NATIXIS ASSET MANAGEMENT

IDEAS *FIXED INCOME*
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Intended for professional clients

Liquidity risk in the Fixed Income Markets

KEY ELEMENTS

- **Liquidity is a complex and multiform concept whose dimensions are difficult to capture in a single measure**
- **Current conditions i.e. low interest rates and the accommodative monetary policy, have failed to maintain high level of market liquidity**
- **The major changes in the regulatory environment that have occurred since the financial crisis have had an important impact on liquidity**

Liquidity in the financial markets

What is liquidity?

From a broad economic perspective, liquidity is the ability of economic agents to exchange their goods into wealth. Liquidity is thus a flow notion (as opposed to the notion of stock). Illiquidity arises when it becomes difficult or impossible to exchange assets. When there is not enough money in an economy, transactions and thus activity slow down.

From a market perspective, investors are concerned with asset liquidity, which is generally defined as the ease with which large quantities can be traded rapidly, at any time, and at a low cost. There are thus four interrelated dimensions of liquidity: **width** measures the costs incurred as the result of a round trip transaction e.g. by instantaneously buying and selling a security; **depth** is the number of shares that can be traded at a given price without incurring additional costs above the bid-ask spread; **immediacy** captures how quickly positions can be traded and corresponds to the time between placing the order and settlement; **resiliency** indicates the ability of the market to absorb random shocks (e.g. uninformative orders).

Why is it important?

Financial markets make it possible to slice risk up into different types (e.g. interest rate, credit, currency) and to distribute it in order to promote efficient funding for investment in the real economy. Efficiency lies in both the broad range of assets available for savers and the low execution costs for funds to be transferred to would-be borrowers.

Liquid markets ensure that assets can be converted into cash, which can then be used to buy goods and services in the real economy. Compared with a purely bank-based financial system, financial markets provide investors with access to broadly diversified underlying portfolios. As liquid markets are easily accessible, risks are spread across a large number of investors, thus helping to promote financial and economic stability. A shortfall in liquidity might result in credit rationing and thus less funding available for investment, regardless of how profitable the investments may be.

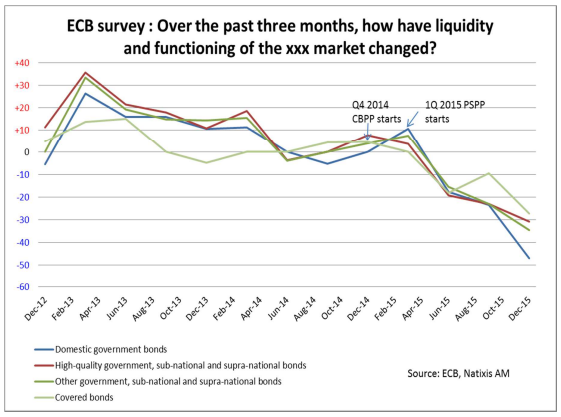
Liquidity is diminishing

Despite accommodative monetary policy - characterized by low rates and quantitative easing - and the emergence of electronic platforms, current market evidence points to a significant reduction in market liquidity. Evidence suggests that market depth has been significantly reduced as it is becoming difficult to execute large orders without impacting prices, pushing market participants to divide their trades up into smaller orders. In the US, dealers' inventories of corporate bonds declined by 60% between 2008 and 2015. Over the same period, banks' trading capacity reduced by 40%. A similar pattern has been observed in the European corporate market: according to PwC's Global Financial Markets Liquidity Study of August 2015, trading volumes declined by 45% between 2010 and 2015.

As policy decisions are transmitted to the real economy via markets, central banks pay a great deal of attention to how the markets function. The ECB conducts regular surveys of market participants. The 4Q15 securities market survey revealed considerably lower liquidity in markets where the ECB has conducted asset purchases. Indeed, as can be seen in the chart below, perception of liquidity in the market for covered bonds started waning as soon as the CBPP3 [1] was launched. Similarly, the start of

[1] The ECB's Covered Bond Purchase Programme launched on 4 September 2014

PSPP[2]purchases coincided with gradually weaker liquidity conditions across the euro sovereign debt markets.



Why is it diminishing?

The impact of regulation on market liquidity

New regulations were clearly needed to address the issues that arose during the 2008 financial crisis. However, there is a growing realization that the regulations came so thick and fast that not enough thought was given as to how they interacted nor to their unintended consequences. Among other things, the new regulatory framework has reduced liquidity in various markets by impacting banks' trading books, the securities lending and repo markets, the derivatives markets, trading in smaller names and the number of players in the market.

