

Reducing Systemic Risk: Canada's New Central Counterparty for the Fixed-Income Market

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Introduction

On 21 February 2012, the Canadian Derivatives Clearing Corporation (CDCC) launched the first phase of its new central counterparty (CCP) service for the fixed-income market. The new fixed-income CCP centrally clears repurchase agreements (repos) of securities issued by the Government of Canada and federal Crown corporations. It is part of the Canadian Derivatives Clearing Service (CDCS), which also clears exchange-traded derivatives and certain over-the-counter derivatives. CDCC and financial market participants are now focusing on further developing the fixed-income CCP by expanding the markets it serves.

The repo market for Canadian fixed-income securities is a core funding market (Fontaine, Selody and Wilkins 2009). Repos—transactions involving the sale of a security with the simultaneous agreement to repurchase it at a later date, for the original price plus interest—are the economic equivalent of secured loans. A resale agreement, or “reverse repo,” is a repo considered from the perspective of the other party.¹ The market for such transactions provides essential liquidity to domestic financial institutions and market-makers, which in turn

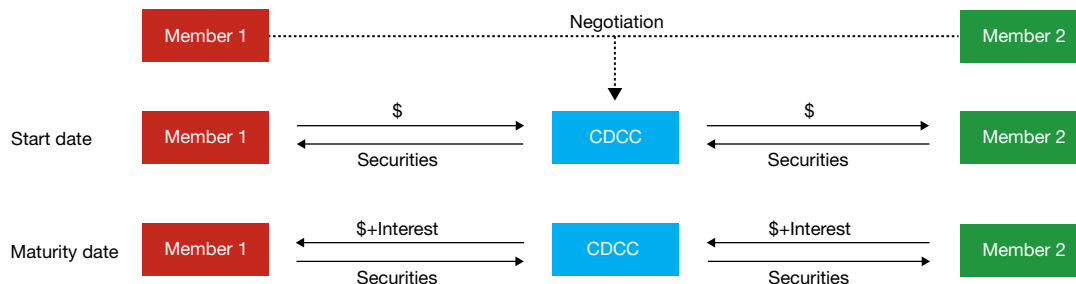
provide liquidity to the broader financial system. At the height of the financial crisis in September and October of 2008, this market experienced periods of illiquidity as financial institutions became increasingly concerned about counterparty credit risk and balance sheets became constrained (Chande, Labelle and Tuer 2010).

A CCP is an entity that intermediates financial transactions by becoming the buyer to every seller and the seller to every buyer for the transactions that it clears through a legal process known as “novation” (Figure 1).² The introduction of an appropriately risk-controlled CCP for the fixed-income market improves this market's resilience by mitigating counterparty credit risk, thus reducing the potential for disruptions to be transmitted through the financial system. This supports the ability of the market to remain continuously open, even in times of stress. A CCP also provides balance-sheet relief to its members through netting efficiencies.

² Novation is the act of either replacing an obligation to perform with a new obligation, or replacing a party to an agreement with a new party. For an explanation of other terms and processes related to CCPs, see Chande, Labelle and Tuer (2010).

¹ See also Morrow (1995).

Figure 1: Novation of a repo trade



Given the centrality of the underlying market, the Bank considers that CDCS could pose systemic risk if appropriate risk controls are not in place (i.e., it is systemically important). The Governor of the Bank of Canada has therefore designated it for oversight under the Payment Clearing and Settlement Act (PCSA).

The Canadian Fixed-Income Market

The fixed-income market has several important functions within the Canadian financial system. Governments and corporations obtain funding by issuing fixed-income securities in the primary market. In addition to their importance in the primary market, prices established in the secondary market for Government of Canada securities also serve as an important benchmark for the pricing of securities issued by provincial governments and corporations. A liquid secondary market allows holders to obtain cash in exchange for the securities before the securities mature, and provides other investors with a greater selection of securities for purchase than just those currently being issued by governments and corporations. At the end of 2011, approximately \$2 trillion was outstanding in Canadian-dollar-denominated fixed-income securities. Bonds and treasury bills issued by the Government of Canada accounted for a large portion of that total, about \$601 billion (Bank of Canada 2012).

