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Estimating Return Impact of Corporate Bond Portfolio Redemptions

- **Our price impact measure (PIM) of corporate bond liquidity indicates that USD IG and HY market liquidity deteriorated between September 2015 and January 2016.**
- At the Barclays 20th Annual Insurance CIO Conference we presented "Redemption Impact Curves" for hypothetical IG and HY portfolios, for one-day redemption percentages ranging from 1% to 10%. These curves, based on September 2015 PIMs, estimated the portfolio return impact, net of the market, due to redemptions.
- Our updated results (using January 2016 PIMs) show that the impact cost of portfolio redemptions has increased since September. Nevertheless, even for large funds, the magnitude of the redemption cost is still relatively modest over the 1%-10% range of portfolio redemption percentages.

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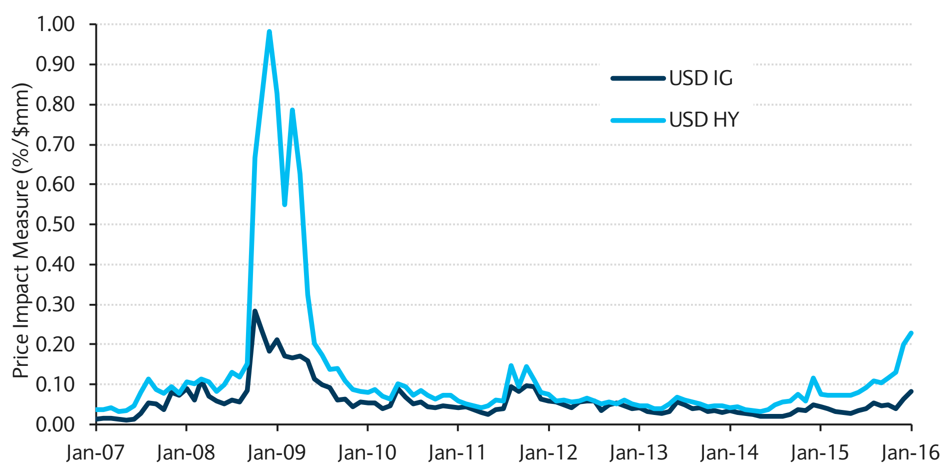
Since September 2015, liquidity conditions seem to have deteriorated along with the increase in market volatility and spread levels (especially for HY). In fact, since September, HY Index Liquidity Cost Score (LCS) has risen 31%, although IG LCS has remained relatively unchanged. This lack of uptrend in IG LCS may reflect less liquidity deterioration in the IG market, or the possibility that the change in bid-ask spreads, as captured by LCS, may not measure some liquidity dynamics, or both. For example, bid-ask spreads for standard trade amounts could remain relatively stable, but a given trade may produce a larger price move relative to the market (i.e., "price impact") than previously. Some consider this a decline in market liquidity. Last year, this particular view motivated us to introduce a return impact measure of liquidity for USD corporate bonds, called PIM.[1] PIM measures the daily excess (or, "abnormal") return of a bond, *versus the market (duration matched)*, per daily $1mn traded in the bond. Bonds with higher PIMs are considered less liquid than bonds with lower PIMs, as the former have a larger abnormal price return per dollar traded.

Judging by PIM, liquidity conditions in IG and HY credit markets have deteriorated since September. As Figure 1 shows, for the IG Index, PIM has risen 78% (from 0.046%/$mn to 0.082%/$mn) while for the HY Index, it has risen 119% (from 0.105%/$mn to 0.230%/$mn).

FIGURE 1

Price Impact Measure (PIM), USD IG & HY, January 2007 – January 2016



Note: This figure shows the overall PIM net of market for each respective Barclays index. The index-level PIM is an arithmetic average of bond-level PIM net of market values. Source: Barclays Research.

One potential use of PIM is to estimate the return impact of portfolio redemptions. If a fund manager has to redeem X% of the fund, the PIMs of the bond positions to be liquidated can be used to estimate the net market impact of the redemption (assumed to be negative) on the overall portfolio's return.

At the Barclays 20th Annual Insurance CIO Conference in January 2016 we presented estimated **"Redemption Impact Curves"** for hypothetical IG and HY portfolios, for one-day redemption percentages ranging from 1% to 10%.[2] These curves estimate the return impact on the portfolio, net of the market, due to portfolio redemptions.

To construct redemption impact curves, we must make an assumption as to what portfolio managers will do when faced with redemptions. There are many possibilities. For our exercise, we assume that managers hold "liquidity sleeves" within their portfolios, composed of diversified baskets of highly liquid bonds. We further assume the managers always have enough funds in the liquidity basket to meet redemptions. These baskets are constructed to

[1] *A Price Impact Measure of Corporate Bond Liquidity: PIM*, Barclays Research, October 2015.
[2] *Estimating Return Impact of Portfolio Redemptions*, Barclays Research, January 2016.

have an estimated beta of 1 versus the portfolio's benchmark.[3] Using bond-level PIMs (as of September 2015) for the bonds in the liquidity sleeve, we estimated the redemption impact curves for various fund sizes.

