Session 15, The “New Normal” For Fixed Income Liquidity - Implications for Insurance Companies

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The “New Normal” for Fixed Income Liquidity – Implications for Insurance Companies

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Liquidity is in secular decline

- The decaying condition of market liquidity should not be viewed as a cyclical sentiment issue through a pre/post crisis prism.

- The nature of market liquidity has changed materially driven by a decade long shift to a less diverse market and a post 2010 regulatory induced changes in dealer business models.

- Liquidity is in secular decline and increasingly more of the corporate universe will become less liquid. A dangerous phenomenon at this stage of the cycle.

### The story your dealer tells you vs. The truth

**TRACE Investment Grade Bond Trading Volumes**

**TRACE IG Volume as a % of Outstanding* IG Corporates**

* Market value of the Barclays Investment Grade Corporate index

Source: BlackRock, TRACE, Barclays, as of 4Q 2015
Liquidity requires a diverse market—someone to be on the other side of the trade.

But market players are becoming more homogenous:

- Investment models are converging
  - Insurance, sovereign wealth funds expanding
  - Hedge funds contracting
  - Asset managers AUM is consolidating
  - Dealers have exited the prop business
  - Investment horizons are converging

- Herding is now the standard
  - Most capital is on the same side of the trade
  - And usually shift in unison

With fewer players controlling more capital:

- Half the volume from just a few investors...
  - % total US IG volume of a large dealer, FY 2014

- One-way market
  - Dealer credit survey positioning, % of respondents

Source: Citi Research

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Dealers have changed their business models

Change in regulatory disincentives has been huge

- Regulatory effort to make banks safer have made markets far less liquid
- New capital and liquidity requirements drive down ROEs
- Making repo driven businesses barely profitable
- Secondary markets are driven by repo
- So the principal model which enhanced liquidity has been abandoned in favor of the agency model
- So systemic risk has been reduced and some portion of TBTF risk has been transferred to investors
- But comes at the cost of much lower market liquidity
- So systemic risk has entered back in the side door

Change in capital required (%)

<table>
<thead>
<tr>
<th>Bank ROE</th>
<th>Chg capital required (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBD</td>
<td>30%</td>
</tr>
<tr>
<td>Cash Eq</td>
<td>35%</td>
</tr>
<tr>
<td>EM</td>
<td>25%</td>
</tr>
<tr>
<td>Credit</td>
<td>15%</td>
</tr>
<tr>
<td>Securitised</td>
<td>5%</td>
</tr>
<tr>
<td>Macro</td>
<td>0%</td>
</tr>
<tr>
<td>Eq Deriv</td>
<td>-10%</td>
</tr>
<tr>
<td>Prime Serv</td>
<td>-20%</td>
</tr>
</tbody>
</table>

Repo as % of UST outstanding

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Risk-off no longer expands liquidity pools – it shrinks them

- The nature of the changed dealer business model, while rational individually, cumulatively creates the threat of a severe market seizure
- We anticipate repeated liquidity shocks and an eventual liquidity seizure
Liquidity premiums are far too small for the risks in place

- Liquidity premiums must be analyzed in a risk neutral fashion
- Identify your liquidity cost of selling before you buy!
- Factoring in expected time horizon is critical
The changing liquidity profile in IG Corporates

- The declining liquidity profiles corporates extends beyond lower volumes
- The less liquid buckets have seen the most notable growth, while the cement bucket has been relatively stable

The evolution of market liquidity:

<table>
<thead>
<tr>
<th>Sept. 2006</th>
<th>% Total Issuer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go-Go</td>
<td>11.3%</td>
</tr>
<tr>
<td>Liquid</td>
<td>14.4%</td>
</tr>
<tr>
<td>Off the Run</td>
<td>23.5%</td>
</tr>
<tr>
<td>Illiquid</td>
<td>35.6%</td>
</tr>
<tr>
<td>Cement</td>
<td>15.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sept. 2010</th>
<th>% Total Issuer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go-Go</td>
<td>9.8%</td>
</tr>
<tr>
<td>Liquid</td>
<td>17.0%</td>
</tr>
<tr>
<td>Off the Run</td>
<td>20.4%</td>
</tr>
<tr>
<td>Illiquid</td>
<td>34.6%</td>
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<tr>
<td>Cement</td>
<td>18.2%</td>
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</table>

<table>
<thead>
<tr>
<th>July 2013</th>
<th>% Total Issuer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go-Go</td>
<td>5.0%</td>
</tr>
<tr>
<td>Liquid</td>
<td>12.3%</td>
</tr>
<tr>
<td>Off the Run</td>
<td>12.7%</td>
</tr>
<tr>
<td>Illiquid</td>
<td>32.5%</td>
</tr>
<tr>
<td>Cement</td>
<td>37.4%</td>
</tr>
</tbody>
</table>

Note: Analysis is based on internal BlackRock research. TRACE data is used to classify issuers of investment grade corporate bonds into five liquidity categories. Reported percentages indicate the breakdown of issuers into those categories at each point in time.

