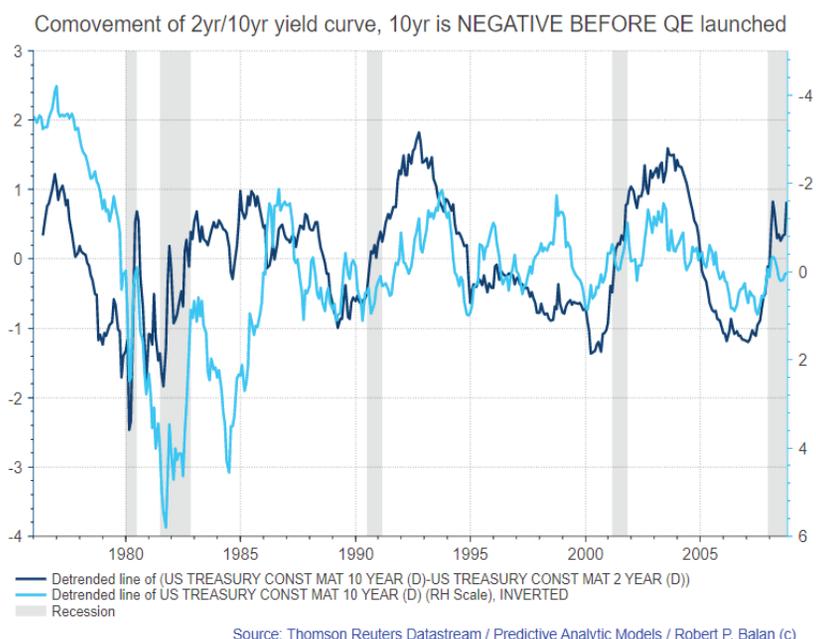


## 36 / The yield curve universe is changing – shifting inflation expectations is prime mover for those changes

**I**n the late 1980s to late-2000s, the yield curve had the tendency to steepen during bond (price) rallies and to flatten during (price) selloffs. Put simply, there was a NEGATIVE correlation between the 10yr yield and the slope of the 2y/10y yield curve. Described another way, when the 10yr yield starts falling, it won't be long before the yield curve steepens. It was a very useful market construct because at that time, changes in the 10yr yield tend to be ahead of the inflection points of the yield curve by about 1 to 2 months. The graph below shows this tendency.

**T**he 10-year yield is on the right-hand axis and showed as inverted scale. The 2yr/10yr spread is on the left-hand axis. **Another interesting feature of this negative relationship: not long after a major, simultaneous inflection of a steepening yield curve and a falling 10-year yield, a growth recession is not far behind.** That was seen in the run-up to the double recessions of 1980 and 1981, in 1990, in 2001, and just before the 2007 recession that ushered in the Great Financial Crisis (GFC) (see 1st graph on this page).

**A**nother feature of the pre-QE negative relationship was that once it starts to change direction, it tends to move towards the same direction with some persistence. The negative correlation between the long term rate and the yield curve tends to feed the inverse movements due to the following: (1) when the curve was steep, steepening trades (selling 10-year notes and buying duration-weighted 2-year notes, both repo-financed) tended to have positive carry, were easy to maintain and were therefore very popular, and (2) on the other hand, when the curve was flat, the opposite tended to be true and the opposite trade was executed. Other factors may have determined the inflection points of both the long-term



bond yield and the yield curve, but once the negative relationship got going, the movements tended to be fed by those lucrative trades.

**U**nfortunately, those easy, profitable trades disappeared once Quantitative Easing (QE) started in November 25, 2008, as the massive infusion of systemic liquidity and new monetary policy tools unleashed by the Federal Reserve sent the yield curve and bond yield comovements into a different direction. The relationship had turned POSITIVE.

**S**ince November 2008, the curve has tended to flatten during bond price rallies (falling yields) and steepen during price selloffs (rising yields) - it was the complete opposite of what was seen pre-QE. True to the new form, when bond yields started to rise sharply after bottoming in July 2016, the yield curve dutifully steepened (see 2nd chart above).