There is an active repo market for Government of Canada securities, which is also an important part of the financial system. A variety of institutions participate in this repo market: investment dealers and banks use it both as a source of low-cost secured funding as well as a means of financing long positions of securities and covering short positions resulting from sales. These activities allow market-makers to generate liquidity for the broader financial system and to maintain liquid secondary markets (Fontaine, Selody and Wilkins 2009). Other types of institutions, such as insurance companies and pension funds, are also active in the repo market, using it primarily as a tool to handle temporary shortfalls or surpluses of cash, but also to manage their balance sheets. The repo market is dominated by Government of Canada securities, which, as of December 2011, are the underlying collateral for about 69 per cent of transactions (Bank of Canada 2012). Also as of December 2011, an estimated \$79 billion of Canadian-dollar repos outstanding was held by federally regulated financial institutions (OSFI 2012).

Why a Fixed-Income CCP Is Necessary in Canada

During the financial crisis, the Canadian fixed-income repo market, like those in other countries, experienced periods of illiquidity as a result of lenders of cash taking measures to reduce their credit exposures to borrowers. When many lenders undertook these measures simultaneously, the amount of financing available was abruptly reduced, creating severe funding pressures in the repo market.

The crisis also generated heightened uncertainty regarding the credit quality of many financial firms involved in the funding markets. Lenders of cash therefore became less willing to assume credit exposures. To limit their risks, banks and investment dealers engaged in fewer transactions, limited the terms of transactions and demanded higher-quality collateral from borrowers.

As anxieties about counterparty credit risk spread throughout the system, banks faced pressures to limit the expansion of their balance sheets. These pressures came from a variety of sources, including: (i) counterparties that demanded collateral to support existing obligations; (ii) clients who sold them their riskier assets; and (iii) clients who drew upon off-balance-sheet lines of credit as a source of precautionary liquidity. Seeking ways to offset these pressures, and in the absence of a CCP for the Canadian repo market to facilitate balance-sheet netting, banks sharply curtailed their repo activity. This reaction exacerbated the liquidity funding pressure and increased market turbulence. The decrease in repo activity was relatively more pronounced in Canada than in other jurisdictions, since repo business accounted for a greater share of the balance sheets of domestic banks than it did for their global competitors.

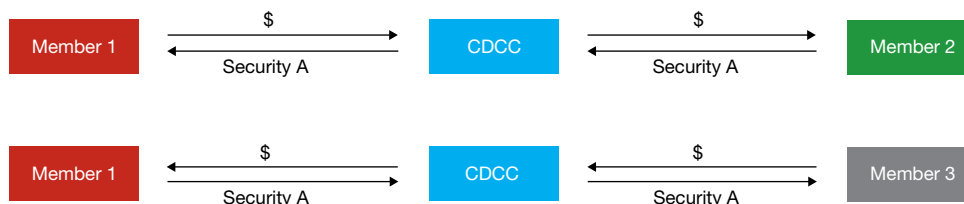
By helping to mitigate counterparty credit risk and alleviate the resulting pressures on bank balance sheets, a CCP for the fixed-income repo market supports continuously open markets.³ Indeed, jurisdictions that had CCPs for their repo markets in place before the crisis were relatively less affected than those that did not. A CCP reduces risk aversion among counterparties by becoming a trusted intermediary between them. CCPs further reduce counterparty credit risk by increasing netting potential. Moreover, a CCP with robust risk controls and clear default-management processes helps individual CCP members to better understand their exposures should another clearing member default.

To minimize the potential contraction of the repo market resulting from balance-sheet pressures during future stressful periods, members of the Investment Industry

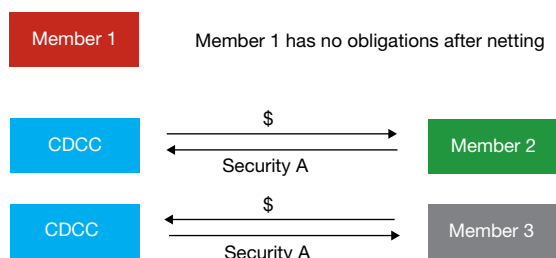
³ See Carney (2008) for a discussion of the concept of continuously open markets.

Figure 2: A simple example of settlement netting

Novated trades prior to netting:



Obligations following netting:



Association of Canada (the industry) sought ways to increase netting efficiencies in order to offset repo and reverse repo transactions on the asset and liability sides of the balance sheet.⁴ The industry concluded that an appropriately designed CCP would allow them to reduce their balance-sheet exposures to the repo business by netting offsetting positions without changing their underlying repo activity. Using a CCP would therefore create a more resilient and efficient balance sheet that could absorb financial shocks with greater ease.

The Role of CDCS in the Canadian Financial System

CDCC was selected by the industry to develop central clearing services for Canadian fixed-income markets. CDCC clears all derivatives contracts traded on the Montréal Exchange, as well as some over-the-counter equity options. Since the introduction of the new CCP service in February 2012, CDCC also clears repo transactions in fixed-income securities, a service in which the major dealers in the fixed-income market participate.