The regulatory changes that impact banks' trading books include:

- The **increase in capital** on the trading book and the new leverage, liquidity and net stable funding ratios (Basel 2.5 and 3). Before the financial crisis, the capital on trading book assets was considerably lower than for banking book assets. This is no longer the case. In fact, capital increases have probably been the greatest in the trading book, making it very expensive to maintain large positions;
- **Single counterparty credit limits** which limit the exposure a bank can hold on any one entity. The limits take into account exposure on entities in the trading book;
- the US **Volcker rule**, which is ambiguous as to whether holding large positions in a particular issuer in the trading book might constitute "proprietary trading", thus inciting dealers to restrict their activities on any one issuer and the overall size of the trading book. A similar rule is likely to apply in Europe at some stage;
- the **bank separation** rules, which oblige banks to separate out their market-making activities. Because the market-making entities are necessarily smaller, their funding costs are likely to be higher, thus increasing the cost of holding a large trading book;
- **Bank Recovery and Resolution plans** which require the banks to hold a minimum amount of long-term assets in order to constitute their "loss absorbing capacity". These plans, plus all the new capital requirements, restrict the amount of capital available to hold against trading activities.

Securities lending and repo markets are an important source of liquidity and short term funding. A reduction in liquidity in these markets affects liquidity in other capital markets. Previously, these transactions consumed very little capital as they were fully collateralized. Under the new regulations, the leverage requirements do not take into account collateral or the creditworthiness of the counterparty, thus significantly increasing capital. In addition, banks are all chasing the same high quality assets which can be used as collateral for both these transactions and for derivatives, and as capital. If less eligible collateral is available, it makes it more difficult to trade.

Derivatives transactions are often used to hedge market positions. If it becomes more difficult to hedge, it becomes more difficult to take the market position, again reducing liquidity. Derivatives have become more expensive because of the cost of clearing and increased capital costs. Moreover, the different clearing requirements in the US and Europe are causing market fragmentation: the same product is trading at different prices on either side of the Atlantic.

Under MiFID and MiFIR, ESMA's definition of "liquidity" is likely to result in illiquid instruments being classified as liquid and thus subject to the pre- and post-trade transparency requirements. This discourages market-makers from trading on less liquid names.

Globally, the increased cost of compliance and reporting is forcing smaller players to exit certain markets, thus depressing liquidity still further.

[2] The ECB's Public Sector Purchase Programme launched on 9 March 2015

Coping with liquidity risk

Impact on investors: cost, opportunities and bubbles

The term "liquidity risk" conjures up notions of cost and loss. The cost of liquidity when trading an asset is typically captured by the bid-ask spread. The components of liquidity cost are threefold. **Direct trading** costs are deterministic transaction costs encompassing brokerage commissions, transaction taxes and exchange fees. **Price impact** costs correspond to the difference between the executed price and the mid-price. It is generally limited to half the bid-ask spread for small orders but can exceed the bid-ask spread for larger positions. When trading a small position, usually the order can be executed at the best price with a single counterparty. As the size of the position increases, a number of counterparties are required in order to absorb the order, each with different beliefs about the fair value of the asset, which can push the price down. **Search and delay** costs are incurred when traders delay execution in order to search for a better execution price than the price "indicated" by the bid-ask spread. By doing so, traders take the risk of seeing the market move by the time they decide to execute their order. This trade-off between price impact costs and seeing the market move is particularly relevant for block orders.

More generally, a drop in liquidity limits the efficiency of the market and increases the cost of funding, leading to forced selling, deleveraging and unwinding of positions. Moreover, liquidity risk can spread to the whole market. For instance, other asset classes can be affected by funding risk: when the banks' margins rise or when a bank goes into bankruptcy because of difficulties affecting a single type of asset, investors find it difficult to fund other kinds of investments. This was clearly demonstrated when the US housing bubble burst.

Liquidity also plays a predominant role in the development of crises and the bursting of bubbles. The concomitance of bubbles and liquidity is well documented in academic papers.

Investors expect to be compensated for bearing liquidity risk, which can push prices down. Academic and professionals estimate liquidity risk premiums at around 0.6% for investment grade bonds and 1.5% for speculative bonds.

How to measure liquidity in Fixed Income markets?

