Exchange-Traded Funds: Evolution of Benefits, Vulnerabilities and Risks

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- The global market for exchange-traded funds (ETFs) has exhibited strong growth in recent years, reaching US$2.3 trillion by the end of 2013. ETFs have clear advantages for investors, such as low-cost portfolio diversification and the liquidity of an exchange-traded product. However, recent disruptions in certain ETF products have highlighted the need to better understand the vulnerabilities and risks associated with this market.
- ETFs are generally perceived by investors as having equity-like liquidity, but in times of stress, this liquidity may prove illusory for some funds. Synthetic ETFs also carry additional counterparty and collateral risk. If any of these risks materialized, it could trigger an investor run, which could negatively impact the underlying market as well as other similar funds.
- The synthetic ETF market in Canada has a high concentration of counterparty risk compared with other jurisdictions. However, given the small size of this market segment, it does not represent a significant vulnerability for the Canadian financial system. Nonetheless, rapid changes in the ETF market imply that authorities need to monitor developments closely.

Introduction

While insulin, poutine and ice hockey have come to exemplify Canadian innovation, perhaps less well known is Canada's pioneering work in the creation of exchange-traded funds (ETFs) in the early 1990s.[1] With close to US$2.3 trillion in assets globally, ETFs have become the fastest-growing investment product worldwide (Deutsche Bank 2014).

An ETF is an investment fund that is traded on a stock exchange. Its popularity is largely attributable to the benefits it provides to investors: the liquidity, ease of trade, and lower cost associated with an exchange-traded product, but with the diversification of a mutual fund. The structure of ETFs also shares certain characteristics with mutual funds; for example, the returns of both these investments are based on the performance of an underlying basket of securities, less a management fee.

However, the rapid growth and innovation in the ETF market may be heightening risks to investors, such as liquidity, counterparty and collateral risk, as well as introducing risks to the financial system. For example, ETFs are generally perceived as having equity-like liquidity; however, in times of stress, this liquidity may prove illusory for some funds.[2] As well, synthetic ETFs, which use derivatives to achieve their intended exposure, offer investors lower management fees but at the cost of additional counterparty and collateral risk. These investor risks may have negative implications for the financial system: if a run on an ETF is triggered, it could amplify selling pressure in the underlying asset market and on other similar funds.[3] The potential for investor runs is heightened for synthetic ETFs and ETFs that provide exposure to less-liquid assets. These risks and the rapid growth of the ETF market have attracted the attention of regulatory authorities globally.[4] In conjunction with these efforts, this report aims to contribute to the ongoing monitoring and analysis of the ETF market.

1 Canada is often recognized as having created the first modern-day exchange-traded fund (ETF). Launched on the Toronto Stock Exchange (TSX) in March 1990, an evolved version of this ETF still trades on the TSX under the symbol XIU. However, in May 1989, the American Stock Exchange and the Philadelphia Stock Exchange offered "shares" that allowed investors to buy or sell an interest in an equity market without having to purchase the individual stocks. Owing to lawsuits by U.S. regulators, the federal court ruled that the shares were actually a futures contract (i.e., a derivative) and therefore could not trade on a stock exchange. While Canada is credited with the creation of the first modern-day ETF, it was in fact the U.S. market that popularized the financial product we see today with the launch of a Canadian-style ETF—the SPDR S&P 500 or "Spider"—in January 1993.

2 Equities themselves, like any other asset class, can also experience market volatility and decreases in liquidity if shocks occur.

3 An investor run on an ETF occurs when a large number of investors try to sell their shares simultaneously because they believe the share price will decrease for reasons other than normal market behaviour.

4 Since 2011, organizations such as the International Monetary Fund (IMF), the International Organization of Securities Commissions (IOSCO), the Financial Stability Board (FSB) and the Bank for International Settlements (BIS) have intensified their scrutiny of the risks associated with ETFs.

The report begins by providing an overview of the ETF market and goes on to describe the trade-offs between investor benefits and risks, as well as the potential implications for the financial system. It concludes with a discussion on how regulations have influenced the evolution of these risks in various jurisdictions, including Canada.

Overview of the Market for Exchange-Traded Funds

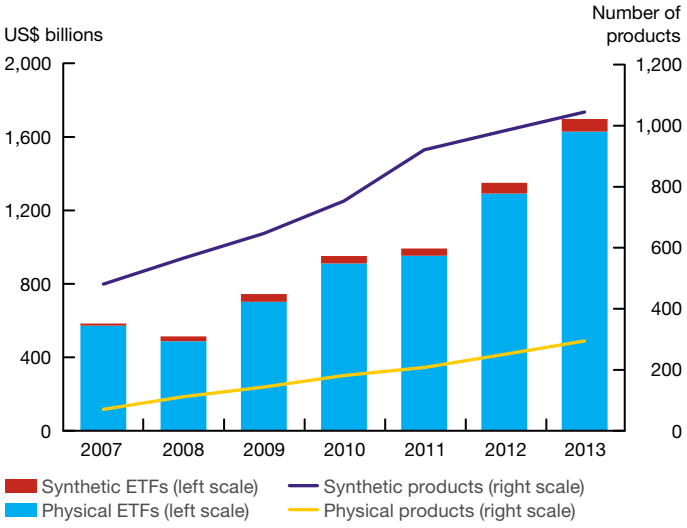
ETF products and global trends

ETFs can be classified into two broad categories: physical and synthetic. Physical ETFs hold individual securities or physical assets (such as commodities); synthetic ETFs use derivatives to replicate the exposure of physical ETFs. For example, a physical ETF that tracks the performance of the S&P 500 would hold individual stocks in proportion to the index. The synthetic version of that same ETF might use a total return swap (TRS) to provide exposure to the S&P 500. With a TRS, the ETF provider would rely on a swap counterparty, typically a financial institution, to replicate the total returns of the S&P 500 (the structure of swap-based synthetic ETFs is described in more detail on page 40).[5]

The United States and Europe represent the two largest ETF markets in the world, with assets estimated at US$1.7 trillion and €288 billion (or US$395 billion), respectively. Synthetic ETFs account for an estimated 33 per cent of the European ETF market but only 4 per cent of the U.S. ETF market (**Chart 1** and **Chart 2**).

