commodities still works as an inflation hedge.

**Allison Nathan: Where do you see the most compelling real-return opportunities in the market right now?**

**Mihir Worah:** It is hard to find value today, but we see it in two places in particular. The first that we've already talked about is TIPS; yes, they have repriced, but I think they have become the new risk-free asset, so there is room for further repricing and I see longer-term value given my view that growth will remain persistently low. The second is real estate. There are concerns that rising interest rates will weigh on real estate returns, but real estate provides an income stream that has a good track record of keeping pace with or exceeding inflation. And to the extent that we see more US infrastructure spending and the economy stays steady, I think real estate remains an attractive inflation hedge. I also think it is worth keeping an eye on EM assets, which have taken a hit post the US election, but could become attractive for real-return opportunities depending on the details of the new administration's policies.

# Reflation salvation or frustration

## Christian Mueller-Glissmann expects the reflation narrative to support risky assets so long as it is driven by growth optimism, but recommends holding some cash as a buffer in case fears of excessive inflation kick in

Since the mid-1980s—on the heels of the Great Moderation and the Volker-led squeeze on inflation—US 10-year Treasury bond yields have trended down, driving strong real bond returns. Bonds have consistently contributed positively to portfolio returns, while equity returns have been more volatile but higher on average. The last 20 years have also been the longest period of consistently negative equity/bond correlations in the last 100 years, owing largely to more solidly anchored inflation expectations and more aggressive central bank action to buffer growth shocks. As a result, bonds have been good diversifiers for equities; the 5-year rolling Sharpe ratio of a traditional 60/40 portfolio (60% S&P 500, 40% US 10-year bonds) has been close to its highest levels in the last 200 years.

### Reflation momentum amid record-low yields

After 35 years of strong risk-adjusted real returns, one of the longest bond bull markets since 1800 seems to be fading. Bond yields remain close to 140-year lows after several years of below-target inflation, secular stagnation concerns, and central bank bond-buying. The last time bond yields were at current levels was in the 1940s, a period preceded by deflation and followed by some of the worst real bond returns in history, including during the stagflation of the 1970s and 1980s.

While we do not expect a sharp increase in inflation, we think that the current reflation momentum suggests potential for the repricing of inflation expectations to extend. Managing duration risk in the portfolio is therefore clearly gaining in importance.

### Hedging the end of the bond bull market

In the last 100 years, credit exposure has helped buffer negative bond returns in bond bear markets, but has usually failed to deliver positive real returns. Commodities have had a good return track record during episodes of high inflation (in part because they can be a major driver of inflation), but they have also been highly volatile, particularly gold. In the near term, gold could suffer amid high volatility, as deflation risk is priced out across assets. However, in the medium term, a pick-up in inflation might see investors return to gold as an inflation hedge and a store of value.

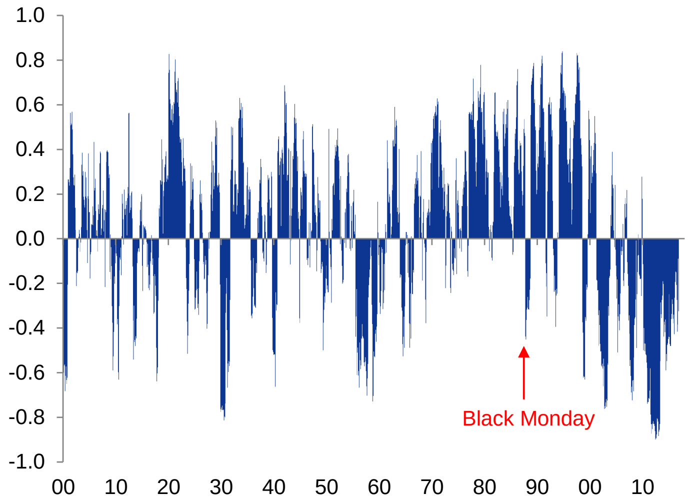
Although equities have outperformed bonds in bond bear markets on average—and fairly consistently since the 1990s—their relative performance has historically been very mixed. Outside the 1940s (following the Great Depression) and the 1998-2000 tech bubble, equities have seldom delivered strong positive absolute returns in bond bear markets. And there were several periods (1968, 1973, and 1980) when bond bear markets spilled over to equities, causing large drawdowns of both. Those were often stagflation episodes, where high inflation met low growth, and sharp increases in bond yields thus weighed heavily on equity valuations and returns. However, the 1994 bond sell-off also weighed on equities despite happening amid a friendlier mix of growth and inflation. In all of these episodes, there were very few places to hide except cash (e.g., US T-Bills). There was also some benefit from investing in equities abroad; while EM equities suffered during recent US bond sell-offs such as the taper tantrum, they were strong performers in earlier periods. (For more detail, see the table on pg. 15.)

### Equities + cash

Going forward, we think equities and risky assets broadly can continue to increase alongside bond yields as long as growth optimism is driving the higher yields. Indeed, as bonds become a drag on returns and a source of risk, investors are likely to rotate out of bonds and into assets that can buffer duration losses, potentially prompting the elusive bond-to-equity rotation that many market participants have hoped for since the Global Financial Crisis. Accordingly, we have turned more pro-risk in our asset allocation, moving to overweight equities and commodities. However, if bonds sell-off too fast due to fears of excessive inflation, there is a risk of indigestion by risky assets. This sort of "reflation frustration" or broader late-cycle concerns could drive a "risk-off" episode, for which bonds may be a poorer hedge than in recent years; as a result, we recommend increased cash allocations as a buffer.

