Bond ETFs: A Liquid Pool of Illiquid Assets

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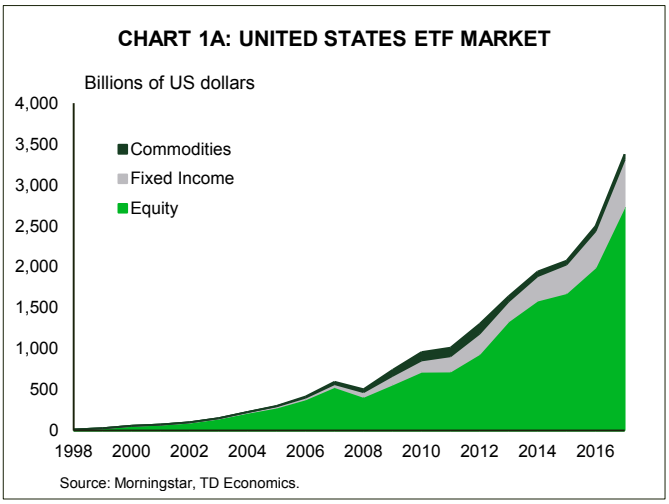
Highlights

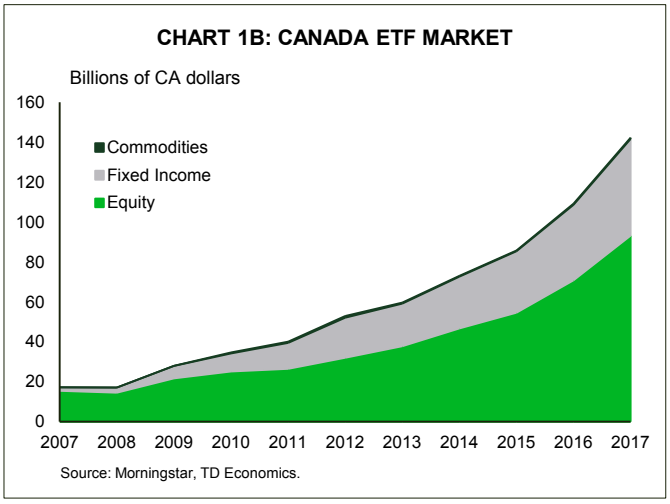
- Exchange traded funds (ETFs) have grown in popularity over the past decade by offering investors a cost and tax efficient way to gain exposure to a broad pool of assets
- Our analysis confirms that bond ETF share prices can get disconnected from the value of the underlying assets, a risk that may not be recognized by some investors
- As a result, regulators have expressed concerns about the potential for ETFs to destabilize financial markets during periods of stress when large outflows could accentuate rapid asset price declines
- As the market size continues to grow, investors can benefit from increased transparency of potential inventory and liquidity risks associated with some ETFs

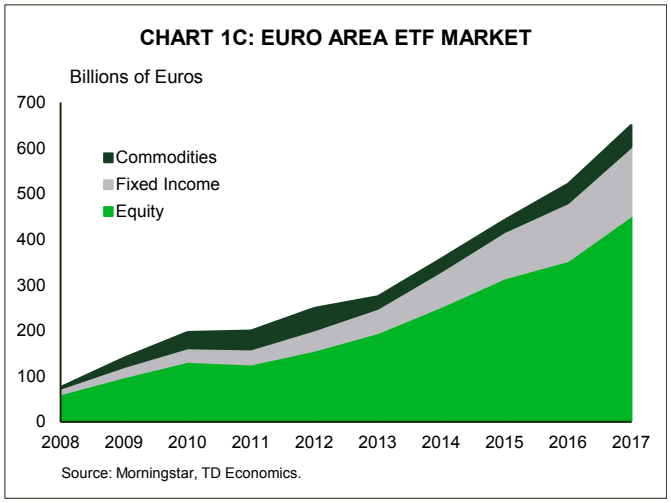
ETFs represent a small but growing share of the market

