



Fixed Income Liquidity in a Rising Rate Environment



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Executive Summary

- Fixed income market liquidity has declined, causing greater concern about prospective liquidity in a potential broad market sell-off if the Federal Reserve (the Fed) begins to raise interest rates.
- However, despite the liquidity decline, Pioneer Investments does not believe the fixed income market is currently facing a liquidity event of the magnitude experienced in the 2008 financial crisis.
- Liquidity events can arise relatively quickly; Pioneer seeks to mitigate liquidity risk in its portfolios in a number of ways, including diversifying portfolios, investing in liquid securities and limiting illiquid investments.
- Pioneer also continuously monitors portfolio liquidity, factoring liquidity risk into every security analysis and portfolio construction decision.

Fixed Income Liquidity in a Rising Rate Environment

Liquidity has become a much-discussed topic among asset managers, with a particular focus on fixed income market liquidity in a rising interest rate environment. Fixed income market liquidity has declined in the face of more restrictive banking regulations, including increased charges for risk-based capital.¹ These higher capital requirements have driven many broker-dealers to hold lower inventories and reduce market-making activities in fixed income assets, particularly in higher risk asset classes, such as high yield corporates.

While asset managers have responded to the lower liquidity regime through increased use of electronic trading systems when possible (thereby marginally increasing price transparency and liquidity), some investors believe that these structural changes have significantly reduced fixed income market liquidity, most notably in the high yield corporate market.

Some investors further argue that the proliferation of high yield exchange traded funds (ETFs) and their use as a liquid asset source, have compounded high yield market liquidity risk. They are particularly concerned about liquidity in a potential broad market sell-off, which we believe could result, should the Federal Reserve begin to raise interest rates.

Putting It All In To Perspective

Before we discuss the approach Pioneer's U.S. fixed income team takes in addressing liquidity risk, it is important to place this recent concern about fixed income market liquidity into perspective. First, it makes sense to consider the concept of liquidity. For U.S. mutual funds, the Securities and Exchange Commission (SEC) defines an illiquid asset as "an asset which may not be sold or disposed of in the ordinary course of business within seven days at approximately the value at which the mutual fund has valued the investment on its books."

Bid-ask spreads – the price at which a seller is willing to sell a bond (the "ask" side), compared to the price at which a buyer is willing to bid for a bond – represents a relatively transparent and simple means of assessing the liquidity of a bond. Liquidity cost should reflect market impact cost, which is a function of a security's riskiness as well as its forecasted trading volume.

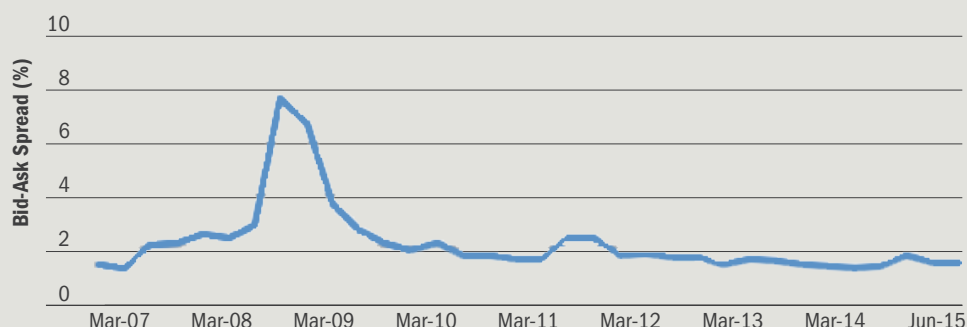
¹ Risk-based capital requirements ensure that a financial institution has sufficient capital to operate, even in periods where it may sustain operating losses.

Fixed income market liquidity has declined in the face of more restrictive banking regulations, including increased charges for risk-based capital.

Using the bid-ask as the measure, the following chart indicates that, while overall liquidity may have declined, we do not believe the fixed income market is currently facing a liquidity event comparable to that experienced during the 2008 financial crisis. In that environment, bid-ask spreads on the Barclays U.S. High Yield Index rose to almost 8%, well in excess of the current 1.5% level set forth below. In its July 15, 2015 minutes, the Fed indicated that it has not observed significant deterioration of liquidity in either the Treasury or the corporate bond markets.