## Why did the relationship change after QE started?

Carry dynamics was not sufficient to explain the phenomenon, and in fact the new, positive comovement between the long-term yield and the curve runs counter to what carry dynamics would normally bring in such circumstances. That the phenomenon appeared exactly after Quantitative Easing series started, suggest that the policy to constrain the policy rate (and thereby, the short-end) had much to do in flipping the relationship. The humongous amount of liquidity floating inside the financial system likely reinforced the new regime.

Since the implementation of the QE programs, the short rate (the overnight rate as proxy) had been anchored. It was not the anchoring that made the difference - there were other times in the past when the overnight rate was anchored as well, and the relationship did not flip. It was the market's perception that, for the very reason that QE was full-blown, the Fed had very limited room to move very far from zero-bound. That differentiated from the other times when the policy rate was anchored but was pinned at significantly higher levels.

Also, at those other times, the Fed had no similar constraints and could easily move away from the anchored level, even forcefully if they must. The QE, and the entire rationale for doing it in the first place, effectively pinned the short-end close to the zero-bound. The high levels of reserves provided the fuel for the unanchored element (the long-end- the sole, unpinned variable) to manifest the potential energy inherent in the system. **It did so, with a vengeance. The long-term yield had become the de facto policy rate** (see 1st chart on this page).

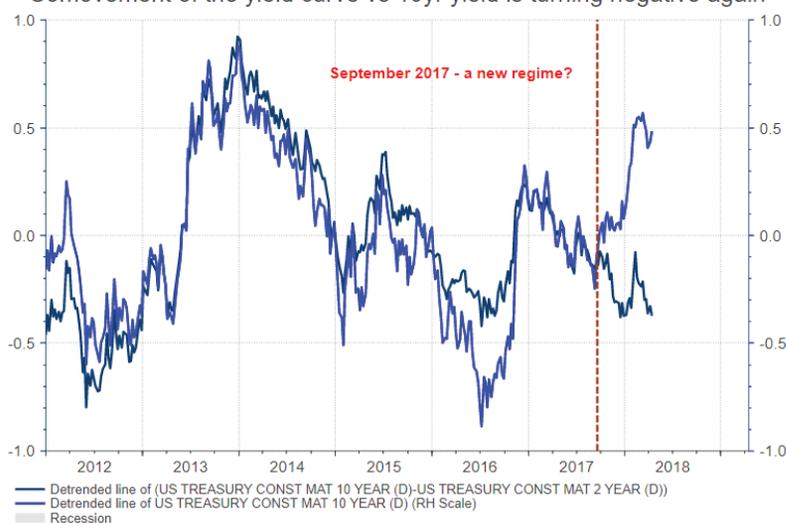
Nonetheless, we can't become complacent because it looks like new trouble is brewing on the yield curve front. Have a second look at the zoomed version of the graph (see 2nd chart on this page) that was shown

Long rates bear the brunt of the markets' effort to reach equilibrium



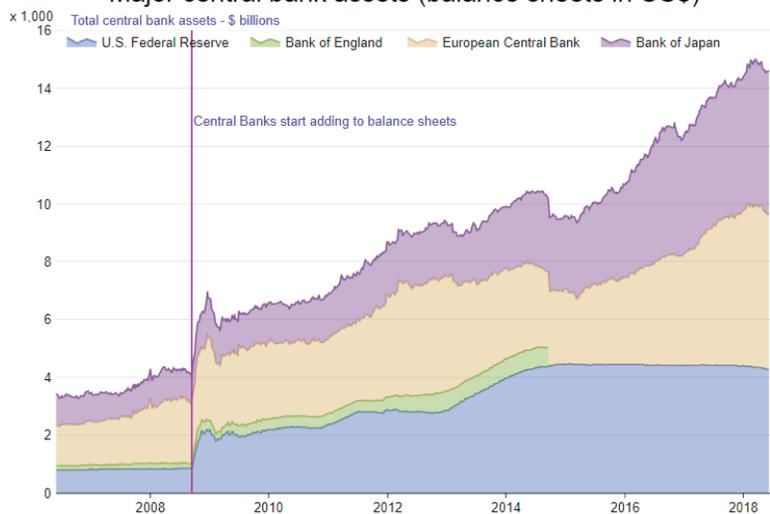
Source: Thomson Reuters Datastream / Copyright: Robert P. Balan Models (c)