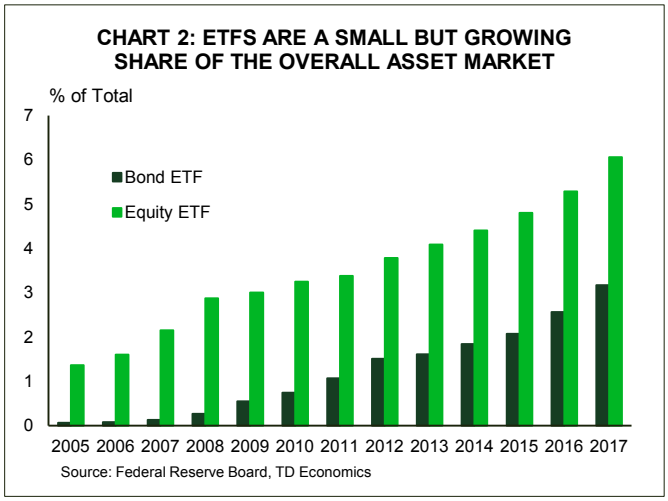
While exchange-traded funds (ETFs) were first introduced in the United States in the early 1990s, their widespread popularity took root after 2009. Since then, the exponential growth of ETFs has been supported by both a soaring demand from investors, who value the diversification benefits, low cost, and tax advantages, and increased ETF issuance in a low yield environment. By the end of 2017, $3.4tn was invested in ETFs in the U.S., CA$142bn in Canada, and €652bn in Europe (charts 1A-C).[1]

Growing popularity has led to an increasingly diverse suite of ETF products, including U.S. equities, emerging market bonds, as well as exotic exposures to commodities, volatility, and cryptocurrencies. By extension, the broader inves-









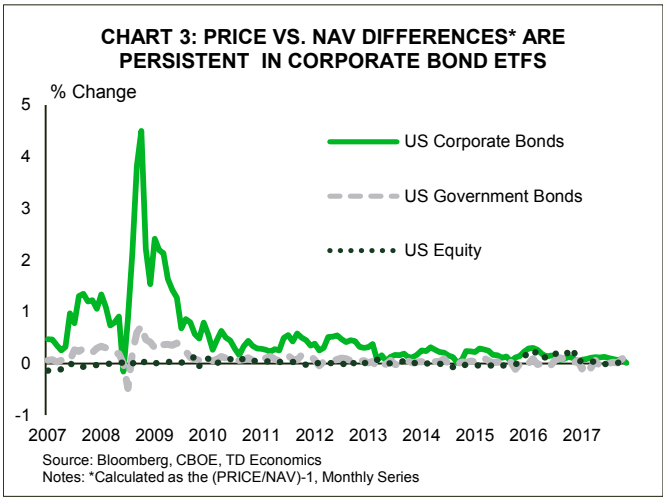
tor base has deepened the market for less liquid assets. Equity-based investments continue to account for the majority of ETF asset holdings, but the fixed-income segment has grown substantially. In the U.S., fixed-income has gone from 5% to 17% of the overall ETF market over the past ten years, with similar trends in Canada and the Euro Area.[2] Rapid market growth is one of the reasons that ETFs have caught the eye of regulators. The other is the concern that trading on ETF exchanges could have destabilizing effects during periods of high volatility.

Still, investment in ETF products makes up a relatively small share of total underlying asset market valuations. In 2017, ETFs accounted for only 6% of the U.S. equity market and 3% of the fixed-income market (chart 2). While absolute share values are small, the threshold for market impact is difficult to quantify. We find that a prolonged financial stress could result in persistent price differentials between ETFs and their underlying assets. In its extreme, this could undermine investors' confidence and result in a contagion to other financial asset classes. To help avoid this, the risks that are unique to the ETF structure should be made more transparent to investors.

Pooled like a Mutual Fund, traded like a stock

ETFs are open-ended investment vehicles that provide exposure to a basket of securities, much like mutual funds. ETF investors enjoy the same jurisdictional authority, compliance, and protection as mutual funds. But unlike mutual funds, ETF shares are traded on an exchange that facilitates transactions through a clearing and settlement process (like a stock market). ETF shares reflect not only the price and liquidity of the underlying securities (in the primary market), but also the supply and demand pressures coming through the exchange (in the secondary market).

Intermediaries – known as Authorized Participants (APs) – operate as broker-dealers to facilitate trade in ETF exchanges. When the demand for ETF shares increases on the exchange, APs notify the fund manager that new shares need to be created. The fund manager provides the AP with units of new ETF shares in return for a basket of securities and cash.[3] If the AP has the assets in inventory, it can simply turn them over to the fund "in-kind". Otherwise, if the AP cannot meet the entire purchase order from its inventory, the assets are purchased in the primary market.