Bid-Ask Spreads Rose Significantly During the 2008 Financial Crisis

High Yield Index Liquidity Cost Score



Source: Barclays Point, using the Barclays U.S. High Yield Index, a measure of the performance of U.S. high yield bonds; last data point June 30, 2015. Indices are unmanaged and their returns assume reinvestment of dividends and, unlike mutual fund returns, do not reflect any fees or expenses associated with a mutual fund. It is not possible to invest directly in an index.

Data represents past performance, which is no indication of future results.

We do not believe the fixed income market is currently facing a liquidity event at all comparable to that experienced during the 2008 financial crisis.

Systemic risk among banks has fallen as a result of more stringent regulation, and bank and consumer leverage has declined markedly. On a fundamental basis, U.S. economic growth is improving and the home price/median income level (U.S. housing being at the epicenter of the 2008 financial crisis) has reverted to 2001 levels.

The 2013 “Taper Tantrum”

In the arguably more relevant period of the “taper tantrum” of 2013, the bid-ask spread remained relatively contained and spread widening was short-lived. During that time, fixed income markets suffered their third worst quarterly sell-off in twenty years, fueled by the Fed’s May and June statements regarding the potential tapering of Quantitative Easing 3 (QE3) later in 2013 (the \$85 billion monthly purchases of Treasuries and agency mortgages). The Fed reasoned that improving U.S. economic data – evidenced by job growth, higher consumer confidence and strong performance of the housing market – might justify a reduction in purchases.

Bond investors responded with record redemptions in June across a broad range of fixed income asset classes including investment grade, high yield and emerging markets. Emerging market bonds and currencies fell, reflecting the reduced attractiveness of the “carry trade” as U.S. rates rose.

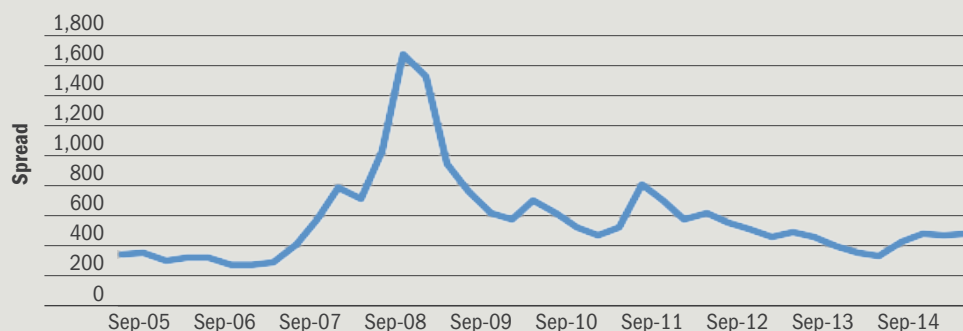
It is also interesting to note that dedicated high yield ETF asset levels have remained relatively stable since 2013. It does not appear that there has been significant growth in dedicated high yield ETFs, although high yield assets may be used in other multi-sector ETFs.

Option-adjusted spread is the spread or difference between the yield on a bond and the yield on a Treasury of the same duration that has been adjusted for any options in the bond, such as call options.

Basis point (bps) is a unit equal to 1/100th of 1%.

Bids Were Relatively Contained During 2013's Taper Tantrum

High Yield Option-Adjusted Spread (basis points)



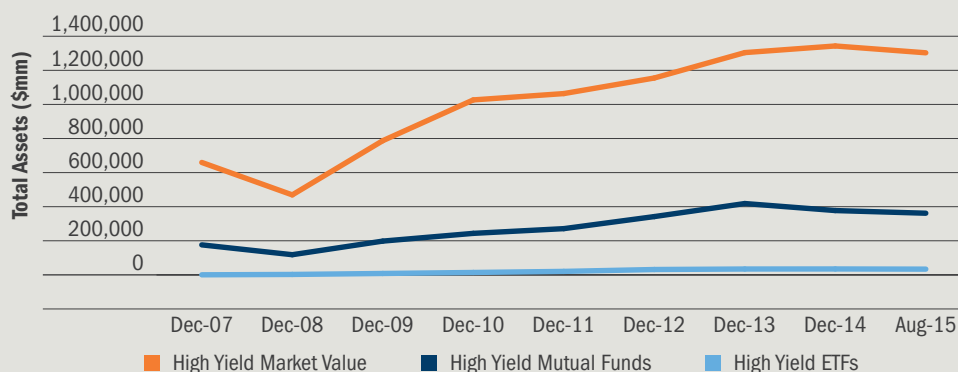
Source: Barclays Point, using the Barclays U.S. High Yield Index, a measure of the performance of U.S. high yield bonds. Last data point June 30, 2015. **Data represents past performance, which is no indication of future results.**