Comovement of the yield curve vs 10yr yield is turning negative again



Source: Thomson Reuters Datastream / Copyright: Robert P. Balan Models (c)

Major central bank assets (balance sheets in US\$)



Source: Thomson Reuters Datastream / DCC / Robert P. Balan (c)

earlier – **the comovement between the yield curve and the 10-yr yield is turning NEGATIVE again!**

The change taking place in the US yield curve are also taking place at a global macro setting. This time, we are talking about really grand scale

– as in the aggregate QE proceeds of the five largest, stimulus-addicted central banks of the world – the Fed, the European Central Bank, the Bank of Japan, the People's Bank of China, and the Swiss National Bank (see last graph above).

## By June 2014, stimulus had no more effect on global rates

Much has been written about the impact of the asset purchases of the central banks on a broad range of financial assets (specifically, the equity markets). The transactions were essentially just plain asset swaps - the Fed took in short-dated securities from the banks (many with no market price at that time), and gave them back Treasury Notes averaging 5yr-7yr duration. That converted the banks' illiquid holdings into bank reserves. Arguably, the effect of those huge bank reserves, transmitted via the portfolio balance channel and the signalling channel, did push up house and equity prices, and also lowered the path of short-term rates and reduced longer-term yields.

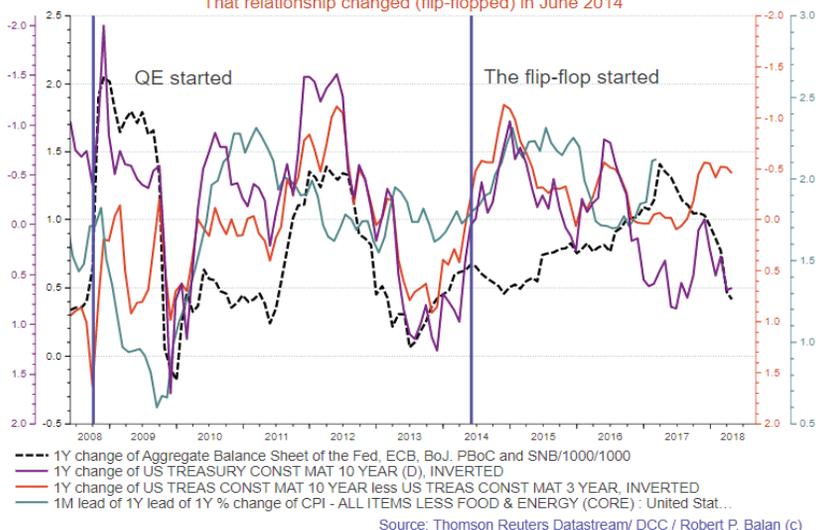
***But, and this is crucial, the depressive effect on rates stayed in place only from November 2008 (when the Fed started QE) until June 2014, even if the equity and housing markets still continued to benefit from the central banks' largesse.***

We still have to find out what special event happened in June 2014 to bring the effect of the mountain of global reserves on rates to a shuddering halt, then reverse the process. At this time, all we know is that as from June 2014 onwards, further addition to the bank reserves drove long bond yields higher, and vice versa; reducing the bank reserves triggered declines in yields – not exactly what the global central banks expected to see (see the 1st & 2nd graphs on this page).

