Economics, Commodities and Strategy Research

Goldman Sachs

Top of Mind

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Issue 11

Bond Bubble Breakdown

From the editor: Near multi-generational low bond yields, driven at least in part by US Federal Reserve asset purchases, have pushed the question of whether or not the bond market is a bubble to Top of Mind. We ask three experts if there is a "bond bubble": Martin Feldstein (Harvard and NBER) – yes and the Fed is entirely to blame; Francesco Garzarelli (GS rates strategy) – no, but yields look expensive and the market is too complacent about rate hikes; and Paul McCulley (former PIMCO partner) – absolutely not and the Fed has done everything right, but could take the lead from the Bank of Japan (!) and do even more (even more imperative for the European Central Bank). We look at it from the Fed's point of view (very low yields are exactly what they intended, and they have tools to cope with any signs of trouble), assess how vulnerable we are to a repeat of the 1994 bond "massacre" (not very) and ask if gold is the real bubble (potentially).

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Inside

"I think the pace of the Fed funds increases from 2016 onwards is underpriced. And that, I think, is where the problem – and the opportunity – lie."

Francesco Garzarelli, GS Rates

"The Fed's long-term asset purchase program, so-called "Quantitative Easing" (QE), has driven down the interest rate on long-term bonds, which was their intent, and by doing so has created this [bond] bubble."

Martin Feldstein, Harvard/NBER

"I think the government bond market is too rich looking out over the next 10 years, but rationally rich. And I have real difficulty with the word 'bubble'."

Paul McCulley, Former PIMCO

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Macro news and views

We believe market direction across assets will continue to depend on the evolution of three key macro risks: (1) European sovereign risk (2) China growth (3) US growth

European sovereign risk

Latest GS proprietary datapoints*/major changes in views

- Our Euro area Current Activity Indicator continues to suggest a contraction of around 0.6% qoq ann, consistent with our forecasts for modestly negative Euro area growth in 1H13.

Datapoints/trends we're focused on

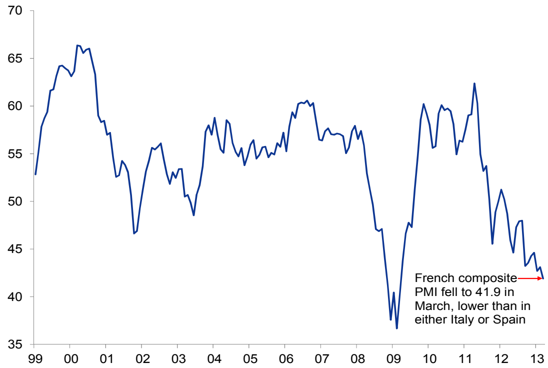
- A weakening trajectory to Euro area data; were this deterioration to continue, it would inevitably bring into doubt the stabilization of Euro activity that we forecast for 2H13.
- Weak data for France in recent months.
- Rising probability of an ECB rate cut, although we maintain that this will likely be "firing blanks" and credit easing would likely prove more effective in boosting growth.
- Continued attempts to form a government in Italy.

Key data/events ahead

- Apr 23: Flash PMI surveys – expect some improvement, and we would be concerned if we don't see any.

French manufacturing survey lower than Spain/Italy's

French Composite PMI, diffusion index



Source: Markit, Goldman Sachs Global ECS Research.

China growth risk

Latest GS proprietary datapoints*/major changes in views

- We revised down our 2013 GDP forecast to 7.8% from 8.2% on softer-than-expected Q1 GDP that stemmed from weaker consumption. We maintain our 2014 growth forecast at 8.4%, on further improvement in exports and domestic demand.

Data points/trends we're focused on

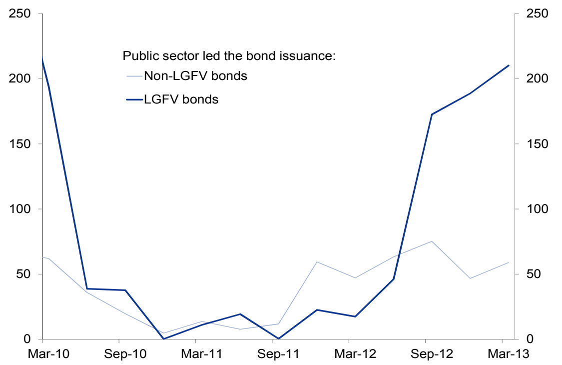
- Cyclical indicators (fixed asset investment, exports, and PMI) holding up, despite weaker-than-expected consumption.
- Inflation likely to remain muted in the near term, but the fast climb of leverage built up by local government financing vehicles will remain a key policy constraint for new stimulus.
- Potential impact of bird flu on catering, travel and tourism.

Key data/events ahead

- Apr 23: HSBC/Markit Flash Manufacturing PMI; May 1: official/HSBC PMI.

Local leverage rising rapidly

LGFV bond issuance, yoy % chg, 4 qtr ma



Source: WIND, Goldman Sachs Global ECS Research.

US growth risk

Latest GS proprietary datapoints*/major changes in views

- Our US Current Activity Indicator has deteriorated sharply to 1.2% in March versus 2.5% in February; our 1Q GDP tracking estimate stands at 3.2%.

Datapoints/trends we're focused on

- Much weaker-than-expected March retail sales, perhaps showing that the payroll tax hike has had some depressant effect on spending.
- The potential for an earlier-than-expected tapering of Fed purchases, but this looks less likely on recent weaker data; will continue to monitor Fed communication carefully.

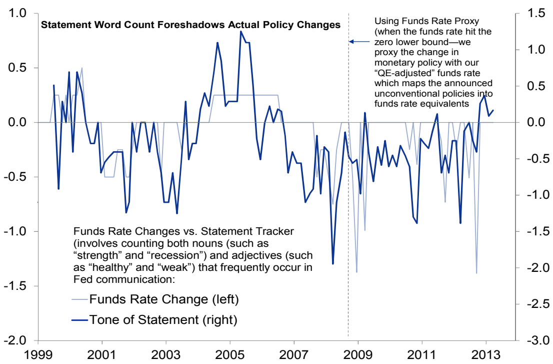
Key data/events ahead

- Apr 26: 1QGDP; our tracking index suggests 3.2% growth; May 3: US payrolls.

For a glossary of GS proprietary indicators, see page 19.

Quantifying Fed communication

%, lhs; Ratio of hawkish words to dovish ones (in logs), rhs



Source: Goldman Sachs Global ECS Research.

Bond Bubble Breakdown

Near multi-generational low bond yields, driven at least in part (and some think in full) by the undeniably large asset purchase program (Quantitative Easing (QE)) that the US Federal Reserve has been implementing in one form or another since the 2008 Global Financial Crisis (GFC), have pushed the question of whether or not the bond market is a bubble to Top of Mind. This question has become even more pressing over the past month as various types of Fed communications (press conferences, speeches, minutes from the March Federal Open Market Committee meeting) seem to be increasingly entertaining the possibility of tapering and, ultimately, ending their asset purchase program sooner rather than later. Although we believe that the recent patch of weaker data may put the brakes on this discussion, for all the bubble watchers, this has nevertheless begun to cause alarm: is the so-called bond bubble about to “pop”, with an earlier-than-expected end to Fed purchases (or other potential catalysts) the pin?

We feature three interviews on the so-called bond bubble. The first is with Professor Martin Feldstein who believes that the bond market (and many other substitutable assets) is a bubble, which won’t take much to “pop”. And this bursting of the bubble could inflict a lot of damage to financial stability if it is held in leveraged portfolios by banks and other actors. The Fed and its asset purchase program are entirely to blame for the bubble, says Feldstein, and escaping the bubble without it bursting will be very tricky business. When asked what the Fed should do right now regarding rates, his response: “pray; it’s one of the remaining untried tools.”

We then talk to our own bond expert, Francesco Garzarelli, who takes a different view. In his eyes, extraordinarily low bond yields have resulted from many fundamental and rational drivers (expectations of weak economic growth and safe haven flows amid the European sovereign debt crisis) in addition to Fed purchases. So while bond prices look expensive, there is nothing particularly bubbly about the bond market today.

And then we turn to former PIMCO partner Paul McCulley, who generally agrees with Garzarelli that the bond market is “rich, but rationally rich” and definitely not a bubble. But he takes it one (or two, or three) steps farther by asserting that the US economy is in a “liquidity trap”, which means that no matter how low rates are, the private sector is just not borrowing and, in turn, spending because it continues to de-lever and heal from the “party of leverage” that kicked off the GFC. In order to push beyond this liquidity trap and return the economy to health, the Fed needs to employ the “Colin Powell doctrine of overwhelming force,” so their aggressive actions have been warranted and, if anything, they should be doing even more. In this context, he (perhaps ironically) suggests that the US and especially Europe should perhaps start taking cues from the Bank of Japan (BoJ), which had been lagging in its response to deflationary conditions but, of course, has finally become extremely active since new Prime Minster Abe and new BoJ Governor Kuroda have taken the helm.

Kris Dawsey of our US economics team then asks “Is the Fed worried about a bond bubble?” His answer: no, because current low rates are exactly what they have hoped to achieve with the combination of their effectively zero policy rate, communication and asset purchase programs, and they believe that have tools to deal with any troubling signs of a bubble, should they arise. Charlie Himmelberg, who heads our credit and mortgage strategy teams, compares the “The ‘Great bond massacre’ of1994” to the current environment, concluding that a repeat of the massacre today would be unlikely. And Jeff Currie and Damien Courvalin of our commodity research team ask “Is gold the real bubble?” In their view, gold has had some very bubbly characteristics.

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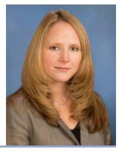


The long history of long (10-year US treasuries) yields

Source: Global Financial Database, Goldman Sachs Global ECS Research. Special thanks to Jose Ursua.

Interview with Martin Feldstein

Martin Feldstein is the George F. Baker Professor of Economics at Harvard University and President Emeritus of the National Bureau of Economic Research. From 1982 to 1984, he was Chairman of the Council of Economic Advisers and President Reagan's chief economic adviser. In 2006, President Bush appointed him to be a member of the President's Foreign Intelligence Advisory Board. In 2009, President Obama appointed him to be a member of the President's Economic Recovery Advisory Board. Below he discusses why the bond market is a bubble.

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

Allison Nathan: What constitutes a bubble and is there a US government bond bubble today?