**Negative correlations: not so consistent, until recently**

1-year rolling correlation of monthly equity/bond returns




*Source: Global Financial Data, Inc., Goldman Sachs Global Investment Research.*

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*Alessio Rizzi contributed to this article.*

## 100 years of bond bear markets

US 10-year real return bond drawdowns >10% and respective cross-asset returns (all real total returns)

| Bond Sell off | | CPI change | GDP growth | US 10y yield | Shiller P/E | Government bonds (local currency) US 10Y | US 30Y | T-Bill | Germany | Japan | UK | Commodities Gold | Oil | Equities S&P 500 | MSCI Europe | Topix | EM | World | Credit DJ Corp. | Portfolio 60/40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jun-01 | Oct-02 | 11.9 | | 2.9 | 25x | **-12** | | -11 | -9 | 1 | -11 | -14 | 6 | -9 | | | | | | -10 |
| Sep-05 | Apr-10 | 4.6 | | 3.0 | 20x | **-20** | | -7 | -11 | 5 | -15 | -19 | -27 | 5 | | | | | | -5 |
| Mar-15 | May-20 | 15.0 | | 3.6 | 11x | **-52** | | -42 | -60 | -50 | -57 | -52 | 109 | -31 | | | | | | -40 |
| Jun-31 | Dec-31 | -6.4 | | 3.1 | 15x | **-12** | -9 | 4 | 1 | -3 | -3 | 3 | 26 | -42 | | 0 | -9 | -35 | -14 | -30 |
| Apr-41 | Sep-59 | 3.9 | | 2.0 | 12x | **-39** | -48 | -38 | -88 | 62 | -43 | -50 | -38 | 681 | | 4268 | 31 | 202 | -10 | 193 |
| Mar-67 | May-70 | 5.0 | 2.7 | 4.5 | 21x | **-22** | -20 | 2 | -4 | 4 | -25 | -13 | -9 | -27 | 4 | 12 | 41 | -14 | -13 | -24 |
| Mar-71 | Sep-81 | 8.3 | 3.0 | 5.4 | 17x | **-46** | -56 | -6 | -13 | -18 | 0 | 406 | 340 | -21 | -13 | 37 | 70 | -8 | -22 | -31 |
| May-83 | May-84 | 4.4 | 7.5 | 10.1 | 10x | **-12** | -19 | 5 | -2 | 6 | -3 | -16 | -4 | -8 | 22 | 19 | 9 | 5 | -6 | -10 |
| Jan-87 | Oct-87 | 5.1 | 4.2 | 7.0 | 15x | **-17** | -25 | 1 | -9 | -11 | 2 | 11 | 6 | 4 | 18 | 24 | 62 | 33 | -8 | -5 |
| Oct-93 | Nov-94 | 2.6 | 4.3 | 5.2 | 21x | **-16** | -23 | 1 | -7 | -5 | -9 | 2 | -2 | -1 | 6 | -8 | 37 | 8 | -10 | -7 |
| Oct-98 | Jan-00 | 2.3 | 4.5 | 4.2 | 34x | **-15** | -24 | 3 | -11 | -8 | -7 | -6 | 89 | 44 | 60 | 60 | 91 | 47 | -7 | 17 |
| Dec-08 | Jun-09 | 4.5 | -3.3 | 2.1 | 15x | **-15** | -31 | -2 | -6 | -4 | -5 | 7 | 80 | 5 | 9 | 8 | 39 | 8 | 3 | -4 |
| Oct-10 | Feb-11 | 2.7 | 0.5 | 2.4 | 21x | **-10** | -20 | -1 | -8 | -4 | -7 | 0 | 3 | 13 | 9 | 12 | 2 | 11 | -5 | 3 |
| May-13 | Sep-13 | 1.7 | 2.4 | 1.6 | 23x | **-11** | -18 | -1 | -7 | -2 | -9 | -7 | 15 | 4 | 3 | 0 | -8 | 2 | -7 | -2 |
| Jul-16 | Nov-16 | 1.0 | 1.2 | 1.4 | 27x | **-8** | -16 | 0 | -4 | -3 | -5 | -14 | 8 | 4 | 5 | 22 | 5 | 3 | -5 | -1 |
| | ***Average*** | ***4.4*** | ***2.7*** | ***3.9*** | ***19x*** | ***-20*** | ***-26*** | ***-6*** | ***-16*** | ***-2*** | ***-13*** | ***16*** | ***40*** | ***41*** | ***12*** | ***371*** | ***31*** | ***22*** | ***-9*** | ***3*** |
| | ***Median*** | ***4.4*** | ***2.9*** | ***3.1*** | ***20x*** | ***-15*** | ***-22*** | ***-1*** | ***-8*** | ***-3*** | ***-7*** | ***-7*** | ***6*** | ***4*** | ***7*** | ***16*** | ***34*** | ***6*** | ***-8*** | ***-5*** |

