

Securities Financing and Bond Market Liquidity

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- Securities-financing transactions, including repurchase agreements and securities-lending agreements, are essential to market liquidity. They enable dealers to borrow and reuse securities efficiently or to fund purchases of securities.
- The importance of the securities-financing market for bonds is growing in Canada. Monthly trading volume in the 5-year benchmark Government of Canada bond increased from 5 times its quantity outstanding in 2010 to over 10 times that amount in 2015.
- The nature of the link between the securities-financing market and bond market liquidity is likely changing as a result of financial sector reforms and the low interest rate environment. The development of the repo central counterparty in Canada and the implementation of the Basel III regulatory framework are changing the incentives for conducting specific types of securities-financing transactions. For example, the new liquidity requirements provide more incentive to conduct longer-maturity transactions. The current low level of the overnight interest rate also diminishes the incentives for timely settlement of securities-financing transactions.
- The Bank of Canada plays a role in supporting securities financing and will continue to monitor how the market for securities financing is supporting the resilience of the financial system and how this market is adapting to new conditions.

Introduction

Financial market participants enter securities-financing transactions (SFTs) to obtain cash or securities using either of those instruments as collateral. These transactions share several features with collateralized loans: the borrower makes interest payments and, at the end of the loan period, the principal and collateral are returned to their respective owners. The most common types of SFTs are repurchase agreements (repos) and securities-lending agreements (see **Box 1** for definitions of

Box 1

Terminology for Securities-Financing Transactions

Repurchase agreement (repo): A contract in which a borrower agrees to sell and later repurchase a security. It is equivalent to collateralized borrowing.

Reverse repo: A repo contract from the perspective of the lender. If bank one is conducting a repo with bank two, then bank two is conducting a reverse repo with bank one. Bank two agrees to purchase and later resell a security.

Securities-lending agreement (sec lending): A contract in which a borrower obtains a specific security in exchange for cash or securities pledged as collateral.

General collateral repo (GC repo): A repo contract in which the collateral can be any security in a menu of

acceptable collateral. In Canada, the most common type of GC repo uses a list of Government of Canada securities.

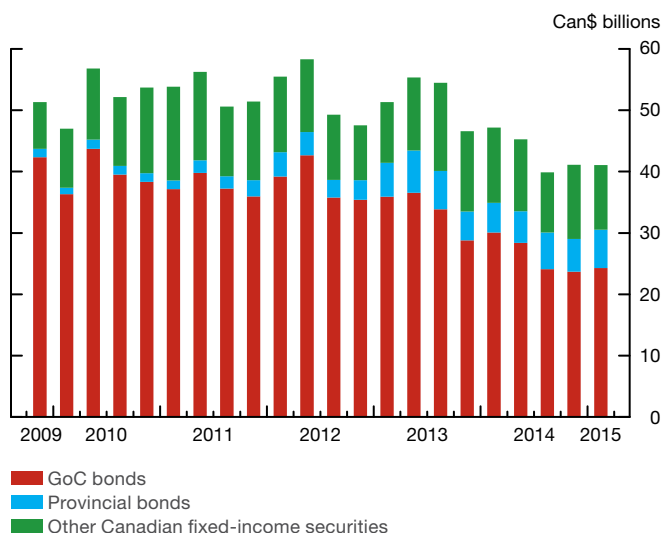
Specific repo: A repo contract in which the collateral is a specific security. A specific repo is similar to a securities-lending agreement in that it is originated by a market participant seeking to borrow a particular security.

Repo settlement failure: The event in which the counterparty that receives the security in a repo fails to return it on the maturity date of the contract.

Haircut: The difference between the market value of securities pledged in a securities-financing transaction and the initial purchase price. A haircut is economically equivalent to a margin.

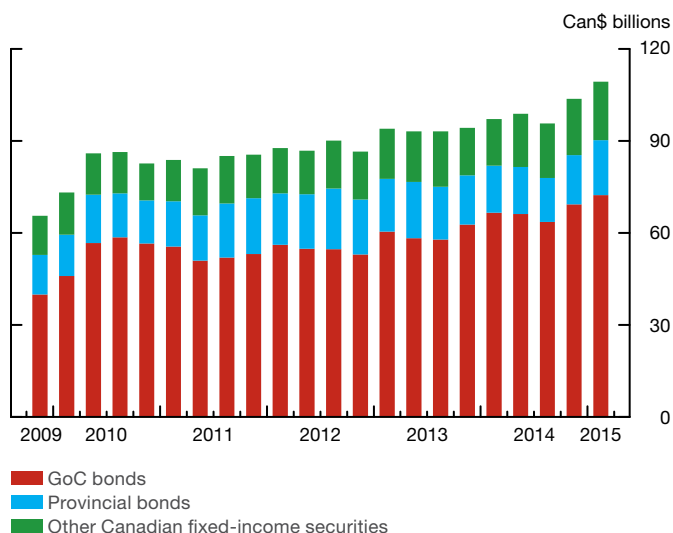
Chart 1: The majority of securities-financing transactions use Government of Canada (GoC) bonds