In performing these functions, CDCC has linkages to other Canadian financial market infrastructures. Fixed-income trade information is first submitted through CDSX, Canada's central securities depository and securities settlement service, which then sends qualified

trades to CDCC for novation. Since virtually all trades in Canadian-dollar-denominated fixed-income securities are settled in CDSX, the novated trades are submitted to CDSX for settlement.⁵

Throughout most of the trading day, CDCC submits trades to CDSX for gross (i.e., individual) settlement as the trades are novated. There are, however, two intraday netting sessions where CDCC will attempt to net together any trades that have not yet settled. As well, there is an overnight session where trades that were submitted to CDCC before the settlement date are netted.⁶ As shown in Figure 2, the intraday or overnight netting sessions can offset a clearing member's obligations to deliver and receive a particular security. This reduces the clearing member's obligation to deliver funds or securities and therefore increases the efficiency of the settlement process. The net obligations are then submitted to CDSX, where they are settled like any other trade. To facilitate smooth settlement, clearing members are required to meet minimum purchase obligations shortly after the intraday netting sessions.

Risk Management

CDCC has established arrangements to manage the various risks that a CCP faces, including legal, operational and financial risks. In this report, we focus on two key financial risks, credit risk and liquidity risk,

⁴ Without a CCP, if a bank transacts in both a repo and a reverse repo for the same security and term, but with different counterparties, both a liability and an asset are created on the bank's balance sheet. If both trades are novated by a CCP, however, the bank would have offsetting trades with the same counterparty, allowing the counterparties to net the trades and not create separate assets and liabilities on their balance sheets.

⁵ Settlement of a fixed-income trade means the exchange of cash for securities. Both the sale and the repurchase leg of a repo transaction generate fixed-income settlements.

⁶ This would also include the repurchase leg of repo trades, since this information was submitted to CDCC when the repo trade was negotiated.

because controlling these risks is key to containing overall counterparty risk in the system. In this context, credit risk is defined as the risk of a permanent financial loss that results from the default of a clearing member, while liquidity risk is defined as a temporary shortfall of cash, either during the course of a day or over a period of one or more days.

Credit risk

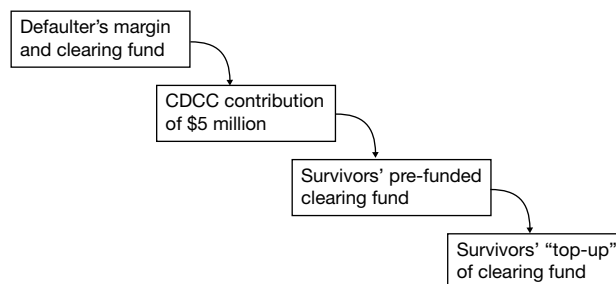
Through the novation process, all CCPs assume credit risk; that is, even if one of the CCP's clearing members fails to meet its obligations, the CCP must continue to meet its obligations to the remaining members, creating the potential for financial loss for the CCP. For example, in the fixed-income service, CDCC could face a loss if the repo party (the borrower of cash) defaulted before the repo matured and the price of the underlying collateral fell. In such a case, CDCC would have to purchase the security from the non-defaulting party on the maturity date of the repo and sell it in the market ("close out") at the lower prevailing price. Following standard practice for CCPs, CDCC collects financial resources from its members to mitigate this risk.

The financial resources collected by CDCC to mitigate credit risk are a blend of "defaulter pays" and "survivors pay."⁷ A variation margin and an initial margin are defaulter-pays resources. On an intraday basis, every clearing member is required to pay to CDCC a variation margin on each trade or portfolio of trades to offset any loss in value of their portfolio since the variation margin was last updated. Members whose portfolios have gained value receive a variation margin payment from CDCC. Thus, a variation margin collateralizes the credit exposures the CCP faces vis-à-vis its members, based on current market prices.

CDCC also collects an initial margin to collateralize credit exposures it could face if market prices move significantly. Initial margins are computed on the basis of the historical volatility of the trades in each clearing member's portfolio and are paid by all clearing members. Taken together, the variation margin and initial margin are meant to ensure that, under normal market conditions, CDCC would not suffer a financial loss from the default of any clearing member.

CDCC's financial resources are further augmented by the survivors-pay clearing fund, which mutualizes losses that CDCC could incur if it was required to close

Figure 3: Default-management waterfall



out a defaulter's positions under extraordinary market conditions.⁸ CDCC determines the size of the clearing fund by conducting stress tests that estimate the credit loss that would result from the default of the largest clearing member under extreme, but plausible, market conditions. Members contribute to the clearing fund in proportion to the risk that they represent to the CCP.