*Source: Global Financial Data, Inc., Goldman Sachs Global Investment Research.*

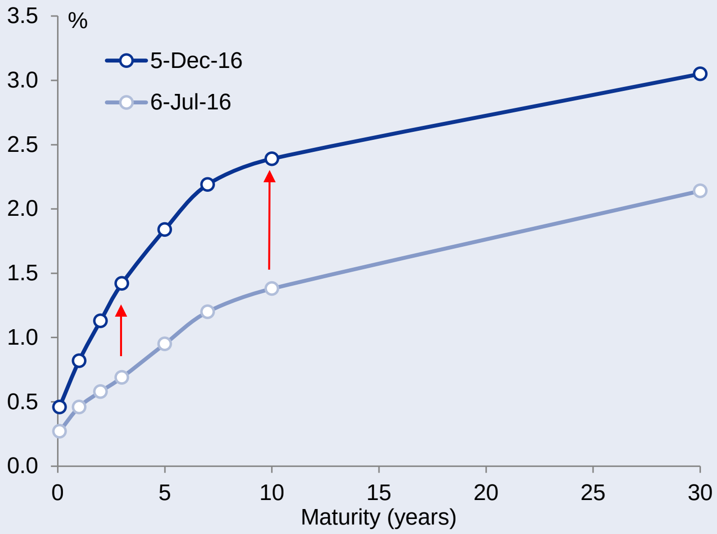
## The US bond market today: On the way to $1tn in losses

GS Senior Mortgage Strategist Marty Young discusses how bond markets are digesting the rise of Treasury yields since mid-year

In earlier research, we argued that the expansion of US bond market debt outstanding, combined with a lengthening of bond durations, had set the stage for large market value losses in the event of a rise in rates. By our estimates, the Barclays US Aggregate Bond Index's duration risk exposure is more than double the inflation-adjusted exposure that prevailed as of 2009, and more than three times the risk exposure of 1994. Thus, we argued that a 1% shock to yields would impose larger real losses to bondholders than at other times in history.

We predicted that a 100bp interest rate shock would translate into over $1tn in market value losses. Recent events tested that prediction, as 10-year Treasury rates have risen 100bp from the lows in July. Over the same period, we estimate that market value losses for the Barclays US Aggregate Bond Index amounted to $910bn—close to, but slightly below, the predicted magnitude. The lower-than-predicted loss owes partly to corporate spread tightening that offset the losses due to duration. However, the more important mitigating factor is that rates have not sold off uniformly by 100bp across the yield curve; 1-year Treasury yields, for example, only rose by 35bp.

**US Treasury yield curve**




*Source: Bloomberg.*

Going forward, we expect the recent trend to extend, as we think the market is still underpricing the potential for further interest rate increases. We look for cumulative bond market losses to exceed $1tn by 4Q2017. The Treasury and corporate bond markets represent the largest sources of duration risk, given the large face value and the long maturities of debt in these sectors. Another source of potential future losses is the MBS market, where higher interest rates have lowered expected refinance rates, lengthening durations by over 80% since July, and thus increasing the sensitivity of MBS bond prices to an increase in rates.

**Marty Young**

*For more, see Global Markets Daily: On the way to $1tn in bond market losses (Young), 2 December 2016.*

# A discussion on equity impacts

David Kostin, Chief US Equity Strategist, and Peter Oppenheimer, Chief Global Equity Strategist, discuss the implications of rising inflation for equity investors, and both express less enthusiasm about exposure to cyclical stocks than one might expect.

*David Kostin*

*Peter Oppenheimer*

**Allison Nathan: Why did it take so long for investors to come around to the prospect of higher inflation in the US?**

**David Kostin:** You're right that inflation has only recently become a focus for US investors. Inflation has been climbing toward the Fed's 2% target over the course of the year, but investors were initially much more focused on wage inflation rather than on broader inflationary pressures, as companies in several sectors continued to report competition in hiring and retaining workers.

The conversation hadn't moved much beyond wage inflation because most investors saw demand as relatively low and therefore saw the ability of companies to raise prices—and thus the broad inflationary impulse—as relatively low. So any inflationary pressures coming from wages would most likely just eat into margins, particularly in businesses with excess capacity. That hasn't necessarily changed, and I continue to expect that US corporate margins will peak during 2017 and then begin to decline.

What has changed the inflation narrative of course is the US election; the combination of a Trump administration and a Republican-majority Congress has increased the odds of higher inflation through fiscal stimulus and potentially more protectionist trade policies.

**Allison Nathan: Is the Donald Trump reflation story justified or overblown?**

**David Kostin:** It is justified, in my opinion. Fiscal expansion will create demand at a time when the labor market is already tight and limited slack exists in the economy. Implied inflation has jumped to 2.0% and bond yields are 50bp higher than before the election. Equity investors are focused on the potential for lower coporate taxes and higher earnings growth.

**Allison Nathan: How have equity investors' views on European inflation evolved? Is the recent focus on higher inflation premature for the Euro area?**

**Peter Oppenheimer:** The situation in Europe is indeed different because the output gaps there remain large compared to that in the US. This should keep core inflation more muted than in the US; our economists expect Euro area core inflation of just 0.7% next year and 1.0% in 2018. Even in the UK, where the currency has depreciated sharply, they see core inflation reaching just 1.4% next year. That is one reason why I expect margins to be pretty flat over the course of the year, albeit at lower levels than in the US, at around 6.3%.

