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Is Bond Market Liquidity Really Falling?

"Taking Three as the subject to reason about--
A convenient number to state--
We add Seven, and Ten, and then multiply out
By One Thousand diminished by Eight.

"The result we proceed to divide, as you see,
By Nine Hundred and Ninety Two:
Then subtract Seventeen, and the answer must be
Exactly and perfectly true."

– *Lewis Carroll,* The Hunting of the Snark

Bond People are Different

Bonds aren't like stocks, and bond markets aren't like stock markets. When we trade stocks, we generally think of our buy or sell orders as making their way from our computer screens (or telephones, in some particularly archaic instances) to the floor of an exchange or to an electronic trading venue, where they meet corresponding orders on the other side for execution. For the most part, the intermediaries in these transactions are brokers, who collect a commission for matching buyers with sellers, but who otherwise have no economic interest in the trades.

In the bond market, on the other hand, most trading still takes place over the telephone, and very little of it involves brokers' matching customers' buy and sell orders. Instead, when we buy or sell bonds we generally trade not with another investor but with a broker-dealer firm acting as a dealer. The bonds we buy come from, and the ones we sell go into, the dealer's inventory. Bond dealers don't generally charge commissions, but instead profit from the spread between the prices at which they buy bonds from customers and the higher prices at which they sell them to other customers. Historically, bond dealers have also benefited from their market position, which gives them an informational advantage over their customers.

Because the bond market is primarily a dealer market, its liquidity — that is, the ease and economy with which customers can trade in the market — depends on the willingness and ability of dealers to act in that capacity. To maintain an inventory of bonds, a dealer must allocate capital to support it, and must either bear or manage the risk of carrying those holdings on its balance sheet. Over the past couple of decades, many of the firms that have traditionally been important bond dealers have either become banks (Goldman Sachs and Morgan Stanley, for example), or been acquired by banks (like Bear Stearns).

In the aftermath of the financial crisis of the past decade, Congress passed the Dodd-Frank financial reform act, which sought, among other things, to moderate the risks that banks might take with their balance sheets. Wall Street, seeing this legislation as constraining their ability to conduct profitable business, has been vigorous in its efforts to slow and dilute rulemaking under the new law. One of their arguments has been that the law's restrictions impair the profitability of bond dealing. As a result, the argument goes, liquidity in the bond market — especially the corporate bond market — has declined, and in a market disruption, that lack of liquidity could turn a problem into a crisis. But while I applaud the public-spiritedness of Wall Street's argument, the evidence indicates that if anything, liquidity in the corporate bond market has improved since the passage of Dodd-Frank.

Has Liquidity Really Disappeared?

Proponents of the view that liquidity has fallen in the corporate bond market tend to cite a significant decline in trading volumes in corporate bonds since before the financial crisis,[1] and it's perhaps no surprise that people that make their living trading bonds view the decline as a problem. From the point of view of investors, however, the issue of bond market liquidity is not one of volume, but of the ease and cost of access to the bond market.

Defining liquidity in terms of market access and trading costs raises measurement problems, since we can't observe directly how often prospective traders submit orders, but find themselves unable to trade or unwilling to accept the prices that dealers offer them. However, the markets do provide us with an important indirect measure of liquidity, through the behavior of exchange-traded funds (ETFs). To see how this works, we'll have to take a brief detour to study how ETFs work.

[1] Robin Wigglesworth of the *Financial Times* has a very good series of articles on the issue. Start here:

ETFs and Mutual Funds

Most exchange-traded funds, like their cousins, unit trusts, open-end mutual funds, and closed-end funds, are registered investment companies: specialized corporate entities whose sole purpose is to hold investment portfolios and issue securities against them. The basic idea behind the original ETFs was to combine the ability of open-end funds to expand and contract with investor demand with the tradability of closed-end funds. To see how a basic ETF works, let's first look at how traditional open- and closed-end mutual funds operate.