Buyer beware - ETF share prices can get disconnected from the underlying asset prices

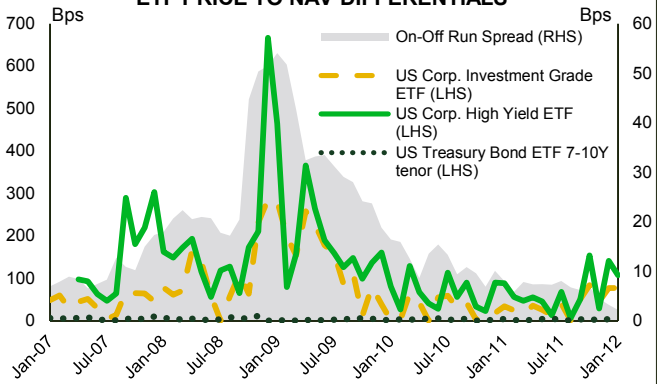
Differentials between the price of the ETF shares in the secondary market and the value of the underlying assets in the primary market provide APs with profitable arbitrage opportunities.[4] Arbitrage trading undertaken by APs brings the price of ETF shares in line with the net asset value (NAV) of the underlying assets. Chart 3 demonstrates that share prices for U.S. equity and government bond ETFs have traded closely in line with the NAV of the underlying assets. This indicates the arbitrage role of APs has been effective for asset classes whose primary markets are as deep and liquid as their secondary ones.

This has not been the case, however, for ETFs comprised of less liquid assets, i.e. assets that cannot be quickly converted to cash. Persistently higher than NAV price reflects complexities associated with managing inventories of underlying assets, such as corporate bonds. As risk increases, APs may require higher compensation for intermediation or engage less in arbitrage operations to reduce strain on their inventories. This may come as a surprise for investors expecting returns benchmarked against the NAV, which in turn could undermine confidence in the ETF asset class and act as an amplifier during times of market stress.

Unique risks

Large, and persistent corporate bond ETF price-NAV differentials reflect several unique risks. First, APs are exposed to timing risk. Transactions in the primary and secondary markets do not take place simultaneously. Bonds are transacted in the over-the-counter (OTC) market, exposing APs to the risk of the price differentials that could erode the profitability of the trade and impact APs' inventories.

CHART 4: MEASURES OF LIQUIDITY INFLUENCE ETF PRICE TO NAV DIFFERENTIALS



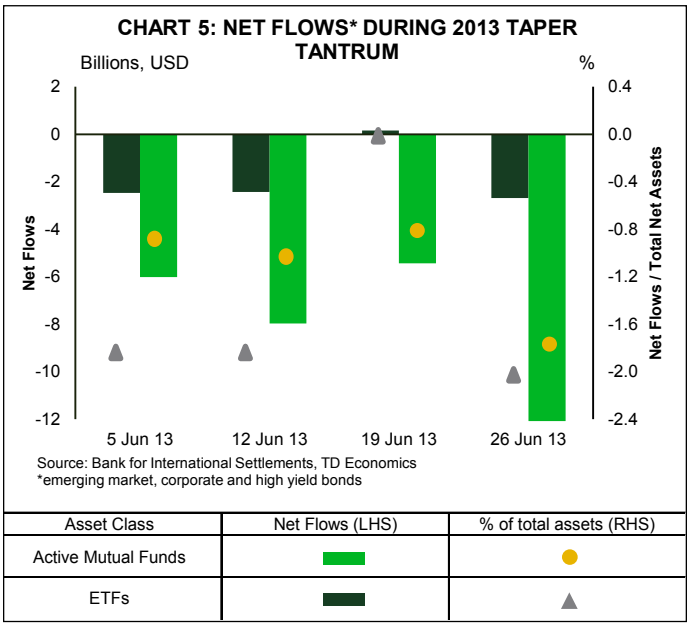
Source: Bloomberg, STLF, FT, TD Economics
ETFs used in analysis: Investment grade: LQD ETF, High Yield: HYG ETF, Government: IEF ETF.
Monthly ETF data transformed to basis points defined as: -10000*(log(1/(1+abs(pnratio_etf))))

Second, APs can face elevated liquidity risk and unpredictable transaction costs during periods of increased uncertainty, when primary market trades have trouble executing at short notice, at a low cost, and with minimal price impact.

