Macro Keys
A Primer on Corporate Bond Liquidity

Economics & Macro Strategy

Global

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What is liquidity? At the most basic level, Merriam-Webster defines liquidity as the state of having things that can be easily changed into money. For corporate bond investors, can one exchange his or her holdings (direct or indirect) into cash on demand? Liquidity is a perennial concern for investors, but interest in the topic has soared and, to be sure, it is ever changing. As the saying goes, liquidity – or lack of liquidity – is hard to define, but do we know it when we see it?

How is liquidity measured? Friewald, Jankowitsch and Subrahmanyam[1], suggest liquidity proxies can be classified into three groups: bond characteristics, trading activity variables and liquidity measures. Bond characteristics, such as amount issued, coupon, maturity, and time from issuance, are static information which may provide a rough indication of potential liquidity. Trading activity variables, including number of trades, average trade size and value of bonds traded, provide information about liquidity based on actual transactions. And liquidity measures, like bid-ask spreads, the Amihud Measure, the No-Trade Measure, the Roll Measure, and the Price Dispersion Measure, essentially measure transaction costs, market impact or turnover.

Which metrics really matter? With respect to corporate credit markets, the answer is not an exact science. However, one could argue that investors should care most about those metrics which impact changes in corporate bond spreads. One academic study[2] concludes changes in corporate bond yields cannot be explained by bond characteristics or trading activity, but rather by liquidity measures. In particular, they find credit ratings, price dispersion, the Roll measure, and number of trades as having significant explanatory power for changes in corporate bond yields. The first and fourth are more straightforward; price dispersion is essentially a measure of the dispersion of transacted prices on a given day, while the Roll measure is effectively a gauge of the effective bid-ask spread[3].

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[1] Illliquidity or Credit Deterioration: A Study of Liquidity in US Corporate Bond Market during Financial Crises, N. Friewald, R. Jankowitsch, M. Subrahmanyam, 2009
[2] N. Friewald, R. Jankowitsch, M. Subrahmanyan, 2009
[3] Jankowitsch, R., A. Nashikkar, and M. Subrahmanyam, Price dispersion in otc markets: a new measure of liquidity, 2008; R. Roll, A simple implicit measure of the effective bid-ask spread in an efficient market, Journal of Finance, 1984

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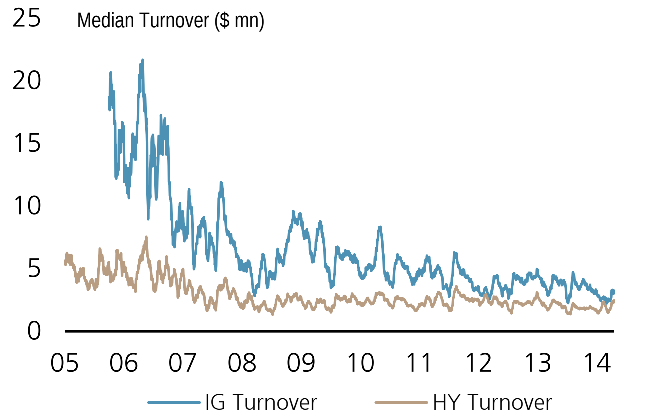
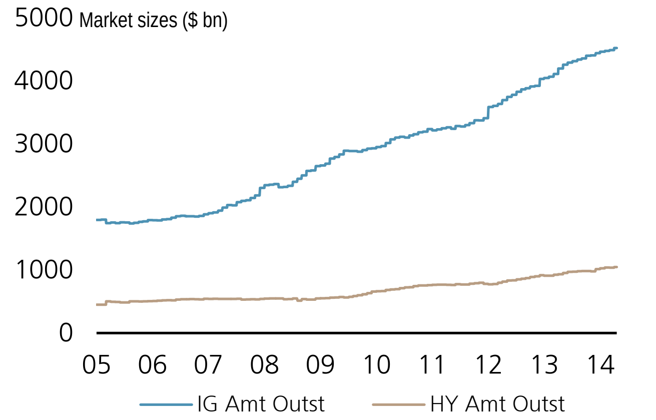
How has liquidity evolved? The answer very much depends on what measure of liquidity one employs. Bond characteristics are fairly static and will not show much change over time. Trading activity elements, such as notional amount traded, suggest market liquidity has deteriorated considerably. In investment grade, for example, median daily turnover has declined from a peak of $20mn to $3-4mn; in high yield, median turnover has fallen from a ceiling of $7mn to $2.5mn. In comparison, the high grade and high yield indices have grown from $1.8tn and $500mn, respectively, to $4.5tn and over $1tn. According to the IMF, depth and breadth have also deteriorated, reflected in lower trading volumes, a smaller share of large trades, and less frequent trading in many corporate bonds[4]. However, liquidity measures, such as quoted bid-ask spreads, suggest less immediate cause for concern. Median bid-offer spreads currently hover near pre-crisis lows at 44bp and 105bp for IG & HY respectively, and price volatility has been fairly contained in the Q3 sell-off.