a. Repurchase agreement volumes by collateral type, quarterly average of daily trading volume



Sources: Canadian Depository for Securities Ltd. and Bank of Canada

b. Security loans outstanding by issuer, quarterly average of daily stock outstanding



Sources: Markit and Bank of Canada calculations

Last observation: 2015Q1

terminology used in SFT markets). The market for SFTs supports bond market liquidity by enabling financial institutions, particularly securities dealers, to engage in two types of borrowing: (i) borrowing funds to satisfy the typical short-term funding needs of a financial institution, and (ii) borrowing and reuse of securities to satisfy client requests to trade or to take a short position. A key feature of SFTs is the reuse of securities, either through outright sales or through further securities-financing transactions.

SFTs play a role in markets beyond their support for market liquidity because they make it possible for investors to engage in a variety of trading strategies. For example, SFTs help investors take leveraged positions by enabling them to borrow cash to purchase additional securities. SFTs also allow institutions to take speculative positions on securities and obtain short-term funding, as well as hedging and managing interest rate risk.

Over the past 20 years, the securities-financing market (SFT market) has grown to about \$450 billion outstanding (across all securities) in Canada.¹ The growth and size of the repo market and the securities-lending market are similar.

Daily trading volume in the repo market typically averages between Can\$40 billion and Can\$60 billion, mostly backed by Government of Canada (GoC) bonds (Chart 1a). Trading volume is lower in the

securities-lending market, since these transactions have long or open-ended tenors. The stock of outstanding securities-lending transactions is estimated to have exceeded \$200 billion in Canada in 2015, which includes equities loaned. The fixed-income portion of this now exceeds \$100 billion, with GoC bonds representing a majority of the securities on loan (Chart 1b).

Participants in the Canadian SFT market include banks, broker-dealers, securities custodians, hedge funds and large asset managers. The majority of SFTs in Canadian markets are conducted by just a few participants, primarily the largest banks and the major pension funds (Bédard-Pagé et al. 2016). Close to half of all securities financing involves a buy-side investor, with interbank trades making up the remainder. For additional information on securities-financing transactions in Canada, see Box 2.

The SFT market is a core funding market in Canada because it provides essential access to funding liquidity for financial institutions and market-makers, the key providers of liquidity to the financial system (Fontaine, Selody and Wilkins 2009). In particular, the market is crucial for supporting trading in the Canadian bond market. A strong and robust SFT market therefore promotes financial intermediation in Canada, allowing bond markets to function efficiently. This is important because the Canadian government and private sector borrowers use bond markets to fund operations and investment plans, which contribute to economic growth and welfare.

¹ This aggregate estimate is based on data, discussions with financial institutions and Bank of Canada calculations and ignores haircuts and overcollateralization.

Box 2

Securities-Financing Transactions in Canada: Sources of Information

Securities financing is included in the Bank of Canada's definition of core funding markets (Fontaine, Selody and Wilkins 2009). Early discussion of the Canadian repo and securities-lending markets and their subsequent development can be found in Morrow (1994–1995) and Reid (2007). The evolution of the repo and securities-lending markets during the financial crisis is discussed in Chande,

Labelle and Tuer (2010) and Dreff (2010), respectively, while Chatterjee, Embree and Youngman (2012) describe the introduction of a central counterparty for repos. Garriott and Gray (2016) provide a detailed discussion of the Canadian repo market. The Bank of Canada is preparing a similar review of the securities-lending market.

In this report, we describe the link between securities financing and the bond market and discuss some of the ways in which securities financing has evolved since the financial crisis. These developments have the potential to change the links between SFT markets and bond market liquidity.

How Securities Financing Supports Bond Market Liquidity

Investors who trade Canadian bonds in the secondary market do so using the services of dealers that stand ready to buy or sell securities with clients. By facilitating trades with clients, dealers are supplying *market liquidity*—the ability to buy and sell an asset at a price close to the market price, in volume, and with immediacy. The SFT market supports bond market liquidity in three fundamental ways, even as the bond market continues to evolve in Canada.