As depicted in **Figure 3**, in the event that CDCC faced a credit loss in closing out a member's positions, the defaulter's variation and initial margin and clearing-fund contributions would be used first to absorb these losses. If this were insufficient, CDCC would use its capital to absorb the next \$5 million of losses. If these funds were still not enough, residual losses would be borne by the surviving members' contributions to the clearing fund. Members would be obliged to make an additional "top-up" contribution to the clearing fund of up to 100 per cent of the value of their original contribution. This cascade of collections is known as a CCP's "default-management waterfall."

Clearing members can meet their margin and clearing-fund obligations with cash or securities, subject to certain restrictions. Members pledge eligible securities to CDCC's account at CDSX, while cash is deposited to CDCC's settlement account at the Bank of Canada through payments made via the Large Value Transfer System (LVTS). Having a settlement account at the Bank of Canada rather than at a private financial institution mitigates banker risk, which is the risk of failure by a private institution acting as settlement agent for a financial market infrastructure.

Liquidity risk

Like all CCPs, particularly those in repo markets, CDCC faces considerable liquidity risk. In the fixed-income service, CDCC manages sizable intraday requirements and, in the event of a member default, must also manage potential interday liquidity demands.

⁷ CPSS (2003) defines a defaulter-pays loss-sharing arrangement as "a loss-sharing arrangement where each participant is required to collateralise any exposures it creates for other participants." It defines survivors-pay arrangements as "loss-sharing arrangements which, in the event of a participant's inability to settle, require losses to be borne by the surviving participants according to some predetermined formula."

⁸ Many CCPs refer to this as a "default fund."

As part of the novation process, CDCC has obligations to purchase securities, which it must settle in CDSX using intraday lines of credit. If CDCC has fully drawn its intraday credit to settle purchases of securities, it must settle sales of securities to repay the line of credit and allow the settlement process to continue. Thus, if clearing members are not settling their purchases from CDCC promptly, this could prevent CDCC from meeting its obligations in an orderly fashion over the course of the day. The netting sessions described above, in combination with the members' minimum purchase obligations and CDCC's provisions for an adequate amount of intraday credit, mitigate this risk and promote an orderly settlement of obligations over the course of the business day.

CDCC could also face intraday and interday liquidity risk in the event of a member default, since it would still be required to settle all transactions on their original value date. For example, if a clearing member defaulted before settling its purchases, CDCC would be obliged to continue to buy the securities from the surviving members, knowing that the defaulter would not in turn buy them from CDCC. Therefore, it would be necessary for CDCC to finance its purchase of the securities until they could be liquidated in the market. To manage this risk and facilitate an orderly liquidation process, CDCC has entered into an agreement with a syndicate of banks for an emergency repurchase facility that allows CDCC to obtain funds by conducting repo transactions with the syndicate, allocated equally to each bank in the syndicate. The facility was designed to be large enough to manage the default of the clearing member (and its affiliates) that has the largest obligation to purchase securities from CDCC, even if the defaulter is one of the banks in the syndicate. Should all of CDCC's private sources of liquidity be insufficient to manage a default, the Bank of Canada has the discretion to act as liquidity provider of last resort on a secured basis.

The legal rules that govern CDCC's management of a default, together with the financial resources available to address credit risk and liquidity risk, enhance the stability of the repo market by ensuring an orderly winding down in the event of the default of a major dealer or bank, as well as ensuring that all novated transactions continue to settle as expected.

Bank of Canada Oversight

Under the Payment Clearing and Settlement Act (PCSA), the Governor of the Bank of Canada may designate an eligible system subject to Bank oversight if the Governor is of the opinion that the system could be operated in

such a manner as to pose systemic risk.⁹ The Bank has issued a guideline (Bank of Canada 2002) that describes the characteristics of a system that would warrant close attention as the decision of whether or not to designate is being considered. These characteristics are (i) the size of the transactions and of the market being served; (ii) the risk exposures; and (iii) the centrality of the system.

CDCC exhibits all three of these characteristics. The most important is the centrality of CDCC, which reflects its importance to the funding market and its linkages with other designated systems, namely, CDSX and the LVTS. As well, since CDCC is a central counterparty, risks that had been decentralized in bilateral transactions are concentrated into a single entity, CDCC. Finally, the market that CDCC serves is quite large, as discussed above, and a significant portion of the market is expected to be cleared through CDCC, particularly as the industry and CDCC complete their efforts to expand the fixed-income CCP services. Because of the market's size, as well as CDCC's centrality and risk exposures, it is crucial that the system incorporate appropriate risk controls.

