Tapering by the Fed and the Beta Convexity Puzzle

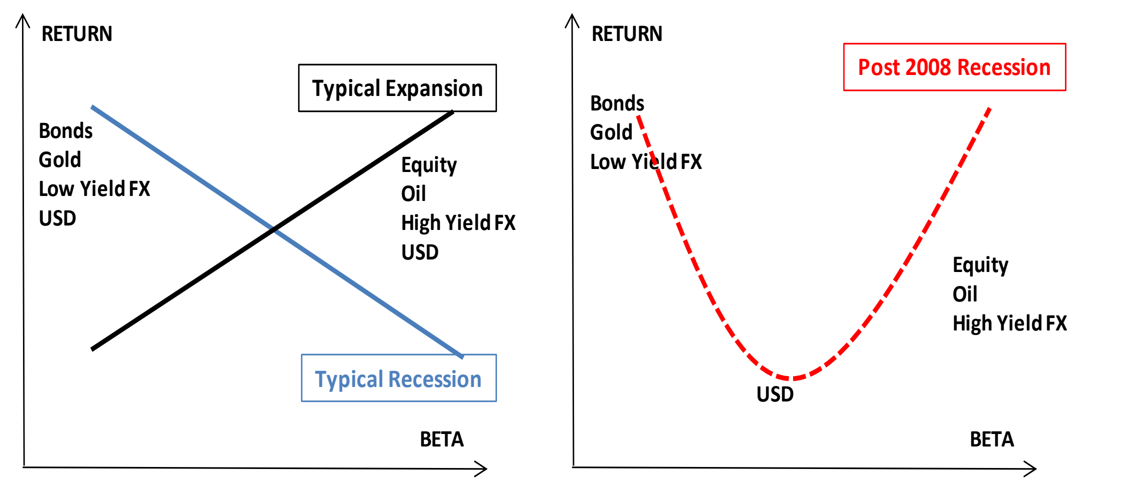
Stephen L Jen & Fatih Yilmaz

June 17, 2013

Bottom line: *QE3 has been a 'success' as it has achieved its objective of artificially inflating the values of both bonds and equities. While its timing and the pace are uncertain, in theory, the Fed's prospective tapering may mark the beginning of the unwind in these asset price distortions, with simultaneous declines in both bonds and equities being a risk, if corporate earnings don't re-accelerate to compensate for the tapering effects. We believe it may be useful to review the concept of the 'Beta Convexity Puzzle' we introduced in August 2011, as this framework may be useful in helping investors think about the likely impact of tapering. High-beta assets (such as equities, AUD and oil) should not in theory rally at the same time as low-beta assets (such as gold, CHF, and Treasuries). For much of the period 2009-2013, however, most of these high- and low-beta assets rallied against the dollar. Such dynamics violate a key assumption underpinning the standard CAPM (capital asset pricing model). We call this the 'Beta Convexity Puzzle' because, according to standard CAPM, the returns on assets should be a monotonic function of beta, i.e., the high- and low-beta assets should be a monotonic function of beta, that they perform differently through a business cycle. In practice, however, QE1, QE2, and QE3 have had powerful effects on asset prices, inflating both wings of the beta curve. Thus, in theory, tapering could lead to an unwind of this convex curve. How bonds and equities behave in the US and elsewhere will be a function of various considerations, including the trajectory of the corporate earnings. But all else equal, tapering by the Fed should lead to a simultaneous sell-off in both bonds and equities. That's the new 'gravity' the Fed and investors need to keep in mind.*

The 'Beta Convexity Puzzle' concept: a brief review. In an earlier note we wrote ('On the Beta Convexity Puzzle' August 15, 2011), we first proposed this concept. Essentially, we argued that the behavior of the global currency markets, and financial markets in general, in the previous four years or so have been peculiar. Not only has volatility in asset prices been low relative to the underlying macro data, it has been unusual in that both high- and low-beta currencies have appreciated against the dollar. This 'beta convexity puzzle' also applied to other assets: gold (traditionally a low-beta or safe haven asset) and oil (historically a high-beta asset) were bought for most of the last four years. So were both AUD and CHF, until recently. Such non-linearity in the relationship between asset returns and beta was in stark contrast to a key assumption made in standard CAPM.

The two charts below help explain what we had in mind.