Martin Feldstein: Yes, I think there is a bond bubble. A bubble exists when asset prices are unsustainable because they are not consistent with fundamentals, and are therefore going to fall at some point. Another, complementary definition of a bubble is when the inevitable price change of the asset is not compensated for by the extra yield you will get for holding that asset, assuming the price change comes to fruition. In the case of bonds right now, 10-year treasury bonds are yielding about 1.7% per annum, relative to Treasury Bills that are close to zero. So an investor who rolls over ten-year bonds for the next five years will expect to receive an additional 8.5% (1.7%*5) in interest payments if rates remain at 1.7%. But if the interest rate rises to let's say 5% five years from now, then the value of the bond will fall by about 30%, far more than the interest paid up to that date. That to me suggests that the US government bond market today is a bubble.

Allison Nathan: What has precipitated the bubble and does it encompass other assets?

Martin Feldstein: The short answer is the Federal Reserve. The Fed's long-term asset purchase program, so-called "Quantitative Easing" (QE), has driven down the interest rate on long-term bonds, which was their intent, and by doing so has created this bubble. **Once there is a bubble in treasury bonds, there is going to be a bubble, to some extent, in every asset that is a potential substitute.** So, corporate bonds, junk bonds, equities, farmland I think are all at inflated prices now, or at bubble level.

Allison Nathan: What would prompt the bursting of the bubble, and when?

Martin Feldstein: I think it's impossible to talk about timing. If the Fed starts to exit and taper back its bond purchase program, that may trigger the bubble bursting. If foreign investors, or even American investors, start getting properly nervous and move out of long-term bonds, that could trigger the bursting**. It doesn't require any specific action.** If your readers read this and say, "Hmm, maybe he's right, maybe we should lighten up our long-term bonds," if enough of them do that, that could start the avalanche that bursts the bubble.

Allison Nathan: How concerned are you about the prospect of the bond bubble bursting generating another wave of financial instability?

Martin Feldstein: That depends very much on how much of these mispriced assets are being held in leveraged portfolios. If it's just that a lot of individual investors or pension funds who are not leveraged are holding long-term bonds, they'll take a loss and be unhappy. But the catalyst for financial instability would be if the banks are doing this or if others are doing it on a highly leveraged basis. I don't know how much leverage is out there in holding these various kinds of long-term securities, but it is a concern.

Allison Nathan: Who will suffer if the bubble bursts?

Martin Feldstein: Obviously, **anybody who is holding these long-term bonds or other assets that fall in value will suffer**, because the extra yield that they're getting now, the difference between holding long-term bonds and holding something very short, will give them some extra income in the short run, but that will be more than offset by the capital loss that they will take when the bubble bursts. And if substantial amounts of long-term assets are being held in leveraged forms, then it could generate the kind of financial instability we talked about a minute ago. If that happened, then it would spread well beyond those who are directly holding the long-term security.

Allison Nathan: But won't those losses only be incurred if the bond is sold before it comes due? If the investor holds the bond until maturity, they will still get their principal back in full, plus the interest they've received?

Martin Feldstein: Right, but **you also incur an opportunity loss** in that you could have invested your money differently. If instead of buying 10-year bonds you invested in a short-term money market fund or treasury bills, and interest rates rise from less than 2% to, say, 5%, you'd have the opportunity of buying those 5% yielding bonds and doing much better for the rest of the period. But, it's certainly true that you don't lose money, in the literal sense, if you simply hold to maturity.

Allison Nathan: So if there's a bursting of this bubble, would investors just hold to maturity to avoid taking losses?

Martin Feldstein: That will differ from investor to investor. There would be a tax advantage of realizing losses up front and then buying other kinds of securities. And, again, there is an opportunity cost to holding the bonds to maturity rather than investing elsewhere.

Allison Nathan: Who will benefit if the bubble bursts?

Martin Feldstein: Anybody who has literally shorted bonds would benefit. And somebody who has a long-term fixed rate mortgage will certainly feel better. They won't necessarily have a direct financial gain, but if they have a mortgage at 3% to 4% now and rates rise to 7% or 8%, certainly the value of their mortgage will look very good.

Allison Nathan: Should investors be shorting bonds?

Martin Feldstein: I wouldn't recommend it to people even though I believe that bond values are ultimately heading lower. **There is an opportunity, but it's very risky, because you're betting against**

the Fed, and you could win three months from now or you could win three years from now, and so you'd have the cost of carrying it for those three years. If I'm right about the potential magnitude of the fall, even if it took three years, that could be a winning bet. But, again, it's a very risky bet right now.

Allison Nathan: Where should bond yields be now?

Martin Feldstein: History suggests the normal real yield on a 10-year treasury would be about two percent. So, that says that if these were normal conditions and we have an expectation of inflation of about 2%, the nominal yield would be about 4%, not the 1.7% we have today. But, these are not exactly normal conditions because we have an enormous fiscal deficit, and large and rising government debt relative to GDP. The Treasury must finance this deficit by issuing new bonds. So, if you didn't have the Fed on the other side of that transaction buying up those bonds, the market would require a higher interest rate to absorb them. Given that, 5% seems to me to be a conservative estimate. Assuming that expected inflation stays at 2%, **I would think a 5% yield on 10-year treasuries would be in line with historic experience.**

Allison Nathan: How does relatively weak economic growth factor in here? Shouldn't the current weaker environment weigh on yields?

Martin Feldstein: True, even if the Fed weren't buying, the fact that there is limited demand on the part of businesses to borrow suggests that these businesses would issue fewer bonds, which would act to depress yields. But the government deficit is so large relative to our savings that the net impact would be to push up interest rates beyond normal, historical levels.

Allison Nathan: Is 2% – roughly the real long-term historical average of 10-year bonds – the right "normal" thinking about the next five or ten years?

Martin Feldstein: I think that's somewhat of a floor. **We're more likely to see a higher number because of the fiscal situation.** The more bonds the Treasury has to issue to finance the deficit, the more upward pressure on yields as investors must be enticed to hold all of this new debt.

Allison Nathan: How much of the rising yield do you expect will come from higher inflation expectations?

Martin Feldstein: Everything I've said until now assumes that inflation expectations will stay at about 2%. So, if inflation does begin to pick up and markets come to expect not 2% but 3% or 4%, then the bond rates will be correspondingly higher.

Allison Nathan: How will policy impact these expectations?

Martin Feldstein: We're starting with a situation in which the commercial banks have nearly $2 trillion of excess reserves. That means they have reserves that they can use whenever they want to start making loans and creating monetary deposits, leading to increased aggregate demand. So, the question will be how will the Fed respond if the private sector starts financing stronger demand, which pushes up inflation? If the Fed doesn't respond in a timely manner by tightening monetary policy and raising interest rates to limit the draw-down of excess reserves, we'll see inflation ticking up and market expectations of inflation will rise, and that will get built into yields.

Allison Nathan: Is the market too complacent about inflation?

Martin Feldstein: Certainly we don't have any inflation today and we haven't had any in the last few years, but **I think the market is not giving any weight to the risk that when inflationary pressures begin to build it will be very easy for them to get out of control.** And there's the risk that, for a variety of reasons, the Fed won't act in a timely and strong enough way. So I absolutely believe that inflation risk is skewed to the upside.

Allison Nathan: Is the US and the global economy better or worse from the US and other QE programs?

Martin Feldstein: **The economy is better off, but perhaps not enough to warrant the risk.** The long-term asset purchases have stimulated the stock market, which has contributed to consumer spending, but not a lot. After all, our growth rate was less than 2% last year. At the same time, I think we're taking a lot of risks: risks of this bubble and risks of future inflation.

Allison Nathan: Why do you think that the Fed's actions are not having greater effect on growth?

Martin Feldstein: **Quantitatively, it's just not possible to stimulate consumption that much by pushing up stock market values or driving down interest rates.** So, it moves the economy in the desired direction, but it's a very weak lever and, therefore, cannot do it enough.

Allison Nathan: What should the Fed have done differently?

Martin Feldstein: **It should have done less in recent years.** During the financial crisis, they took a number of unusual measures that helped a lot to get the markets functioning again. But by 2009 they had stopped doing those things, hoping that the fiscal policy of the new administration would get the economy moving. And when it didn't, they came back in 2010 with the long-term asset purchase program. **This program should have gradually stopped a year ago** and should not have moved up to this current level of $85 billion a month.

Allison Nathan: What should the Fed do now?

Martin Feldstein: **I think that they have to start unwinding sooner rather than later** by tapering their purchases and try to do so without bursting this bubble, which won't be easy. They've created a difficult situation for themselves. But I don't think they have much choice, because it won't be easier a year from now.

Allison Nathan: What about rates?

Martin Feldstein: They should pray that rates don't go up too quickly. Prayer is one of the remaining untried tools.

Allison Nathan: What should investors be doing right now?

Martin Feldstein: **If anything, they should be short.** I think that you take on the bubble-bursting risk – the risk of a decline in asset prices – if you stay in any kind of longer-term securities. You can't get in too much trouble if you're in a three-year bond rather than a treasury bill, but you're not getting a lot of extra compensation for that. Once you reach out to 10 years or go to junk bonds, etc. I think that you are exposing yourself to too much risk. I would say the equity market is also overpriced at the present time, so none of those assets are where I would want to be. The only places that might look attractive are perhaps high-yield hedge fund type products that are going to compensate you for the risk, or long/short equity portfolios, where you don't have interest rate risk. There may be ways of picking up yield without exposure to the potential of a bursting bubble, but not many.

Is the Fed worried about a bond bubble?

Kris Dawsey of the GS US economics team discusses why the Fed isn't too worried about a bubble

In normal times, the Fed influences longer-term interest rates indirectly by setting the level of, and influencing expectations about, the path of short-term interest rates. Short-term lending is usually not meaningful for economic growth, and so monetary policy is mainly potent to the extent that it influences broader financial conditions, such as longer-term interest rates, equity prices, and the value of the dollar.