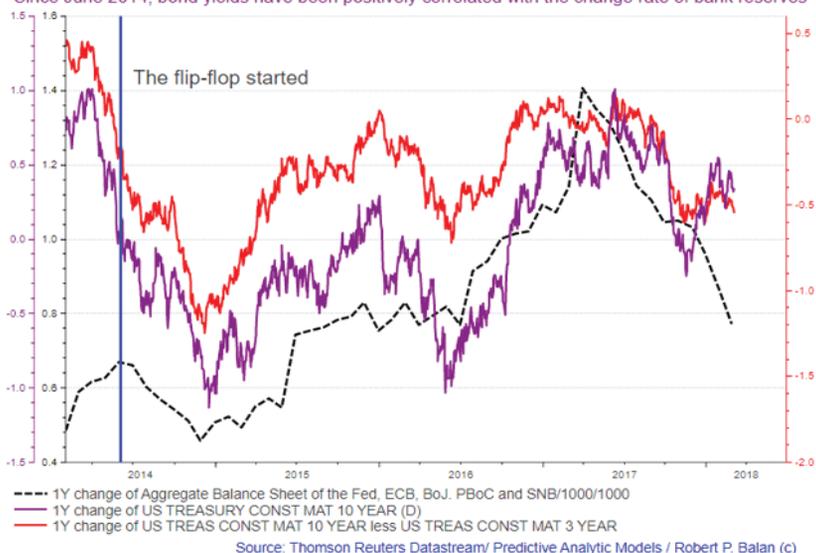
### The phenomenon is global

Now, we have to dispel the idea that this phenomenon is local to the United States, because if it were, then we should not see the same effect in global long rates. But we do see it in the global yields versus the aggregated balance sheet: reduction of stock and falling flows in the global balance sheet were followed by falling yields (see Last graph on this page and first on next page):

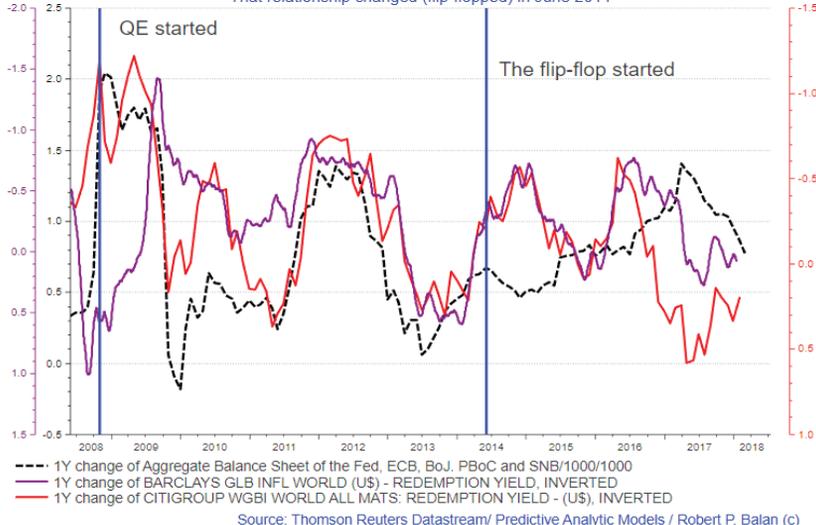
G5 (US,EU,JPN,CHI,CHF) balance sheet, M0 (in US\$) vs Bond Yields, Yield Curve  
From Nov. 2008, bond yields have been negatively correlated with the change rate of bank reserves  
That relationship changed (flip-flopped) in June 2014



G5 (US,EU,JPN,CHI,CHF) balance sheet, M0 (in US\$) vs Bond Yields, Yield Curve  
Since June 2014, bond yields have been positively correlated with the change rate of bank reserves



G5 (US,EU,JPN,CHI,CHF) balance sheet, M0 (in US\$) vs Bond Yields, Yield Curve  
From Nov. 2008, global yields have been negatively correlated with the change rate of bank reserves  
That relationship changed (flip-flopped) in June 2014