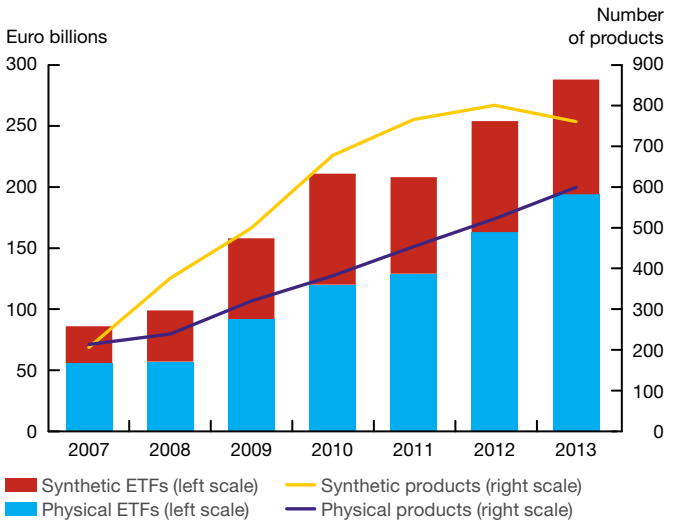
In line with global trends, the Canadian ETF market has exhibited strong growth in recent years, reaching Can$72 billion in assets in July 2014 (**Chart 3**). In relative terms, the Canadian ETF market is about one-tenth the size of the mutual fund market—this is comparable with the relative size of the ETF market in the United States (IFIC 2014; ICI 2014). Canadian investors also increased their holdings of U.S.-listed ETFs to approximately Can$16 billion as of June 2014 (**Chart 4**).[6] While physical ETFs are the dominant product in the Canadian marketplace, synthetic ETFs are estimated at Can$3.2 billion in assets; Canadian investors also hold U.S.-listed synthetic ETFs estimated at Can$500 million.

Chart 1: Physical ETFs dominate the U.S. ETF market



Sources: Morningstar and Bloomberg, based on Bank of Canada calculations
Last observation: December 2013

Chart 2: A large share of the European ETF market consists of synthetic products

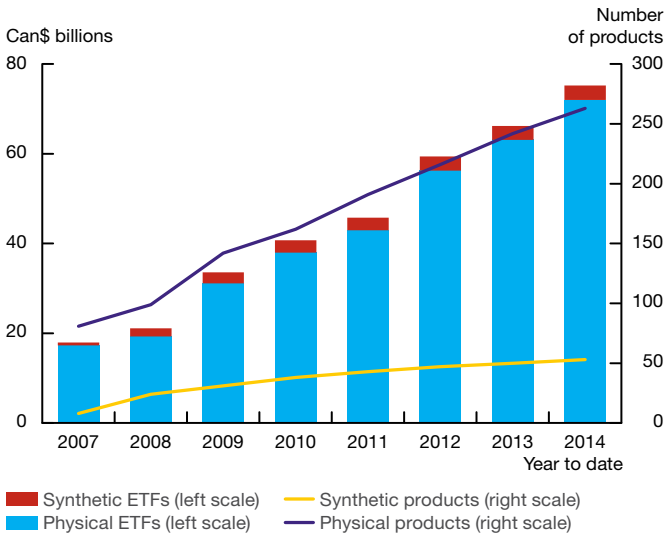


Sources: Deutsche Bank and Bloomberg, based on Bank of Canada calculations
Last observation: December 2013

5 The term "synthetic ETF" describes any ETF that uses derivatives such as total return swaps, forwards and equity options to achieve its investment strategy. For the purpose of this report, we focus primarily on swap-based ETFs. Leveraged ETFs, which seek to double or triple the daily returns of their benchmark index, use an economically equivalent "swap" arrangement through the use of forwards. This type of ETF structure has risk characteristics similar to those of a total return swap in Canada.

6 Canadian investors may purchase U.S.-listed ETFs for various reasons. For retail investors, the U.S. ETF market offers a wider variety of products at a potentially lower cost. For institutional investors, it may be easier to trade in ETFs with more volume.

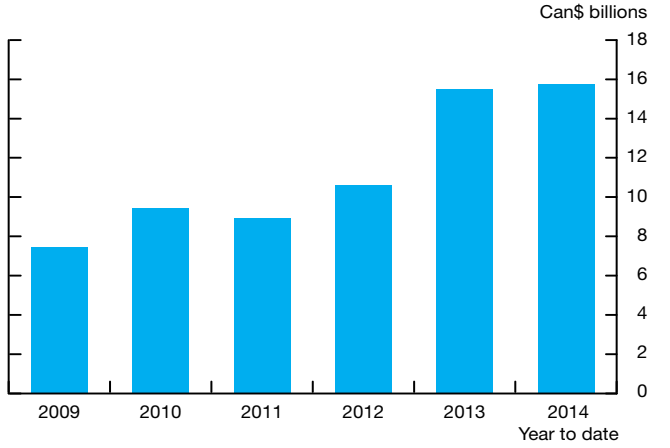
Chart 3: Physical ETFs dominate the Canadian ETF market