Figure 1: Median turnover for investment grade and high yield bonds (3mo rolling, $ mn)



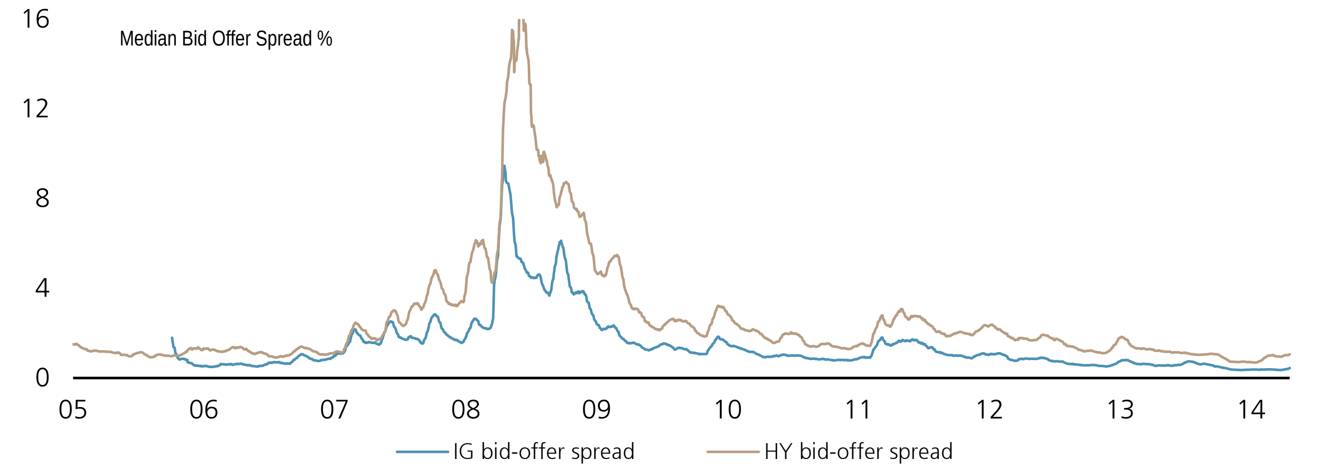
Source: UBS Asset Allocation, FINRA.

Figure 2: Investment grade and high yield index debt outstanding



Source: Yieldbook

Figure 3: Median bid-offer spreads for investment grade and high yield bonds (3mo rolling, % of price)



Source: UBS Asset Allocation, FINRA.

[4] Global Financial Stability Report, IMF, October 2014

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How have outflows and illiquidity impacted overall markets? As we have discussed previously[5], the principal concern around rising market liquidity relates to concerns around mutual fund outflows stemming from normalization of US monetary policy, deteriorating fundamentals and declining fund performance. In this context, we have clearly witnessed some of these fears manifest themselves since 2013. Since peaking near $100bn in Q3 2012, high yield mutual funds have lost almost $30bn in cumulative flows through last month; excluding dividend reinvestment, the figures are $80bn and $40bn, respectively (Figure 4). Over the short run, HY spreads clearly exhibit considerable sensitivity to fund withdrawals. Since 2010, a simple regression on monthly flows versus HY spread changes implies that outflows of roughly 1% of the total market size (equivalent to roughly $10bn) translate into about 110bp in spread widening.