## Global Inflation at work (or not)

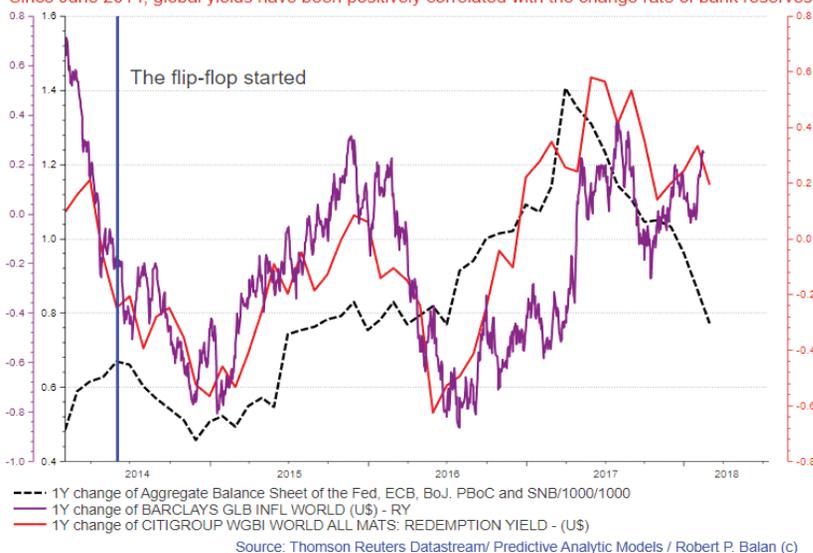
We have no idea if there was a specific event that triggered the flip-flop. But since the changes in rates synchronized with the changes in the central banks' aggregated balance sheets, we suspect that the evolution of GLOBAL INFLATION (actual and expected) may have been the culprit. If you include an inflation-linked instrument in the graph above (Barclays Global Inflation Bond Index, showing its Redemption Yield), it does correlate well with the changes in the aggregated global balance sheet. To test this hypothesis further, we added a measure of expected inflation using the Citi G10 Surprise Inflation Index as proxy. We replicated the procedure used above to find the comovements - the results confirmed our fears. Global inflation expectations were driving the show (see 2nd & 3rd graphs on this page).

## After June 2014, the central banks overstayed their welcome

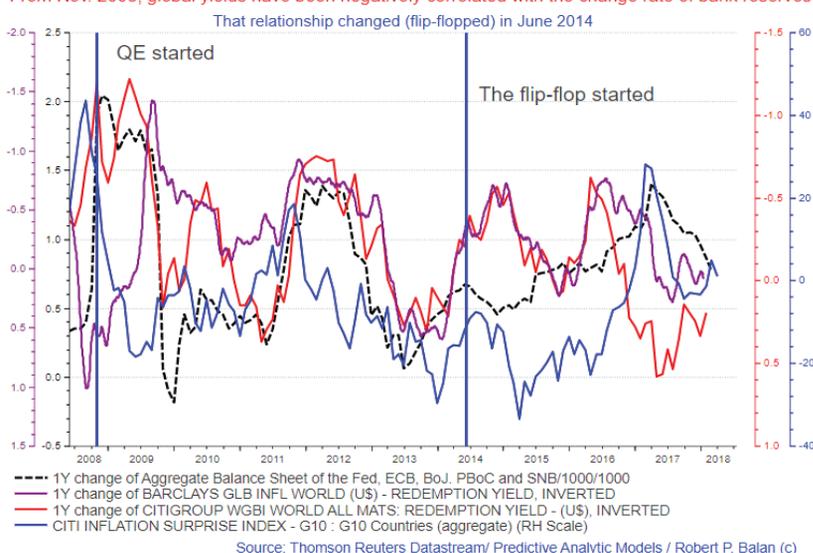
It is clear that global inflation expectations have been driving a large portion of the movements in global yields (as it should be), especially after June 2014. After that, rising amounts of global reserves drove both inflation expectations and global bond yields higher. The inverse was, of course, is also true. After June 2014, reduction of global reserves was followed by lower inflation expectations and falling global bond yields.

Simply put, the central banks have overstayed their welcome. No wonder, the serial Stimulators have shifted their objective from keeping yields lower (and equity and house prices higher) to pushing up inflation to (or in the case of Japan, above) their inflation targets.

G5 (US,EU,JPN,CHI,CHF) balance sheet, M0 (in US\$) vs Bond Yields, Yield Curve  
Since June 2014, global yields have been positively correlated with the change rate of bank reserves



G5 (US,EU,JPN,CHI,CHF) balance sheet, M0 (in US\$) vs Bond Yields, Yield Curve  
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From Nov. 2008, global yields have been negatively correlated with the change rate of bank reserves  
That relationship changed (flip-flopped) in June 2014



