ETFs HELP IMPROVE MARKET STABILITY

A CLOSER LOOK AT FIXED INCOME ETF BEHAVIOR DURING RECENT BOND MARKET MOVEMENT

iShares by BlackRock®

OCTOBER 2014

Introduction

Over the past 10 years, ETFs have played an increasingly important role in the fixed income markets, helping to make them more stable and efficient during both normal market conditions as well as when markets are challenged with uncertainty. In times of stress in particular, ETFs are increasingly becoming the place where bond investors are finding liquidity and price discovery.

This paper examines the behavior of bond markets and fixed income ETFs during the recent period of significant money flows following the news of Bill Gross's departure from PIMCO on September 26, 2014. The analysis focuses on the behavior of the two broad bond market ETFs which represent 96% of exchange traded product assets benchmarked to the Barclays US Aggregate Index – the iShares Core U.S. Aggregate Bond ETF (AGG) and the Vanguard Total Bond Market ETF (BND).[1]

During this time, the ETFs that we examined helped defuse uncertainty and facilitate orderly and stable markets. Rather than amplify market volatility as some have speculated, ETFs continued to demonstrate their ability to add liquidity to the fixed income markets and act as shock absorbers to high volume activity, deliver price transparency via on-exchange pricing, and allocate costs fairly as transaction costs are generally externalized from the fund and isolated to transacting investors.

Key Takeaways

ETFs continue to demonstrate their ability to:

- **Add liquidity** to the fixed income markets and act as shock absorbers to high volume activity in the asset class without putting stress on the underlying market.
- **Deliver price transparency** via on-exchange pricing of the ETF in an otherwise somewhat opaque OTC market structure for bonds.
- **Allocate costs fairly**, as transaction costs are generally externalized from the fund and isolated to transacting investors.

Background: Bond Markets and the Emergence of Fixed Income ETFs

Since the financial crisis, fixed income markets have experienced a decline in liquidity even as bonds outstanding have grown in size due to ballooning debt issuance, as discussed in a recent BlackRock Investment Institute report.[2]

The primary reason for this deterioration in secondary market liquidity is that traditional providers such as broker-dealers and banks have reduced trading activity due to new charges on capital, limits on proprietary trading activity and overall risk assessment. With balance sheet commitments shrinking, so too has the number of U.S. primary bond dealers — declining to 22 in 2014 from 46 in 1988.[2]

The result: Bond trading has become more fragmented. For example, the average daily number of trades in the U.S. corporate bond market has surged, but the size of these trades has declined to an average of $536,000 per transaction, down from $948,000 in 2007.[2]

And as bond investors have struggled to find liquidity, many have turned to ETFs. Traditional bond fund buyers, along with other bond market investors, have embraced the ability to access a diversified portfolio of bonds in a single wrapper that makes its holdings, costs and performance transparent to all investors.

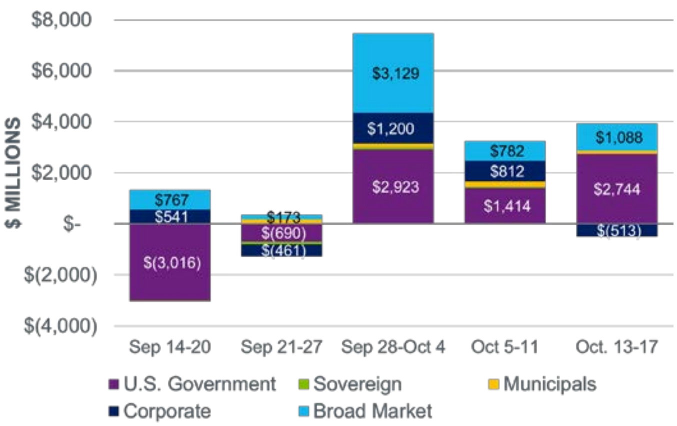
Fixed income ETFs usage is on the rise, with over $400 billion invested in fixed income ETFs globally[3] and one third of recently surveyed fixed income institutions planning to increase their fixed income ETF allocations in the next year.[4]

Market Review

Over the weeks following the announcement of Bill Gross' PIMCO departure, billions were withdrawn from PIMCO funds. During this same time, money moved into fixed income ETFs (Figure 1). ETFs helped many investors allocate towards a broad bond market "beta" in the form of the Barclays US Aggregate Index as they reassessed their fixed income holdings.