Source: SLJ Macro Partners

These charts show the relationships between various types of assets and their 'beta,' relative to the growth rate of the global economy. The chart on the left is the 'what-should-have-happened' chart, and shows two lines, highlighting what *should* happen on average during typical business cycles. The upward-sloping line shows that, for high-beta assets such as equities, crude oil, and high yield FX, their returns should improve as the global economy accelerates, but should not perform well if the world is in a recession. In contrast, the downward-sloping line shows that, in a recession, the low-beta assets such as bonds, gold, and low-yield currencies should out-perform.

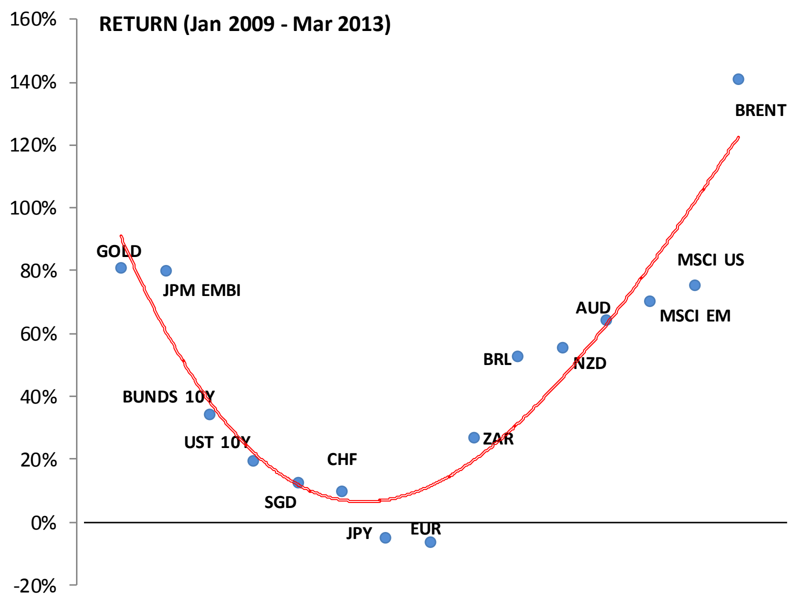
For the global economy and the financial markets, CAPM assumes a monotonic relationship between expected returns and beta (systemic risks) in the long-term. However, a persistent violation of this linear relationship at the global level would turn the standard finance theory upside down.

The rounds of QE and the 'Beta Convexity Puzzle.' The chart below shows that, during January 2009-March 2013, there was indeed such a violation of the standard finance theory. There was an odd convex relationship between high- and low-beta assets, that, almost regardless of the global business cycle, most assets appreciated in value, measured in US dollars. While there are various possible explanations[1] for these distortions, we believe the multiple rounds of QE by the Fed, as well as the QE operations by the other G7 central banks, have played a dominant role.

The chart below shows this stark convex relationship of the asset returns relative to beta, very similar to what we had suspected in the 2011 note (compare the chart below with the chart on the right side above).

During this period, six of the G7 central banks were printing money: the Fed's balance sheet rose from 14% of GDP to 20%, and the balance sheet expansions were significant for other reserve currency-issuing central banks as well: 23% to 32% for the ECB; 13% to 26% for the BOE; and 35% to 84% for the SNB. Extraordinary policy aggression by these central banks was evident. Both brent and gold – the odd couple in this beta space – registered significant gains; so did MSCI US and 10Y USTs. The Sharpe ratios of most portfolios were extremely high, because both bonds and equities performed (high numerator) while volatility was artificially suppressed (low denominator). What were supposed to be hedged portfolios were in fact levered plays on the Fed's QE.

[1] We have proposed several hypotheses. (1) A structural decoupling between DM and EM may help explain why commodities (oil, copper) and commodity currencies (AUD, ZAR, BRL) could appreciate when much of DM was stuck in slow growth. Outsized growth in China may have helped support other EM economies' growth, especially those countries in China's 'manufacturing eco-system.' (2) Decoupling between macro and micro may have also helped explain how corporate profits could have remained high despite low employment growth.