This update looks at how the redemption impact curves have changed since September 2015. For an apples-to-apples comparison we assume the "liquidity sleeve" portfolio has not changed.

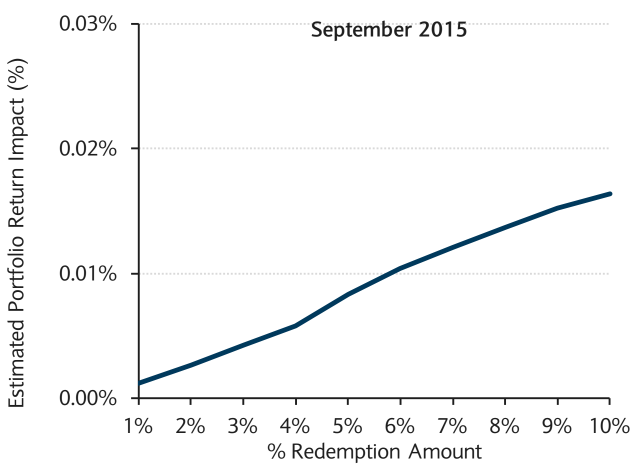
Figure 2 shows the redemption impact curves for a $10bn IG Corporate Fund.[4] For September 2015 we estimated that a 10% fund redemption (i.e., $1bn) would produce a negative, net of market, return impact for the entire fund of approximately 1.6bp. In January 2016, for the same 10% redemption in a $10bn fund, we estimate a return impact of approximately 2.5bp.

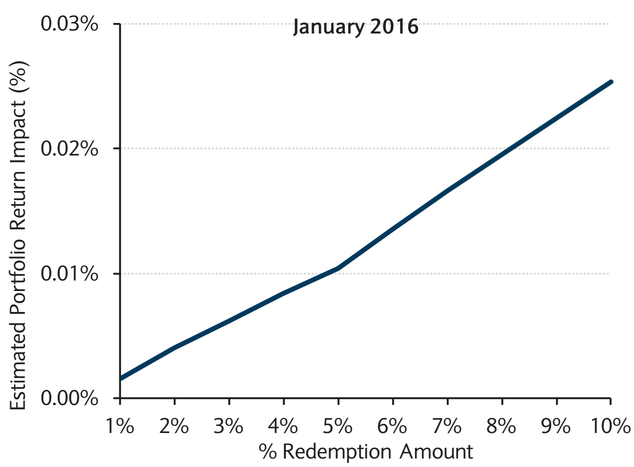
Results for high yield are presented in Figure 3. In September 2015, a 10% fund redemption for a $10bn high yield corporate fund was estimated to produce a net (negative) portfolio return impact of approximately 5.7bp (compared with 1.6bp for IG). By January 2016, the estimated return impact has risen to 7.8bp (versus 2.5bp for IG).

At first glance, the portfolio redemption impact may seem relatively modest. This owes to several factors. First, the liquidity sleeve, by construction, is a highly liquid portfolio geared to having very low PIMs. Second, the redemption percentages range from 1% to 10%. While a 10% fund redemption is far from trivial, it is also not extreme.[5] Finally, the redemption impact of the liquidation is spread across the entire portfolio, which hides the fact that the liquidation portfolio itself generally suffers a relatively large return impact.

FIGURE 2

USD Investment Grade, Estimated Portfolio Return Impact Curves, $10bn Fund, M3_PIM_net_mkt





Source: Barclays Research

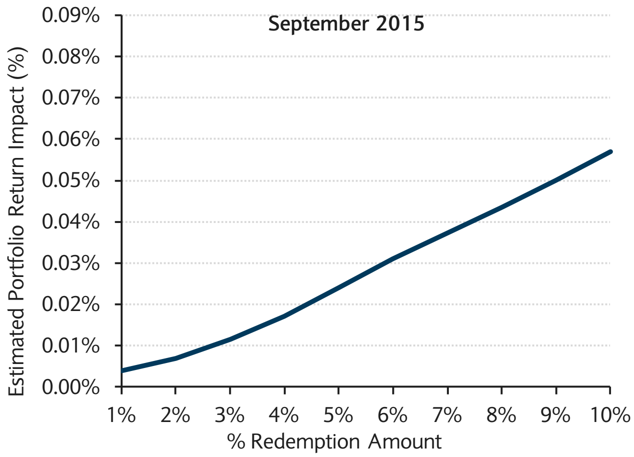
3 For IG, the liquidity sleeve is our USD IG Corporate TCX basket, a 50-bond portfolio of highly liquid bonds designed to track the Index. Details are in monthly LCS Reports, Barclays Research. For HY, we construct a similar basket (40 bonds).