That said, investors in Europe nevertheless seem focused on a reduction in the tail risk associated with deflation owing to rising commodity prices, the rhetoric and action of some central banks to accommodate more inflation, and, as David mentioned, the increased prospects of fiscal easing, which have fueled a reflationary narrative. This shifting investor mindset matters a lot for the outcome for different parts of the market given that we're starting at such low levels of inflation and interest rates. And of course this shift in perception goes hand in hand with the rise in bond yields since the summer, which recently accelerated sharply. It's true that US Treasury yields have increased by more than European bond yields, but European equity markets are actually impacted as much by the former as they are by the latter.

**Allison Nathan: If we have indeed passed the inflection point for bond yields and inflation expectations, what does that mean for equity performance?**

**Peter Oppenheimer:** The first point to make is that the decline in inflation expectations and the related fall in bond yields in recent years dramatically and substantially pushed up valuations across all financial assets, but especially of equities. And in the case of Europe, where profit growth has been relatively weak, the resulting increase in P/E multiples generated most of the return earned over the last three to four years. So a reversal of these trends begs the broader question of where equity returns will come from going forward given a still-lackluster outlook for profitability.

But perhaps even more importantly, the shift to a reflationary narrative has reversed the binary outcomes in the market that separated those sectors that benefitted the most from falling inflation expectations and bond yields—generally defensive, bond-like proxies such as consumer staples—and those that had the most at risk from deflation, such as financials, where relative valuations had become the most stretched. As a result, we have seen the notable underperformance of cyclicals versus defensives, value versus growth stocks, and low-volatility stocks versus the index turn to outperformance in recent months.

> "I believe the outperformance of cyclicals will continue in the near term, but most of the rally is likely behind us…I prefer domestic-facing cyclical industries like financials and transportation going forward. They're less expensive than global cyclicals and should benefit more from better US growth, and financials in particular will get a boost from higher rates."
>
> *-David Kostin*

**David Kostin:** A key difference between the US and Europe is that the US has actually had very strong profit growth for several years, which has helped equity performance alongside rising multiples. So the US story has not been all about falling inflation expectations and bond yields. That said, higher inflation expectations since mid-year and especially after the election did drive much of the outperformance of US cyclicals relative to defensives over that period.

**Allison Nathan: Is the recent outperformance of cyclicals sustainable?**

**David Kostin:** I believe the outperformance of cyclicals will continue in the near term, but most of the rally is likely behind us. At the beginning of July, US cyclical stocks traded at 15x forward earnings while defensives were at 19x earnings, but that historically large valuation gap has closed dramatically as cyclicals have outperformed by over 17 percentage points during the last five months. That's why I prefer domestic-facing cyclical industries like financials and transportation going forward. They're less expensive than global cyclicals and should benefit more from better US growth, and financials in particular will get a boost from higher rates.

**Peter Oppenheimer:** In Europe, cyclicals and defensives also broadly trade on similar valuations now. The only real exceptions are the financials on the one hand, which have very low multiples, and the consumer staples on the other hand, which have high multiples—again, the two extremes of the market that are most leveraged to inflation expectations and bond yields. So the rotation between these two likely has further to go, and we are overweight banks and underweight consumer staples. I do not see much room for outperformance in other cyclicals. However, given that the move in bond yields has been almost entirely driven by expectations for higher inflation, not for stronger growth, cyclicals could still broadly benefit from any rise in real yields if we see an increase in growth expectations.

In general, though, I think that just looking at cyclicals versus defensives oversimplifies things. Ultimately, it's the drivers of inflation that determine the relative winners and losers. Historically, rising inflation driven by commodities has helped basic resource and industrial stocks, whereas pressure from rising wages has supported consumer-facing cyclicals. So far in Europe, hints of inflationary pressure have resulted more from the former than the latter. And that has contributed to dispersion near record highs between the best and worst cyclical performers this year, with basic resources stocks rising by roughly 65% year-to-date and bank stocks falling by about 8% over the same period. The resources stocks also benefitted from improved growth drivers, particularly in EM, but I think that has largely played out for now and that the focus has shifted to the rise in inflation expectations and bond yields that we have been discussing.

**David Kostin:** I agree that the drivers of inflation matter. For example, even before the recent inflation discussions, clients were focused on higher US wage growth, which would suggest outperformance of companies with relatively low labor costs. And indeed, US companies with low labor costs relative to their overall expense structure have outperformed those with high labor costs by more than 4pp and the broader S&P 500 by almost 6pp since mid-year. I expect that divergence to continue into 2017 as wages continue to rise.

> "A bit of inflation resulting from stronger growth is obviously a positive for equities, but there is a limit... low bond yields have pushed equity valuations to relatively high levels, so a continued rise in bond yields on inflationary momentum would very likely weigh on valuations… the tipping point may be when 10-year US Treasury yields surpass 2.75%."
>
> *-Peter Oppenheimer*

**Allison Nathan: More broadly, how much more room is there for equities to run in an environment of rising inflation and bond yields?**

**Peter Oppenheimer:** A bit of inflation resulting from stronger growth is obviously a positive for equities, but there is a limit. As I mentioned, low bond yields have pushed equity valuations to relatively high levels, so a continued rise in bond yields on inflationary momentum would very likely weigh on valuations. On our estimates, the tipping point may be when 10-year US Treasury yields surpass 2.75% or 10-year German Bund yields get to 0.75-1.00%; at that point, any further rises in bond yields would probably be negative for stock returns.