Traditional mutual funds, or open-end investment companies, expand and contract as investors add or withdraw money. After each day's close, the fund's manager calculates the value of the fund's portfolio and subtracts out any expenses the fund may have accrued (investment management fees, for example). The result is the fund's net asset value. The manager divides that net asset value by the number of share the fund has outstanding, arriving at a net asset value (NAV) per share. If investors have bought the fund during the day, the fund issues them new shares. The number of shares each investor receives is the amount they've contributed, less any sales charges or other transaction costs, divided by that NAV per share. Investors taking money out of the fund receive the proceeds from redeeming their shares at NAV, less any back-end charges. When open-end fund holders redeem their shares, the fund extinguishes them. The result is that an open-end fund expands when investors buy in, and contracts when they pull out. All those transactions occur on a daily cycle, at prices based on the fund's end-of-day NAV per share.

Closed-end funds operate differently. When a sponsor launches a closed-end fund, it plans to offer a specific number of shares, creating a fund of a specific initial size. The launch includes an initial selling period, during which share purchases result in additions to the fund.[2] Once the initial selling period ends, though, investors interested in buying the fund have to trade in the secondary market — that is, prospective buyers have to buy existing shares from existing holders, trading at a market-determined price. Likewise, when holders want to take their money out of a closed-end fund, they have to hope to find a buyer to whom they can sell their shares in the market. Since closed-end fund trades are market transactions, they can occur at any time during the trading day, perhaps an advantage compared with open-end funds. But the market prices at which closed-end funds trade do not necessarily equal the funds' net asset value. In fact, they are often quite far from the funds' NAV, and closed-end funds can trade at prices above NAV (a premium), or below it (a discount). On consistency of market pricing, open-end funds have the advantage.

[2] I wrote about this process in more detail a number of years ago, in "Hidden Costs of Investing: Closed End Funds," July 7, 2006.

ETFs aim to combine open-end funds' consistent pricing with closed-end funds' availability for trading at any time the market is open, rather than just at the end of the day. To accomplish this, ETFs employ a technique designed to keep the market price at which investors buy and sell throughout the day close to the net asset value.

ETFs trade like closed-end funds, but are able to expand and contract in size through a mechanism called Creation Units. Most of us buy into an ETF by buying existing shares in the secondary market. As a result, an ETF can trade at a premium or discount to net asset value, in the same way as a closed-end fund. However, certain designated institutions, (Authorized Participants, or APs), have contractual rights to assemble Creation Units, baskets of securities equal in value to a large number, usually 50,000, of shares. The APs can deliver the securities to the fund in kind, receiving in exchange newly created ETF shares which they can then sell in the market. Heavy net public buying can drive the ETF to a premium, inducing Authorized Participants to take advantage of the arbitrage between the basket of securities and the market price of the ETF. This drives the ETF market price back toward net asset value and increases the size of the fund to correspond to the net public buying. If there's net public selling, driving the market price to a discount, the process works in reverse -- Authorized Participants can take advantage of the arbitrage by buying fund shares in the public market and exchanging them for an in-kind distribution of portfolio securities. The ETF sponsor then extinguishes the shares.

The Authorized Participant arbitrage mechanism ties an ETF's market price to its net asset value. Most important, Authorized Participants must be able to assemble baskets of securities matching the ETF's portfolio, and do so quickly. The mechanism works best if the market for the underlying securities is liquid, since Authorized Participants will only take advantage of it if the frictional costs aren't too high. ETFs built on illiquid markets could easily trade far away from their net asset values, since the costs of building baskets in those markets could be high. So in general, the ETF Creation Unit mechanism works best for ETFs based on well-known indices covering deep, liquid markets.