However, over the longer run, HY spreads have proven quite supple in spite of significant mutual fund/ ETF outflows. In Q3 2014, HY spreads widened c160bp from their 2014 lows, resulting in market versus model spreads that converged close to fair value versus moderately rich heading into the summer. However, in the context of history, market spread widening has been moderate in comparison to historical periods (e.g., late 1990's, 2010 – 13). From a different perspective, since the peak of inflows in Q3 2012, HY spreads have actually tightened from 570bp to 470bp as of yesterday's close (Figure 6).

Who will be the next marginal buyers to provide support in a sell-off?

With respect to broader US corporate credit markets, the Federal Reserve Flow of Funds data provides some insight with respect to who could step up to buy to mitigate a liquidity crunch. In terms of ownership, three key creditors have historically owned a majority of the $11.3tn corporate debt market: foreign investors ($2.9tn), life and P&C insurers ($2.7tn), and mutual funds/ETFs ($2.5tn)[6]. While we are awaiting the Q3 report, recent trends highlight two points: first, overall mutual fund inflows appear much stronger through Q2 2014, partly reflecting the growing divergence between high grade and high yield fund flows. Second, foreign investor purchases of corporate bonds have been sizeable in recent quarters. In the event of a liquidity crunch, we expect a mix of rest of world, insurance and pension fund demand to help stabilize markets – in particular high grade. For high yield, there is a fair amount of total return (e.g., private equity) capital on the sidelines, but they're unlikely to step in until prices drop substantially.

[5] Global Credit Navigator, M. Mish, 23 July 2014, Macro Keys, M. Mish, 6 Aug 2014
[6] See Macro Keys, M. Mish, 20 March 2014

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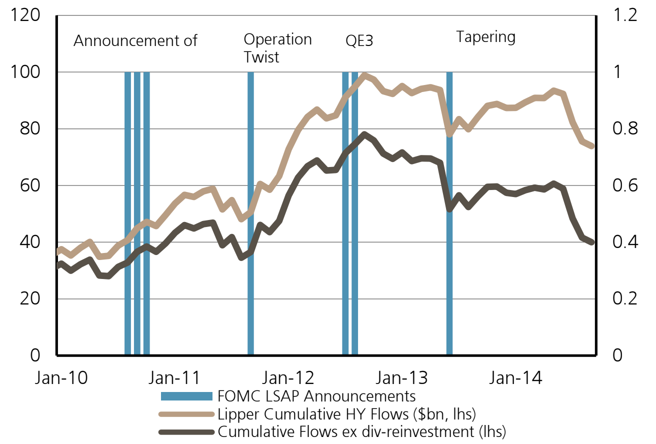
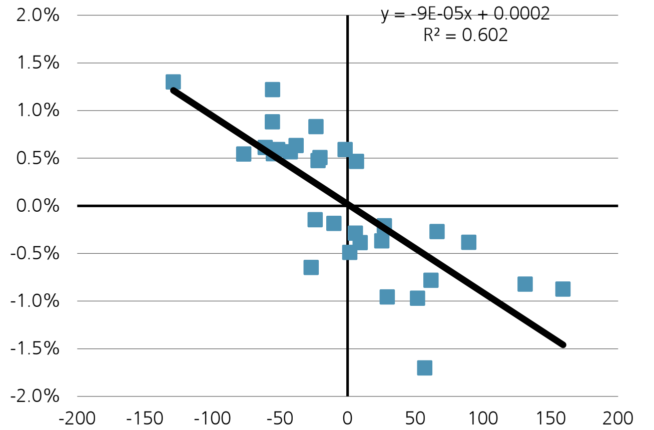
Figure 4: Cumulative US high yield fund flows ($ bn)



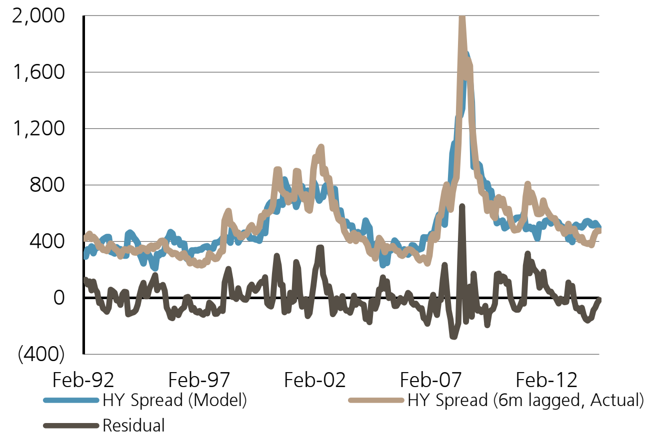
Source: UBS, Lipper.