That's the key reason why I continue to expect equity returns to remain in a "fat and flat" range. In short, much stronger growth would likely go hand in hand with higher inflation expectations and bond yields, which would constrain market upside. On the flip side, weaker growth would likely keep rates very low, which would likely limit absolute returns but also market downside.

**David Kostin:** Higher US inflation and Treasury yields will weigh on valuation expansion in the second half of next year. The average S&P 500 forward P/E multiple when 10-year Treasuries are yielding 2-3% has historically been 14.2x—but we're currently starting from a forward P/E that is stretched by historical standards according to almost any metric. I believe the five-year P/E expansion cycle has come to an end. The multiple has increased by 70% since the low in 2011, well above the typical expansion cycle of 50%. The S&P 500 will trade at 2300 in 12 months, after rising to 2400 in the early part of next year, but the appreciation will reflect higher earnings rather than a higher P/E. In a more inflationary scenario than our economists currently envision, that adjustment might happen more disruptively.

# Reinforcing the case for reflation

## Francesco Garzarelli and Rohan Khanna discuss the drivers behind our call for higher US and Euro area inflation pricing

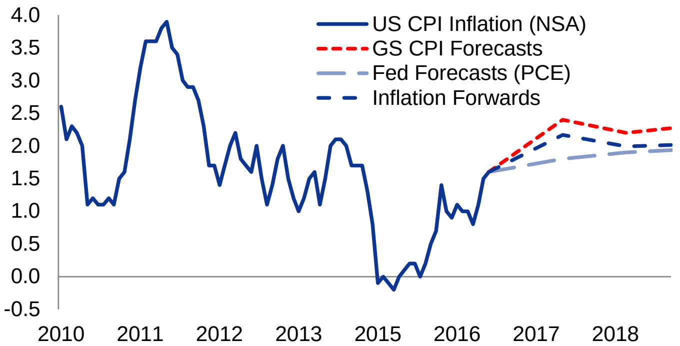
We have long held that markets were pricing too little inflation compared to the cyclical position of the US economy and still-accommodative monetary policy in developed markets. However, several factors got in the way of the reflation trade this year, namely, the China-led risk shakeout during Q1 and the Brexit "policy shock" in June. That said, the reflation narrative has since regained momentum and, following the election of Donald Trump, has roared ahead on the possibility of greater fiscal stimulus and protectionist trade policy. While most of the factors that were at the crux of our reflation views for 2016 have only strengthened, additional factors could support the tailwind for the reflation trade in 2017.

### Reinforcing reflation

First, thanks to base effects from energy components, headline CPI inflation will rise entering 2017 across the major advanced economies. Our economists expect US headline CPI to average 2.2% yoy in 2017 from the trailing level of 1.6% and Euro area HICP inflation to average 0.9% yoy from 0.5% currently. PCE and core PCE in the US are expected to average 2.0% and 1.9%, respectively, in 2017. This repricing in spot inflation dynamics should influence inflation expectations positively.

Onward and upward for 2017

US realized inflation, GS forecasts, and forwards, %




*Source: Haver Analytics, Goldman Sachs Global Investment Research.*

Second, with "austerity" in the rear-view mirror, the onus of stimulating demand appears to be shifting from central banks towards the fiscal authorities. We forecast a relatively large, synchronized support to GDP growth from the public sector in Japan, China, the US, and Europe. In the US, our economists' working assumption is for a fiscal package of around 1.0% of GDP that would increase the level of real GDP by about 0.6%. This, along with some of President-elect Trump's protectionist policies, should give a fillip to inflation, though the latter will eventually also hurt growth. In Europe, our economists expect a fiscal impulse of 0.5% of GDP in 2017, to add to the 0.25% in 2016. We expect only a part of the increase in fiscal support across developed markets to expand potential output, with the bulk potentially stoking inflation.

Third, the major central banks have been aiming for inflation to run at/above their 2% target for some time to compensate for the undershooting in recent years. With this objective, the ECB, BoE and BoJ are all creating more "fiscal headroom" for their respective treasuries through large-scale purchases of government bonds. We expect these purchases to continue throughout 2017. In this context, we think that greater attention will be given by both the BoJ and the ECB to prevent an excessive flattening of their respective nominal term structures of rates. This should allow the inflation forwards to expand.

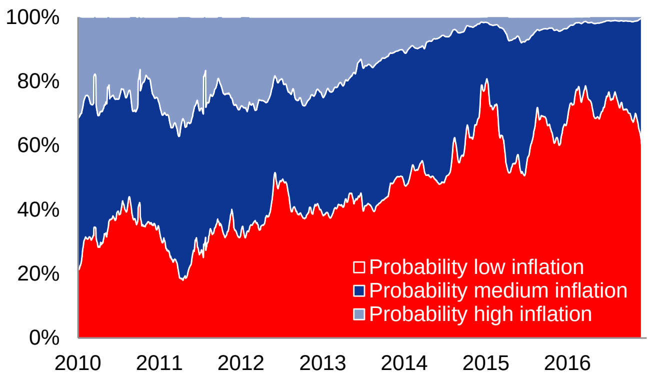
Finally, our commodity strategists are now tactically bullish on oil and overweight commodities. Their rationale is that the recent reacceleration in global PMIs suggests commodity markets are entering a cyclically stronger environment, supported further by policy-related supply restrictions and/or economic reductions across the commodity complex. A pick-up in commodity prices should support risk sentiment and further boost the prospects of an increase in inflation expectations.