Things going as planned, for now

With the short-term interest rate stuck at the zero lower bound for more than four years, the Fed has sought other ways to push longer-term rates down further, including explicit forward guidance on the path of the fed funds rate and various flavors of "large scale asset purchases," including QE1, QE2, Operation Twist, and QE3. The explicit intent of these programs, according to Fed officials themselves, has been to reduce longer-term interest rates below where fundamentals or fair value models would otherwise suggest they should be. **This is all part of an effort to stimulate interest-rate-sensitive sectors of the economy such as housing and durable goods consumption.**

The 10-year yield is not far from multi-generational lows at 1.7%, while yields on Treasury Inflation Protected Securities (TIPS) are negative even past 10 year maturities, suggesting that investors can expect to end up with less purchasing power than they started with by investing in Treasuries, even with a long investment horizon. On top of that, one valuation measure that the Fed puts particular emphasis on—the "term premium"—suggests that longer-term yields are unusually low relative to the already very low expected path of short-term interest rates. In fact, this measure suggests that investors are paying more for longer-duration securities with higher interest rate risk. Although factors apart from the Fed have also influenced pricing of Treasury securities, all of this is to say **that Treasury yields are very low—an *intended* impact of the Fed's monetary policy choices.**

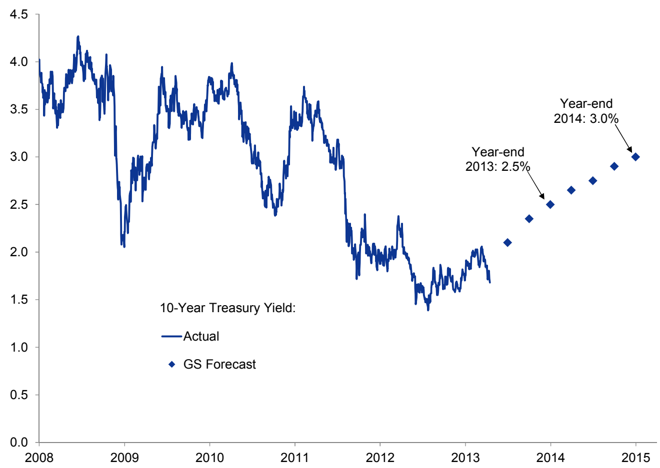
What would worry the Fed?

Given that the Fed clearly wants bond prices to be high (and yields low) at the moment, under what circumstances might they be worried about a "bond bubble?" In a speech on March 1 titled "Long-term Interest Rates," Chairman Bernanke noted two possible scenarios of concern: (1) low yields persist for too long, creating imbalances elsewhere in the financial markets (presumably if the Fed were overwhelmingly worried about this possibility they could simply tighten policy), and (2) longer-term interest rates could rise rapidly and in a disorderly manner as a bond bubble "pops," potentially creating leveraged losses at systemically important financial institutions, for instance.

There is in fact some historical precedent for rapid increases in longer-term interest rates associated with shifting Fed policy. For example, in 1994 the 10-year yield rose around 2 percentage points over the course of the year, prompted by unexpectedly aggressive Fed rate hikes**. Our forecast, and the rate path implied by forwards, is for a gradual and modest rise in the average level of interest rates over the coming years** as the Fed slowly inches away from its current exceptionally easy policy stance, quite distinct from the 1994 experience. However, significant volatility around that average path is certainly possible.

Expecting a gradual rise in Treasury yields

Percent



Source: Bloomberg, Goldman Sachs Global ECS Research.

Tools to avoid a "pop"

According to the Chairman's remarks, the Fed could lean against any disorderly rise in longer-term interest rates by creating expectations that it will maintain securities purchases for longer, or communicating a longer expected holding period for its current holdings. **This suggests that the Fed may try to "actively manage" longer-dated rates as the Fed withdraws stimulus**, if circumstances warrant.

Under our forecast for subdued inflation in coming years, any significant increase in interest rates would likely be driven by rising "real yields," i.e., an increase in yields after adjusting for expected inflation. Real yields are currently much further away from historical norms than market-implied inflation expectations are. **An increase in real yields could be managed to some extent through clear communication about the forward path of Fed policy**. The less likely scenario in which longer-term rates rise due to a significant increase in inflation expectations would be more uncomfortable for the Fed. Raising expectations for monetary stimulus probably would not be as effective in dampening the rise in longer-term rates under these circumstances, as this could increase inflation expectations further, adding to upward pressure on interest rates. However, the Fed probably views this scenario as unlikely.

On net, the very low level of interest rates is an intended consequence of the Fed's monetary policy and as a result **the Fed is probably not particularly worried about a potential bond bubble.** How smooth the ultimate adjustment from the current exceptionally low level of yields to a more normal level remains to be seen.

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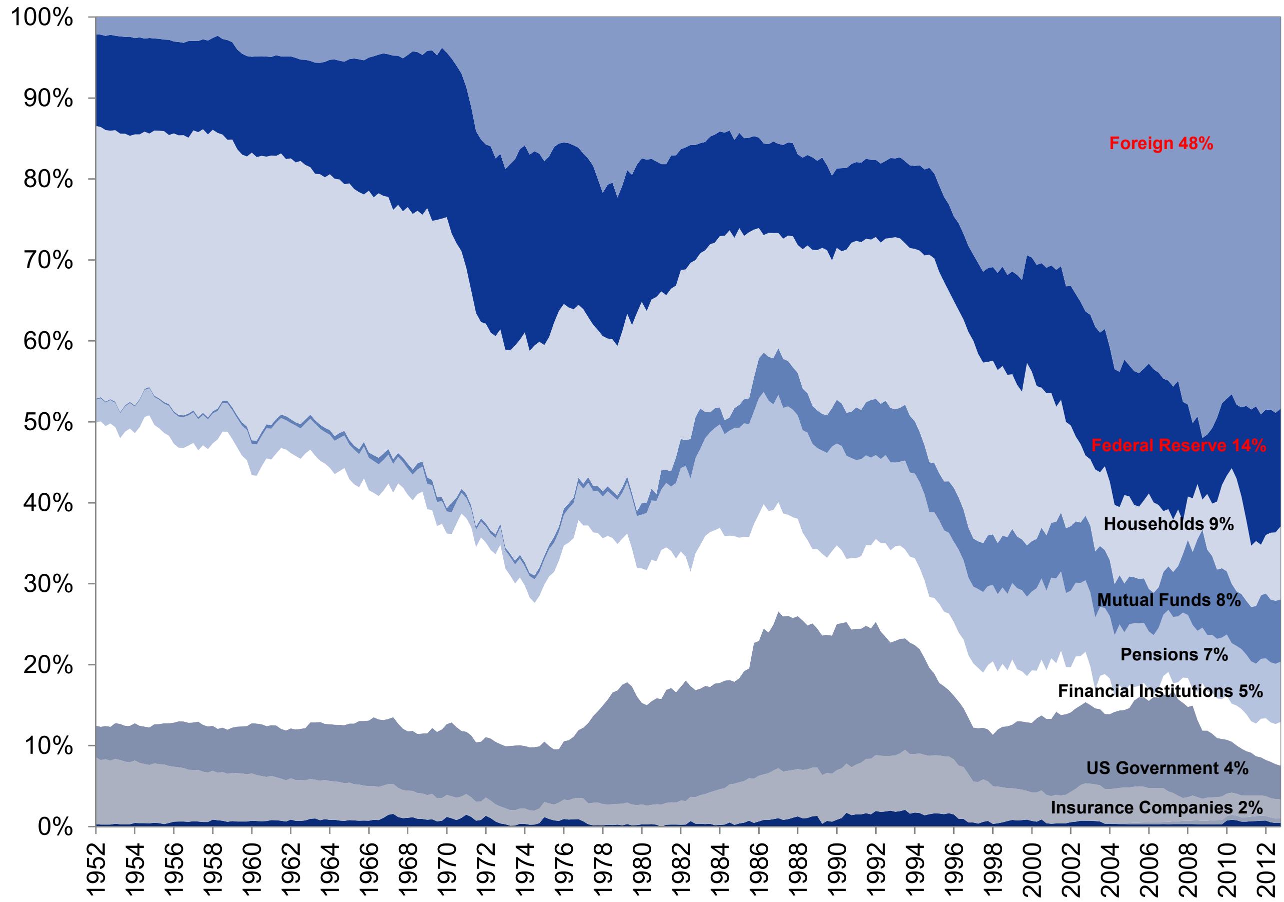
Who holds US bonds?

Ownership of US government bond market since 1952



Source: Federal Reserve, Haver, Goldman Sachs Global ECS Research. Holdings as of 4Q 2012. Special thanks to the US Portfolio Strategy team.

Anatomy of the US Bond Market

	Federal		Municipal		Corporate		GSE		Total	Percent
	US$Bn	% of tot Fed	US$Bn	% of tot Mun	US$Bn	% of tot Corp	US$Bn	% of tot GSE	US$Bn	% of tot Bond mkt
Financial Institutions	$619	5 %	$392	11 %	$2,002	16 %	$2,097	28 %	**$5,110**	**14 %**
Foreign	5,546	48	68	2	2,478	20	1,077	14	**9,169**	**26**
Mutual Funds	880	8	1,050	28	1,894	15	1,378	18	**5,203**	**15**
Households	1,036	9	1,679	45	2,326	19	73	1	**5,114**	**14**
Pension Funds	851	7	6	0	741	6	431	6	**2,030**	**6**
Insurance Companies	270	2	450	12	2,540	20	472	6	**3,733**	**11**
ETF's	64	1	12	0	155	1	0	0	**231**	**1**
GSE's	52	0	17	0	214	2	315	4	**599**	**2**
Federal Reserve	1,666	14	0	0	0	0	1,003	13	**2,670**	**8**
US Government	477	4	10	0	128	1	325	4	**941**	**3**
Business Holdings	108	1	28	1	32	0	372	5	**540**	**2**
Total	**$11,569**	100 %	**$3,714**	100 %	**$12,511**	100 %	**$7,544**	100 %	**$35,338**	**100 %**

Source: Federal Reserve, Haver, Goldman Sachs Global ECS Research. Holdings as of 4Q 2012. Special thanks to the US Portfolio Strategy team.

Interview with Francesco Garzarelli

Francesco Garzarelli is co-head of Goldman Sachs' global Macro & Markets Research team. He joined the firm in 1993 and has focused on the rate and credit markets globally since 1998. Below he shares his views on current low bond yields and where they are likely headed from here.

Allison Nathan: What's been driving exceptionally low government bond yields in the US?

Francesco Garzarelli: I think the main factor driving bond yields has been expectations of economic growth, which underwent a critical shift in the summer of 2011. Heading into that year, there was a general feeling that most of the recession was behind us and there were high hopes for the recovery to accelerate. But that summer there were two important events that happened almost at the same time. The first one was the announcement of a restructuring of Greek public debt, which marked a key turning point in Europe because people then realized that government securities were also subject to default risk. And the second was the downgrade in US sovereign debt by the rating agencies. Both really brought home the idea that we faced a period of deleveraging and a likely reduction in welfare entitlements, both of which would depress economic growth. Once expectation shifts like this take hold, you need a lot to convince the market to change their beliefs again, and this has been in my view a stable and persistent driver of low yields.

The second key driver has been "safe haven" flows, most of which have stemmed from concerns about the Euro area sovereign crisis. Residents of the area have essentially seen the "benchmark" riskless rate they had used in their previous investment decisions split along country dimensions, which has created distortions in their portfolios. Not surprisingly, we have seen a huge increase in "home bias" in bond investments. Alongside this, there has been a tremendous demand for German government bonds ("Bunds"), by foreign investors who have sought refuge away from other large markets like Italy, Spain, but also increasingly France. Investors have felt that Bunds are the safest security you could have should the Euro break because you would have a claim in the new German Mark, which investors assume would appreciate in such a scenario. That expanding demand for Bunds against a relatively low new supply (Germany runs a balanced budget) obviously drove their prices up and their yields down. This dynamic has reverberated across other markets, with the US also receiving large safe-haven flows. This factor has also been quite persistent because once investors decide to change their bond benchmark allocations, this decision is not easily reversed.