Funding inventory

Dealers use securities financing to manage the cost of holding inventories. It is difficult to forecast what bonds clients might like to purchase, and holding a large inventory of bonds is costly. The SFT market provides a flexible avenue for dealers to fund the purchase of inventory at short notice. Dealers who are asked to purchase a bond can source the cash for the purchase based on other securities in their inventory or even on the security they purchase.² In normal conditions, this greater flexibility created by securities financing enables dealers to provide liquidity to clients at a lower cost.

Sourcing securities efficiently

Dealers do not always hold in inventory the exact securities that a client might want to buy. If a client wants to buy a bond that is not in the dealer's inventory, the

dealer can facilitate the trade by either (i) looking for a counterparty from whom to purchase the bond outright or (ii) borrowing the bond in the SFT market. Borrowing the bond allows the dealer to sell the bond to the client quickly, while providing the dealer with more time to find, purchase and return the bond to its lender at a later date.

Allowing reuse of securities

Each bond is issued in limited supply and, in some cases, a large part of the issue is held by buy-and-hold investors who have no desire to sell or lend it. If a specific bond becomes scarce in the market, securities borrowers will offer an attractive interest rate to entice the bondholders to lend the security. This makes the securities more readily available to the broader market while allowing the investor to retain the economic benefits of ownership. The SFT market not only brings more bonds into the market but also allows bonds to be reused. A bond in one SFT can be used by the receiver in another transaction, creating a chain of transactions for a single bond. Securities reuse is similar to the reuse of money by commercial banks, since a bank holding retail deposits from its clients can use the money to issue loans to companies. In both cases, reuse makes an asset more available when and where it is needed.

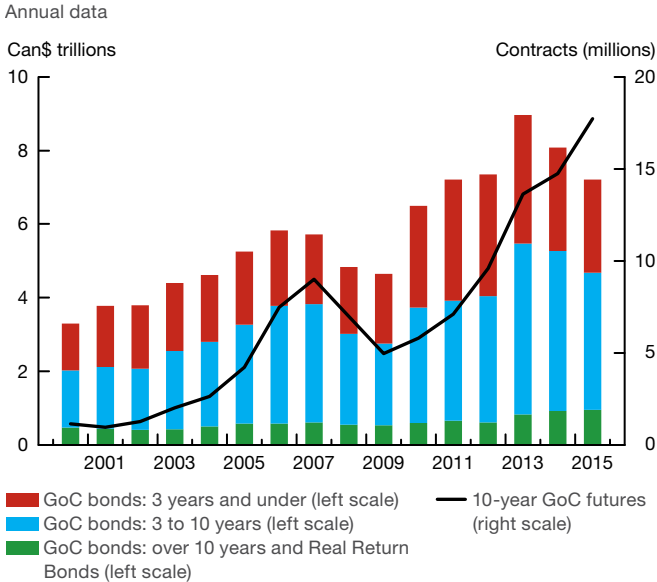
The Growing Importance of Securities Financing

Trading volume for GoC bonds has grown considerably in the past 15 years (Chart 2), reaching Can\$9 trillion traded on the cash market in 2013.

Higher trading volumes have occurred even though the stock of Canadian sovereign debt has not grown significantly in the past five years: the amount of benchmark GoC bonds outstanding has been stable since 2009, at roughly \$30 billion to \$40 billion across 2-year, 5-year and 10-year bonds (Chart 3). To support the growing trading volume on this fixed base, the outstanding stock of benchmark bonds must turn over more frequently. In Canada, monthly trading volume in

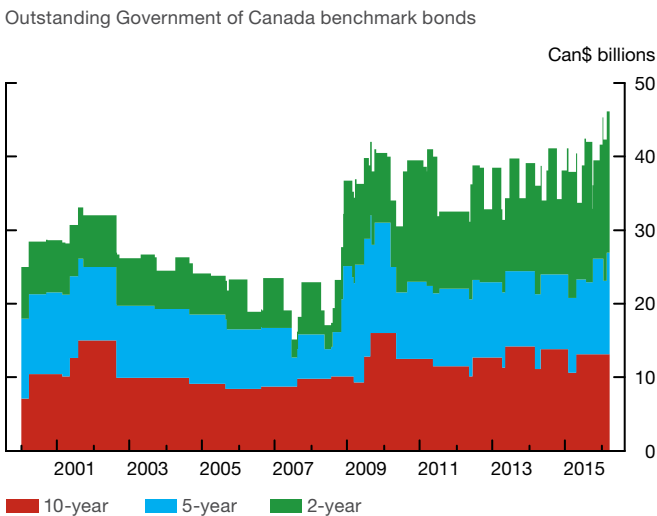
² A financial institution can obtain funding for a purchase using the purchased asset as collateral in much the same manner as a home borrower obtains a home loan using the home as collateral. The institution purchases the security and then repos the security to obtain an amount of cash that is equivalent or nearly equivalent to the purchase price.