### The trade

We recommend being long both US$ and EUR 10-year inflation. We suggest implementing the US leg through selling 10-year nominal bonds and buying equivalent-maturity TIPS and the Europe leg through HICP inflation swaps. We like the US leg of the trade because expansionary fiscal policies in an economy already operating at essentially full capacity will likely push up domestic price and wage inflation. And we have confidence in the EUR leg of the trade in large part because of our view that the ECB will maintain its highly accommodative monetary policy stance, as well as the still very pessimistic skew in inflation expectations in the Euro area, underscored by the inflation options market assigning a 70% chance of CPI staying below 1% over the next five years. While shifts in the growth outlook or a drawdown in commodity prices pose risks to our view, our economists remain optimistic on the economic environment, and the downside from commodity prices should be lower thanks to the stronger cyclical backdrop.

Still too pessimistic, in our view

Option-implied probability distribution of five-year inflation by strike "clusters": low (≤1%), medium, and high (≥3%) inflation




*Source: Bloomberg, Goldman Sachs Global Investment Research.*

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*See also Global Markets Daily: "Top Trade #5" (23 November, 2016).*

# Snapshot of our views

## How does higher US inflation affect your asset class?

For more detail, click on the name of the asset class in the left-hand column.

| Asset class | View |
|---|---|
| **FX**<br><br>**Robin Brooks**<br>**Silvia Ardagna** | • Rising US inflation reinforces our call for monetary policy divergence and US dollar strength. The inflation story is unique to the US; while our economists expect core PCE to reach the Fed's target of 2% by end-2017, they continue to forecast below-target inflation over the coming years in the Euro area and Japan. We believe that the market is continuing to underprice future Fed tightening, which in our view points to further upside for the US dollar, including in the near term.<br>• We forecast the trade-weighted dollar to appreciate roughly 7% against G10 currencies over the next 12 months, and we see risks to our 12-month forecasts for EUR/$ (1.00) and $/JPY (115) as tilted in the direction of more dollar strength. |
| **Rates**<br><br>**Francesco Garzarelli** | • Inflation remains among the most important drivers of our view that core rates will continue to rise, albeit at a slower pace than in recent weeks. We forecast 10-year US Treasury yields reaching 2.75% by end-2017.<br>• While the forthcoming boost to US headline CPI from base effects is largely already priced, we believe that the market is not yet fully discounting a drift higher in US core inflation, as spare capacity is absorbed and wage growth accelerates. Additional support to inflation and inflation expectations should come from a fiscal package under the new US administration, as well as a cyclically stronger environment for commodities.<br>• We like being long both US$ and EUR 10-year inflation, one of our top trades for 2017 (for more, see pg. 18). |
| **EM**<br><br>**Caesar Maasry**<br>**Kamakshya Trivedi** | • Rising US inflation and DM rates from exceptionally low levels can create headwinds for EM asset market performance. However, better valuations and reduced reliance on external financing mean that the sensitivities of EM assets to DM rate shocks have somewhat subsided since the 2013 "Taper Tantrum."<br>• If the rise in US inflation and US rates comes alongside higher commodity prices and stronger growth, cyclical assets (equities, commodity currencies) could still thrive, but local-currency bonds would likely underperform.<br>• History also shows that EM assets are much better positioned to withstand gradual rate increases, while a sudden and sharp repricing of future US inflation or rates will most likely lead EM to sell-off across the board.<br>• The repricing of cyclical equities (vs. defensive sectors) in EM has lagged relative to DM. We expect EM equities to "catch up" in the near term, especially in Brazil, India, and Poland, where markets are relatively more insulated from US trade policy, core rate rises, and China growth worries than most other EMs. |
| **Credit**<br><br>**Lotfi Karoui**<br>**Bridget Bartlett** | • The repricing of US inflation and related sharp sell-off in rates have fueled concerns about the risk to credit spreads. However, history suggests that higher rates typically lead to tighter credit spreads, as rising rates have generally reflected a friendly mix of growth, inflation, and monetary policy. Our baseline view is that spreads will likely continue to resist higher rates, as they did in previous cycles.<br>• That said, output and employment are near full capacity, while credit spreads are at the low end of their post-crisis range. The risk that higher inflation dominates the growth impulse from easier fiscal policy is therefore greater. A significant upside surprise in inflation over a sustained period would probably force the Fed to recalibrate its reaction function and result in a less friendly backdrop for credit.<br>• The speed and the magnitude of the rates selloff could potentially cause a prolonged period of fund outflows as retail investors reduce their exposure to corporate bonds. But the risk of a spiral featuring heavy outflows and wider spreads is low in our view. Absent a significant inflation upside surprise, we would view any flow-driven technical dislocation as an opportunity to add risk. |
| **Equity**<br><br>**David Kostin**<br>**Ben Snider** | • Slightly higher inflation expectations pose only modest risk to US equities in aggregate. Equity returns should generally reflect the growth of nominal earnings. The S&P 500 is typically positively correlated with breakeven inflation, as equities and inflation share similar sensitivities to the outlook for US growth and Fed policy.<br>• However, if inflation rises too far, too quickly, it may harm equities by destabilizing the economic environment, weighing on profit margins, and/or causing real yields to rise and pressuring valuations. We expect higher inflation and rates to limit upward EPS revisions and restrict S&P 500 valuation expansion during 2H17.<br>• Investors concerned about rising inflation should buy stocks with low labor costs (GSTHLLAB) and sell those with high labor costs (GSTHHLAB). In addition, if bond yields continue to rise alongside inflation expectations, weak balance sheet stocks (GSTHWBAL) may underperform strong balance sheet stocks (GSTHSBAL).<br>• Rising inflation supports the outperformance of cyclical sectors and factors (financials, energy, materials, industrials, small-cap, value) over stocks with bond-like qualities (consumer staples, low volatility). We expect the recent cyclical outperformance to continue near-term, though most of the rally is likely behind us, and recommend domestic-facing cyclicals such as banks, insurance, and transportation (GSSBDCYC). |
| **Commodity**<br><br>**Jeff Currie**<br>**Max Layton** | • Since the election of Donald Trump, gold prices have sold off as rates have increased, in line with the historical inverse relationship between gold prices and real rates. Improving expectations for global growth have also been driving global physical ETF liquidation; we continue to see the near-term risks to our $1,200/oz 3 and 6-month gold price forecasts as skewed to the downside.<br>• The potential boost to fiscal stimulus under a Trump administration, especially via infrastructure, should support industrial metals prices, at least initially. That said, copper prices are up c.20% since the US election, and given that our economists expect Chinese growth to slow in 1Q17, we think this move is overdone in the near term. However, we see risks to our $5,000/mt 3-mo copper price forecast skewed to the upside.<br>• We are also closely watching the Fed. If the Fed is in front of the curve, the resulting rise in real rates and dollar strength would be bearish for EM growth and metals. However, if the Fed is behind the curve, real rates would remain low or potentially decline, with bullish implications for all metals. |