The third factor at play has been direct purchases of domestic securities, largely government bonds, by central banks ("Quantitative Easing, QE") in the United States, the UK, and now more prominently in Japan. After policy interest rates had been reduced to essentially zero (they were not particularly high when the recession kicked off, so the zero-bound was reached relatively quickly) central banks started using bond purchases to attempt to influence financial conditions and boost economic growth, as such purchases put downward pressure on interest rates farther into the future – hopefully providing a further stimulant to investment. These purchases have increased the demand for government securities, boosting their prices and weighing on yields.

Allison Nathan: What is your response to those who believe that QE has been the primary culprit of low rates? How much of an impact have these asset purchases really had?

Francesco Garzarelli: This is clearly a very contentious point. Looking at the US, **we calculate that the *cumulative* effect of Fed purchases alongside the promise to keep policy rates floored for a number of years in the future could have shaved off as much as 1 percent from 10-yr Treasury yields**. But the tricky part is not so much calculating this impact from Fed bond purchases, but rather asking what bond yields would have been without the purchases? By buying bonds, the central bank is depressing their yield, but also boosting the outlook on the economy and other asset prices. So where would bond yields be if the central bank had not engaged in asset purchases? Possibly at the same level they are today? That is very difficult to answer.

Allison Nathan: Is there a "bond bubble" in the US?

Francesco Garzarelli: No, not in a conventional sense, because if you think of the definition of a bubble, it's usually when people buy for no other reason than they believe that prices will continue to rise. As I just discussed, there are many fundamental reasons why people have bought bonds. That being said**, if we are right on the macro outlook, there could be an "expectations bubble" in the making.** We forecast that the Fed will start pulling policy rates up from 2016, and that the longer they keep them at the current ultra-low levels, the faster they will probably have to raise them once they get going. But that future increase in rates is not adequately priced into the market. Why is this? Because the Fed has been very convincing in its communications that it will keep rates low for an extended period and because the market is pessimistic about future growth**. I think that is a wrong expectation and that there's too much complacency about future rate hikes.** In terms of where the price of US Treasuries is now relative to where we think they should be given a moderately improving economic backdrop, we do think they look overvalued.

Allison Nathan: Is there anywhere in the world where government bonds do look more bubbly?

Francesco Garzarelli: Bond yields across the world tend to move together, so if you think that the US bond market is stretched, then equally, you would think the same about Germany or the UK. Right now, they all look somewhat over-priced, although, again, I wouldn't describe them as "bubbly". **The only market that I watch that looks more fairly valued is Sweden's**.

Allison Nathan: Are you worried about negative side effects on the bond market from the ongoing Fed buying and its aggressive easing stance in general?

Francesco Garzarelli: **There are some concerns that the Fed's actions may have generated complacency in the market** that Fed support will always be there to prop up and protect risky assets, which dulls the reflexes of bond investors in their response to changes in the macro economy. This, in turn, leads to worries that inflation may start to rise but the bond market "vigilantes" are half asleep, comforted by the Fed. And all of a sudden, inflation really rises but, at that point, it's too late.

In this context, I think what the Fed did last December was very smart. They went from promising to keep rates on hold until a point in the future to saying that rates are going to be on hold until certain macroeconomic conditions are met (unemployment below 6.5% and inflation above 2.5%). That shift should in principle encourage bond investors to start thinking again about macro conditions and ask when is the unemployment rate going to fall below 6.5% and when is inflation going to go above 2.5%? If we can predict these circumstances, we'll have the answer to when the Fed will move rates.

Bringing more of that macro thinking back to the market is healthy and diminishes the probability of instability down the road, but you can never be sure. For instance, since they've done that, market expectations really haven't changed much. So at times I worry that the Fed's actions may have already bred too much complacency.

Allison Nathan: What happens when central banks stop buying?

Francesco Garzarelli: We have surveys that say most investors think that the Fed will stop buying towards the end of this year and so if that happens, you would expect that it is already priced in and there would not be much impact**; if it happens earlier or later than this, the market might be caught off guard.** But if factors start to shift that may lead the Fed to pull forward or push back this timing, you would think that they would do their best to communicate this. As I said earlier, Fed purchases are only one of the factors keeping bond yields down.

Allison Nathan: When will US government bond yields rise and what will drive this move?

Francesco Garzarelli: We expect US bond yields to rise pretty continuously from here on out largely driven by improving economic growth (a "soft patch" in second quarter activity is already largely priced in, in our view). Admittedly, it might take some time for the market to realize that growth is moving above trend next year and beyond, but we think that's where we are headed and that bond yields will follow. I think that today's levels offer a good entry point into short positions in intermediate maturity government bonds. Specifically, we expect US 10-year Treasury yields to end the year at 2.5% and build from this level in 2014.

Allison Nathan: Would another cut in US credit ratings have an impact?

Francesco Garzarelli: Yes, I think it would and that this impact could be larger than in the past and of opposite sign. When we had the ratings downgrade in 2011, again, I think we lived in a world that probably was too optimistic. At the time, the rating action was a sort of wake-up call on the near-term prospects for growth. With the economy now on firmer footing, a ratings downgrade motivated by a high "structural" deficit would make investors wonder if we are really sowing the seeds of future instability. Government bond yields would rise to signal increasing risk related to these fiscal concerns, and/or higher inflation if central banks continue to accommodate deficit spending by keeping policy rates low far into the future.

Allison Nathan: What could prompt a near-term spike in bond yields?

Francesco Garzarelli: I can think of a more aggressive policy response to the credit strains we are seeing in the southern part of the Euro area, for example. That would alleviate downside risks to European growth, reprice German Bund yields higher and this would feed across other fixed income markets. **The most pronounced and persistent trigger for higher yields would be inflation.** Investors tend to be somewhat relaxed about the prospect of near-term inflation. Core CPI inflation is running at 2% and priced to remain around that level. Should inflation pick up speed people could start spinning stories about the Fed being late and inflation becoming more entrenched into expectations, and that anxiety could pick up quickly.

Allison Nathan: How vulnerable are banks to an unexpected spike in yields? Could such a spike be a catalyst for another financial meltdown?

Francesco Garzarelli: In general, **commercial banks actually look healthier when bond yields rise.** This is because when rates are going up, it generally means that the economy is doing better and the credit quality of banks' portfolios is improving. In this better environment, banks can charge more on lending, and their net interest margin (the difference between the interest income they take in and the amount of interest they pay out) goes up. All of this is invalidated if the banks have piles of securities that are wrongly priced or are suddenly worth much less because of an unexpected spike in yields that, for example, comes from an inflation panic or a miscommunication between the market and the Fed. That could be concern, but **I don't think it is a systemic risk that would threaten financial stability.**

Allison Nathan: How likely is it that the so-called "bond-massacre" of 1994 will be repeated?

Francesco Garzarelli: Stuff that has happened in the past is unlikely to be repeated in the same way, if anything because we are aware of it. Also, circumstances have changed in many important ways: for example, we have more transparent communication by central banks, and a less prominent mortgage market than we had in 1994**. If one really wants to draw historical analogies, I would point to 2004**. I remember that all the way through the second quarter of that year forecasters (including ourselves) were of the view that the Fed would keep rates at 1% for much longer. As it turned out, the Fed started preparing the market for a tightening in policy in April-May, and hiked at the end of June**. The lesson I took away is that market expectations, and what policymakers say and do, can change really** quickly. And, as I said earlier, I think the pace of the Fed funds increases from 2016 onwards is underpriced. And that, I think, is where the problem – and the opportunity – lie.

Allison Nathan: How should investors be positioned in the current environment?

Francesco Garzarelli: Over the crisis we've seen a very big increase in the demand for traditional "safe haven" investments like cash and gold, for example. As systemic risks have declined, investors have started coming out of these assets. With high unemployment and unstable expectations about the outlook, there is still strong demand for instruments that provide a running "income", like corporate bonds and high dividend stocks, over "growth" or capital appreciation over the medium run. But this is set to change, and **I find the relative pricing between "income" and "growth" attractive.** In the near term, the combination of a direct presence of central banks in the markets, lower aggregate leverage, and less appetite by dealers to warehouse risk because of regulations, etc. has left many financial assets without a clear trend. We therefore must try to look at very specific situations or events and make the best out of them. So far this year, for example, getting the "fiscal cliff", or the Italian elections, Cyprus and the BoJ policy shift right were the things that in macro space would have made most of the difference in performance.

The "Great Bond Massacre" of 1994

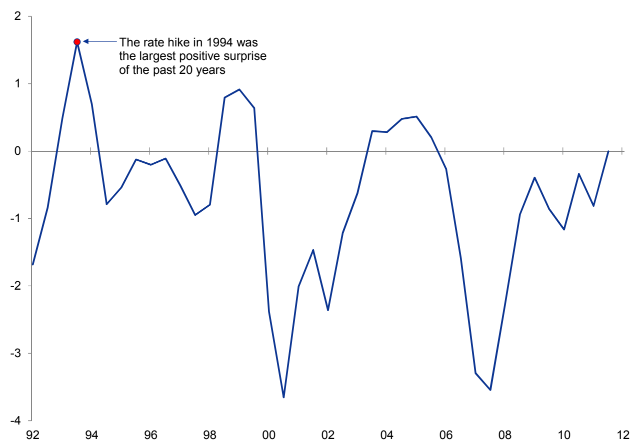
Charlie Himmelberg, head of our credit and mortgage strategy teams, finds that a repeat of the 1994 "bond massacre" is unlikely today

In February 1994, the Federal Open Market Committee initiated a 12-month period of aggressive rate hikes during which the FOMC eventually raised rates by a cumulative 300 bps. By October of that year, the damage was so great that Fortune magazine ran an article titled "The Great Bond Massacre".

The speed and scale of these hikes exceeded market expectations by a substantial margin. The US economy had been struggling to gain momentum in the face of "headwinds", as Fed Chairman Alan Greenspan had described only one year earlier, and market participants were expecting a period of slowly rising rates. In early December of 1993, for example, when the 3-month Treasury bill rate was averaging around 3.1%, the Livingston Survey of economic forecasts indicated that economists were expecting the 3-month rate to rise to just 3.4% over six months and 3.7% over 12 months. But by June that rate was closer to 4.1%, and by the end of the year it had risen to 5.5%, a rise of 240bp – roughly four times the 60bp increase that economists had been forecasting 12 months prior, making it the largest positive surprise of the past 20 years.