The Governor of the Bank of Canada has designated CDCC as systemically important, effective 30 April 2012. Designation provides legal protections for the system's rules, helping to ensure finality of settlement in cases of default, and provides the legal basis for oversight of the system. The Bank undertakes oversight—which is broadly described in the PCSA and is facilitated by a regulatory oversight agreement with the system operator—to ensure that the system is operated in such a manner as to control systemic risk. The Bank's oversight responsibility applies to CDCC's derivatives business as well as to the new fixed-income business, since all of these services are operated under the same legal entity (CDCC) using a common clearing system (CDCC). The oversight process includes reviewing significant changes to the system or its rules, reviewing the results of audits and defining standards.

The Bank's standards for oversight are guided by international standards that provide guidance on the risk management of a CCP, including legal risk, operational risk, financial risk, default management and governance (CPSS-IOSCO 2004). The Bank will be adopting the new CPSS-IOSCO Principles for Financial Market Infrastructures (CPSS-IOSCO 2012) as part of its risk-management standards.

⁹ The PCSA defines systemic risk in terms of the impact that a problem experienced either by the system or by a participant could have on other participants, systems or financial institutions. The Minister of Finance must be of the opinion that designation for Bank of Canada oversight is in the public interest. In addition to CDCC, the Bank has designated and oversees three other systems: the LVTS, CDSX and CLS.

Table 1: Development of the Fixed-Income CCP

	Type of service introduced	Eligible securities	Status
Phase 1	Single-security bilateral repos	Government of Canada bonds and treasury bills or fixed-income securities issued by federal Crown corporations	Launched
Phase 2	Cash trades; interdealer brokered cash and single-security repos		Planning
Phase 3	General-collateral repo		Planning

In fulfilling its oversight responsibilities, the Bank works closely with the relevant financial market regulators, the Autorité des marchés Financiers and the Ontario Securities Commission.¹⁰

Next Steps

With the successful launch of the first phase of the fixed-income service, CDCC clears bilaterally negotiated repurchase transactions on eligible securities.¹¹ Given the benefits of CCPs, CDCC and the industry are working to expand the CCP service to additional segments of the fixed-income market and are planning to introduce two additional phases (Table 1).

The second phase will expand the CCP to clear cash fixed-income trades as well as trades transacted using interdealer brokers, which act as intermediaries between dealers to facilitate trades. While interdealer brokers already offer anonymous cash trades, all repo trades are completed on a “name give-up” basis, where the names of both parties to the trade are revealed. Completion of the second phase will allow interdealer brokers to offer anonymous trading for repos cleared by the CCP, which are known as “blind” repos.

The third and final phase will introduce central clearing for the Canadian general-collateral repo market. Currently, general-collateral repo is traded as specific repos on a bilateral basis, but is not centrally cleared. In this type of transaction, the lender of cash is willing to accept as collateral any securities from a pre-specified list of eligible securities, provided their total value equals or exceeds the amount of cash loaned. The introduction of the general-collateral service is expected to significantly enhance the efficiency of the funding market and to contribute to the development of a more-liquid market for term repos. Investing institutions such as asset managers, pension funds and insurance firms, which make up most of the “buy-side,” represent a large portion of repo market activity. The presence of a well-functioning repo market, including a robust term repo market, during times of crisis will offer a strong incentive for the buy-side to become direct or indirect participants of the CCP in its third phase.

Conclusion

A new CCP for bilateral repo transactions with robust risk-management processes is now operational in Canada. The first phase of the CCP project has delivered some benefits to the financial system. The next phases will add to these benefits by offering increased netting efficiencies and attracting the participation of a broader group of investors to a transparent and resilient term market, thus improving the liquidity of the fixed-income market. The benefits from this infrastructure will increase as the two remaining phases of development are fully implemented and a broad and diverse group of participants join the service.

¹⁰ CDCC is regulated in Quebec by the Autorité des marchés Financiers (AMF). CDCC is currently exempted from registration as a clearing agency in Ontario by order of the Ontario Securities Commission (OSC). Both the OSC and the AMF regulate the operator of CDSX, to which CDCC has close links.

¹¹ CDCC launched the service on 21 February 2012 and, over the next three months, gradually increased the number of securities eligible for clearing. This approach was used to allow the values and volumes cleared through the new fixed-income CCP to increase as the industry and CDCC gained experience with the service.

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