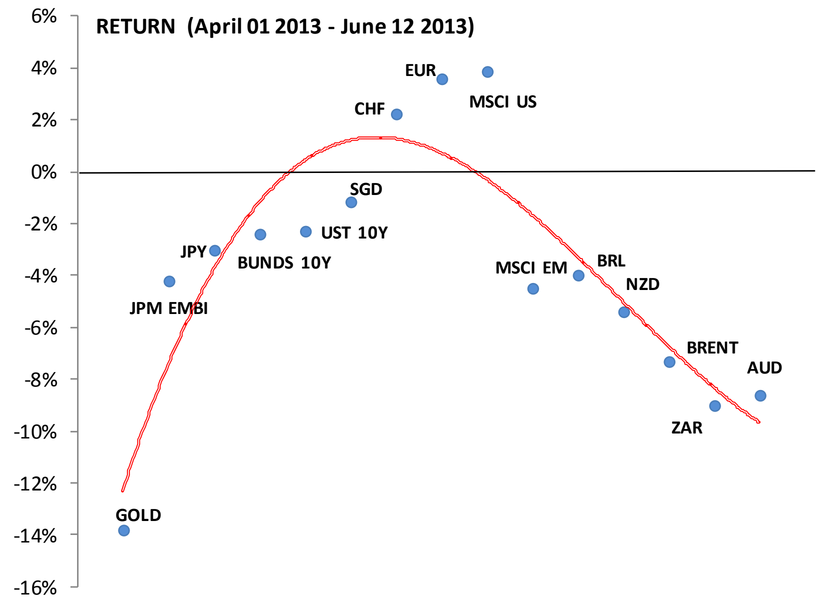


Source: SLJ Macro Partners, Datastream and Bloomberg. Note: JPM EMBI is JP Morgan Emerging Market Bond Index. MSCI is Morgan Stanley local equity market index. All exchange rates are measured against the USD and adjusted for carry returns. Smooth return curve is fitted using third-order polynomial trend.

Tapering by the Fed. More recently, however, the FOMC members have begun talking about 'tapering' – scaling back the size of the monthly QE operations. Chairman Bernanke's JEC testimony on May 22, 2013, marked the main inflection point in this discussion. However, this idea had already been suggested by some FOMC members as early as April.[2]

Since the tapering discussions began, global bonds and equities have experienced a sharp rise in volatility, and some of the assets (gold and the Nikkei) have experienced extraordinary declines in value. The chart below shows the asset returns relative to beta since April 2013. What used to be a *convex* relationship (the previous chart) has turned into a *concave* relationship (the chart below). In other words, since the tapering discussion began, both bonds and equities have come under pressure.

[2] John Williams, President of the Federal Reserve Bank of San Francisco, first announced the possibility of tapering in a speech on April 3, 2013. William Dudley, president of the NY Fed, and Sandra Pianalto, of the Cleveland Fed, also alluded to tapering back in April, suggesting that asset purchases could be scaled back if the economy continued to gather momentum.



Source: SLJ Macro Partners, Datastream and Bloomberg. Note: JPM EMBI is JP Morgan Emerging Market Bond Index. MSCI is Morgan Stanley local equity market index. All exchange rates are measured against the USD and adjusted for carry returns. Smooth return curve is fitted using third-order polynomial trend.

We have these thoughts.

- **Thought 1. Both bonds and equities can sell off simultaneously if the Fed tapers too fast**. This is the new 'gravitational pull' both the Fed and the investors need to keep in mind when tapering starts. The preference of the Fed is presumably to allow the 10Y UST yield rise gradually, to reflect the expected economic recovery and tapering, but for equities to remain supported by improving corporate earnings. But it is not clear that they will get what they want. First, the Fed has argued that it is the 'stock' not the 'flows' of their operations that should support bond prices (keep the yields low). But this claim has not yet been tested. Tapering would be such a test: lowering flows while keeping the stock high. Recent market price action suggests bond prices may fall further with tapering. Second, the BOJ's inability to stabilize the JGBs highlight that there is a threshold to how much markets can be 'bullied', that market expectations may at times be more powerful than the sheer size of the QE operations. Third, US corporations derive a great deal of their profits from outside the US. We have discussed about global economic decoupling. But a faltering rest of the world will weigh on the US equities.
- **Thought 2. Gold and the Nikkei the leading indicators**? The collapse in gold in April and that in the Nikkei in May were extraordinary. Gold

is a key safe haven asset, while the Nikkei is one of the highest-beta assets. For both to collapse so sharply, it does raise the question whether they are leading indicators of what could happen to other low- and high-beta assets. Further, not only were these sharp price collapses against the prevailing consensus expectations at the time, the fundamental arguments in favour of buying and holding gold and the Nikkei have not changed even after the price corrections. This suggests that there might have been large gaps between the pricing of the assets and the underlying fundamentals. But the same could be said for most other financial assets; thanks to QE.

