

Bank of Canada Oversight Activities for Financial Market Infrastructures

2022 Annual Report

March 2023

Executive summary

Financial market infrastructures (FMIs) are critical to the financial system. The Bank of Canada designates and oversees FMIs operating in Canada that have the potential to pose systemic risk or payments system risk. This report outlines the Bank's key oversight activities for designated FMIs in 2022.

Designated FMIs overseen by the Bank continue to improve controls to manage a variety of risks to their operations. In 2022, disruptions related to third-party service providers reaffirmed the importance of risk controls to support cyber and third-party risk management as well as business continuity arrangements at FMIs.

The Bank conducted two core assurance reviews specific to CDS and CDCC this year: credit risk (CDCC only) and business risk and default management. For Payments Canada systems, the Bank conducted core assurance reviews for access and tiering (started in 2021) and non-cyber operational risk. For *Interac* e-Transfer, the Bank looked at fraud risk management. Overall, the Bank found that the FMIs' core frameworks underlying the management of these risks are generally adequate and that the systems possess broadly appropriate policies and procedures. However, the Bank set some expectations for the system operators to strengthen their practices.

Additionally, the Bank conducted a core assurance review for cyber resilience for all designated systems. This review assessed the FMIs' level of adherence to the Bank's [Expectations for Cyber Resilience of Financial Market Infrastructures](#) and the [Principles for Financial Market Infrastructures](#), in particular Principle 17 on operational risk. The Bank's assessment shows that designated systems generally have strong cyber risk management practices, but it also found some areas where designated systems need to improve.

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The Bank's approach to oversight of financial market infrastructures

Financial market infrastructures (FMIs), also known as clearing and settlement systems, play an important role in the sound functioning of the financial system. They provide critical services that allow individuals and firms to safely and efficiently purchase goods and services, invest in financial assets and manage financial risks.

Given their central role, FMIs require strong risk management practices and must be resilient to shocks.

Regulatory framework

Under the [Payment Clearing and Settlement Act](#), the Governor of the Bank of Canada has the authority to designate an FMI if it is deemed to have the potential to pose systemic risk or payments system risk in Canada.¹ The Bank is responsible for overseeing these designated FMIs to ensure risk is adequately controlled. In this role, the Bank coordinates with other federal and provincial authorities that also have oversight responsibilities for a designated FMI established in Canada.² Formal agreements between the Bank and relevant authorities exist to guide this collaboration.

The Bank also designates and oversees foreign-domiciled FMIs that have the potential to pose systemic risk to the Canadian financial system. For the designated foreign-domiciled FMIs, the Bank relies on co-operative arrangements in the form of oversight colleges or committees that are led by authorities in the jurisdiction where the foreign FMI is domiciled.

The Bank has adopted the [Principles for Financial Market Infrastructures](#) (PFMI) as the risk management standards for designated systemically important FMIs (systemic FMIs). The Bank has also developed [Criteria and Risk-Management Standards for Prominent Payment Systems](#) that are based

¹ The Minister of Finance must agree that designation is in the public interest. See the glossary in Appendix 2 for a full definition of systemic risk and payments system risk.

² Canadian Depository for Securities Ltd (parent company of the operator of CDSX) and the Canadian Derivatives Clearing Corporation (operator of the Canadian Derivatives Clearing Service) are recognized and regulated by the Autorité des marchés financiers, the British Columbia Securities Commission and the Ontario Securities Commission. The Minister of Finance shares the responsibility of overseeing Payments Canada (operator of Lynx and the Automated Clearing Settlement System).

on the PFMI but that are proportional to a level of risk present in a prominent payment system (PPS).

Table 1: Financial market infrastructures (FMIs) designated for Bank of Canada oversight

Domestic designated FMIs			
System name	System type	Designation type	System description
CDCS	Central counterparty	Systemically important	The Canadian Derivatives Clearing Service (CDCS) is a central counterparty operated by the Canadian Derivatives Clearing Corporation (CDCC). [*] It clears transactions in all derivatives trades on the Montréal Exchange and certain fixed-income securities, repurchase agreements and over-the-counter (OTC) equity derivatives.
CDSX	Securities settlement system / Central securities depository	Systemically important	CDSX is a system operated by CDS Clearing and Depository Services Inc.. [†] It consists of a securities settlement system, a central securities depository for equities and fixed-income securities, and a central counterparty service for eligible Canadian exchange-traded and OTC equities.
Lynx	Payment system	Systemically important	Lynx is an electronic funds-transfer system operated by Payments Canada. It settles large-value and time-critical payments.
ACSS	Payment system	Prominent	The Automated Clearing Settlement System, operated by Payments Canada, is a retail payment system that clears cheques and electronic items such as pre-authorized debits, direct deposits and Interac debit payments.
Interac e-Transfer [®]	Payment system	Prominent	<i>Interac e-Transfer[®]</i> , operated by Interac Corp., is an electronic payment system offered through online banking with participating Canadian financial institutions.
Foreign-domiciled designated FMIs			
CLS Bank	Foreign exchange settlement system	Systemically important	CLS Bank is a special-purpose bank offering the settlement of foreign exchange transactions, including those involving the Canadian dollar.
SwapClear	Central counterparty	Systemically important	SwapClear is a clearing system operated by LCH Limited. It centrally clears interest rate swaps and other OTC interest rate derivatives denominated in multiple currencies, including the Canadian dollar.