4 For this exercise we use the PIM (M3_PIM_net_mkt) defined as the bond's excess return net of the OAD-bucket matched corporate index excess return, averaged over the past three months. We compute PIMs for six different trade bucket sizes and use the PIM value appropriate for the size of the bond position sold from the liquidity sleeve. For example, if $20mn of a bond position is being sold from the liquidity sleeve, we use the bond's PIM value associated with trades in the bond in the neighborhood of $20mn.

5 We can estimate the redemption impact curve for very high redemption percentages only for relatively small funds. For large fund sizes, a high redemption percentage would correspond to extremely large trade magnitudes. Unfortunately, there are very limited data with which to properly estimate a PIM value for such large trades.

FIGURE 3

USD High Yield, Estimated Portfolio Return Impact Curves, $10bn Fund, M3_PIM_net_mkt



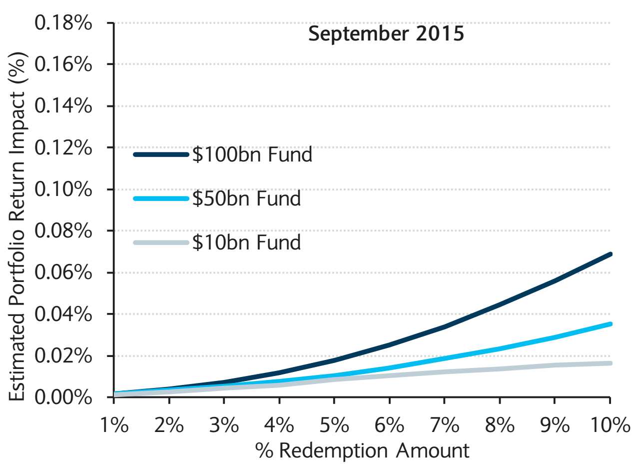
Source: Barclays Research

Return impact generally increases with the amount traded. Consequently, a portfolio's return impact curve is a function of the portfolio's size. Figure 4 shows the redemption impact curves for three different fund sizes ($10bn (used in Figures 2 and 3), $50bn and $100bn). For the large fund sizes, we see a larger redemption cost change between September 2015 and January 2016.

In September, a 10% redemption of a $100bn IG fund produced an estimated portfolio return impact of approximately 7.5bp.[6] However, the same redemption percentage in January produced an estimated return impact of approximately 16bp. (In contrast, for a $10bn fund, the return impact increased only from 1.8bp to 2.6bp.) Figure 4 highlights that for small funds, the redemption impact curves have not moved much, while for large funds, they have become noticeably steeper, reflecting the larger price impact for larger trade amounts.[7]

FIGURE 4

USD Investment Grade, Estimated Portfolio Return Impact Curves, $10bn, $50bn and $100bn Fund Sizes, M3_PIM_net_mkt



Source: Barclays Research

[6] For a 50-bond liquidity sleeve, a 10% redemption for a $100bn fund works out, on average, to a lot size of $200mn. Due to limited data, it is difficult to estimate PIMs for such large trade amounts. However, for this particular liquidity sleeve, daily traded amounts of $200mn are not unrealistic.

[7] A redemption impact curve does not address the probability of a certain redemption amount. It may be the case that small funds have a higher probability of large percentage redemptions compared to large funds, or vice versa.

As mentioned, it is important to note that the redemption impact curves show the net market impact on the entire portfolio, not just the liquidity sleeve that is being sold. The net market impact on the liquidity sleeve itself is typically much larger, but this impact cost is then spread over the entire portfolio. For example, as shown in Figure 3, while a 5% redemption for a $50bn portfolio is estimated to produce a 2bp portfolio return impact, the return impact on the 5% liquidity sleeve itself is approximately 42bp.

Each portfolio manager has his/her own strategy for managing redemptions. In this example, we assumed that the manager uses a liquidity sleeve fully invested in a highly liquid, diversified basket. However, other managers may hold cash or very liquid assets such as Treasury securities. Some may hold cash and index derivatives (e.g., CDX), while others may simply sell a “vertical slice” of their entire portfolio to meet redemptions. With some modifications, all these redemption strategies can be analyzed in our PIM-based framework.

While each redemption strategy has its own expected redemption impact cost, it is often overlooked that each redemption strategy has an ongoing cost continually borne by the portfolio when there are no redemptions. To maintain its attractive redemption impact cost curve, a highly liquid basket needs to be periodically refreshed (to remain highly liquid) and rebalanced (to keep beta = 1), with the attendant transactions costs. Moreover, the liquidity sleeve entails an opportunity cost as this portion of the portfolio is unavailable for expressing and harvesting the manager’s alpha generating views. Using LCS and the manager’s historical alpha, it is possible to compare the cost of maintaining a particular redemption strategy against the estimated impact cost in the event of redemptions.

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