Chart 2: Trading volumes of Government of Canada (GoC) bonds continue to rise



Sources: Bloomberg, Market Trade Reporting System and Bank of Canada calculations
 Last observation: 2015

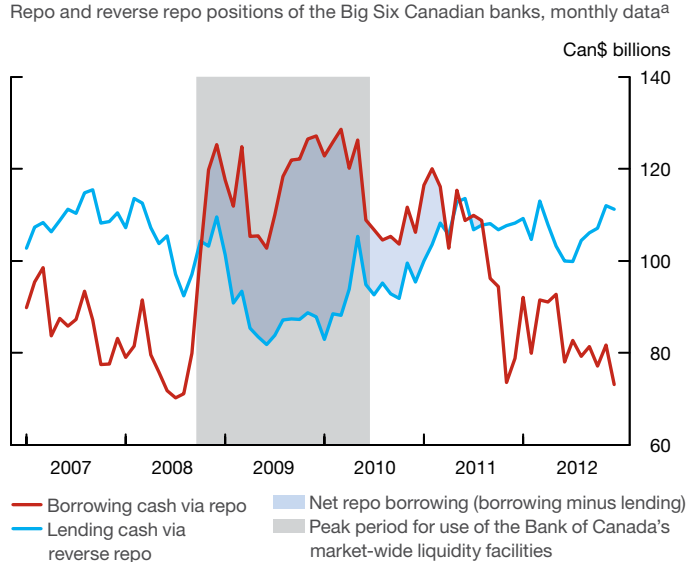
Chart 3: The stock of benchmark bonds outstanding is stable



Source: Bank of Canada
 Last observation: 15 March 2016

the 5-year benchmark bond has increased from 5 times its supply in 2010 to over 10 times that amount in 2015. The SFT market has played an important role in the growth of trading volume because it enables higher turnover through reuse of securities. A key factor behind the growth in trading activity and turnover is the greater issuance and amount outstanding of corporate bonds and mortgage-backed securities. The expanded stock of fixed-income securities increases the demand by bondholders to hedge interest rate risk, which leads to greater reuse of securities to establish short positions.

Chart 4: Large banks became net repo borrowers during the financial crisis



a. Bank of Montreal, Canadian Imperial Bank of Commerce, National Bank of Canada, Royal Bank of Canada, Bank of Nova Scotia and Toronto-Dominion Bank
 Sources: Regulatory filings of Canadian banks and Bank of Canada calculations
 Last observation: December 2012

Regulatory Reform

During the financial crisis, the Canadian SFT market—like those in other countries—experienced periods of illiquidity. Many participants were concerned about counterparty risk and simultaneously reduced the amount of financing they provided in the market. For example, while large Canadian banks are generally net lenders of cash in the SFT market, they were net borrowers of cash in 2009, shortly after the financial crisis (Chart 4). Because of the central role of SFT markets, the illiquidity spread throughout Canadian fixed-income markets, resulting in large, widespread dislocations in bond prices (Pasquariello 2014). In response, the Bank of Canada engaged in a program of term cash lending to support financial stability (Zorn, Wilkins and Engert 2009).

An important part of the response to the crisis has been international and domestic reforms of the SFT market. The aim of these reforms is to make the market a source of stability, even in stressful situations, rather than a channel for the propagation and amplification of financial stress. The reforms can be divided into two parts: (i) additional capital and liquidity regulations for banks (the primary dealers in the SFT market) that make them more resilient, and (ii) reforms targeted at SFTs themselves. In Canada, to address the objective of these reforms, market participants have set up a central counterparty for repo transactions.