This is supported by empirical evidence[5]. Bond ETF price discrepancies can be explained by the VIX and TED spread (the measure of funding liquidity)[6]. By extension, we compared the differentials to the proxy for market liquidity preference - the spread between on-the-run and off-the-run[7] U.S. Treasury yields. As seen in chart 4, on-/off-the-run spread correlated with persistent ETF price-NAV differentials observed between 2007 and 2011. Further, the influence of the spread is stronger for less liquid assets, as liquidity preference was accentuated over the course of these years. The on-/off-the run spread peaked at close to 54 basis points in early 2009, coinciding with a 666 basis point peak in the U.S. high-yield corporate debt ETF price - NAV differential. ETF price - NAV differentials for more liquid U.S. fixed-income assets peaked at much lower levels (286 basis points for investment-grade corporate bonds and 12 basis points for U.S. sovereign bonds).

And last, but not least, risk is captured by low transactions costs and the intra-day trading feature of ETFs that attract investors with short-term horizons. This results in higher turnover than mutual funds and was evident during the "taper tantrum" episode in June 2013. Although in absolute terms the net outflows were greater in active mutual funds, ETF outflows as a percent of total net assets were more volatile than mutual funds over the four-week period (chart 5).

The large outflows during the taper tantrum were accompanied by large ETF price-NAV differentials, especially for less liquid assets. Daily movements in ETF price – NAV differentials for high yield corporate bonds varied between a discount of -1.13% and a premium of 1.07% over the month (chart 6A). By comparison, ETF price – NAV differentials for the more liquid U.S. aggregate



bonds lay within a tighter band of -0.39% discount and 0.18% premium over the same time period (chart 6B). Fortunately, by the end of the four-week taper tantrum episode, the two markets were able to settle, noted by the congruence of daily price-NAV curves by June 26, 2013.

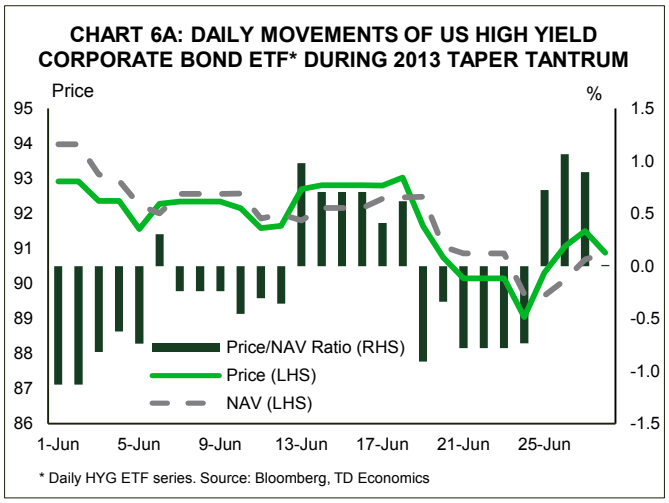
Regulators are concerned

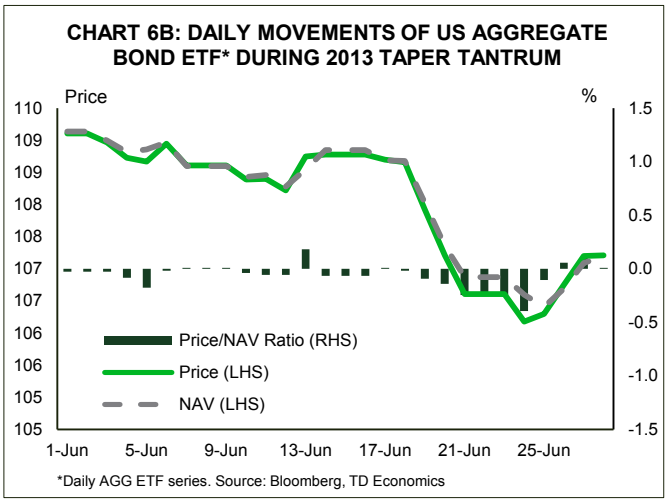
Nevertheless, regulators remained concerned about the potential for ETFs to destabilize financial markets during periods of stress. FINRA observed that "AP activities may also result in pressure on the financial integrity of broker-dealers in some conditions and this, in turn, could impair the liquidity provision function the broker-dealer plays when acting as an AP. "[8] IOSCO investigated the concern that ETFs could lead to disruptions if APs exited the market during periods of volatility. APs are not contractually obligated to ensure that ETF prices are in line with their NAV. As a result, APs may require higher compensation for intermediation in such situations or might decide not to bear the risk, leaving a discrepancy between ETF price and the NAV. For example, Citibank halted redemption of iShares J.P. Morgan USD Emerging Market bond ETF in April 2013 due to internal liquidity constraints. In this instance, other APs stepped up to make the market, alleviating the impact on the underlying asset prices.