Caught by surprise

12-month surprise in 3-mo treasury yield



Source: Goldman Sachs Global ECS Research.

More recently, the exceptionally low level of rates and aggressive Federal Reserve purchases of securities through its QE program (which some fear has created a bubble in the bond market) have generated concerns over a potential repeat of the 1994 bond massacre or worse, given the much larger size of bond holdings today. A potential trigger of a so-called "bursting" of the alleged bond bubble could be a move by the Fed to taper its purchases. **While the 1994 episode still usefully illustrates the dangers of becoming too complacent about rate risk, we think a policy surprise and resulting sell-off comparable to 1994 are much less likely in the current environment. And the lessons for risk markets are surprisingly benign.**

1994 damage: long bonds suffered greatly, but risky assets were largely spared

Long-maturity bond positions in the rates market suffered most from the 1994 hikes, and the mortgage market may have helped to amplify the move. As mortgage rates moved higher, this effectively caused the maturity of existing mortgages to extend, because investors had previously believed that these mortgages would be paid back early, but higher rates discouraged refinancing. This effectively increased the supply of long-maturity bonds in the market, causing 10-year Treasury yields to fall further.

Consistent with this dynamic, yields of long bonds rose more than yields on short-term bonds in February and March, suggesting that the effective increase in long-maturity rate exposure depressed bond demand at least for a few months**. As selling led to more selling, bond yields were arguably caught in a feedback loop not unlike the forced unwind of leveraged positions during 2008-2009.** But whatever pressure there was appears to have been short-lived; by June, the slope of the yield curve had generally reverted back to January levels and was even flatter in some instances.

Risky assets such as equities fared surprisingly well, consistent with the offsetting benefit of the improving growth outlook. The sell-off in equities was mild, with the S&P 500 declining just 4% from February 1 to year-end. Bank equities fell harder, with the S&P banks sub-index falling over 11% from February 1 to year-end. And credit market spreads were essentially flat.

Lower risk of policy surprise today

While the market lessons of 1994 are informative (and surprisingly benign for risky assets), we think a repeat policy surprise equal to 1994 is very unlikely, for two reasons.

First, the Fed is no longer fighting to establish its anti-inflation credentials. In 1994, the trauma of high inflation in the 1970s and the high costs of recession required to wring it out were still fresh in the minds of politicians, policy makers, and the public. Inflation levels had only recently fallen from the elevated levels over the 1980s, and the market still harbored inflation doubts. The Fed today (like many other central banks) enjoys much greater policy credibility than it did in 1994, which should allow the committee to begin "tapering" QE at the end of 2013 while keeping policy rates at zero through early 2016. Key to this forecast is the fact that Federal Reserve officials have suggested that "substantial" improvements in the labor market will be needed to justify ending QE, and that the unemployment rate will probably need to fall to 6.5% or lower for the funds rate to rise.

Second, changes in communication policy have dramatically reduced the risk of a "pure" policy surprise (that is, one not driven by higher growth or inflation). Better communication does not necessarily mean the FOMC aims to be fully predictable. On the contrary, some communication strategies (such as the switch from calendar guidance to "thresholds") aim to convey the appropriate degree of intrinsic policy uncertainty arising from the uncertainty of future economic conditions. But it does mean that the Fed is much less likely to surprise the market with policy actions that are not obviously in line with developments in the outlook for employment and inflation. We expect the pace of that improvement will be measured.

Charlie Himmelberg, Head of Credit and Mortgage Strategy Research

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Snapshot of our views

Implications of the so-called "bond bubble"

FX
Thomas Stolper & Team

- Developments in rates differentials are currently key for FX Markets. **The main premise for our bearish dollar view lies on the view that the Fed will remain more accommodative than other central banks globally.**
- Weakness in Euro area data and the Bank of Japan's surprising shift towards aggressive easing have so far challenged this view, but only in driving real rate expectations outside the US lower vis-à-vis the US.
- Developments in global bond yields are also crucial for EM currencies. The low level of G10 yields has led EM central banks to maintain local real rates at levels highly accommodative relative to their already narrow output gaps. Long periods of resource scarcity have created imbalances with non-tradable sectors growing together with current account deficits in particular EMs. And how local policy makers address these challenges will be key to local stability. The policy dilemmas would become more pronounced in an environment of rising US yields.
- All else equal, a sharp move higher in front end US yields, driven by us data strength, would likely lead the dollar stronger against both EM but also several DMs too.

Rates
Francesco Garzarelli & Team

- US Treasury yields are well below our measures of macro "fair value" and we expect 10-year US Treasury yields to gradually realign with their macro underpinnings.
- We forecast 10-year UST yields at 2.5% by year-end and at 3.75% in 2016, the end of our forecast horizon.
- **We do not think that there is a "bubble" in the bond market, but future increases in rates are not adequately priced into the market, in our view.** This is because the Fed has been very convincing in its communications that it will keep rates low for an extended period. Moreover, the market is still quite pessimistic about future growth.
- If we are right on the macro outlook, investors will start asking for a higher term premium to hold intermediate and long-dated US Treasuries bonds.

Credit
Charlie Himmelberg & Team

- While risk-free rate have fallen to historically low levels, we don't think the bond market is a bubble.
- We think the current yield environment is largely warranted by persistently sluggish growth, excess capacity, low inflation, and Fed policy – conditions that we expect will constrain the pace at which both policy rates and long bond yields will normalize over the next few years.
- We think persistently low yields on risk-free assets will sustain a firm bid for credit assets as the "search for yield" remains in force.
- Despite the current intensity of the "search for yield", **we do not think that corporate credit markets or credit spreads are "overheated".** While new-issue conditions are robust, and spreads are tight, we do not (yet) see signs of excess leverage or "uncompensated" risk taking.
- If current "search for yield" conditions persist, the risk of overheating will rise. We therefore think it is important to monitor for such signs, as recently suggested by Fed officials like Jeremy Stein, but so far we do not see it.

Equity
David Kostin (US)

Kathy Matsui (Japan)

Tim Moe (Asia ex-Japan)

Peter Oppenheimer (Europe)

Helen Zhu (China) & Teams

- The key question in equity markets relative to the bond bubble debate is whether equity prices have been inflated artificially by low bond yields and therefore should suffer as bond yields rise.
- **It is our view that this is not the case. The low bond yields are mirrored by very high equity risk premia. We see both of these as a consequence of the weakness of the economy and related risk aversion. The overall discount rate (bond yield + equity risk premium) that equities are pricing does not look stretched.**
- If bond yields were to rise gradually in line with our forecasts on the back of better growth, we would expect equity markets to perform well as outlined in our GOAL - Global Strategy Paper No. 9, April 11, 2013.
- A more rapid rise in bond yields driven by concerns that current central bank policy will lead to rapid inflation would likely be very bad for equities.

Commodity
Jeff Currie & Team

- Under our economists' forecast, a gradual acceleration in the US recovery will generate a gradual increase in US interest rates. We expect that this underlying growth will prove supportive to commodities demand, with energy demand most impacted as the US still represents 20% of global energy use. Admittedly, we also expect that rising production will help meet this stronger demand and keep oil prices range bound near $105/bbl. We expect this gradual rise in (real) rates to coincide with a decline in gold prices.
- **A faster rise in interest rates caused by rising inflation would prove supportive to commodity prices given their historical large positive returns in response to both core and non-core US inflation.** This strong positive correlation between commodity index returns and inflation has been observed in both passive and active US monetary policy regimes, suggesting it is fairly robust to changes in monetary policy. And while such an outcome would be supportive to gold prices as well, cyclical commodities have historically performed better than gold in periods of rising inflation.
- A spike in interest rates from the unwind of a potential bond bubble would potentially put at risk the US recovery, creating downside risk to our commodity consumption forecasts, with the largest negative impact on the energy markets. We would expect such an outcome to coincide with a sharp decline in gold prices.

Interview with Paul McCulley

Paul McCulley is a former partner at PIMCO, where he was a member of the Investment Committee, manager of multi-billion dollar portfolios and founding author of the research publication, Global Central Bank Focus. He is currently Chairman of the Society of Fellows of the Global Interdependence Center, which he founded. Below he shares his views on why the bond market is currently rationally priced, and most definitely not a bubble.

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

Allison Nathan: Why has there been a big rush towards bonds in recent years?

Paul McCulley: US government bonds remain the ultimate "safe asset," meaning that you're guaranteed to get your interest and your principal back in nominal terms when the bond matures, with very little credit risk attached. There have been periodic political debates about whether or not we're going to default on debt by political decision, but this so far at least has not come to pass. Meanwhile, in the 2008 crisis, equity risk was beaten up very severely, as were property markets and other asset classes. So people were bitten by too much equity and property risk and discovered the inherent riskiness of them: stocks and in particular property don't always go up. **You tend to worry most about the dog that just bit you, so there's been a flight to a safer asset.** That's number one.

Number two is that the bond market has been supported by the Federal Reserve, both with its traditional monetary policy having short-term interest rates at effectively zero, as well as the various QE programs and communication programs that have flattened the yield curve. **So, there's been the flight to the safe asset class, and the safe asset class has been nurtured, fed and supported by the Federal Reserve.** Consistent with that, a third reason is that the absolute return on cash has been yielding zero, and investors have said, "I just can't live with zero. Therefore, I have to be in something besides cash. I don't want to buy stock because I got burned the last time I bought stock. I don't want to buy a second home because I got burned on that too. So, I've got to go somewhere." Literally, it's been that sort of default.

In particular, I think that flight from cash into bonds has been actually concentrated quite heavily in private sector bonds, which trade at a higher yield than Treasury bonds, because people want yield. And this rotation into private bonds has actually increased their value. So**, it's had elements of a self-fulfilling prophecy. People want their safer asset class and by wanting it, i.e., bonds, they've made bonds perform very well, which validates and reinforces their decision to go into the asset class.**

Allison Nathan: Has this self-reinforcing dynamic created a bubble in government bonds?

Paul McCulley: No. I think the government bond market is too rich looking out over the next 10 years, but rationally rich. And I have real difficulty with the word "bubble" in this context. Let me walk you through why. Long-term interest rates are expected short rates plus a risk premium that investors demand for tying up their money for a long period of time and the uncertainty inherent in that. So, the fundamental valuation for the bond market is short-term interest rates, which the Fed absolutely controls. And the Fed has said that it will keep short-term rates at current very low levels for a very long time. In December of last year, they went as far as to say that "we're not even going to contemplate raising rates from their current level of effectively zero until the unemployment rate falls to 6.5% and/or the expected inflation rate rises to 2.5%" (the "Evans Rule"). Essentially, the Fed has told you it's not zero interest rates forever, but it is for as far as the eye can see as long as we have an elevated unemployment rate, and also that our expectations for inflation remain quiescent**. Looking at the bond market, it should therefore logically be at very low yields** because it is a forward curve on expected short rates, and short rates are going to be down here for a very long period of time.