Bank regulation

Basel III—like previous regulatory frameworks—requires regulated financial institutions to satisfy capital requirements (e.g., a capital-adequacy ratio). In addition, it has introduced a backstop leverage ratio and two liquidity requirements: the Liquidity Coverage Ratio and the Net Stable Funding Ratio. The Basel III capital ratios require more capital for certain forms of bank borrowing, including cash borrowing on securities collateral, since previous requirements did not fully capture the risks associated with those transactions. The liquidity requirements limit the use of short-term financing by regulated institutions and create incentives to use longer-term funding. Short-term financing, such as securities financing, can make banks more vulnerable in times of stress. If institutions use securities financing to borrow for terms of less than 30 days, the liquidity standards require the collateral to be high quality. Since the new regulations put constraints on the composition of balance sheets, they are expected to change securities-financing costs and incentives (CGFS 2014). SFTs will need to be more profitable to be considered viable, or regulated institutions may decline transactions that will worsen their regulatory ratios. The liquidity requirements can also be expected to increase demand for high-quality assets and to lengthen the average term of funding, since higher-quality assets and longer terms improve the capital and liquidity ratios of a regulated institution.

Regulating the securities-financing market

The Financial Stability Board (FSB) has published a policy framework for addressing systemic risks posed by securities financing (FSB 2013, FSB 2015) with the policy goals of improving data collection, imposing more-rigorous standards for collateral reuse and limiting leverage in SFTs.³ The lack of data on SFTs is acute in some markets and prevents regulators from enhancing their monitoring of the buildup of leveraged exposures. Canada is addressing the data gap in its repo markets through the new Market Trade Reporting System, which in late 2015 began to collect trade-by-trade data on repos, including quantity, price, collateral and counterparties. Canadian regulators are also developing better methods to collect data on securities-lending exposures, consistent with the guidance given by the FSB.

The FSB has also recommended improved disclosure to the market of collateral reuse to allow better monitoring of risks by counterparties to a trade. It has proposed

standards for the liquidity and quality of investments made using the cash collateral of clients. The FSB also proposes the use of central clearing, where feasible, to reduce counterparty risk; where clearing is infeasible, it proposes numerical floors, as well as qualitative standards, for calculating haircuts. These reforms would also change the costs and incentives associated with securities financing. Canada is considering how to implement the FSB proposals, and Board members have agreed on a 2018 deadline for implementation.

Repo central counterparty

To increase the resilience of market liquidity, the Investment Industry Association of Canada worked with the Canadian Derivatives Clearing Corporation (CDCC) to create a repo central counterparty (CCP), which opened in 2012. This CCP manages counterparty risk in the market by guaranteeing the performance of participants in a repo transaction and by netting offsetting trades to reduce the total counterparty exposure in the financial system (Chatterjee, Embree and Youngman 2012). The Bank of Canada continues to work with market participants to expand their use of the repo CCP so that its stability benefits can be brought to a larger share of the market.

Settlement Fails

In a securities-financing transaction, the borrower of a security may fail to return the security on the maturity date of the loan. This is called a settlement fail. The contracts underpinning securities-financing transactions contain explicit clauses governing a failure to return securities. In most cases, the bond lender chooses to roll over the transaction and impose a penalty: interest does not accrue after the repo's original maturity date. The lender of the bonds gets to keep the cash at zero interest until the securities are returned (Fontaine et al. forthcoming), and the borrower who failed to return the security forgoes the interest rate.

Borrowers might fail to deliver the security for a number of reasons. In the simplest case, the borrower may be experiencing operational difficulties with its systems and is physically unable to transfer possession of the security. In another case, the borrower may have reused the security, lending the bond to another party that failed to return it.

Settlement fails and low interest rates

Since the financial crisis, short- and long-term interest rates have declined to historical lows and are expected to remain low for an extended period. The terms of securities-financing contracts were not written with near-zero interest rates in mind. Consequently, in the current low interest rate environment, a borrower who fails to

³ Excessive reuse of collateral is a vulnerability because it can expose securities lenders to the behaviour of multiple, possibly unknown, participants. Collateral reuse can generate long chains of loans in which each participant lends to the next using the same security as collateral. SFTs can also transmit risks through the financial system because they can create leveraged interconnections between market participants. When SFTs create interconnected and leveraged exposures, the failure of one entity can spread to others and may amplify the impact.

return securities forgoes very little interest. The monetary incentives to avoid fails are therefore weak when interest rates are very low (Fleming and Garbade 2005).⁴ However, market participants may still have other incentives to avoid failure. For example, regulatory capital charges can increase the costs of settlement fails, and reputational risk can provide incentives to avoid failing in a bilateral transaction where the counterparty is known.