IOSCO found that while ETF-specific liquidity management practices are not presently needed, they will consider a wider examination of the concerns within the ETF market.[9] Under extreme market conditions, there is the potential of sizeable and prolonged ETF price - NAV deviations, which presents ETF investors with an additional layer of risk to assess.

Conclusion

Growth in ETFs over the past few years has contributed to the expansion of the credit cycle. By the end of 2017, assets invested in ETFs were six-fold 2008 levels, and shares of the overall asset markets have more than doubled. Investors' search for yield in the prolonged low-interest rate environment has increased demand for more risky, less liquid assets.





There is no doubt that ETFs have a number of advantages like enabling investors to access a broader range of assets with low transaction costs and enhanced liquidity in the secondary market. In periods of low volatility and ample liquidity, trading ETFs enhances liquidity and price discovery. Approximately 77% of daily volume trading in the bond ETF space happens in the secondary market via in-kind transactions, which do not involve liquidation of the underlying assets.[10] In contrast, mutual fund redemptions are met by selling assets in the primary market. ETF exchanges therefore typically have a stabilizing influence on pricing in the primary market.

But, explosive growth means that the resilience of the present-day ETF market has yet to be tested over a contraction phase of the credit cycle. We already have evidence that periods of financial stress can limit the amount of liquidity APs can provide. This factor, together with the potential for rapid outflows sparked by a sudden swing in investor sentiment, could act to accentuate asset price declines.

This is why regulators are pondering how investors can benefit from increased transparency of inventory and liquidity risks when considering ETFs. Understanding these embedded risks, especially the mechanics of market intermediaries, can help investors weigh potential risks against the benefits of asset diversification and lower management fees.

Endnotes:

1. Morningstar, 2017
2. Ibid
3. See Investment Company Institute (ICI): https://www.ici.org/pdf/per20-05.pdf
4. See ICI: https://www.ici.org/pdf/2017_factbook.pdf, page 64
5. Chacko, Das, Fan (2016) http://srdas.github.io/Papers/etfliq.pdf. The the authors constructed an illiquidity measure from ETF price-NAV differentials interpreted as a "continuously compounded rate (quoted in basis points)" to assess the liquidity across ETF asset classes. Using Principal Component Analysis, the authors find the illiquidity measure to be correlated with market illiquidity metrics, including the VIX and TED Spread (U.S. 3M Libor- U.S. 3M Treasury Bill Spread), and find systematic illiquidity in bond markets.
6. TED spread (formed from T-bill and Eurodollar) - the difference between 3-month LIBOR (price for Eurodollar deposits) and 3-month Treasury Bill. An increase in the TED spread is generally indicative of an increase in the interbank funding cost. This is not always the case, as the spread can also be affected by short-term supply/demand dynamics unrelated to funding cost.
7. On-the-run Treasuries are the most recently issued U.S. Treasury bonds and are considered more liquid than off-the-run Treasuries, which were issued before the most recent batch of notes. The spread between on-the-run and off-the-run U.S. Treasury bonds of the same maturity can therefore be considered a proxy for investor liquidity preference.
8. See Financial Industry Regulatory Authority (FINRA): http://www.finra.org/industry/2016-regulatory-and-examination-priorities-letter, page 9
9. See International Organization of Securities Commissions (IOSCO): http://www.iosco.org/library/pubdocs/pdf/IOSCOPD590.pdf
10. See ICI: https://www.ici.org/pdf/2017_factbook.pdf