# Summary of our key forecasts

| | GDP Growth (% yoy) | | | | FX | | | | Equity | | | | Rates (% eop) | | | | Revision Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2016 | | 2017 | | 3-mth | | 12-mth | | 3-mth | | 12-mth | | Policy* | | 10-yr | | |
| | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | 2016 | 2017 | 2016 | 2017 | |
| **Global** | 3.1 | 2.9 | 3.5 | 3.1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | **EUR/$** | | **EUR/$** | | **SP500** | | **SP500** | | | | | | |
| **US** | 1.6 | 1.6 | 2.2 | 2.2 | 1.08 | 1.05 | 1.00 | 1.05 | 2400 | 2235 | 2300 | 2350 | 0.50 to 0.75 | 1.25 to 1.50 | 2.00 | 2.75 | In our 2017 US equity outlook published December 6, we raised our 3/6/12-month S&P 500 forecasts to 2400/2350/2300, respectively, from 2100/2125/2175 previously. The revised path reflects initial market "hope" about the possibility of lower corporate taxes, repatriation of overseas cash, less regulation, and fiscal stimulus, followed by "fear" that tax reform proves limited, rising inflation prompts more Fed tightening, and bond yields continue to rise. |
| | | | | | **EUR/$** | | **EUR/$** | | **Eurostoxx 50** | | **Eurostoxx 50** | | | | | | |
| **EURO AREA** | 1.6 | 1.6 | 1.4 | 1.3 | 1.08 | 1.05 | 1.00 | 1.05 | 3150 | 3100 | 3250 | 3295 | 0.00 | 0.00 | - | - | In our 2017 European equity outlook published November 28, we raised our 3/6/12-month Eurostoxx 50 targets to 3150/3200/3250, respectively, from 2900/3100/3200 previously, reflecting modest earnings growth boosted by commodity and financials sectors, as well as continued reflationary dynamics (although the latter could ultimately pose a risk to equities). |
| | | | | | **EUR/$** | | **EUR/$** | | **DAX 30** | | **DAX 30** | | | | | | |
| **GERMANY** | 1.7 | 1.8 | 1.4 | 1.4 | 1.08 | 1.05 | 1.00 | 1.05 | - | - | - | - | - | - | 0.30 | 0.80 | |
| | | | | | **$/JPY** | | **$/JPY** | | **TOPIX** | | **TOPIX** | | | | | | |
| **JAPAN** | 0.8 | 0.6 | 1.2 | 0.8 | 108 | 111 | 115 | 114 | 1550 | - | 1600 | - | -0.10 | -0.10 | 0.05 | 0.15 | In our 2017 Japan equity outlook published December 1, we raised our 3/6/12-month TOPIX targets to 1550/1500/1600, respectively, from 1300/1350/1400 previously. Our view rests on four assumptions of a favorable macro backdrop, earnings growth, additional structural reforms, and favorable flow of funds. |
| | | | | | **$/CNY+** | | **$/CNY+** | | **MXCN** | | **MXCN** | | | | | | |
| **CHINA** | 6.7 | 6.7 | 6.5 | 6.4 | 7.00 | 6.98 | 7.30 | 7.14 | - | - | 66 | - | 2.40 | 2.10 | - | - | In our 2017 China equity outlook published December 1, we lowered our 2017 MXCN forecasts to 66 from 70, reflecting in part a slow expected start to 2017 due to slower sequential growth, temporary fiscal drag, and capital outflows. |
| | | | | | **$/BRL** | | **$/BRL** | | **BOVESPA** | | **BOVESPA** | | | | | | |
| **BRAZIL** | -3.4 | -3.3 | 1.1 | 1.0 | 3.20 | 3.42 | 3.40 | 3.49 | - | - | - | - | 13.75 | 11.00 | - | - | |
| **Commodities** | Brent crude oil ($/bbl) | | | | Copper ($/mt) | | | | Gold ($/toz) | | | | Corn (cent/bu) | | | | |
| | 3-mth | | 12-mth | | 3-mth | | 12-mth | | 3-mth | | 12-mth | | 3-mth | | 12-mth | | |
| | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | GS | Cons | |
| | 56.5 | - | 51.5 | - | 5000 | - | 4800 | 4840 | 1200 | - | 1250 | - | 350 | - | 335 | - | |