The Barclays US Aggregate Index is widely accepted as a measure of the broad U.S. investment-grade bond universe, with 71% of index-based and actively managed funds in the Morningstar intermediate term bond category benchmarked to the index.[5] This analysis focuses on the two U.S. broad market bond ETFs which represent 96% of exchange traded product assets benchmarked to the Barclays US Aggregate Index - the iShares Core U.S. Aggregate Bond ETF (AGG) and the Vanguard Total Bond Market ETF (BND).[1]

Figure 1: U.S. LISTED ETP FIXED INCOME FLOW
Fixed Income Flow by Category



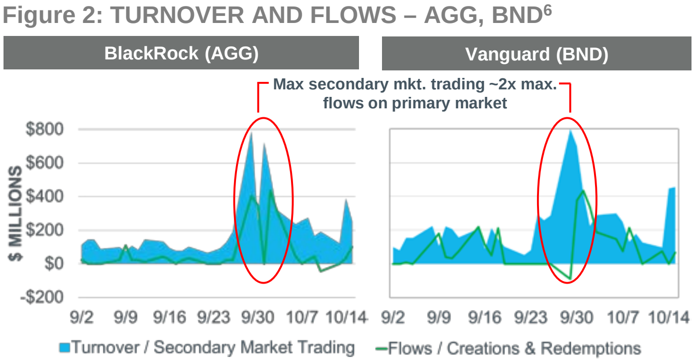
Source: BlackRock, for the weeks of 9/14/14-10/17/14.

A Closer Look at Liquidity

Figure 2 shows secondary market turnover and the subsequent creation activity for new shares of AGG and BND for the period in focus.

Despite this trading surge, the funds continued to closely track their underlying index and trade at efficient levels.

Figure 2: TURNOVER AND FLOWS – AGG, BND[6]



Source: Bloomberg, 9/1/14-10/15/14.

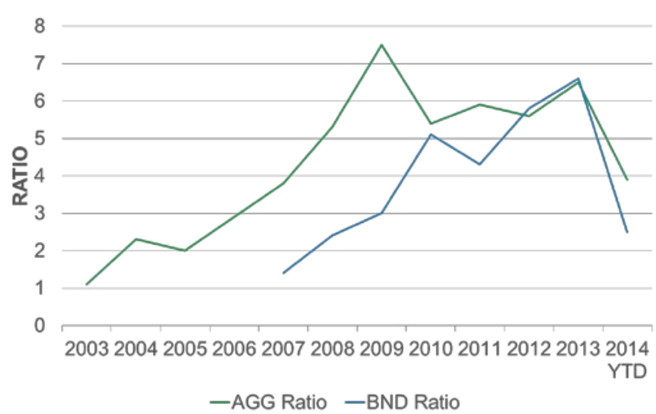
Many market participants observe ETF exchange volumes and assume a direct, 1:1 translation into OTC bond trades. In fact, much of the buying and selling of fixed income ETFs is accommodated through secondary market trading of ETF shares on the exchange.

A minority of the activity results in primary market activity (the purchase or sales of individual bonds in the OTC bond market). For example, during this time period, for every $2.50 of exchange volume that occurred in the iShares Core U.S. Aggregate Bond ETF (AGG) or the Vanguard Total Bond Market ETF (BND), only $1 of bonds ultimately traded via primary market creation/redemption activity.

This data illustrates why investors often choose to execute more efficiently through fixed income ETFs rather than purchasing or selling individual bonds: over 70% of all investor trading activity during this period occurred on exchange, rather than the less liquid, more costly underlying OTC bond market.

ETF liquidity generally expands as a fund matures, as more natural buyers meet more natural sellers without needing purchases or sales of the underlying bonds. The ratio of secondary ETF trading to primary market activity is a key indicator of the amount of additional liquidity that the ETF is contributing to the bond market. AGG's liquidity expansion since its launch in 2003 is evidenced in its changing secondary to primary ratios (Figure 3). Shortly after it was first launched, for every $2 that traded on exchange, $1 traded in the underlying bond market. This ratio is typical for a newer bond ETF with little existing supply of ETF shares in the market. Approximately two years after the launch of the fund, there was a significant jump in this liquidity ratio as an increasing number of investors began to use the fund as a source of fixed income liquidity. Today the secondary/primary ratio is approximately 4:1, which highlights how the ETF may have grown to serve as a buffer to demand on the underlying bonds. While the ratio during the period in focus is slightly lower, the buffer remained effective and the drop is actually to be expected given the one-directional sentiment over a short timeframe.