## We can now make some notes and a few conclusions:

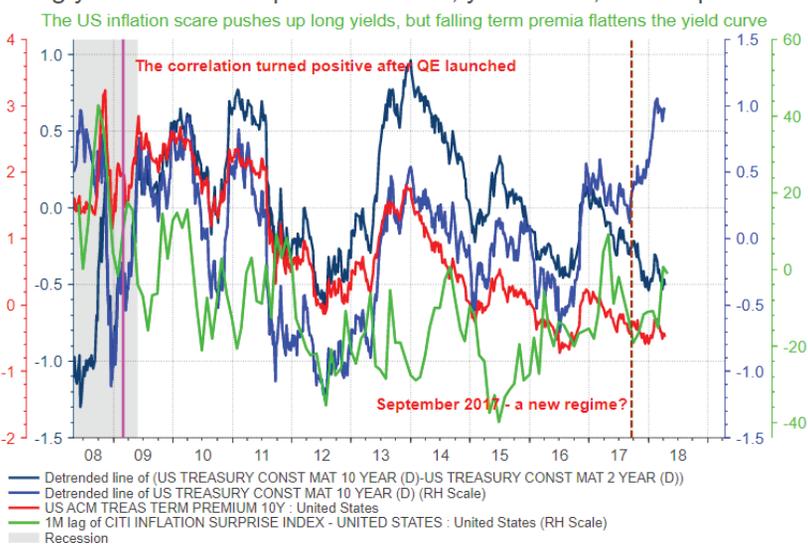
- The market, as from June 2014, started to believe that more stimulus results in higher inflation down the road. Hence, after the global aggregates peaked in March 2017, global inflation expectations fell sharply. (see the *Citi Inflation Surprise Index - G10* in the graphs on the previous page)
- The nominal amount (stock) and change rate (flow) of the aggregate global central bank balance sheet have been falling sharply for a few quarters now, since March 2017.
- With those reductions well in place, actual global inflation is expected by the market to fall further, following the sharp declines in global inflation expectations since March 2017.
- Despite their rebound since mid 2017, Global bond yields did top-out in March 2017 with the reduction in the flow of the global balance sheet and global inflation expectations: global yields lag the two variables by one quarter. (see the *Barclays and Citi Group World redemption yields indexes* in the graphs on the previous page)
- With recent declines in the balance sheet flow, global bond yields should resume their fall (based on this metric).
- **There is no empirical evidence which supports the market fear that reduction of the global balance sheet will cause global interest rates to rise.**

## The new US yield curve-10yr yield conundrum

But what is the linkage between the global picture and the new, negative divergence (since September 2017) between the US yield curve and the Treasury long bond yield?

It turned out that inflation expectations were the culprit there as well, but the thrust of the argument is towards

## Long yield reacts to expected inflation; yield curve, to term premium



the opposite direction – the market believes that US inflation will be rising sharply in the near-term at least. Hence, the long bond has been driven higher out of proportion to the delta of the near-term inflation expectations (see *1st graph on this page*). In other words, the long-end is now certifiably too rich.

**The general market has been very sanguine insofar as inflation is concerned. On the other hand, the bond market has been more circumspect, and in fact downright dovish with regards to US inflationary pressures. Proof? The 10-year Treasury Term Premium has been falling in step-ladder basis – and the yield curve has basically kept pace with it on the way down. The 10yr term premium has even turned negative.**

The bond term premium is the excess yield that investors require to commit to holding a long-term bond instead of a series of shorter-term bonds. It is a significant component of bond yields, and it changes over time. In the example we showed in the above graph, the term premium on the 10-year Treasury note depends crucially on financial market expectations about the course of shorter-term U.S. interest rates over the next ten years. It can be additive to, or subtractive of, the bond yield. Note that, along with expectations on the path of short-term rates, the term premium also

takes in the fluctuations in long-term bond yields due to changes in market expectations about long-run inflation.

## The general market worries about inflation; the bond market does not

In the current case of the negative divergence between the 10yr yield and the yield curve, it is obvious that the bond market is not so worried about the implications of long-run inflation on the valuations of long-term bonds. And the evidence is a negative term premium in the composition of the long-term bond yield.

So, the general market thinks inflation will be a huge problem down the road (overly rich 10yr yield). On the other hand, the bond market yawns and flattens the curve by having a negative term premium on the 10-year yield. Another point to consider is that global inflation expectations are heading lower (actual inflation follows to the downside after a short lag) – global bond yields should be declining further out.

**We side with the bond market, which you can rely time and time again to get it right.**