Sources: Morningstar and Bloomberg, based on Bank of Canada calculations

Last observation: July 2014

Chart 4: U.S.-listed ETFs held by Canadian investors have increased

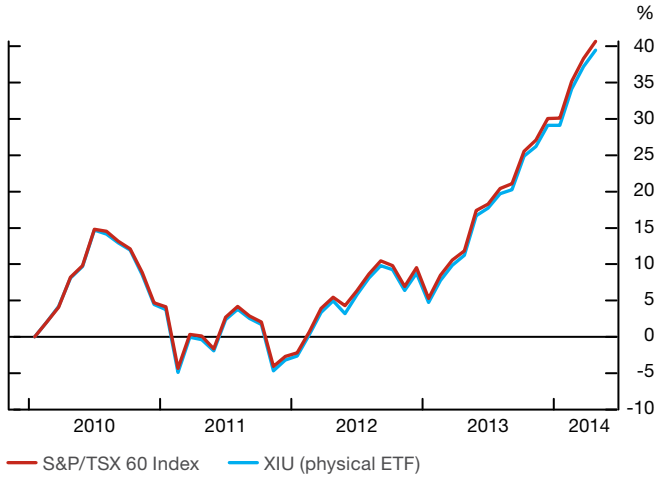


Source: Investor Economics

Last observation: June 2014

Chart 5: Passive physical ETFs closely track the return on underlying assets

Cumulative returns, monthly

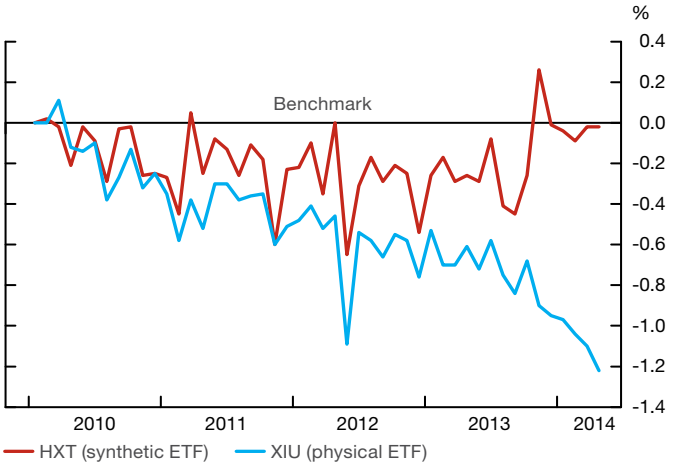


Source: Bloomberg, based on Bank of Canada calculations

Last observation: August 2014

Chart 6: Synthetic ETFs track returns more closely than physical ETFs

Cumulative underperformance of ETFs versus the benchmark, monthly



Source: Bloomberg, based on Bank of Canada calculations

Last observation: August 2014

Benefits of exchange-traded funds

Given that the ETF market has more than tripled in size over the past five years, it is evident that investors value the benefits of these products, including low management-expense ratios and the liquidity of an exchange-traded product.[7] Most ETFs have a "passive" investment strategy in that they try to replicate their benchmark. A passive investment strategy follows its benchmark's returns very closely, minus its tracking error.[8] In contrast, leveraged or actively managed ETFs are designed to outperform their stated benchmark.

For example, an investor who compared the returns of the iShares S&P/TSX 60 Index (XIU) physical ETF—one of the most popular ETFs in Canada—with the returns of the S&P/TSX 60 Index itself would find that the iShares ETF has deviated from its benchmark by only 1.2 per cent on a cumulative basis over a four-year period (**Chart 5**). Synthetic ETFs, such as Horizon's S&P/TSX 60 Index (HXT), are even more efficient at tracking their benchmark, with a deviation of only 0.02 per cent (**Chart 6**).

7 The average ETF expense ratio is 0.6 per cent, compared with 1.3 per cent for mutual funds (Morningstar 2014).

8 Tracking error is a measurement of how much the return on an ETF deviates from the return on its benchmark index. Trading and management costs represent one of the largest sources of tracking error.

An ETF is able to closely track its benchmark through its unique share-creation/redemption process, which allows the number of outstanding ETF shares to fluctuate on a daily basis to reflect investor demand. This ensures that the ETF share price more accurately reflects the value of the underlying assets. The motivation to create or redeem shares stems from whether the ETF is trading at a premium or a discount to the net asset value (NAV) of the underlying assets. ETFs typically have multiple authorized participants (APs)—usually financial institutions—that are responsible for creating and redeeming shares with the ETF provider.[9] As a result, an ETF's liquidity depends not only on the supply and demand for ETF shares on the exchange, but also on an orderly share-creation/redemption process. (For more information on the role of an AP and its process for creating and redeeming shares, see **Box 1**.)

9 For example, if the share price of an ETF trades higher than its net asset value (i.e., at a "premium"), the AP may have an incentive to create shares by buying the underlying assets, exchanging them for ETF shares, and selling those ETF shares in the market, which would drive the ETF share price down, closer to its NAV. Conversely, when an ETF's share price is trading lower than its NAV (i.e., at a "discount"), the AP may purchase the ETF shares in the market and redeem them with the ETF provider in exchange for the underlying assets. This would raise the ETF share price closer to its NAV.

Box 1

The Mechanics of the Share-Creation/Redemption Process for Physical and Swap-Based Synthetic Exchange-Traded Funds

The share-creation/redemption process for exchange-traded funds (ETFs) is what makes this investment product unique among pooled investment funds.

Physical ETFs

Before an investor can purchase a share in an ETF, shares must be created and delivered to an exchange by an authorized participant (AP) (**Figure 1-A**). To create an ETF share, the AP deposits a basket of securities with the ETF provider, which then issues a specific number of ETF shares to the AP (the primary market). The AP can then either keep the shares or sell some of them on an exchange, making them available to investors (the secondary market). This process can also work in reverse as APs can redeem their shares with the ETF provider in return for securities. APs provide a central market-making function that allows ETFs to derive some of the benefits that distinguish them from traditional mutual funds (e.g., greater liquidity and a share price that is closer to the value of the underlying assets).