Figure 3: AGG SECONDARY TO PRIMARY RATIO SINCE INCEPTION[7]



Source: Bloomberg, 1/1/03-10/24/14.

A Closer Look at Price Transparency and Discovery

One of the challenges faced by many investors in the bond market is price transparency. Real-time traded levels are widely available for U.S. Treasury securities, but most market participants do not have access to real-time market levels for other bond sectors such as municipal bonds, investment grade corporate bonds, or high yield corporate debt. Prices for these sectors are reported out through publicly available sources, but generally on a delayed basis. As a result, real-time executable bond price levels do not exist for the vast majority of investors in the market.

With the growth of fixed income ETFs, all market participants who can view equity market prices can now observe bond price movements through fixed income ETFs. As the ETF represents a transparent, diversified, portfolio of bonds trading on the exchange, its price movements can provide valuable information to market participants about the movements of the fund's underlying fixed income securities.

The period in focus was marked by a significant increase in overall market volatility. By observing price movements in AGG and BND, investors were able to assess the impact that price movements were having on the broad investment grade bond market that AGG is benchmarked to. Observing individual bond price movements would not provide this same level of transparency as those prices are generally delayed, and only a small fraction of the market transacts on any given trading day, which makes assessments of the broad market difficult. Observing mutual fund NAVs is also not helpful for assessing market movements as these levels are only published at the end of each trading day.

By looking at ETF price levels and comparing them to published NAVs we can get a sense of how accurately ETFs are tracking their underlying bond market. During this period, premium/discount levels of fixed income ETFs remained low as prices tracked closely to NAVs. Additionally, market price bid/ask spreads of fixed income ETFs remained within historical ranges (Figure 4).

Figure 4: AVERAGE PREMIUMS/DISCOUNTS

	YTD	9/25/14 – 10/10/14
AGG	0.076%	0.108%
BND	0.082%	0.124%

Source: Bloomberg and NYSE, from 1/1/14 -10/10/14.

Most importantly, fixed income ETFs provided pricing information to investors throughout the trading day, and not only after the market close like open-end mutual funds. Investors could use ETFs to understand fixed income market movements and make more informed investment decisions. During this period, ETFs delivered price transparency via on-exchange pricing in an otherwise opaque, OTC market structure.

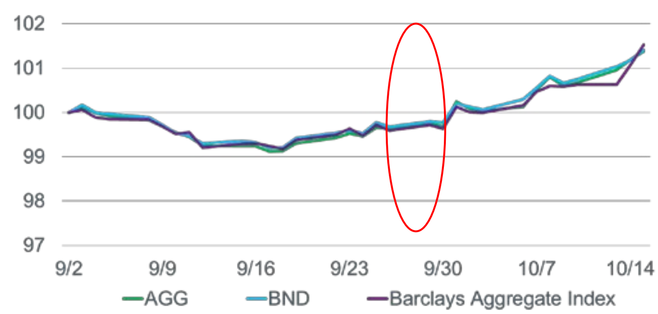
A Closer Look at the Allocation of Costs

An additional benefit of the ETF structure that is highlighted during periods of heightened market activity is the ability to externalize transaction costs. Unlike mutual funds, most ETFs issue and redeem their shares in large aggregations through an in-kind transfer of securities. For example, during the period in focus, investors purchased a significant number of AGG and BND shares on the exchange. As a result, broker/dealers who sold the shares to investors needed to source the shares. In order to source the shares, the broker/dealer purchased baskets of bonds in the OTC bond market, and delivered these bonds to the ETF providers in exchange for new shares of the ETFs. For funds with significant selling activity, a similar reverse process takes place. As investors sell shares of the ETF on the exchange and broker/dealers accumulate ETF positions, broker/dealers will eventually unwind their positions and deliver the shares back to the ETF provider in exchange for a portfolio of individual bonds.

Despite all the movement of assets in the ETFs described above, what makes the ETF in-kind creation/redemption mechanism unique is that it protects existing shareholders in the fund from being impacted by the activity of transacting investors. By transacting in-kind, the ETFs are able to externalize transaction costs generated by new investors and not impact fund performance due to inflows and outflows in the ETF. This fair allocation of transaction costs is evidenced in the close and consistent performance of the ETFs vs. their target benchmarks (Figure 5).