Based on behavior in 2013 during the taper tantrum, neither high yield ETFs nor high yield mutual funds fell victim to massive redemptions or a dramatic market sell-off. The high yield market is less liquid because its securities are lower-rated. Accordingly, its history can be a proxy for illiquidity. Admittedly, circumstances are different today and the high yield market could come under more pressure in a rising rate environment to the extent that there are significant redemptions from fixed income mutual funds. In addition, equities, to which high yield is highly correlated (high yield returns tend to move in the same direction as equity returns over time), may be poised for a more significant correction, which could also hurt high yield returns.

Finally, should commodities prices, including oil, continue to fall, high yield returns would fall, given the significant commodities exposure in the high yield market. In 2013, however, fears about the impact of ETFs on the high yield market in a period of monetary tightening were not realized. The liquidation of these supposedly liquid ETF instruments did not place inordinate downward pressure on the underlying, less liquid holdings and did not generate a dramatic repricing of the entire high yield market or of corporate credit assets.

No Dramatic Sell-Off for High Yield Funds or ETFs in 2013

Total High Yield Net Assets



High yield market value is represented by the BofA ML High Yield Master II Index, a commonly accepted measure of the performance of high yield securities. **High yield mutual funds and ETFs** are represented by the ICI and Morningstar High Yield categories, respectively.

Source: Strategic Insight, Investment Company Institute (ICI) and Bloomberg. Last data point August 31, 2015.

The U.S. Treasury market is generally known as the most liquid market. Liquidity declines with lower quality, longer maturity and geographic spectrum, with developed market securities offering higher liquidity than emerging market issues.

Mitigating Liquidity Risk in Portfolios

Because liquidity events can arise relatively quickly, as we have witnessed with the China/commodities sell-off that took hold in the third quarter of 2015, Pioneer Investments seeks to mitigate liquidity risk in its portfolios in a number of ways.

We invest in diversified portfolios, particularly with respect to our non-investment grade exposures.

Non-investment grade assets may include high yield corporates, bank loans, non-agency mortgage-backed securities/asset-backed securities (MBS/ABS), emerging market sovereign and corporate debt, convertibles, preferred and event-linked bonds. Such diversification can also help diversify liquidity risk for the portfolio. These markets may have distinct investor groups, driven by different fundamental risk drivers and differing investment needs. Historically, Pioneer's high yield strategies have invested across a broader range of fixed income sectors than other high yield mutual funds in the Morningstar High Yield Bond category.²

Our multi-sector strategies seek to have sufficient cushion available from increased investment in more liquid asset classes of U.S. Treasuries and Agency MBS. Over the past year, we have reduced credit risk and added exposure in the lower risk asset classes of U.S. Treasuries and agency MBS, the latter being explicitly or implicitly guaranteed by the U.S. government. We seek a higher liquidity premium than we have historically, particularly when investing in less liquid asset classes. While measuring such a "liquidity premium" continues to be more an art than a science, as part of our means of measuring and monitoring liquidity, we use the Barclays Liquidity Cost Score, which assesses liquidity at the issue and issuer level, through assessing bid-ask spreads, and compares portfolio liquidity to that of the respective index.

We seek to invest in liquid securities and we must limit illiquid investments to 15% of the strategy in our open-end funds. That being said, liquidity generally follows a continuum with respect to asset class, maturity and quality. The U.S. Treasury market is generally known as the most liquid market. Liquidity declines with lower quality, longer maturity and geographic spectrum with developed market securities offering higher liquidity than emerging market issues.