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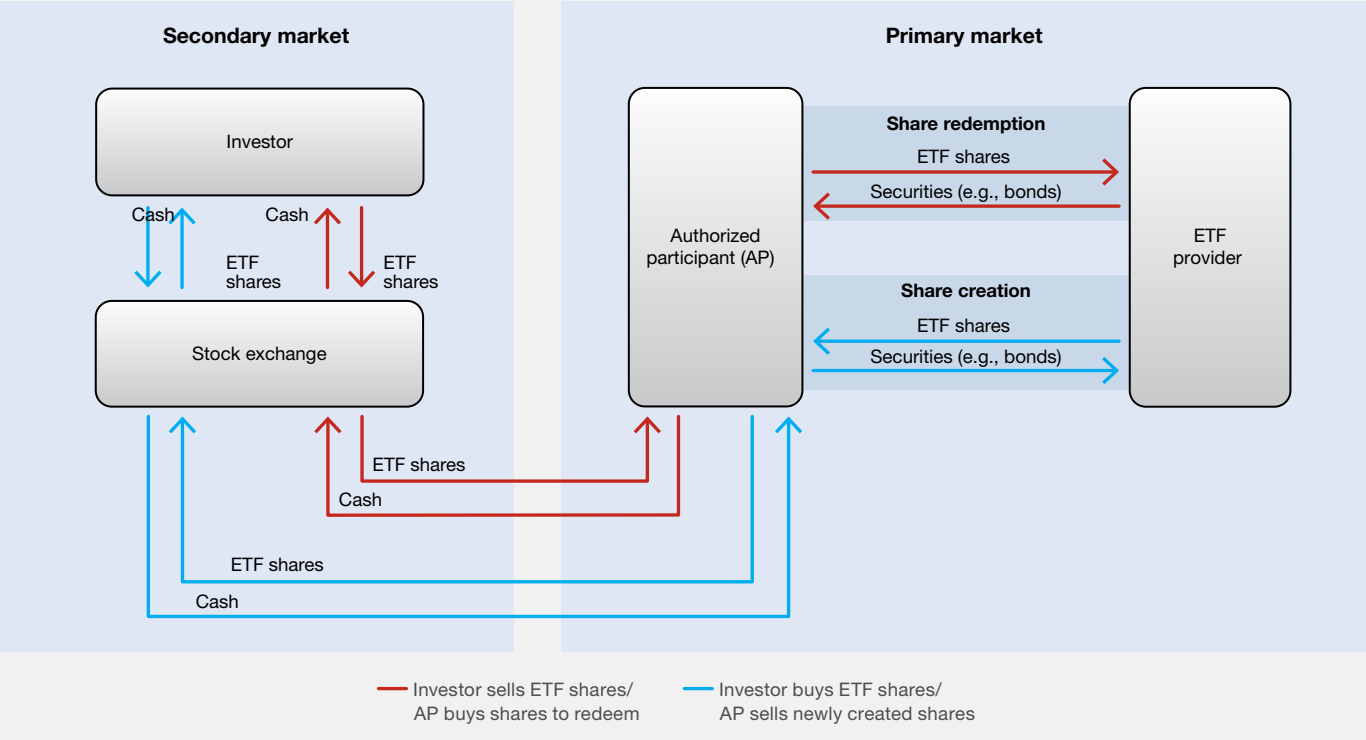
Figure 1-A: Physical ETFs—Simplified Process for Creating and Redeeming Shares



Box 1 *(continued)*

Swap-based synthetic ETFs

Unlike a physical ETF, a swap-based ETF provider does not hold the basket of underlying securities. Instead, the ETF provider enters into a derivatives contract, known as a total return swap (TRS), with a counterparty (**Figure 1-B**).[1] The swap counterparty delivers the total returns (including dividends) on the ETF's stated investment strategy (e.g., replicating the S&P 500 index) to the ETF provider in exchange for an agreed funding rate, typically based on a reference rate (e.g., LIBOR) plus a spread. The ETF provider issues newly created shares to an AP in exchange for cash. With the cash, the ETF provider invests in collateral; the interest earned on the collateral typically covers the cost of the swap.

To meet share redemptions, the ETF provider sells the collateral in return for the ETF shares. The swap counterparty plays no role in the share-creation/redemption process. The only obligation of the swap counterparty is to pay the return on the index or underlying basket of assets it is contracted to replicate for the investors.