- **Thought 3. Economic decoupling and asset market decoupling: a negative outlook for EM**. We believe the prospective de-coupling between the US and China could add another dimension to this discussion, that EM assets, in particular, could be hurt in the months and quarters ahead, even if US equities hold up. We will not repeat the arguments we've made in the past, only to stress that the growth deceleration in China is likely to be both cyclical and structural: the former is healthy while the latter is inevitable. China has gone beyond 'growing-at-all-costs', mainly because the world has changed after the Global Financial Crisis. Some of the legacy issues (e.g., off balance sheet lending, local government debt, and low yields on infrastructure investments) will need to be dealt with. While China can take care of itself during this transition, the same could not be said about commodity-exporting economies and the economies in the manufacturing eco-system centred around China. We expect to see a strongly 'concave' relationship between EM bonds and equities and beta.
- **Thought 4. The USD and the EUR**. This Beta Convexity framework of course is not able to address specifically the current pricing of EURUSD. However, it does show that *both* the USD and the EUR have behaved in similar ways. In fact, over the last few years, there are more similarities between the USD and the EUR than differences: both the USD and the EUR had under-performed during 2009-2013; both the US and the EMU had major issues and conducted QE at the same time; both the USD and the EUR have been the backbone of the global financial system and sources of global capital. When both the USD and the EUR suffered at the same time, demand for gold, CHF, and others on the left side of the convex beta curve rallied, reflecting 'global uncertainty aversion'. The assets on the right side of the convex beta curve had

double reasons to rally. The EM countries have suffered a lack of asset supply. The global liquidity imparted by both the Fed and the ECB in turn helped fuel the credit and investment cycles in EM that were not sustainable. More recently, the Fed's tapering talk also coincided with a hawkish turn at the ECB, when President Draghi refrained from adopting a negative deposit rate and instead re-adopted a rather optimistic view of the Euroland economy. In short, we think of the USD and the EUR as having played similar roles in fuelling the simultaneous rallies in global bonds and equities. Any curtailment in their policy aggression would lead to problems with the low- and high-beta assets.

- **Thought 5**. **In search of balanced portfolios**. One major problem in portfolio management is the lack of a balance between bonds and equities. As discussed above, if bonds and equities are positively correlated, as are gold and oil, it is very difficult for portfolio managers to construct hedged or balanced portfolios. If we are right, that, as the Fed tapers, there is a transition period where a concave relationship dominates in the beta space, then it is not clear what one would buy if he/she cuts back on both bonds and equities. Of course, when the Fed normalizes its policies, we should in theory see the normal beta relationships, and not just convex or concave relationships. But getting from here to there, we fear that the Sharpe ratios in general will likely be inferior than they were in the past four years.

Bottom line. The Fed's QE operations artificially inflated the values of both bonds and equities. This was not a negative side effect of QE, but the intended objective. But now that the Fed is contemplating tapering, we believe investors need to prepare for the possibility that both bonds and equities falter, at least this is the new 'gravitational pull', all else equal. If the Fed could somehow engineer this policy reversal in line with the recovery in the US economy and therefore the corporate earnings, US equities might just hold up okay even if USTs sell off further. However, in most scenarios we can imagine, financial in the rest of the world (especially EM) will likely struggle much more, when the Fed tapers.