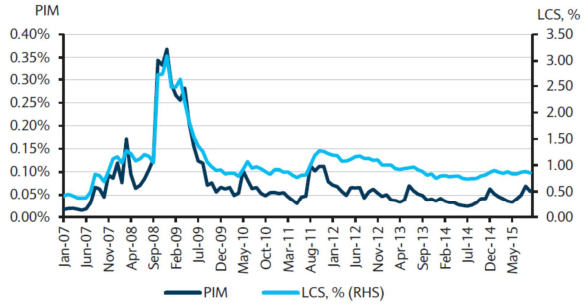
Extending liquidity measures traditionally used in the equity markets to bond markets is not straightforward, for at least a couple of reasons. First, the liquidity of a bond depends on the bond's intrinsic characteristics. Unlike shares, bonds redeem at maturity. The liquidity of a 10 year bond is not the same as the liquidity of a 3 month bond of the same issuer. Secondly, measuring liquidity on the basis of traded volumes can be misleading as a traded bond is not necessarily liquid e.g. forced selling and falling angels. In addition, bonds that are not traded are not necessary illiquid.

Dastidar and Phelps (2009) invented the liquidity cost score (LCS) to measure bond liquidity. A bond's LCS represents the round-trip cost, as a percentage of the bond price, of immediately executing a standard institutional transaction. A lower LCS value denotes better liquidity.

While the LCS focuses on the cost dimension of bond liquidity, the price sensitivity of a corporate bond to transaction volume is captured in a separate measure called the Price Impact Measure (PIM). The PIM measures the ratio of a bond's daily absolute excess return (net of the Corporate Index excess return) to its daily dollar volume of transactions.

Bonds with higher spreads and durations have higher LCS and PIM.

Time Series of Market PIM and LCS, USD Investment Grade Corporates, January 2007-September 2015



Source: Barclays Research

The Trade Efficiency Score (TES) complements the LCS and PIM by ranking corporate bonds with both their LCS and traded volumes. This relative liquidity measure is useful for identifying the most liquid bonds in a bucket of securities.

How do asset managers manage liquidity risk for their clients?

Liquidity risk ranks high among the risk factors affecting the P&L of a portfolio. It is taken into account in the portfolio construction process in addition to strategic allocation, market opportunities and investors guidance. These measures have been recently complemented by new practices such as swing pricing.

Portfolio construction: monitoring turnover, an illiquid strategy bucket and the risk-return trade off

Unlike other risk factors, liquidity risk cannot be diversified. For example, one cannot offset a given level of liquidity "exposure" by going short an illiquid security. No known liquidity-based derivatives hedge

this particular risk. Indeed, in stressed markets, bid rather than mid prices prevail.

However, illiquidity generally occurs over the short term but vanishes over the long term: a security held to maturity has no liquidity cost.

Given that, the asset manager can adapt the risk-return profile of the portfolio by strategically allocating certain assets to the illiquid strategy bucket e.g. private debt. Such a bucket helps to boost the overall return of the portfolio by capturing an extra premium while offering potential diversification benefits.

Illiquidity increases with the size of the position. As a result, even for liquid strategies, turnover has to be closely monitored and trading strategies balanced against potential liquidity costs before the strategy is implemented. This is even more critical for illiquid strategies. For instance, a breakeven yield, compensating for taking into account transaction costs, can be calculated for a strategy or issue by issue.

Swing pricing

Swing pricing aims to protect the overall performance of the portfolio for the benefit of existing investors.

Trading activity incurs costs (brokerage fees, liquidity spread, taxes) that are traditionally charged to the fund and thus dilute the value of existing investors' investments.

Swing pricing is a mechanism by which the NAV of a fund is adjusted upwards in the case of large net inflows and downwards in the case of large net outflows. Namely, if there are important subscriptions or net inflows (or redemptions or net outflows) exceeding a certain threshold, the NAV will be swung upwards (or downwards) by a predefined swing factor. Subscribers thus contribute to the cost that their transactions generate by entering the fund at a higher price, while redemptions are executed at a lower price. The swing factor and threshold level are reviewed on a regular basis by a committee dedicated to validating the parameters of the swing pricing.

Swing pricing does not generate additional costs for holders; it modifies the allocation of costs among shareholders. Nonetheless, the mechanism may generate volatility in daily prices, thus increasing the tracking error or the volatility of the fund, irrespective of any fundamental change in the inherent risk of the portfolio.

Conclusion

Liquidity conditions in financial markets are among the main concerns for investors at present. Liquidity represents the ability to trade rapidly large amounts of securities with minimal impact on market prices. The recent evolution of the regulatory framework has reduced the ability of banks to maintain market-making activities with negative consequences on the functioning of markets. These changes have forced asset managers to measure liquidity risk more accurately and to take it into account in their investment processes while adapting asset allocation modelling. The protection of investor interests in funds required the introduction of swing pricing to better distribute liquidity costs across shareholders.

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