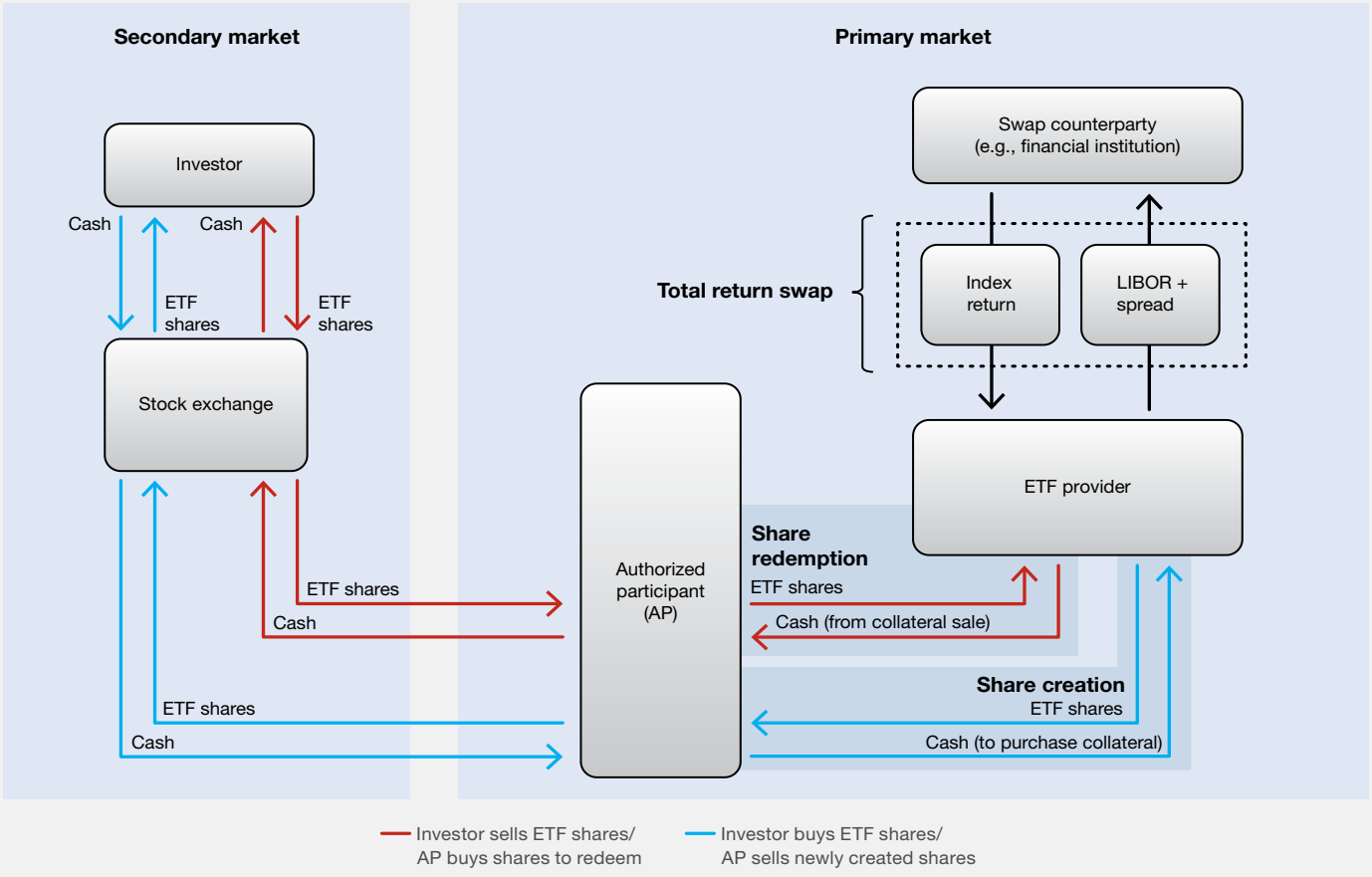
At any time, the value of the ETF consists of the combined value of the collateral and the marked-to-market value of the swap. For the ETF's swap counterparty, the motivation for entering into a TRS arises from the synergies with its normal banking activities (for example, to hedge exposures to existing trading-book positions), low-risk fee generation and economies of scope (e.g., tax and regulatory benefits).

Based on standard market practices for interest rate swaps, if a swap counterparty terminates a TRS contract early, it must cover any decline in the value of the index it tracks from the last date when an exchange of payment occurred (i.e., the reset date), and usually pays an early exit fee (or replacement cost for a new swap).[2]

1 Based on typical market practice, a swap counterparty buys a fresh portfolio of assets for every new total return swap it enters, in order to tailor the basket to the specific risk profile sought by the ETF provider. In some cases, banks may opt to borrow rather than purchase the assets outright. Banks sell this basket of assets upon the termination or expiration of the TRS contract.

2 Determining the value of early termination payments is difficult and is largely dependent on the terms of the swap contract, the performance of the underlying asset at the time of termination (including its liquidity) and the nature of the negotiations between the counterparties.

Figure 1-B: Swap-Based Synthetic ETFs—Simplified Process for Creating and Redeeming Shares



Another major benefit of ETFs is that they facilitate the diversification of investor portfolios. Through ETFs, investors can now gain low-cost exposure to asset classes such as corporate bonds and commodities that previously were only accessible to institutional or high net worth investors. More importantly, retail investors can now use ETFs to broaden their diversification to markets, such as emerging-market assets and real estate.

Risks to Investors and the Financial System

Investors have realized tangible benefits from the introduction of ETFs. Yet, despite these benefits, ETFs also carry risks for the investor. While all ETFs exhibit price fluctuations and liquidity risk, certain ETFs also pose counterparty and collateral risk to investors. If any of these risks materialized, an investor run could be triggered, which could have a negative effect on the financial system. While liquidity risk is common across all types of ETFs, additional counterparty risk and collateral risk can be found in synthetic ETFs.[10]

Liquidity risk

Authorized participants (APs) provide an essential market function that allows ETFs to derive some of their advantages over traditional mutual funds (e.g., greater liquidity and a share price that is closer to the value of the underlying assets). However, APs can also transmit liquidity shocks from the ETF to the underlying assets (and vice versa). As ETFs and the underlying market become more interconnected, a small liquidity shock originating in either the ETF or the underlying securities could be amplified through a feedback loop (via APs). This could result in a large liquidity shock and a reduction in price informativeness for both the ETF and the underlying market (Cespa and Foucault 2014).

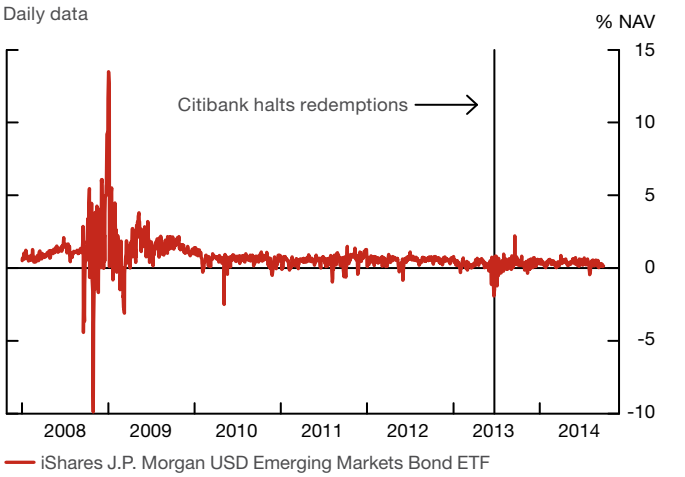
While ETFs are typically priced based on their underlying securities, the underlying securities of ETFs that track less-liquid securities, such as high-yield bonds, may also be priced off the ETF, since it trades more frequently (Tucker and Laipply 2012, 2013). Given that the price of the underlying securities is a source of information for the price of an ETF, a shock to the underlying securities (e.g., an increased fear of corporate defaults) raises uncertainty for the APs, which could lead them to halt redemptions for prolonged periods of time. Should this price-discovery mechanism between the ETF and the underlying market break down, this shock to the ETF (via the halt in redemptions) can then feed back to the underlying market. The effect on the underlying market is then amplified, since investors in this market have lost a key source of information to price their securities.