Recent Notes

Tapering by the Fed and the Beta Convexity Puzzle, June 17, 2013

The Fed and the Pre-Quake Tremors of EM Currencies, June 10, 2013

Does Tokyo have a 'Ceiling' on USDJPY, May 28, 2013

Assessing the Sudden Stop Risks for EM, May 9, 2013

PM Abe's Arrow 3 – the 'Golden Arrow', May 7, 2013

FISH: Assessing its Head and Tail, April 26, 2013

Sell in May, and Come Back in October? April 8, 2013

PM Abe's First Arrow Hits the Bulls-Eye, April 4, 2013

Over-Levered European Banks and the Lending Channel, March 22, 2013

The Dollar Smiles Again, March 18, 2013

The Fate of USDJPY will be Determined by Japanese Investors, not Foreign Hedge Funds, February 27, 2013

Next Stop for USDJPY: 100-110, February 15, 2013

EUR Overshoot? Consider the 'Ballast Effect', February 6, 2013

Time Inconsistencies of Sustained Fiscal Stimulus and QE, January 31, 2013

Diaoyu Islands and the Japanese Yen, January 24, 2013

Assessing the Potential Firepower of the GPIF, January 15, 2013

The Resource Curse, December 18, 2012

The World Currency Basket, November 29, 2012

The Long-Term Fiscal Challenges of the US, November 22, 2012

Hard Power of Nations, November 13, 2012

China: Three Key Drivers of a Lower Potential Growth Rate, November 2, 2012

The Return of the Feldstein-Horioka Puzzle, October 29, 2012

Weakening Global Trade and the Undershot US Dollar, October 20, 2012

What Deleveraging? October 12, 2012

Assessing the Risks of US Recessions in a New World, August 29, 2012

Déjà vu: A Repeat of Spring 2009? August 22, 2012

Stereotyping Currencies based on TFP and TOT Growth, August 15, 2012

The True Interest Burden of Spain and Italy, August 9, 2012

Robots, Demographics, and the Labour Markets, July 30, 2012

Policy Short-Termism, July 12, 2012

The EMU Crisis, Hysteresis, and the Zone of Inaction, June 7, 2012

Quantitative Easing: Benefit-Cost Tradeoffs, May 14, 2012

Fields of Education & Global Competitiveness – A Hypothesis, March 20, 2012

Moving to the Right Side of the Dollar Smile, March 13, 2012

China's Soft Landing to be Negative for AUD and BRL, February 22, 2012

QE3 and the Beta Convexity Puzzle, February 9, 2012

Mind the Falling BRIC, January 13, 2012

Dual Currency Arrangements (DCAs) for Hong Kong, Germany, and Greece, November 29, 2011

The US Labour Skills and Macro Policy Mismatches, November 4, 2011

The Coming Deleveraging by European Banks, October 13, 2011

On the Low-Yield DM World and the High-Yield EM World, September 2, 2011

On the 'Beta Convexity Puzzle', August 15, 2011

On Entitlement Spending in the Developed World, August 11, 2011

China's 'Lewis Point' and its Impact on the World, June 27, 2011

Active Currency Overlay: Carry and Momentum Trades, June 20, 2011

QE3 < QE2 < QE1: the Power of the 'Bernanke Put' to Wane, June 10, 2011

On the Colliding Economic and Financial Tectonic Plates, May 18, 2011

The 'Global Funneling Hypothesis,' May 5, 2011

DISCLAIMER

This research note is provided by SLJ Macro Partners LLP, a Limited Liability Partnership with Company Number: OC362504, registered in England with Registered Office Address 7 Clifford Street, London W1S 2WE. SLJ Macro Partners LLP is authorised and regulated by the Financial Services Authority (FRN 554074).

This commentary has been prepared by a member of SLJ Macro Partners LLP and may not be reproduced, redistributed or copied in whole or in part for any purpose. Neither this document, nor any copy or part thereof, may be distributed in any other jurisdictions where its distribution may be restricted by law and persons into whose possession the material comes should inform themselves about, and observe, any such restrictions.

The information and opinions provided in our research take no account of investors' individual circumstances and should not be taken as specific advice on the merits of any investment decision. No member of SLJ Macro Partners LLP accepts any liability whatsoever for any direct or consequential loss howsoever arising, directly or indirectly, from any use of our research or its contents.

This note is provided in accordance with s54(1) of The Financial Services and Markets Act 2000 (Regulated Activities) Order 2001, which provides that the giving of advice in this way is neither that of:

(a) the regulated activity of giving advice; nor

(b) leading or enabling persons to buy, sell, subscribe for or underwrite securities or contractually based investments.

SLJ Macro Partners LLP has taken all reasonable care to ensure that the information contained in this document is accurate at the time of publication, however no representation or warranty, express or implied, is made as to the accuracy, reliability or completeness of such information.