Figure 5: ETF PERFORMANCE VS. TARGET BENCHMARK

Cumulative Return 9/26-10/15/14



Source: Bloomberg, from 9/26/14-10/15/14. The performance quoted represents past performance and does not guarantee future results. Index returns are for illustrative purposes only. Indexes are unmanaged and one cannot invest directly in an index. For standardized performance, please see the end of this document.

Conclusion

As demonstrated by the ETFs we examined during this period, fixed income ETFs provide deep liquidity, price transparency, and fair allocation of costs when markets are challenged with uncertainty or significant money flows, as well as during periods of market stability. In times of stress, fixed income ETFs are increasingly becoming the place where bond investors are finding liquidity and price discovery.

As bond markets evolve over the coming years, ETFs will play an important role in providing investors with transparent, exchange-traded, reliable exposure to a variety of market segments.

Glossary of Terms

Balance Sheet – A statement that reflects a company's assets and liabilities.

Beta – A measure of the tendency of securities to move with the market as a whole. A beta of 1 indicates that the security's price will move with the market. A beta less than 1 indicates the security tends to be less volatile than the market, while a beta greater than 1 indicates the security is more volatile than the market.

Bid/Ask Spreads – The amount by which the price an investor would pay to buy a security exceeds the price an investor would receive if they sold the security. Generally, the smaller the bid/ask spread the more liquid the security.

Broker-Dealers – A firm in the business of buying and selling securities.

Creation/Redemption – The process by which shares of ETFs are added or subtracted from a fund in order to meet market demand.

Debt Issuance – Corporations and governments offer debt issues as a means of raising funds. In return, lenders generally receive payments from these corporations and governments in return.

Exchange Traded Fund (ETF) – A fund that combines features of mutual funds and stocks, ETFs are diversified mixes of assets managed by experienced professionals. ETFs typically offer low overall costs, tax benefits, and the ability to buy and sell throughout the day as long as the market is open.

In-Kind Transfer – The exchange of ETF shares for shares of the underlying securities. It is this transfer that enables ETFs to create/redeem shares of the ETF without undergoing a taxable event.

Liquidity – The degree to which an asset can be bought or sold in the market without affecting the asset's price. Assets that exhibit high liquidity are those that can be easily bought or sold.

Market Volatility – A measure of the dispersion of returns for the securities that comprise a market. Generally, the higher the volatility of a market the riskier.

Mutual Fund – A type of professionally managed fund that pools money from investors to purchase securities.

Net Asset Value (NAV) – The per share dollar value of a fund, reflecting the value of the securities in a portfolio divided by the number of shares outstanding.

Open-End Mutual Funds – A type of mutual fund without restrictions on the amount of shares the fund can issue. The vast majority of mutual funds are open-end.

Over-the-Counter (OTC) – A security that is not listed or traded on an organized exchange such as a secondary market.

Price Discovery – The basic supply and demand process used to determine the price for a specific security in the market.

Price Transparency – The level of information available to investors regarding the quantity of assets being offered in the market (the supply) and the bids at various price levels (the demand). Greater transparency means investors more clarity around what an asset is currently worth in the market.

Primary Markets – The market for new issues of securities including both stocks and bonds.

Proprietary Trading – The practice of a firm trading for its own gain rather than to merely process customer trades.

Secondary Markets – Markets, such as the New York Stock Exchange, where investors buy and sell securities from other investors. Following their initial sale in the primary market, securities trade on the secondary market going forward.

Volume – The number of shares of a security or those that comprise a market that trade during a period of time. Broadly, the higher the volume the more liquid the security or market.