Figure 5: Scatterplot of monthly changes in HY spread changes (x-axis, bp) and HY fund flows (y-axis, % total market, 2010 – present, 1st and 4th quartiles of observations)



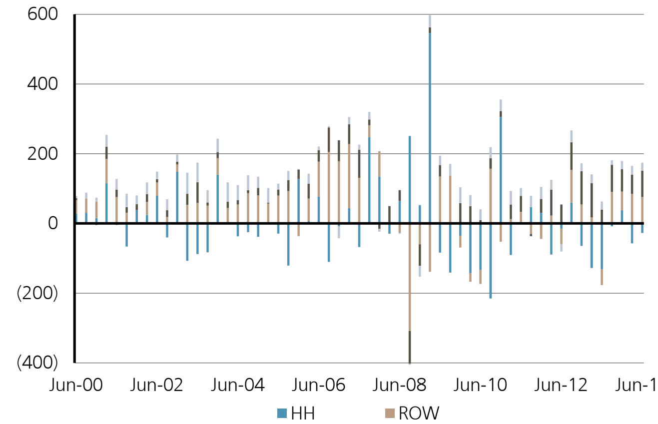
Source: UBS, Yieldbook, Lipper.

Figure 6: US high yield market versus model spreads and the residual (bp)



Source: UBS, Yieldbook.

Figure 7: Quarterly changes in corporate bond holdings for largest holders ($ bn)



Source: UBS, Federal Reserve.

What will be the trigger for a liquidity crisis? And which market segments will suffer worst?

We have consistently maintained the view that such a liquidity crisis will come with a more severe downturn in credit and economic fundamentals, with the former leading in time. Such a scenario will likely trigger an exodus from non-institutional and crossover/tourists from US corporate bond markets – principally high yield. A large body of academic literature finds that high grade bonds are more liquid than high yield as high grade benefits from a flight-to-quality effect. Conversely, high yield bonds suffer primarily due to the *interaction* between liquidity and default risks. The basic intuition is familiar to investors: an issuer's fundamental prospects deteriorate, secondary market liquidity declines as dealers pull back, and default

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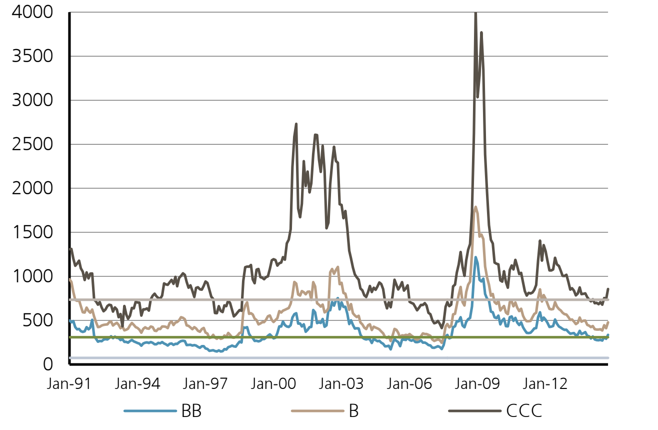
risk rises as equity holders face larger losses in refinancing maturing bonds. According to one paper, this 'default-driven liquidity channel[7] explains a large fraction of the jump in credit spreads unrelated to default risks. True to script, this mosaic played out to some extent in the lower-quality, high yield energy issues in recent weeks amid the volatility in oil prices.