Allison Nathan: Why is the Fed making such extraordinary efforts to communicate that rates are going to remain so low for such a long period of time?

Paul McCulley: Because the US is in a liquidity trap, which is when the Fed has reduced interest rates rather dramatically—in this instance to zero—but there is not a meaningful increase in the demand for credit from the private sector. Normally, if you go back prior to the crisis in 2008 and you said "we're going to have zero interest rates," there'd be a huge party of leverage. The reason that zero now doesn't give you a huge party is that we already had a huge party, which the private sector is still recovering from. In other words, the private sector is de-levering and will continue to do so until it is healed, no matter how cheap borrowing is. The fact that we've had short-term rates at zero for nearly five years but the unemployment rate is still stuck up near 8% is clear evidence that the economy is stuck in a liquidity trap. We also have inflation that is below the Fed's target**. It doesn't mean that the Fed is ineffective. It means that they're far less effective than if the economy was not in a liquidity trap.**

Allison Nathan: How do we get out of the liquidity trap?

Paul McCulley: The process of escaping the liquidity trap requires that the Fed keep rates down here near zero, in part to make possible refinancing of existing debt at lower interest rates, and that's obviously one of their big objectives with their mortgage-backed security (MBS) purchase program of QE. But the hope is that zero rates will also help make asset prices rise, which is another and perhaps the easiest way that the private sector can recover; if, for example, house prices rise, then suddenly negative home equity can turn into positive home equity. With zero rates and therefore zero yields on cash, it makes it painful for people to own cash so they buy other things, which will hopefully increase the price of assets that people have applied leverage to. The big one is the property market, but also the equity market, which literally creates wealth. And perhaps they will invest in the real economy too.

What's really important here is it is this aim of getting out of the liquidity trap that explains why the bond market is so expensive right now. The concept of **"rational overshoot"** – that it is quite possible for markets to rationally and understandably overshoot in both directions their long-term fair value – was developed by Rudi

Dornbusch in 1976 in the context of currency markets. He argued that it was rational for currencies to undershoot their fair value following a dramatic cut in interest rates because the only way that investors would want to own the currency in the lower rate environment would be if the currency were considered "cheap" even relative to the lower rates. I think this argument can be applied to the bond market today. **We will exit the liquidity trap precisely because the bond market is overvalued relative to its long-term fair value.** So yes, the bond market is rich relative to its fair long-term value assuming that we exit the liquidity trap, but it is necessary, required and rational overshooting.

Allison Nathan: Are you at all concerned about a near-term spike in interest rates?

Paul McCulley: **Unambiguously no.** You can have your risk-on, risk-off days but the bond market is rationally overvalued because this is what is required to escape the liquidity trap. Those who are arguing the bubble camp automatically assume an **"immaculate escape"** (in other words, a quick and easy escape) from the liquidity trap. And then they use the Taylor Rule (a monetary-policy rule that stipulates how much the central bank should change the nominal interest rate in response to changes in inflation, output, or other economic conditions) to figure out that short-term interest rates should be 4% if we escape the liquidity trap and the economy is once again all hunky-dory, meaning that the unemployment rate is about 5.5/6% and the inflation rate is about 2%. I understand the argument **but I categorically refuse to assume an immaculate escape from the liquidity trap.** Japan has been in a liquidity trap for 20-plus years and hasn't escaped yet (although it may finally be on the verge of doing so!).

When you do escape, there's going to be a pretty nasty selloff in the bond market. I don't think that short-term rates are ever going back to 4%, but if short rates increased to even 2%, it would still mean a nasty selloff for long rates because, remember, long rates are expected short rates. **But that will only happen way down the road once we've escaped the liquidity trap.**

Allison Nathan: Should the Fed be doing anything differently?

Paul McCulley: **The Fed is doing everything right** because what they're doing will hopefully bring about, not immaculately, but on the back of what's going on in asset markets and in the real economy, the exit from the liquidity trap. The Fed understands that this may not be the right level for monetary policy in the very long run on the other side of the liquidity trap, but right now the overwhelming objective needs to be to get out of the liquidity trap. They are practical policymakers. And in the real world, there's nothing immaculate; you have to actually put in place the policies that help bring about that outcome.

Allison Nathan: Should anyone be doing anything differently?

Paul McCulley: Absolutely. I think that the love affair with austerity should be summarily ended. The notion that in the liquidity trap, when the private sector is still in recovery, that the public sector, which has access to a printing press, should voluntarily, aggressively and with moral righteousness go put themselves on a spending and leveraging sick leave too is called a prescription for a depression. If there is any evidence needed for that, we can simply look to Europe, which has been preaching with high moral overtones the notion that what ails Europe is government profligacy and that what you need is fiscal austerity, which is not working very well. When the private sector is de-levering, the public sector should go the other direction, which raises another core doctrine of economics – the Paradox of Thrift. It's rational for one sector, such as the household sector right now, to be thriftier, and one of the ways to be thriftier is to pay down debt. But one person's spending is another person's income so if no one is spending then net incomes, and, in turn, net savings will end up lower. That's not to deny that we have a long-term fiscal problem in this country. But **trying to solve a long-term fiscal problem with fiscal austerity in the short run when you're in a liquidity trap is completely nonsensical.** I believe that there is tremendous scope right now for public investment to help get us out of the liquidity trap.

Allison Nathan: Would you be a buyer or a seller of treasuries today?

Paul McCulley: **The short answer is that I like other things more.** I want to own the asset classes that need to go up, either as a result of policy-induced healing or organic healing so I don't like treasuries relative to other, risky asset classes. But if the only two things that you can own are treasuries or cash, I think probably a five-year treasury makes a fair amount of sense, even though the yields are incredibly low, because I think that the Fed is going to be near zero for a long period of time.

Allison Nathan: What do you like as an investment now?

Paul McCulley: **The most intriguing asset class for me right now is risk assets in Europe**, which I believe are very cheap looking out over the next three to five years. I felt the same way a year ago with respect to Japan. Japan has finally said, "Enough of this liquidity trap" and we're finally seeing proper monetary policy and proper coordination between monetary and fiscal policy in Japan, where assets have had a really nice run for the last six months. It's nice to see proper policy being categorically rewarded by the marketplace. Now, you have people saying, "Japan's printing money; this party's going to end badly." I want to participate in the party. I also think it's the right policy and we're not anywhere near Europe doing a Japan, and Japan's probably got some more room to run. But **I can actually conceive of a scenario in the next three to five years in which Europe and the United States are more Japan-like.** It's interesting to actually say that because Japan's been in a liquidity trap for 20-odd years but **they're finally using the "Colin Powell doctrine of overwhelming force", and I don't want to bet against Colin Powell.** I think what we need in monetary and fiscal policy around the world to get us out of this liquidity trap is overwhelming force, and, in that scenario, equity risk is going to win versus pure duration risk for long-term investors.

Allison Nathan: What has surprised you the most over the last five years in the markets and what are you most concerned about in the markets today?

Paul McCulley: Actually, I have the same answer for both questions. What has surprised me the most over the last five years is the inability of my profession called macroeconomics to see clearly. I do not think that my profession has wrapped itself in glory; there's still a great deal of discussion in my profession about whether we're in a liquidity trap or not and this love affair with the notion of somehow expansion through fiscal austerity. So **what's surprised me the most is how my profession has responded post-2008, and what worries me the most going forward is that my profession will continue to respond in the same way.**

Has gold been the real bubble?

Jeff Currie, head of our global commodity research team, looks at the bubbly properties of gold

The recent pronounced decline in gold prices clearly brings into question whether the gold market is a bubble in the midst of bursting. Even before this recent sharp pull back in gold prices, market fundamentals had already raised concerns around whether gold was a bubble. At the center of this concern was the physical-backed gold ETF. At its peak at the end of 2012 its holdings were 84.6 million oz. **This made it one of the world's largest gold reserves behind only the German and US central banks and the IMF.** Since then it has seen a sharp decline of 9.4 million toz., which alone is 10% of annual gold production. But with this drop only Italy and France have barely edged it out.

The Gold ETF is still the 4th largest gold reserve

Country/Institution	Gold reserve (mtoz)
Euro Area	346.7
United States	261.5
Germany	109.0
Italy	78.8
France	78.3
ETFs	**75.3**
China	33.9
Switzerland	33.4

Source: International Monetary Fund, Bloomberg.

Defining a bubble

The textbook definition of a bubble is asset price inflation generated by excess demand, which is not fundamentally supported. **The ETF could clearly be described as this type of excess demand.** The key question is whether this excess demand leads to a buildup in long positions that can quickly unwind and crush prices in the future, i.e., popping the "bubble." Because the gold ETF is backed by physical gold, you could also similarly ask whether the ETF holdings have literally generated an inventory build of gold that can come back into the market and push prices sharply lower. We believe that the ETF is an inventory build that has this bubble property, leaving the only question of how "sticky" is this inventory?

Surplus versus hoarding

An inventory build that is associated with declining prices is usually labeled a "surplus." Such an inventory build typically ends when prices fall low enough to create a fundamental correction, which in turn draws the inventory down, causing a price rise in the future. In contrast, an inventory build that is associated with rising prices is usually labeled as "hoarding." Hoarding usually ends when the hoarder either proves to have been prudent, in which case the realization of the event that motivated the hoarding in the first place causes the inventory to decline, or it becomes clear that the event that motivated the hoarding will not occur, in which case the inventory re-enters the market and crushes prices.

During the US housing boom people hoarded property under the belief that demand and prices would continue to rise. When that belief was proved wrong, the inventory re-entered the market and prices collapsed. Interestingly, we never use the term "bubble" to describe this dynamic in food and energy when "precautionary" inventories are built in anticipation of events such as bad weather that are expected to create demand for the inventory and cause prices to rise. Instead, we call it "prudent" despite the fact that it is very difficult to predict these events or even assess the probability of them occurring. However, when that bad weather event doesn't happen – just like a bubble – the precautionary inventories re-enter the market and crush prices. **The only reason we call the precautionary inventory build in food and energy prudent is that it determines our mortality unlike houses, gold or bonds.**

Fundamental drivers, but hard to pin down

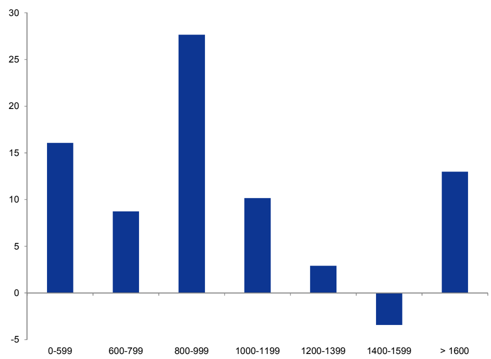
In gold, the weather event is a systemic financial or monetary crisis and the ETF can be interpreted as the precautionary inventory build to protect from this event. In recent years we have linked changes in ETF demand to movements in sovereign credit default swaps, real interest rates and exchange rates – all measures of debasement and the potential risk for a substantial financial crisis. Unfortunately, these correlations are not consistent over time, which makes it extremely difficult to connect the level of the ETF to a measurable probability of sovereign default, debasement or other financial crises. And **because this relationship changes over time, it is extremely hard to predict despite our view that it is entirely rational behavior.**

How sticky is ETF demand?