Source: BlackRock, TRACE data
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Quantitative Measures of Bond Liquidity

March 15, 2016
What is Needed? Objective Measures of Liquidity

- As we know, “liquidity” is difficult to define, much less quantify

- Perceptions of liquidity are highly susceptible to
  - Market commentary
  - Political / regulatory / competitive motivations
  - Anecdotes
  - Individual’s degree of market experience

- Quantitative liquidity measures are needed to impartially assess:
  - Liquidity conditions over time and across markets
  - The level of liquidity risk
  - The need and efficacy of (proposed) regulations
Liquidity Cost Scores (LCS)

- Liquidity Cost Score (LCS) is Barclays’ bond-level measure of liquidity, available back to 2007.
- “Liquidity” is defined as the cost of an institutional-size, round-trip transaction, expressed as a percent of the bond’s price.

\[
\text{Liquidity Cost Score (LCS)} = \begin{cases} 
\text{OASD} \times (\text{bid spread} - \text{ask spread}) & \text{if quoted on spread} \\
\frac{\text{ask price} - \text{bid price}}{\text{bid price}} & \text{if quoted on price}
\end{cases}
\]

- We use simultaneous bid & ask spreads quoted by Barclays traders to clients. These quotes are used for index price verification.
- Some trader quotes are commitments to make a market, whereas others may be indications and are not executable at those levels. The LCS computation algorithm widens such quotes.

Example:
- For a bond with an OASD of 5, a trader quotes a bid spread of 40bp and an ask spread of 25bp. Given this bid-ask spread of 15bp, the bond’s LCS is \( 5 \times 0.15 = 0.75\% \). In other words, a round-trip trade would cost 75bp.

Credit spread widening in January (25bp for USD IG credit and 13bp for EUR IG credit) was not accompanied by big changes in liquidity conditions. LCS of these two markets barely moved (Figure 2). Liquidity in the USD EM market, which experienced a large negative return this month, was equally stable. LCS in USD HY increased somewhat, led by the energy sector. Compared to December, trading volume was significantly higher across all markets (Figure 5). This was to be expected after the holiday slowdown. However, market volatility may also have contributed to the increased activity. In non-credit markets (Figure 8), the EUR Treasuries LCS decreased by 22% in relative terms. With the exception of the UK, the liquidity of European inflation-linked government debt did not materially change.

Source: Barclays Research
A Bond-Level Metric Allows Market Liquidity Analysis

Cross-sectional and historical analysis of customized market segments

![Graphs showing bond-level metric analysis](image)

<table>
<thead>
<tr>
<th>Size, $mm</th>
<th>&lt;1</th>
<th>1-5</th>
<th>5-7.5</th>
<th>7.5+</th>
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<td>&lt;300</td>
<td>0.63</td>
<td>0.65</td>
<td>0.82</td>
<td>0.72</td>
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<tr>
<td>300-500</td>
<td>0.65</td>
<td>0.68</td>
<td>0.76</td>
<td>0.65</td>
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<tr>
<td>500-750</td>
<td>0.46</td>
<td>0.52</td>
<td>0.71</td>
<td>0.53</td>
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<tr>
<td>750-1,500</td>
<td>0.32</td>
<td>0.44</td>
<td>0.56</td>
<td>0.46</td>
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<tr>
<td>1,500-2,000</td>
<td>0.26</td>
<td>0.29</td>
<td>0.46</td>
<td></td>
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<tr>
<td>2,000-3,000</td>
<td>0.24</td>
<td>0.25</td>
<td>0.43</td>
<td>0.29</td>
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<tr>
<td>&gt;3,000</td>
<td>0.22</td>
<td>0.24</td>
<td>0.30</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Source: Barclays Research
LCS Applications

- Portfolio construction (e.g., TCX Baskets - liquid index tracking portfolios)
- Optimization (using LCS as a constraint or as the objective function)
- Custom benchmark design
- Monitoring the liquidity status of portfolios
- Testing the effect of transaction costs on the projected performance of alpha strategies
- Spread Decomposition (Risk Premium, Default, and Liquidity)
- Monitoring trading desk inventory positions
- Liquidity-adjusted tail risk
- Market studies

Stand-alone Barclays publications are available on many of these subjects.
Price Impact Measure (PIM) for USD Corporate Bonds
Introducing PIM