Note: Recent revisions marked in red; GDP consensus is Bloomberg; all other consensus is Reuters; commodity 12-mo consensus is Reuters for 2017 average.

+ CNY daily fix    * Euro area rate is MRO rate. China rate is 7-day repo rate.

*Source: Bloomberg, Thomson Reuters, Goldman Sachs Global Investment Research.*

# Glossary of GS proprietary indices

## Current Activity Indicator (CAI)

Measures the growth signal in the major high-frequency activity indicators for the economy. Gross Domestic Product (GDP) is a useful but imperfect guide to current activity. In most countries, GDP is only available quarterly, is released with a substantial delay, and initial estimates are often heavily revised. GDP also ignores important measures of real activity, such as employment and the purchasing managers' indexes (PMIs). All of these problems reduce the effectiveness of GDP for investment and policy decisions. Our CAIs are alternative summary measures of economic activity that attempt to overcome some of these drawbacks. We currently calculate CAIs for the following countries: USA, Euro area, UK, Norway, Sweden, China, Japan, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, Australia and New Zealand.

## Financial Conditions Index (FCI)

Financial conditions are important because shifts in monetary policy do not tell the whole story. Our FCIs attempt to measure the direct and indirect effects of monetary policy on economic activity. We feel they provide a better gauge of the overall financial climate because they include variables that directly affect spending on domestically produced goods and services. The index is calculated as a weighted average of several financial variables, including short-term interest rates, long-term interest rates, equity prices, and the trade-weighted dollar.

## Global Leading Indicator (GLI)

Our GLIs provide a more timely reading on the state of the global industrial cycle than the existing alternatives, and in a way that is largely independent of market variables. Global cyclical swings are important to a huge range of asset classes; as a result, we have come to rely on this consistent leading measure of the global cycle. Over the past few years, our GLI has provided early signals on turning points in the global cycle on a number of occasions and has helped confirm or deny the direction in which markets were heading. Our GLI currently includes the following components: Consumer Confidence aggregate, Japan IP inventory/sales ratio, Korea exports, S&P GS Industrial Metals Index, US Initial jobless claims, Belgian and Netherlands manufacturing surveys, Global PMI, GS Australian and Canadian dollar trade weighted index aggregate, Global new orders less inventories, Baltic Dry Index.

## Goldman Sachs Analyst Index (GSAI)

Our US GSAI is based on a monthly survey of Goldman Sachs equity analysts to obtain their assessments of business conditions in the industries they follow. The results provide timely "bottom-up" information about US economic activity to supplement and cross-check our analysis of "top-down" data. Based on their responses, we create a diffusion index for economic activity comparable to the ISM's indexes for activity in the manufacturing and nonmanufacturing sectors.

## Macro-data Assessment Platform (MAP)

Our MAP scores facilitate rapid interpretation of new data releases. In essence, MAP combines into one simple measure the importance of a specific data release (i.e., its historical correlation with GDP) and the degree of surprise relative to the consensus forecast. We put a sign on the degree of surprise, so that an underperformance will be characterized with a negative number and an outperformance with a positive number. We rank each of these two components on a scale from 0 to 5, and the MAP score will be the product of the two, i.e., from -25 to +25. The idea is that when data are released, the assessment we make will include a MAP score of, for example, +20 (5;+4)—which would indicate that the data has a very high correlation to GDP (the '5') and that it came out well above consensus expectations (the '+4')—for a total MAP value of '+20.' We currently employ MAP for US, EMEA and Asia data releases.

## Real-Time Inflation and Activity Framework (RETINA)

RETINA provides a comprehensive econometric methodology able to filter incoming information from the most up-to-date high frequency variables in order to track real GDP growth in the Euro area. Along with a GDP tracker, RETINA also captures the interrelated mechanisms of the area-wide pricing chain, providing a short-term view on inflation dynamics.

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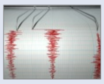

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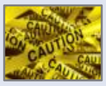

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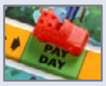

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