A liquidity shock to an ETF can also occur if multiple APs halt redemptions for reasons other than a shock to the underlying securities. For example, if the APs are balance-sheet constrained owing to their other banking activities (e.g., regulatory constraints on capital, equity or leverage), they may have to halt redemptions.

In both scenarios, whether a shock originates in the underlying securities or from the AP itself, an ETF may trade at a discount to its NAV. While short periods of discounts to the NAV are not a major concern (since they may be a result of the price-discovery process), there is a potential risk for large discounts to the NAV to persist and to worsen over time. If investors believe that a prolonged halt in redemptions might occur, an investor run could be triggered as it could create a perceived first-mover advantage. This selling pressure would further aggravate the discount to the NAV, increasing the probability of contagion to the underlying market and to other similar ETFs. As more investors herd into ETFs based on less-liquid assets in their search for yield, it is more likely that a run event may be amplified (U.S. FSOC 2013).

A breakdown in the redemption process by an AP is not a hypothetical event (Massoudi, Braithwaite and Foley 2013). One of the most recent redemption failures took place during a period of market volatility in June 2013, when Citibank (an AP) refused to redeem shares to avoid exceeding its balance-sheet-risk limits. In this case, Citibank's refusal to provide redemptions did not create a large discount to the NAV for its ETFs, since other APs were able to step in and redeem shares (**Chart 7**).[11] However, in times of market stress, such as the 2008

Chart 7: Less-liquid ETFs price at larger discounts to their NAV in times of stress



Source: Bloomberg, based on Bank of Canada calculations

Last observation: 23 September 2014

10 Some physical ETFs may be exposed to counterparty and collateral risk if they engage in securities lending.

11 Citibank was identified as an authorized participant for the iShares J.P. Morgan USD Emerging Markets Bond ETF as of April 2013 (Blackrock 2013).

financial crisis, certain ETFs temporarily had large discounts to their NAV, which could have been exacerbated in a scenario where APs halted redemptions.

Counterparty risk

Synthetic ETFs predominantly rely on swap counterparties to provide their underlying asset exposure (e.g., via a TRS). While the main benefit of synthetic ETFs is that they offer a lower tracking error than physical ETFs, the trade-off is that investors are exposed to collateral and counterparty risk.

Swap transactions are typically terminated automatically if a counterparty defaults or its credit rating falls below a pre-specified level. Should the swap counterparty default, the ETF provider may be able to replace the swap with a new counterparty. However, if a replacement swap is not secured, the ETF provider would have to liquidate its collateral in an attempt to either (i) physically purchase the underlying securities that it is trying to replicate in its investment strategy or (ii) close the fund. Both of these options may expose investors to potential losses through the forced liquidation of collateral. This risk to investors is heightened if there is a concentration of counterparty risk (i.e., a single swap counterparty). In addition, risks to the financial system could be higher if multiple ETFs rely on the same counterparty.

A deterioration in a counterparty's creditworthiness has the potential to create an investor run if some investors try to pre-empt the possibility that a swap cannot be replaced.[12] Even in a scenario where there are multiple swap counterparties to the ETF, if one of those counterparties defaults, the possibility of an investor run may still be present. As noted by the Bank for International Settlements, synthetic ETFs have yet to be tested by large investor redemptions and do not have liquidity risk-management tools to restrict investor withdrawals (e.g., "gating" techniques such as those used by hedge funds in times of market stress) (Ramaswamy 2011).

Collateral risk

At any time, the value of a synthetic ETF consists of the combined value of the collateral and the marked-to-market value of the swap. Because the counterparties in a swap transaction do not exchange notional values of the underlying basket of securities, most of the value for investors resides in the assets held in the collateral account of the ETF. An investor in a synthetic ETF is exposed to the market value of the collateral used to secure the TRS in two ways. First, given that the interest received from the collateral is used to cover the funding rate (i.e., the cost) of the swap, the investor is exposed to interest rate risk if the funding cost for the swap exceeds the interest generated by the collateral. Second, if the value of the collateral falls, it could decrease the price of the ETF; liquidation of collateral could also put downward pressure on prices in the underlying asset market. This effect will be more pronounced with less-liquid collateral.

Potential system-wide risks

In principle, if any of the above risks were to materialize, they could amplify or transmit shocks through the financial system. If a physical ETF is based on less-liquid securities (e.g., corporate bonds), a liquidity shock in the underlying asset market could transmit to the ETF. Alternatively, a liquidity shock can originate in the ETF itself; as APs provide their services to multiple ETFs, a redemption halt could affect a number of funds simultaneously. In a worst-case scenario, this could trigger investor runs on the ETFs and similar funds (e.g., mutual funds). These events could then feed back to the underlying asset markets, amplifying the initial shock and propagating beyond the ETF market.