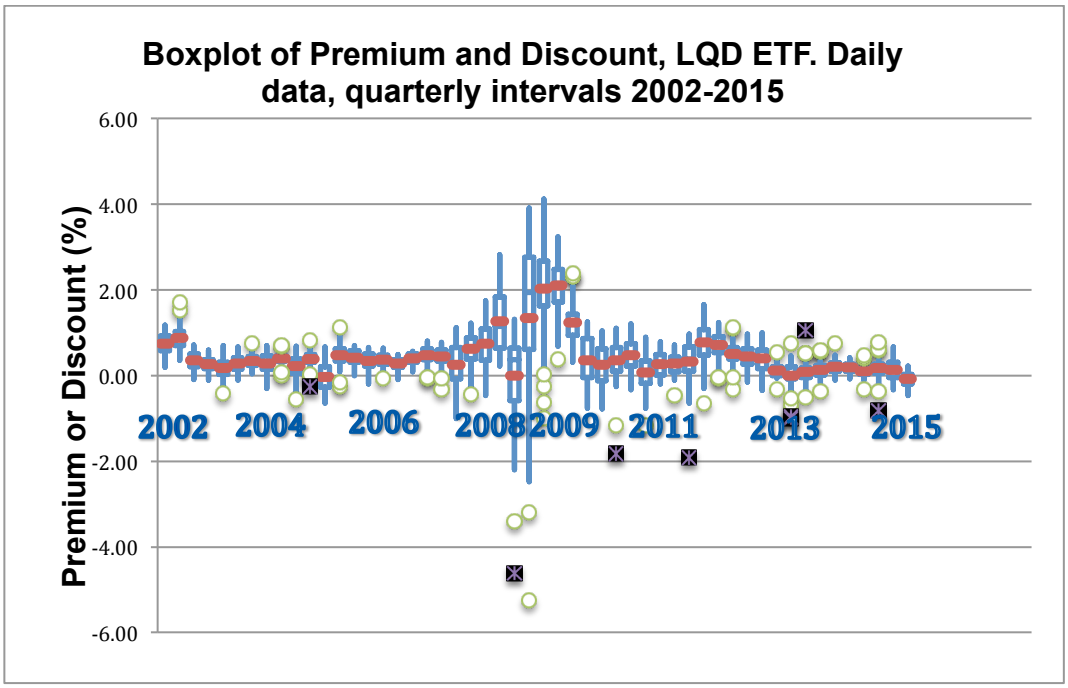
For our purpose here, the arbitrage mechanism also provides a measure of market liquidity. If liquidity is good, then a small premium will suffice to induce APs to buy up portfolio securities, exchange them for Creation Units, and then sell the newly-created ETF shares. If liquidity is poor, then APs can only undertake the arbitrage profitably one the premium grows large.[3] Hence, the behavior of an ETFs premium or discount serves as an indication of the liquidity of the market for the securities underlying it.

[3] We can also make mirror-image statements for the case where the discount grows large, and APs take advantage of the opportunity to receive securities in exchange for ETF shares.

ETFs and Corporate Bond Liquidity

We're finally able to make our measurements of liquidity in the corporate bond market. We'll examine the behavior of the premium or discount of two corporate bond ETFs, the iShares Intermediate Credit Bond ETF (ticker: CIU) and the iShares iBoxx $ Investment Grade Corporate Bond ETF (ticker: LQD).