Notes

1. Source: Morningstar, as of 10/23/14. Includes all exchange traded products (ETPs) in the U.S. that list either the Barclays U.S. Aggregate Bond Index or the Barclays U.S. Aggregate Bond Float Adjusted Index as their Primary Prospectus Benchmark in Morningstar. AGG and BND comprise $45.7 billion of the $47.5 billion in assets in this category. Of the 3 other ETPs with less than 4% of category assets, one is an inverse ETF (the Direxion Daily Total Bond Market Bear 1x Shares ETF, ticker: SAGG) and was excluded from this analysis given the fund does not directly track the index. The other 2 ETPs (the SPDR Barclays Aggregate Bond ETF, ticker: LAG, and the Schwab US Aggregate Bond ETF, ticker: SCHZ) were also excluded as they each have less than $1 billion in assets and less broad investor traction than AGG and BND.
2. Source: "The Liquidity Challenge: Exploring and Exploiting (Il)Liquidity", BlackRock Investment Institute, June 2014.
3. Source: Global ETP Landscape, BlackRock, September 2014.
4. Source: "ETFs: An Evolving Toolset for US Institutions," Greenwich Associates, May 2014.
5. Source: Morningstar, as of 10/22/14. Represents the percentage of open-end mutual funds (oldest share class only) within the Morningstar Intermediate-Term Bond Category that list the Barclays U.S. Aggregate Bond Index as their Primary Prospectus Benchmark.
6. Source: Bloomberg, 9/1/14-10/15/14. During this period, AGG traded $5.8 billion and BND traded $6.5 billion. The other ETPs in the Morningstar Intermediate-Term Bond Category were excluded from this analysis as the collective turnover was less than $400 million (SCHZ $294 million, LAG $71 million, SAGG $1.3 million) and the collective fund flows were less than $150 million (SCHZ $145 million, LAG ($6) million, SAGG $0).
7. Source: Bloomberg, 1/1/03-10/24/14. The other ETPs in the Morningstar Intermediate-Term Bond Category behaved in a similar fashion but were excluded from this analysis due to their lower assets under management, turnover, and flows as detailed in footnotes 1 and 6.

Performance as of 12/31/16

Fund Name	Fund Inception Date	1-Year Returns NAV	1-Year Returns Mkt Price	5-Year Returns NAV	5-Year Returns Mkt Price	10-Year Returns NAV	10-Year Returns Mkt Price	Since Inception NAV	Since Inception Mkt Price
iShares Core U.S. Aggregate Bond ETF (AGG)	9/22/03	2.56%	2.42%	2.15%	2.09%	4.20%	4.18%	4.06%	4.06%
Vanguard Total Bond Market ETF (BND)	4/03/07	2.57%	2.54%	2.12%	2.12%	--	--	4.24%	4.25%

The performance quoted represents past performance and does not guarantee future results. Investment return and principal value of an investment will fluctuate so that an investor's shares, when sold or redeemed, may be worth more or less than the original cost. Current performance may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by visiting www.iShares.com, www.blackrock.com, or www.vanguard.com.

Shares of ETFs are bought and sold at market price (not NAV) and are not individually redeemed from the Fund. Brokerage commissions will reduce returns. Market returns are based upon the midpoint of the bid/ask spread at 4:00 p.m. eastern time (when NAV is normally determined for most ETFs), and do not represent the returns you would receive if you traded shares at other times.

Carefully consider the iShares Funds' investment objectives, risk factors, and charges and expenses before investing. This and other information can be found in the Funds' prospectuses, which may be obtained by visiting www.iShares.com or www.BlackRock.com. Read the prospectus carefully before investing.

Investing involves risk, including possible loss of principal. Fixed income risks include interest-rate and credit risk. Typically, when interest rates rise, there is a corresponding decline in bond values. Credit risk refers to the possibility that the bond issuer will not be able to make principal and interest payments.

This material represents an assessment of the market environment as of the date indicated; is subject to change; and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding the funds or any issuer or security in particular.

Information on BND is provided strictly for illustrative purposes and should not be deemed an offer to sell or a solicitation of an offer to buy shares of any fund, other than the iShares Funds, that are described in this material.

This material is not intended to be relied upon as a forecast, research or investment advice, and is not a recommendation, offer or solicitation to buy or sell any securities or to adopt any investment strategy. The opinions expressed are as of the date indicated and may change as subsequent conditions vary. The information and opinions contained in this post are derived from proprietary and nonproprietary sources deemed by BlackRock to be reliable, are not necessarily all-inclusive and are not guaranteed as to accuracy. As such, no warranty of accuracy or reliability is given and no responsibility arising in any other way for errors and omissions (including responsibility to any person by reason of negligence) is accepted by BlackRock, its officers, employees or agents. This post may contain "forward-looking" information that is not purely historical in nature. Such information may include, among other things, projections and forecasts. There is no guarantee that any of these views will come to pass. Reliance upon information in this post is at the sole discretion of the reader.

This material is provided for educational purposes only and does not constitute investment advice. The information contained herein is based on current tax laws, which may change in the future. BlackRock cannot be held responsible for any direct or incidental loss resulting from applying any of the information provided in this publication or from any other source mentioned. The information provided in this material does not constitute any specific legal, tax or accounting advice. Please consult with qualified professionals for this type of advice.

Not FDIC Insured • No Bank Guarantee • May lose Value

BLACKROCK®

iS-18781-0716