So just how sticky is the ETF demand, driven by a diverse group of small and large retail, institutional, and sovereign investors? As the economic climate improved during 1Q13, ETF holdings declined in the largest and longest stretch since inception. Given the sharp drop in prices, we estimate that 12.7% of the existing holdings, or 9.55 million oz., have a cost basis above current levels, pointing to potential further reduction in under-water holdings. And while using real interest rates as a guide to how ETF holdings could evolve going forward points to an additional 7.6 million oz. decline in ETF holdings by year-end 2014, the recent pace of decline has been much stronger, pointing to downside risk to our $1270/toz. year-end 2014 target. As we know that these relationships were unstable on the way up, **there is no way to be certain it doesn't all rush to the exit at once.** The history of commodity markets tells us that when a precautionary inventory build is deemed unnecessary it nearly always proves not to be sticky.

ETF costs

Net accumulation of ETF holdings by price range, $/oz



Source: COMEX, Bloomberg, Goldman Sachs Global ECS Research.

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Notable bubbles in history

1621
Tipper and See-Saw Time
Money in German states was debased with an intention to defraud neighboring states by exchanging the debased currency for solid currency in those states, all in an effort to raise money for the Thirty Years' War

1637
Tulip Mania
In Holland, tulips that were rare at the time became symbols of prosperity; the most expensive tulips sold for fifteen or twenty times the annual salary of a skilled craftsman

1720
South Sea Company
A British joint-stock company and public-private partnership created to consolidate and reduce the cost of debt but marketed to the public as a growth opportunity because of its monopoly on trade with South America, which would realistically never take place because of Spain's control over that continent at that time

1720
Mississippi Company
A bank and trading company with a monopoly over French foreign trade; exaggerated claims of the wealth of French colony Louisiana led to wild speculation in the shares of the company

1846
Railway Mania
Speculative frenzy over railroad shares in Britain

1886-92
Encilhamento ("Mounting")
Economic bubble in Brazil facilitated by new banking laws that were intended to stimulate industrialization, but that encouraged unbridled speculation around IPOs and other practices

1920s
Florida Land Boom
Speculative land boom

1969-70
Poseidon Bubble
Stock market bubble in Australian mining shares initially prompted by a speculative frenzy over shares of a company that had made a large nickel discovery at a time when nickel was in shortage

1980-90s
Japanese Asset Price Bubble
Abundant liquidity, financial deregulation, monetary easing and euphoria over future growth prospects led to speculation in the stock and property markets

1997-2000
Dot-com Bubble
Speculative bubble in stocks related to the burgeoning internet

2000s
Real Estate Bubbles
2005 – India
2006 – UK, Ireland, Spanish
2007 – **US**, China
2008 – Romania
2009 - Australia

2006
Jatukam Craze
Speculative frenzy over Jatukam amulets (look like over-sized pieces of vaguely hindu/buddhist jewelry that you wear around your neck) in Thailand that were thought to bring wealth

2007
Uranium Bubble
Uranium prices skyrocketed, possibly initially prompted by flooding of the Cigar Lake Mine in Saskatchewan, the largest undeveloped source of uranium in the world, but which wasn't yet producing anything at the time

"An asset-price bubble is when asset prices are driven up far above their fundamental economic values due to irrational-psychological behavior of investors."
Subjectmoney.com

"A speculative bubble is a social epidemic whose contagion is mediated by price movements."
Shiller, July 2012

"An asset price bubble is when asset prices exceed fundamentals because owners believe they can resell the asset for a higher price in the future."
Brunnermeier, The New Palgrave, 2008

"An asset price bubble is when the prices of specific asset classes are over-inflated due to excess demand for the asset as an investment vehicle."
USeconomy.com

"An upward price movement over an extended range that then implodes".
Kindleberger, 1978

"When the prices of securities or other assets rise so sharply and at such a sustained rate that they exceed valuations justified by fundamentals, making a sudden collapse likely - at which point the bubble 'bursts'".
Financial Times

"An asset price bubble describes an asset price that has risen above the level justified by economic fundamentals, as measured by the discounted stream of expected future cash flows that will accrue to the owner of the asset."
Federal Reserve Board of San Francisco, October 26, 2007

"Price increases (or declines) that become unmoored from fundamental valuations."
Bill Dudley, President of the NY Fed, 2010

Sources: Business Insider; Carvalho, 2004; Richard Dale, 2004; Mike Dash, 2001, 2012; Kindleberger, 1978; McKay, 1841.

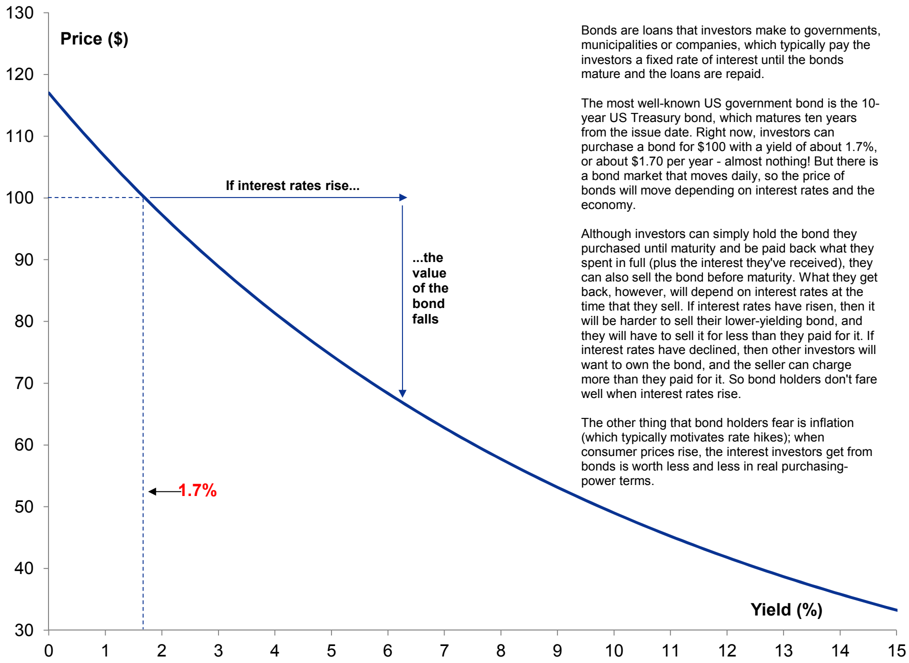
Bonds 101

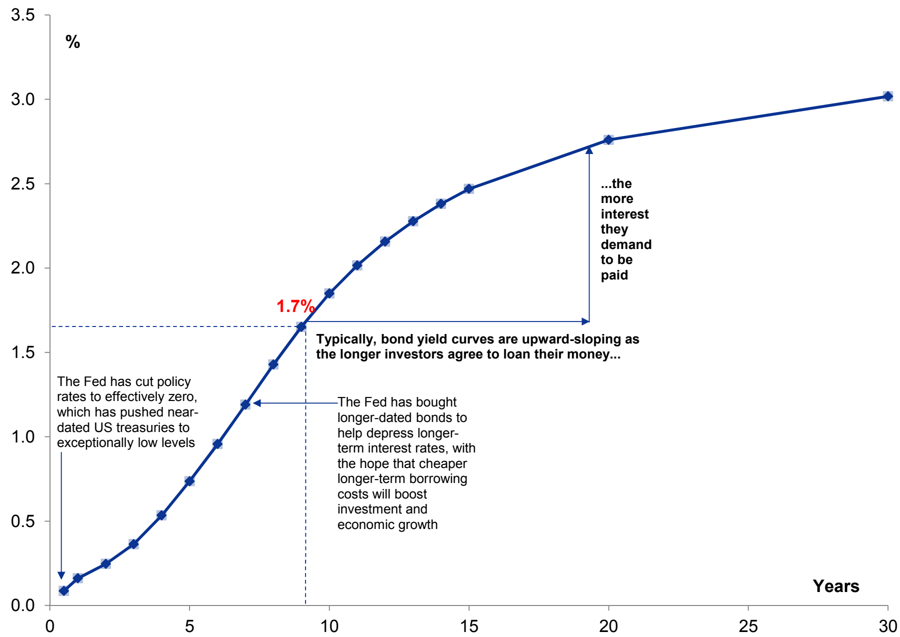
Bonds are loans that investors make to governments, municipalities or companies, which typically pay the investors a fixed rate of interest until the bonds mature and the loans are repaid.

The most well-known US government bond is the 10-year US Treasury bond, which matures ten years from the issue date. Right now, investors can purchase a bond for $100 with a yield of about 1.7%, or about $1.70 per year - almost nothing! But there is a bond market that moves daily, so the price of bonds will move depending on interest rates and the economy.

Although investors can simply hold the bond they purchased until maturity and be paid back what they spent in full (plus the interest they've received), they can also sell the bond before maturity. What they get back, however, will depend on interest rates at the time that they sell. If interest rates have risen, then it will be harder to sell their lower-yielding bond, and they will have to sell it for less than they paid for it. If interest rates have declined, then other investors will want to own the bond, and the seller can charge more than they paid for it. So bond holders don't fare well when interest rates rise.

The other thing that bond holders fear is inflation (which typically motivates rate hikes); when consumer prices rise, the interest investors get from bonds is worth less and less in real purchasing-power terms.