The asset allocation of Pioneer's multi-sector strategies can vary significantly over time; rather than providing an estimate at a specific point in time, we are providing general liquidation timelines for major sectors in which we invest in an environment with normal liquidity.

| Asset Class | Liquidation Timeline* | | | | |
|---|-----------------------|--------|--------|---------|----------|
| | 1 Day | 3 Days | 1 Week | 1 Month | 2 Months |
| U.S. Treasuries | 100% | | | | |
| Agency MBS | 80% | 100% | | | |
| Investment Grade Corporates | 80% | | 95% | 100% | |
| Non-Agency MBS/ABS/CMBS | | | 70% | 100% | |
| Non-Investment Grade/ Emerging Markets | 10% | | 60% | 95% | 100% |

Source: Pioneer Investments.

* **Please note:** timelines provided are general parameters only. They are not absolute and will vary. Due to market anomalies or abnormal market conditions, the stated timelines may not be in effect.

² Source: Pioneer research using Morningstar as of 6/30/15.

We believe diversification of the strategy reduces liquidity risk, in that different risk factors can affect liquidity of a single asset class over time.

Continuous Monitoring of Portfolio Liquidity

As stated earlier, we continuously monitor portfolio liquidity using third party liquidity models, which estimate absolute liquidity and liquidity relative to benchmarks. These models help stress test liquidity within the portfolios on an ex-ante basis. Specifically, these models serve three functions:

- 1. Identify the level of highly liquid assets** and determine the fund's ability to cover current redemptions without incurring any cost.
- 2. Calculate a liquidity ratio.** The analysis of liquidity on the fund's holdings is measured by using a transaction cost model. Once determined, a liquidity ratio is calculated by incorporating the results of the liquidity cost analysis and comparing it to various redemption values.
- 3. Calculate liquidity ratio in stress scenario.** Using the transaction cost model, stress scenarios are run to re-calculate the fund's liquidity ratio. In 2015, a 50% widening of bid-ask spreads and a 30% increase in market volatility scenarios have been used.

We also examine portfolio liquidity using three-tiered risk pools, with money market-qualifying instruments and Treasuries in the most liquid pool. While we seek to buy investments that are liquid, on occasion, events may occur that damage the liquidity of an instrument. We believe the diversification of the strategy reduces liquidity risk, in that different risk factors can affect liquidity of a single asset class over time.

We consider liquidity in all security analysis and in portfolio construction, requiring greater compensation for relatively lower liquidity. Generally, as buy and hold investors with a one-to three-year investment horizon, our purchases are made with the understanding that our investments will weather market disruptions. With respect to corporate bonds, we focus first and foremost on a company's free cash flow as a percentage of its debt; we believe our companies have greater financial flexibility to weather illiquidity events.

In addition, we generally seek to invest in liquid issues and keep aggregate holdings small enough that we can exit the position quickly, if we foresee fundamental deterioration. But liquidity judgments are made on a case-by-case basis. No more than 5% may be invested in any one corporate obligor, or in one mortgage collateral pool. But, corporate issuer exposure tends to average 0.30% to 0.50% (although maximum permitted exposure is 5%), and non-agency MBS deal exposure is generally less than 1%. In addition, we seek to limit investment in single issues relative to the total issue outstanding and generally invest in issues with greater than \$100 million outstanding.

Summary

Fixed income liquidity is declining and many asset managers are concerned about a broad market sell-off if the Fed raises interest rates. Pioneer's U.S. fixed income team closely examines liquidity risk in all security analysis or portfolio construction. We invest in diversified portfolios, particularly with respect to our non-investment grade exposures, and we seek to cushion our multi-sector strategies with increased investment in more liquid asset classes. We believe diversification can reduce liquidity risk, in that different risk factors can affect liquidity of a single asset class over time. We also seek to invest in liquid securities and, in our open-end mutual funds, limit illiquid investments to 15% of the strategy.

Before investing, consider the product's investment objectives, risks, charges and expenses. Contact your advisor or Pioneer Investments for a prospectus or summary prospectus containing this information. Read it carefully.

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