For synthetic ETFs, counterparty and collateral risk are a greater concern to the financial system—especially where there exists a concentration of counterparty risk. If investors believe that a significant swap counterparty may have its swaps terminated, it could trigger investor runs on multiple ETFs, potentially spilling over to other related ETFs. In a default scenario of a swap counterparty, ETFs may be forced to liquidate their collateral; if the ETFs are large enough, the immediate sale of their collateral could affect the asset market of the collateral. Alternatively, if synthetic ETFs are holding less-liquid or low-quality collateral, a shock to the collateral's asset market could trigger investor runs on those ETFs as investors try to sell their shares before the decline in the value of the collateral decreases the share price. This would create redemption pressure, leading to an amplification of the initial shock to the asset market of the collateral.

Regardless of the ETF product involved, an investor run would have a negative impact on overall investor confidence in the market. A loss of this confidence would further exacerbate market volatility and amplify selling pressure on ETFs and their underlying assets.

Regulatory Developments and Implications for the Financial System

The market structure and regulatory framework governing ETFs have had a significant impact on how risks have evolved in various jurisdictions.

12 According to Baba, McCauley and Ramaswamy (2009), institutional investors would likely be the first to run when markets question the solvency of a fund provider, which could trigger a broader run on other similar funds.

United States and Europe

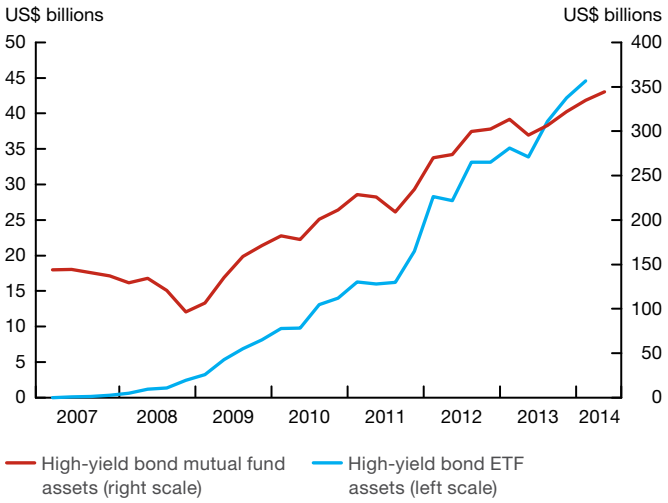
In the United States, which has the largest and most-liquid ETF market in the world, regulators have closely monitored the rapid innovation in the sector and have modernized the rules governing ETFs, especially with regard to counterparty and collateral risk. For example, the limited growth of synthetic ETFs in the United States is due in part to regulatory standards that limit the use of derivatives to replicate underlying indexes and promote the adoption of sound market practices, such as the use of multiple counterparties in swap agreements.[13] Additionally, in March 2010, the Securities and Exchange Commission imposed a moratorium on new synthetic ETFs that use swaps.[14]

While European synthetic ETFs grew in popularity between 2006 and 2010, a gradual shift toward physical ETFs took place between 2011 and 2013, driven in part by new guidelines on ETFs issued by the European Securities and Markets Authority.[15] Despite the size of synthetic ETFs in Europe, regulators limit counterparty risk to 10 per cent of the ETF's NAV, suggesting that investors would have a cap on their initial losses if a swap counterparty defaulted.[16] In addition, and similar to swap arrangements in the United States, most synthetic ETFs have multiple counterparties for a single swap. Despite these regulatory controls, the synthetic ETF market in Europe continues to represent a source of risk to investors and the financial system and, as such, is monitored closely by local regulators.

In the United States, the growth of ETFs based on less-liquid assets such as high-yield bonds represents a greater risk. U.S. high-yield bond ETFs now account for approximately 3 per cent of the outstanding U.S. high-yield bond market. While the market share held by ETFs is not large, there is a risk that a sell-off could spill over to the underlying bond market, triggering a sell-off in the much larger high-yield bond mutual fund market (**Chart 8**). According to J.P. Morgan, during sell-off periods, outflows from high-yield bond funds are generally led by the ETF sector, partly owing to the larger presence of hedge funds (or "fast money").[17] Therefore, sophisticated institutional investors likely monitor high-yield ETFs closely in times of stress. Should ETFs face a sudden sell-off and APs halt redemptions, ETF outflows could quickly transmit to the underlying market, which could also trigger or aggravate outflows from bond mutual funds and amplify the impact on the financial system.

Chart 8: U.S. high-yield bond fund assets have increased rapidly in recent years

Quarterly



Sources: Thomson Reuters LPC and Morningstar, based on Bank of Canada calculations

Last observation: 2014Q2

Canada

In Canada, provincial securities commissions regulate the ETF market. Canadian ETFs are classified as "exchange-traded mutual funds in continuous distribution" and, as such, are subject to the same regulations as mutual funds, including rules governing the use of derivatives.[18] Much like the United States, Canada has not experienced notable growth in synthetic ETFs. While there is no regulation specifying the collateral composition of synthetic ETFs, strong collateral-management market practices prevail in Canada.[19] However, certain

13 Under the U.S. Investment Company Act of 1940, an investment fund can invest no more than 25 per cent of its total assets with a single issuer for 50 per cent of the fund's assets. With respect to the remaining 50 per cent of the fund's assets, no more than 5 per cent may be invested in a single issuer. Although the application of this framework is somewhat unclear with respect to swaps, as a matter of practice, funds typically consider the counterparty to be an issuer for purposes of compliance with these regulations. As a result, funds that rely heavily on swaps typically use multiple counterparties (ICI 2011).

14 In December 2012, the Securities and Exchange Commission announced that it would lift part of its moratorium on applications for new, actively managed ETFs that use swaps.

15 According to Morningstar (2012), European regulation prior to 2011 allowed banks sufficient flexibility to post lower-quality and less-liquid collateral when they serve as swap counterparties.