In our view, the post-crisis world characterized by heightened regulation, limited dealer risk appetite and greater retail ownership in high yield only heightens the liquidity risks in the lowest rated bonds. The Fed's quantitative easing (QE) programs have fuelled a massive grab for yield, driving investors to buy down the credit spectrum. Valuations keenly reflect this phenomenon; high yield bond spreads barely cover investors for average credit losses through the cycle (Figure 8). Further, these figures only account for *average* defaults and losses in default, and do not incorporate mark-to-market losses. In that context, prices for BB rated bonds have proven more resilient, bottoming out at $87 in the 2001 – 2002 downcycle versus $103 current. In comparison, B rated issues dropped to a low of $76 versus $103 current. The same cannot be said for CCC rated bonds, which declined into the mid $40s in 2001-2002.

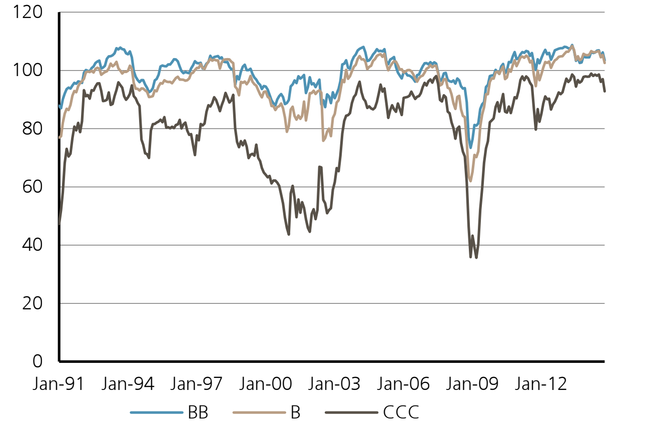
In conclusion, investors should be mindful, but not fearful, of the liquidity risks in broader corporate credit markets. And they should differentiate according to *quality*. Simple rules work well: the higher the quality, the less the concern. The lower the quality – well, consider yourself warned. We'll certainly not be touching most CCC-rated issues with our 6 foot witches broom this Halloween…or next for that matter.

Figure 8: US high yield bond spreads by rating versus average credit losses



Source: UBS, Yieldbook, Moody's.

Figure 9: US high yield bond prices by rating



Source: UBS, Yieldbook.

[7] Quantifying Liquidity and Default Risks of Corporate Bonds over the Business Cycle, H. Chen et al, 2014

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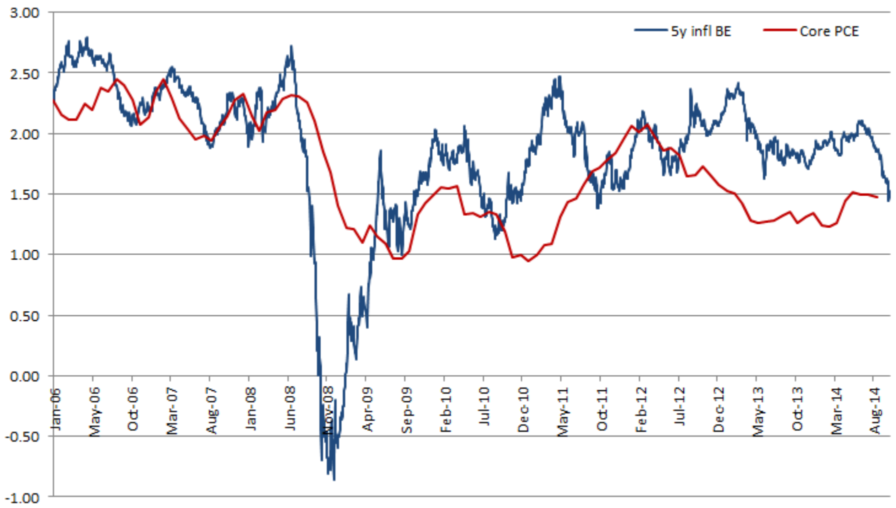
A case study in Liquidity: US TIPS

In the past few months, the TIPS market has gone through the first two "intuitive" steps: fundamentals have decayed and liquidity has faded. Default risk is not a concern in TIPS, but the TIPS template still is a helpful guideline for credit investors.