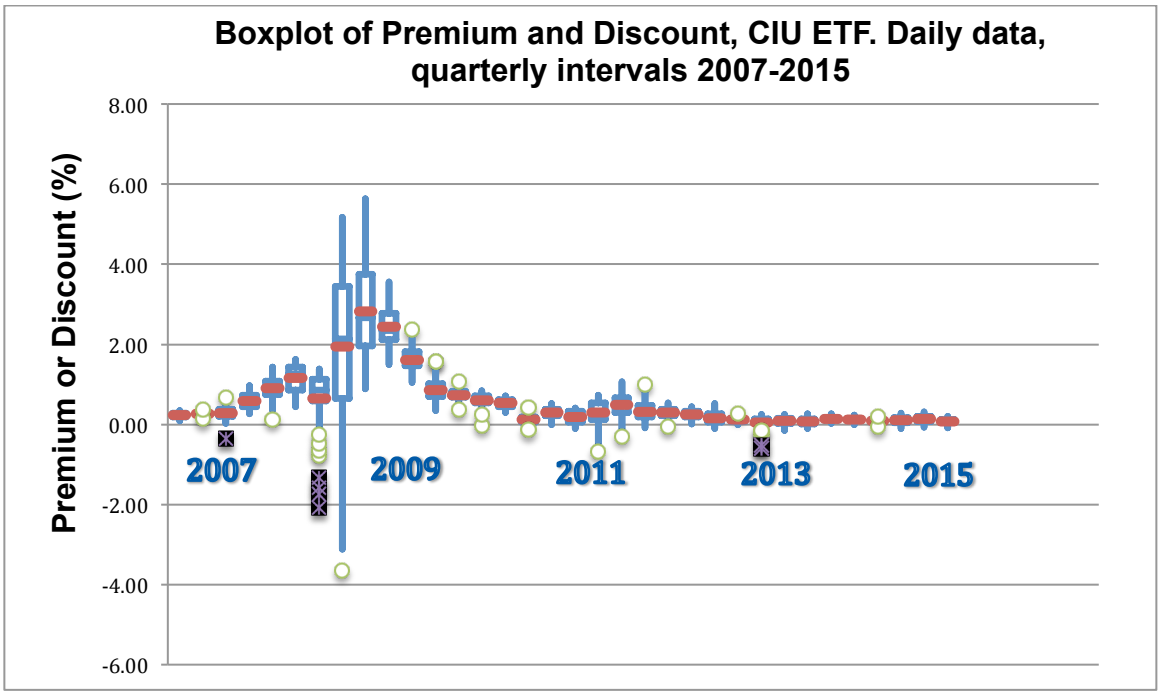
The experiment is simple enough. The iShares website (www.ishares.com) provides daily end-of-day net asset value (NAV) data for both ETFs. From Yahoo! Finance, we were also able to collect daily closing market values for the same two ETFs. For each trading day, we calculated the daily closing premium or discount, which is simply the difference between the closing market price and the end-of-day NAV, and then expressed the premium or discount as a percentage of NAV. To see how liquidity in recent periods compares to that in the past, we arranged the daily observations into quarterly intervals, and then summarized the distribution of each quarter's observations by creating a series of boxplots[4], one for each quarter. The figure below shows the boxplot for LQD.



[4] Each boxplot features a central box extending from the 25th to the 75th percentile of the quarter's observations. Inside each box are a blue mark displaying the median, and a red mark showing the mean. The "whiskers" above and below each box show the range of the data for that period. Where individual observations lie far enough from the main body of the data to qualify as possible outliers, the chart shows them separately. My daughter, Amelia Tiemann, assembled the data for these plots.

The LQD plot shows that the ETF traded at a fairly consistent premium of around 0.3%, with some variation, for most of the period before the financial crisis. The premium then expanded dramatically, and also became substantially more volatile, during the crisis of 2008 and 2009, before settling down in 2010. For the next couple of years, the premium was generally larger than it had been before the crisis, but since around 2013, the premium has fallen to a much lower level than even before the crisis, in the range of 0.15%, and it has also been less variable. In 2005, the average end-of-day premium was 0.29%, with a standard deviation of 0.31%. In 2014, the average was 0.14%, and the standard deviation also 0.14%.[5]

The boxplots for the CIU ETF, shown below, tell much the same story:



For CIU, the average premium in 2007 (January to September – the boxplot shows that the premium was already increasing by the fourth quarter of that year) was 0.26%, with a standard deviation of 0.10%. In 2014, the average premium was 0.11%, with a standard deviation of 0.06%.

The message in these charts is clear: If corporate bond market liquidity had declined in recent years, we would expect the premium and discount in corporate bond ETFs to

[5] Data available on request.

increase. Instead, at least in the case of CIU and LQD, the premium has fallen. This suggests that the market is liquid enough that Authorized Participants can profitably deal in Creation Units at smaller spreads than in the past, despite what some of the same firms may be saying about liquidity.

Conclusion — Corporate Bond Liquidity

Even if trading volume in the corporate bond market has fallen in recent years, it's far from clear that the drop has led to any impairment in market liquidity for investors. The evidence from two large, popular corporate bond ETFs suggests that, if anything, the market liquidity most relevant to investors has improved. If liquidity had deteriorated, then the ETF premium necessary to induce Authorized Participants to undertake the arbitrage operation to close that gap would likely have increased. Instead, premiums have fallen, suggesting that the trade is now profitable when the difference between the ETFs' price and NAV is quite small — in other words, that liquidity is plentiful for those that need it. The claim that Dodd-Frank has created a regulatory environment that impairs liquidity in the market for high-grade corporate bond market liquidity does not stand up to market-based evidence from exchange-traded funds.

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