16 This is based on the European Union UCITS III directive (2009/65/EC).

17 Based on 13F regulatory filings, it is estimated that hedge funds make up close to 31.5 per cent of the investor base in high-yield ETFs, the largest share among all asset classes. In comparison, the ownership rate of hedge funds for the top five investment-grade bond ETFs is approximately 17 per cent (J.P. Morgan 2014).

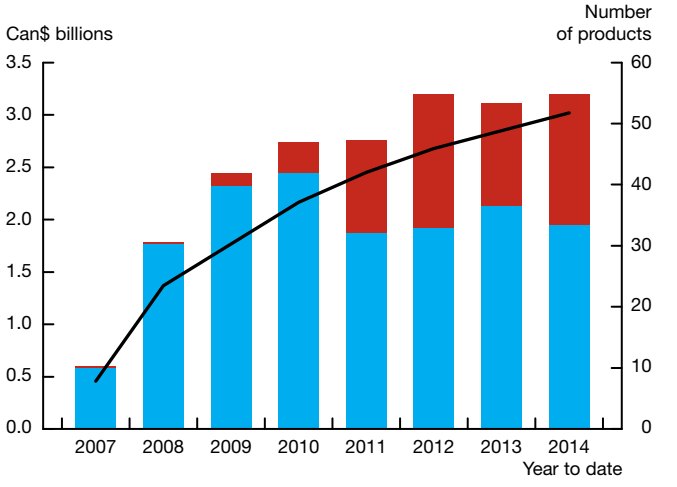
18 This classification of ETFs is established under National Instrument (NI) 81-102 provided by the Canadian Securities Administrators. ETFs that employ leveraged strategies or are backed by commodity pools can be exempt from 81-102 and are subject to NI 81-104. For fund disclosure requirements, ETFs must also be compliant with NI 81-106.

19 For swap-based synthetic ETFs in Canada, ETF providers typically hold high-quality short-term money market instruments as collateral (Pallaris 2011).

existing synthetic ETFs are currently backed by less-liquid collateral or collateral unrelated to the investment strategy of the ETF.

A greater concern in the Canadian synthetic ETF market relates to the concentration of counterparty risk. As in Europe, Canadian regulations specify that an investor's exposure to a counterparty default cannot exceed 10 per cent of its NAV. However, a majority of synthetic swap-based ETFs in Canada use a single counterparty to provide their synthetic exposures, concentrating all counterparty risk with one entity. Given the concentration of counterparty credit risk in Canada, a default by a swap counterparty would lead to the simultaneous termination of swap contracts backing multiple synthetic ETFs.[20] Currently, Canadian synthetic ETFs using swaps have an estimated Can$2 billion in assets (**Chart 9**).[21] An affected ETF would have three options: (i) find a replacement swap; (ii) liquidate the collateral and use the remaining funds to physically purchase the underlying index; or (iii) liquidate the collateral and return the remaining funds to investors (i.e., close the ETF). This concentrated counterparty risk could be mitigated with multiple swap counterparties or backup swap agreements.

Chart 9: Canadian synthetic ETF assets remain a small market



a. "Other synthetics" use futures, currency forwards or equity options as part of the ETF's investment strategy, and usually complement a portoflio of securities. This is in contrast to swap-based ETFs that use a single derivatives instrument (i.e., a total return swap) to provide the desired exposure.

Sources: Morningstar and Bloomberg, based on Bank of Canada calculations
Last observation: July 2014

20 Securities law in Canada requires that counterparties providing a forward structure or swap agreement maintain a designated rating by a designated rating organization (e.g., single "A" by DBRS). For example, if a swap counterparty is downgraded below the designated rating, it could be considered a "technical default," which would automatically terminate all of that counterparty's swap contracts.

21 In Canada, 38 of 42 swap-based ETFs employ forward agreement "swaps" as a replication method, whereas the remaining four funds use total return swaps. The prevalence of forward agreement "swaps" is largely owing to their favourable tax treatment.

In terms of liquidity risk, less-liquid ETFs such as high-yield bond funds represent a small segment of the ETF market in Canada (estimated at Can$3.9 billion). More importantly, many of the underlying high-yield bonds in Canadian ETFs are U.S. assets, suggesting that any sell-off of these Canadian ETFs would have limited implications for the Canadian bond market. However, Canadian ETFs that hold U.S. bonds could transmit a liquidity shock originating from the U.S. bond market to the Canadian ETF.

Conclusion

Exchange-traded funds (ETFs) generate significant benefits for investors, such as low-cost portfolio diversification and the liquidity of being traded on an exchange. However, they also introduce a number of new risks that may have implications for the financial system. While ETFs are generally perceived by investors as having equity-like liquidity, their structure is heavily reliant on authorized participants for this liquidity. The underlying asset market against which ETF shares derive their value may also be less liquid. Synthetic ETFs also carry additional counterparty and collateral risk. While ETFs have so far proved resilient in times of market stress (including the 2008 financial crisis), if any of these investor risks materialized, it could trigger an investor run, which could amplify shocks and negatively impact the underlying asset market and other similar ETFs.

The regulatory framework in major ETF markets has evolved alongside the growth and innovation of ETFs. However, different jurisdictions continue to face challenges unique to their markets. Given the past growth of synthetic ETFs in Europe, counterparty and collateral risk are being monitored, especially in light of the experience of European banks during the sovereign debt crisis. In the United States, the growing share of less-liquid ETFs suggests that riskier segments of the credit market, such as high-yield bonds, may be vulnerable to liquidity shocks. Owing to the high level of integration between the Canadian and U.S. financial markets, Canadian bond and equity markets would likely not be immune to liquidity shocks occurring in the United States. In addition, the synthetic ETF market in Canada has a concentration of counterparty risk, which could have implications for the financial system in the event of counterparty credit concerns. However, given the small size of this market segment in Canada, this is not a significant vulnerability for the Canadian financial system. Nevertheless, with the rapid changes in the ETF market, authorities need to monitor developments closely.

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