- Liquidity is a broad term subject to interpretation
  - One measure may not be sufficient
  - Some argue that while bid-ask spreads (LCS) have not changed much recently, liquidity has deteriorated because a given trade amount now moves the price more than it used to (i.e., greater price/return impact)

- A price impact measure ("PIM") measures liquidity by examining how much a bond's price moves – relative to the market – per dollar amount ($1mn) traded
  - A bond with a higher PIM is considered less liquid than a bond with a lower PIM
Calculating a Bond’s PIM

We use prices of *trader-quoted bonds* to calculate a bond’s daily excess return, *net of the duration-matched Corporate Index excess return (Net ExRet)*

- Bond must have total par volume $\geq$ $1m$ for the day
- For net ExRet, we use the portion of the Corp Index that matches the duration of each bond

For each bond:

- We use TRACE data to compute the total market value of transactions ($Tvol$)

- Each day, we compute a ratio of the absolute value of its daily net excess return divided by its daily market value trading volume in $\text{million}$:

  $$R_t = \frac{|\text{Daily Net ExRet}_t|}{Tvol_t}$$

- We average these daily ratios (so PIM is a “rate”) to produce the bond’s monthly PIM value:

  $$\text{PIM} = \frac{1}{n} \times \sum R_t$$

- A high (low) PIM value means that the bond’s net excess return changed a lot (a little) per million of traded volume
  - Example: A PIM of 0.0005 means that, on average, the bond’s excess return relative to the market was 5bp per $1mn$ traded
  - For a bond with an OASD of 5, this is approximately a 1bp move in spread vs. the market index
Market PIM and LCS: Are They Always in Agreement?

Investment Grade, Jan 2007 – Jan 2016, excluding top 1%

Investment Grade:
- We currently compute PIM for 57% of bonds in Barclays Corporate Index
- LCS and PIM are highly correlated:
  correlation = 0.93 (0.71 in changes)

High Yield:
- We currently compute PIM for 62% of bonds in Barclays High Yield Index ex-144A bonds; and for 36% of all index bonds
- LCS and PIM are highly correlated:
  correlation = 0.97 (0.62 in changes)

Source: Barclays Research
Estimating Return Impact of Portfolio Redemptions
Estimating Redemption Impact Curves: Formulation

- Assume a portfolio of a given size

- The manager is concerned that a possible X% withdrawal

- To meet redemptions, the manager creates a “liquidity portfolio”
  - Assume a beta = 1 to the Corporate Benchmark (IG or HY)
  - Relatively few bonds (50)
  - Highly liquid bonds (low LCS)
  - This is our USD IG Corporate TCX portfolio

- Selling the liquidity portfolio to meet redemptions should leave the portfolio risk reasonably unchanged, although
  - The remaining portfolio will likely be less liquid
  - Alpha positions will have a higher weight

- We measure the liquidity portfolio’s PIM, and how it varies by trade size
  - For example, a $300mn liquidity portfolio will have a different PIM than a $2bn portfolio
  - We then estimate the return impact (net of market) of the portfolio redemption amount
Redemption Impact Curves for Funds of Different Sizes

Estimated return impact, Inv. Grade, January 2016

Estimated return impact, High Yield, January 2016

Estimated return impact, Inv. Grade, November 2008

Estimated return impact, High Yield, November 2008

Source: Barclays Research
Liquidity Portfolios Incur Rebalancing and Opportunity Costs

- Liquidity portfolios must be rebalanced periodically to remain liquid and to maintain $\beta = 1$
  - Assuming a 30% quarterly turnover (TCX experience); we estimate rebalancing cost (bid-ask spread)
- Liquidity portfolios also reduce opportunity for PM to implement his/her best ideas
  - Assume opportunity cost increases with size of liquidity portfolio; maximum rate is 50bp (IG) and 75bp (HY)

### Estimated Redemption Return Impact (bp) vs. Annual Portfolio Liquidity Cost, bp/y

- **IG, Jan 2016**
- **IG, Nov 2008**
- **HY, Jan 2016**
- **HY, Nov 2008**

Source: Barclays Research
Summary

- Portfolio managers increasingly have answer very specific questions about their portfolios’ liquidity characteristics.

- Quantitative liquidity measures are needed to give defensible answers to these questions.

- We introduced PIM (price impact measure) to facilitate an objective estimation of the portfolio return impact of redemptions.

- PIM may help portfolio managers to:
  - Assess the return impact of portfolio redemptions.
  - Evaluate the tradeoff between the redemption impact cost and the cost of maintaining a liquidity portfolio (e.g., “perhaps the liquidity sleeve is too liquid?”).
  - Design a liquidity portfolio.
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