Figure 10: 5y TIPS BEI versus Core PCE, 2006-2014



Source: UBS, Bloomberg

Technicals or fundamentals

TIPS have experienced a perfect storm in the past several weeks: a tepid CPI print for August, falling energy prices, and a negative macro backdrop.

Figure 10 shows generic 5y TIPS breakeven inflation (BEI) beginning in 2006. We use this measure for two reasons. First, breakevens tie in to underlying fundamentals. Essentially, the BEI is a market-implied projection of the average-annualized inflation over the next several years, subject to risk and liquidity premiums. Consequently, we can quantify how much market levels have diverged from inflation forecasts built on economic fundamentals.

Second, the BEI gives us an idea of how well or poorly less liquid assets (such as TIPS) have done versus liquid assets, like the traditional "safe haven" - nominal US Treasury bonds. It shows the relative performance of TIPS versus nominal Treasuries.

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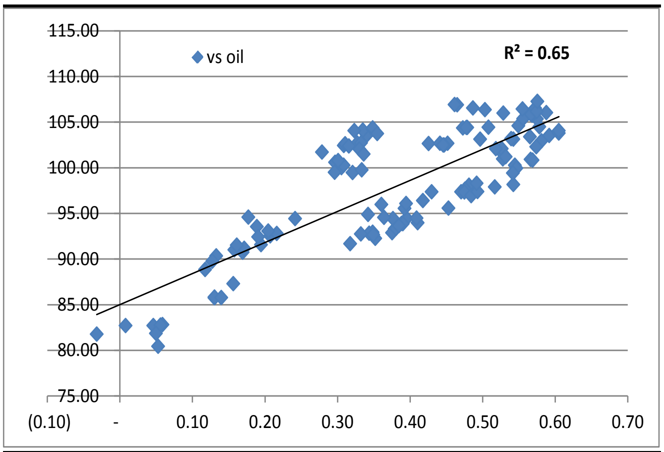
The chart shows that TIPS just endured their worst performance versus Treasuries since the so-called "taper tantrum" in May 2013. Furthermore, 5y BEI has fallen toward 12-month trailing core PCE and may even be slightly below this inflation measure. In non-crisis periods, the 5yr BEI consistently has been at least 25bp above realized core inflation.

A positive spread makes sense: investors are willing to pay some premium for the protection from inflation offered by TIPS. Some investors may debate whether breakevens should be compared to the CPI indices rather than PCE. In our view, the volatile CPI is a more natural comparator for short-term breakevens. 1-2y TIPS have relatively few resets left, so they are naturally very sensitive to actual index prints. 5y and longer TIPS BEI should reflect long-term inflation trends. Historically, the evolution of core PCE, despite not being the index on which TIPS are based, has captured these trends much better than CPI numbers that exhibit a lot of short term volatility. Consequently, we use it here as yardstick for longer-term TIPS.

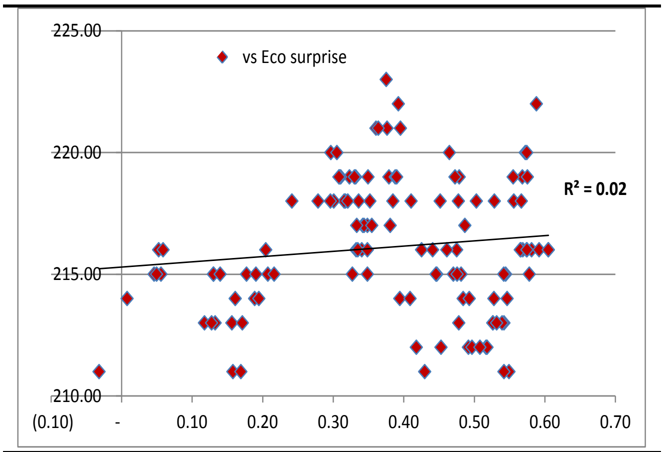
Going by this logic, the chart shows that TIPS have overshot fundamentals. Five-year BEI trading through core PCE is characteristic of periods with heightened systemic risk. In other words, times when the market believes that inflation protection has little or no value. This was the case during the crisis in 2008, and again for two brief periods in 2011 and 2012 when the Eurozone sovereign debt markets looked especially worrisome. Although the market action last week was spooky and global growth seems to be weakening, it is a stretch to argue that systemic risk is nearly as high now as it was In those previous episodes.