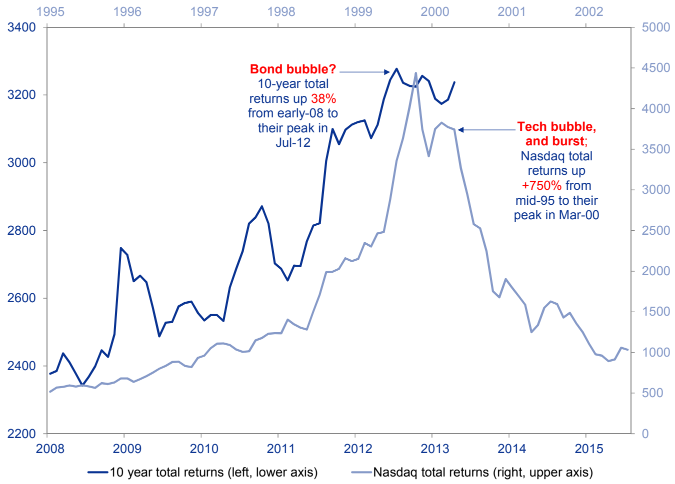
Source: Goldman Sachs Global ECS Research.

Bond bubble in pics

A special thanks to Silvia Ardagna, Francesco Garzarelli, Stuart Kaiser and Peter Lewis for most of these pics.

Hmmmm

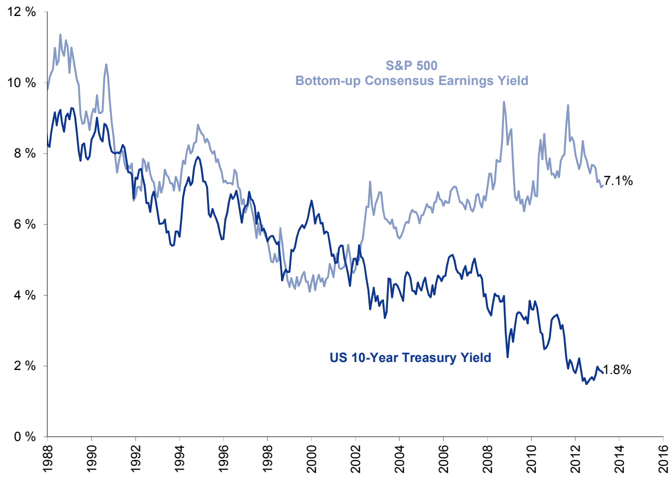
Total return



Source: Goldman Sachs Global ECS Research.

Bond bubble, anyone?

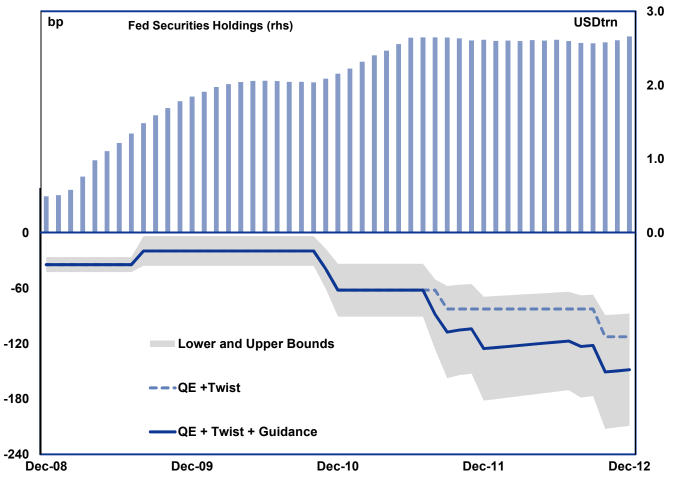
Yields



Source: Goldman Sachs Global ECS Research.

Fed speak, purchases have mattered

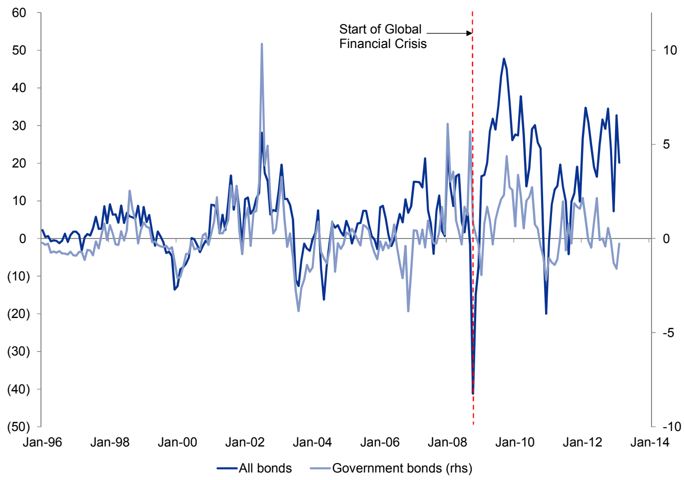
Estimated impact of Fed Policies and EMU Crisis on 10-year yields



Source: Goldman Sachs Global ECS Research

The great bond rush

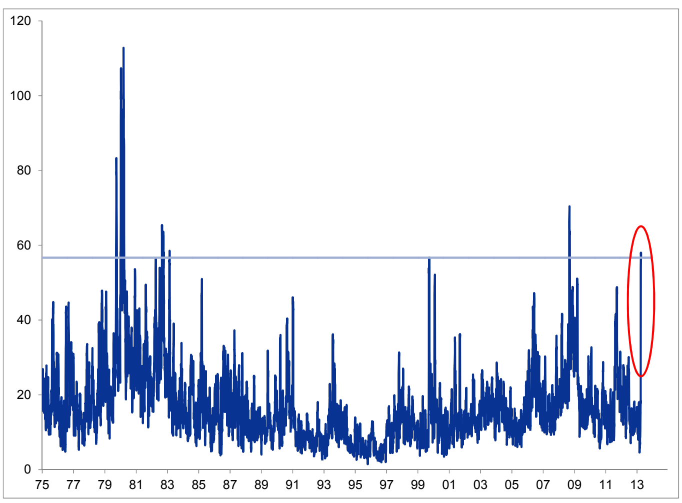
Bond flows into mutual funds, $bn



Source: ICI, Goldman Sachs Global ECS Research.

Is this what a bursting bubble looks like?

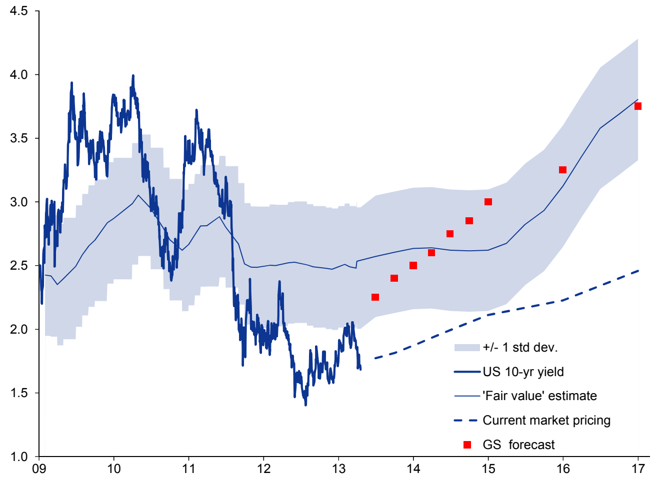
10-day realized gold volatility (1975-present), %



Source: Goldman Sachs Global ECS Research.

Expensive, but no bubble

10-year yields: actual, fair value, GS forecast



Source: Bloomberg, Goldman Sachs Global ECS Research.

Snapshot of our key forecasts

	GDP Growth (% yoy)				FX				Equity				Rates (% eop)				Revision Notes
	2013		2014		3-mth		12-mth		3-mth		12-mth		Policy		10-yr		
	GS	Cons	GS	Cons	GS	Cons	GS	Cons	GS	Cons	GS	Cons	2013	2014	2013	2014	
Global	3.2	3.3	4.1	3.9	-	-	-	-	-	-	-	-	-	-	-	-	
					EUR/$		**EUR/$**		**SP500**		**SP500**						
US	2.1	2.1	2.9	2.7	1.36	1.29	1.40	1.27	1550	1551	1650	-	0.13	0.13	2.5	3.0	On March 27, we modestly raised our 10-year yield forecast off the back of more resilient than expected US growth.
					EUR/$		**EUR/$**		**Eurostoxx 50**		**Eurostoxx 50**						
EURO AREA	-0.5	-0.4	0.8	0.9	1.36	1.29	1.40	1.27	2750	2778	3000	-	0.75	0.75	-	-	
					EUR/$		**EUR/$**		**DAX**		**DAX**						
GERMANY	0.7	0.7	1.9	1.7	1.36	1.29	1.40	1.27	-	-	-	-	-	-	1.8	2.0	On March 27, we revised down our end-2013 10-year yield forecast to 1.8% from 1.9% as economic conditions in the Euro area have weakened.
					$/CNY		**$/CNY**		**HSCEI**		**HSCEI**						
CHINA	7.8	8.2	8.4	8.0	6.23	6.20	6.20	6.13	-	-	-	-	6.00	6.50	-	-	On April 18 we revised down our 2013 GDP forecast to 7.8% from 8.2% owing to softer-than-expected Q1 GDP.
					$/BRL		**$/BRL**		**BOVESPA**		**BOVESPA**						
BRAZIL	3.3	3.1	4.4	3.7	1.95	1.98	1.95	2.01	-	61077	-	-	8.50	8.50	-	-	
					$/JPY		**$/JPY**		**TOPIX**		**TOPIX**						
JAPAN	1.4	1.3	1.7	1.3	102	95.20	105	97.30	1180	-	1350	-	0.10	0.10	0.8	1.0	On April 11, we raised our GDP growth forecasts and our 3/6/12-month TOPIX targets to reflect expectations of a weaker yen. On April 10, we revised our FX forecasts toward a weaker Yen to reflect the monetary policy regime change at the April 4 BOJ meeting, which far exceeded expectations. On March 27, we lowered our 10-yr yield forecasts owing mainly to higher global interest rates.

Commodities	Brent crude oil ($/bbl)				Copper ($/mt)				Gold ($/toz)				Corn ($/bu)				Revision Notes
	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	
	110	110	105	110	7500	-	7000	-	1530	-	1390	-	6.50	-	5.25	-	On Apr 22, we reduced our copper forecast largley on an increasing willingness of the market to price future surplus ahead of time, especially given downside risks to EM growth and a rising likelihood of a greater surplus. On April 10, we further reduced our gold price forecasts on waning conviction from ETF investors to hold long positions; On April 1, we reduced our corn price forecasts on expectations of higher inventory levels.

Note: Recent revisions marked in red; GDP consensus is Consensus Economics, all other consensus is Reuters, commodity 12-mo consensus is Reuters for 2013 average.

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 includes four variables: real 3-month interest rates, real long-term interest rates, real trade-weighted value of the exchange rate and equity market capitalization to GDP.

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.

Disclosure Appendix

Reg AC

We, Allison Nathan, Damien Courvalin, Jeff Currie, Kris Dawsey, Francesco Garzarelli, and Charlie Himmelberg hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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