Settlement fails and bond market liquidity

From 2003 to 2005, when the overnight interest rate was low, the US Treasury market experienced increased episodes of settlement fails associated with market stress (Fleming and Garbade 2005). Markets with many settlement fails might be less effective in supporting bond market liquidity because they discourage the participation of securities holders. In an extreme case, a large cluster of fails may amplify the propagation of financial shocks and could drive increases in bond market illiquidity.

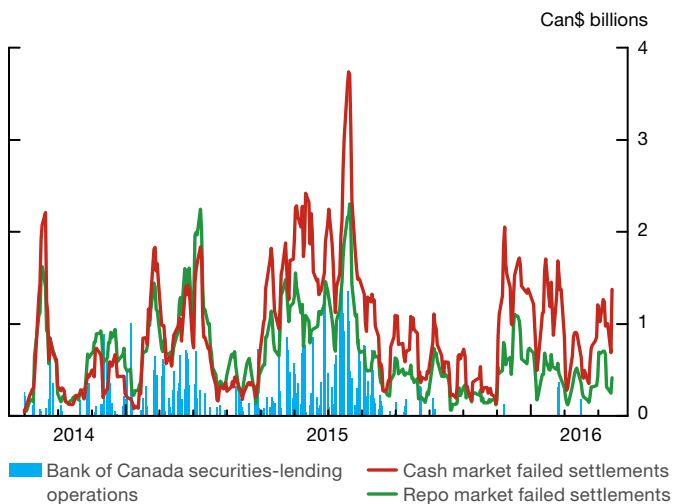
A market with a high and persistent rate of fails can benefit from an increase in the penalties (implicit or explicit) associated with settlement failure. In the United States, the Treasury Market Practices Group introduced a minimum 3 per cent fail fee in 2009. Since the implementation of this fee, the number of fails has been substantially lower, despite the overnight rate remaining close to zero for several years. Nonetheless, settlement fails have not disappeared in the United States, partly because the level of the minimum penalty is constant and its efficacy at discouraging fails is reduced when the cost of borrowing a security approaches the minimum penalty (Fontaine et al. forthcoming). Overall, however, the international experience—including in Italy, Japan and Spain—indicates that introducing a minimum penalty discourages settlement fails.

Despite concerns about high and persistent rates of settlement fails, failure to return a bond is not a rare event in markets, with or without fail fees. In Canada, the median value of repo settlement fails since 2014—when data became continuously available—is close to Can\$600 million and has not fallen below Can\$60 million. These markets are able to tolerate substantial rates of fails while operating reasonably well.

Since 2002, the Bank of Canada has participated in the securities market as a lender of bonds, making its holdings of Government of Canada securities available to market participants through an auction when these securities are scarce.⁵ The Bank modified the design of its securities-lending operations in 2009 and again in

Chart 5: Failed settlements have increased moderately

5-day average for failed settlements



Sources: Canadian Depository for Securities Ltd. and Bank of Canada. Last observation: 15 March 2016

2015 to promote their efficacy whenever the overnight rate is close to the effective lower bound. These activities mitigate some, but not all, of the consequences associated with settlement fails and occur by design when bonds are scarce. Indeed, in recent years, these operations have often coincided with the occurrence of clusters of settlement fails (Chart 5). In addition, the Bank of Canada has reduced its planned purchases of GoC securities and—acting as custodial agent—has allowed more flexibility to its clients wishing to lend securities.

Nonetheless, a persistent rise in settlement fails above levels seen in recent history would raise concerns about the functioning of the GoC bond market and would require further investigation.

Conclusion

Securities-financing markets are essential to broader market liquidity. They provide dealers with flexibility in obtaining funding and securities to transact with clients. The SFT market in Canada is growing, and recent regulatory changes, as well as low interest rates, are affecting these markets, with potential consequences for market liquidity.

The Bank has a role in supporting securities financing. It is working with market participants to expand use of the repo CCP opened in 2012 to bring its stability benefits to a larger share of the market. It is also monitoring the progress and effects of new regulations as they are implemented in SFT markets. Finally, the Bank is assessing the effects of settlement fails on the functioning of the bond market and may consider further measures to mitigate these effects if the situation worsens.

⁴ This analysis applies to the case of positive interest rates. With negative interest rates, the penalty would actually benefit the failing party, creating perverse incentives. Therefore, in securities-financing contracts, negative rates continue to accrue after a fail.

⁵ Details of the securities-lending program can be found at <http://www.bankofcanada.ca/2015/10/securities-lending-program>.

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