Figure 11: 5y BEi/Core PCE spread vs oil, May-Oct 2014



Source: UBS, Bloomberg

Figure 12: 5y BEi/Core PCE spread vs UBS US Economic Surprise Index, May-Oct 2014

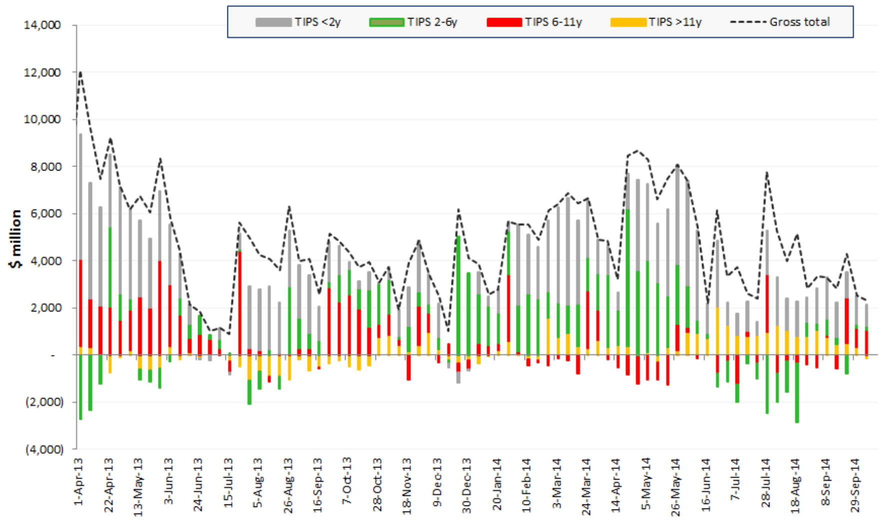


Source: UBS, Bloomberg

To further that point, Figure 11 and Figure 12 above show that the "inflation insurance premium", i.e. the spread between 5y BEI and Core PCE, was strongly correlated with oil prices but exhibited zero correlation with UBS US economic surprise index during the May-October period. Given that energy commodities are only 5.5% of the inflation index used for TIPS resets, the relatively lofty 0.65 correlation with oil is arguably a manifestation of negative sentiment driving technicals during the plunge of breakevens. Similar analysis performed over more normal markets produces much lower correlation between 5y BEI and oil. Furthermore, Figure 12 shows that 5y BEI has completely disconnected from the US economic surprise index while this selloff unfolded (correlation=0.02). Given that this index presents a much more accurate picture of the broad economic

conditions, TIPS have appeared to completely disregard fundaments during the recent selloff.

Figure 13: Primary dealers TIPS holdings



Source: Federal Reserve, UBS, Bloomberg

Secondary market liquidity declines

Historically, dealers have served as market shock absorbers. No more. Now, dealers appear to focus heavily on limiting balance sheet size and minimizing volatility of revenues. Figure 13 demonstrates that dealers' average risk exposures to TIPS actually *declined* as the selloff picked up steam. This move is consistent with VAR models at least partly dictating risk limits.

In other words, dealers aimed to transfer risk quickly to end users, rather than retain it themselves. **The key takeaway for corporate bond investors may be simply that market maker balance sheet capacity is a precious commodity**. Yes, this point may seem obvious, but the recent experience in TIPS shows it is true to life.

Dealers will provide some degree of liquidity but will be reluctant to absorb surging flows, particularly during a period of market tumult. Instead of focusing on providing liquidity they are more likely to strive to preserve regulatory capital and risk ratios.

Clients are aware of this issue. Indeed, numerous clients seem to be adjusting by extending their expected holding periods. During a significant sell off, portfolio managers may find that they will have to work more closely with market-makers to offload risk, if it is possible at all. The risk is that markets may gap when/if investors rush for the exit.

The TIPS experience is yet another example showing that a market sector can sell off unpleasantly without an overpowering shift in fundamentals. The TIPS market suggests that corporate bond markets conceivably **could** experience a rough ride even if defaults remain tame.

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