^{*} CDCC is a wholly owned subsidiary of the Montréal Exchange, which is a wholly owned subsidiary of TMX Group Limited (TMX Group).

[†] CDS Clearing and Depository Services Inc. is a wholly owned subsidiary of the Canadian Depository for Securities Ltd., which is a wholly owned subsidiary of TMX Group.

The Bank's FMI oversight framework

The Bank regularly monitors and assesses designated FMIs against its risk management standards. Central to this process are ongoing core assurance reviews that focus on FMIs' controls and risk management practices in specific areas. Further, under the *Payment Clearing and Settlement Act*, all FMIs are required to notify the Bank of any significant changes in their systems. If the Bank determines that a change would have an effect on the control of risk for the system, such a change would require the approval of the Governor of the Bank of Canada before implementation.

Findings identified in core assurance reviews are presented to the Bank's Oversight Risk Advisory Committee, which is composed of senior Bank staff with expertise in FMIs, risk management and financial stability. Under this approach, each of the Bank's risk management standards is assessed in depth over a three-year cycle. The prioritization of any remediating measures the Bank requests from an FMI is based on how relevant the measures are to the safety and soundness of the FMI and the broader financial system.

Oversight expectations for Payments Canada systems

This section presents key priorities for Lynx and the Automated Clearing Settlement System (ACSS), the two designated FMIs operated by Payments Canada. It includes updates on focus areas identified in previous years (Table 2) and priorities identified in the Bank’s 2022 oversight reviews.

Progress on past oversight expectations

In 2022, Payments Canada significantly improved its cyber resilience and began to develop a contingency mechanism that would allow Lynx to continue operating during an extended disruption. It also undertook foundational work to understand the business needs served by ACSS. In addition, it began work related to access and risk management that will inform what the next-generation retail batch system will look like.

Table 2: Progress on past oversight expectations for Payments Canada systems

	Completed	Outstanding
Cyber resilience		
Payments Canada	<ul style="list-style-type: none"> ▪ Developed a cyber resilience strategy ▪ Created an evergreen inventory of information assets and system configurations, including interconnections with other internal and external systems ▪ Enhanced its cyber resilience framework by establishing cyber resilience objectives and risk tolerance ▪ Enhanced its testing program for cyber security controls 	<ul style="list-style-type: none"> ▪ Develop a comprehensive audit and compliance program for its cyber resilience framework
Operational risk		
Lynx—Remediation of security vulnerabilities	<ul style="list-style-type: none"> ▪ Identified and addressed security vulnerabilities before launching Lynx ▪ Implemented security improvements 	<ul style="list-style-type: none"> ▪ This expectation is now closed.
Lynx—contingency arrangements	<ul style="list-style-type: none"> ▪ Completed a feasibility assessment on viable contingency options to address a prolonged Lynx disruption scenario ▪ Identified a contingency solution for Lynx for real-time gross settlement: the RTGS Extreme Contingency Service 	<ul style="list-style-type: none"> ▪ This expectation is now closed.
Modernization		
ACSS—future state of retail batch payments	<ul style="list-style-type: none"> ▪ Completed initial analysis on the access, financial risk and business models for the future state of retail batch system 	<ul style="list-style-type: none"> ▪ Develop a comprehensive set of business requirements that will meet the needs of the future state of retail batch payments

Findings of core assurance reviews

In 2022, the Bank completed three reviews of Payments Canada systems: cyber resilience, access and tiered participation arrangements, and non-cyber operational risk management.

Cyber resilience

Based on its review of the cyber resilience of Payments Canada's systems, the Bank established two new expectations. First, the Bank identified the need to strengthen Lynx's cyber resilience capabilities. To address this need, Payments Canada implemented the RTGS Extreme Contingency Service (RECS)³. RECS is the culmination of work initiated in 2020 to improve the overall resilience posture for Lynx by developing effective contingency measures to respond to potential system disruptions. Second, the Bank identified the need for a long-term resilience strategy for Lynx because RECS cannot respond to all contingencies. While RECS provides an alternative if the two core operational data centres are unavailable, it does not address Lynx's dependence on two other critical service providers, namely, the Swift messaging network used to exchange payment messages and Nexi, the licensor of the Lynx and RECS applications. For 2023, the Bank expects Payments Canada to identify the business requirements for a long-term resilience strategy for Lynx as a first step. The implementation of the strategy will take place later.

Access and tiered participation

The review of Payments Canada's access and tiered participation arrangements showed that, although Payments Canada monitors tiered participation, it does not have a comprehensive framework for identifying and managing financial risks arising from such arrangements. The Bank did not set any formal expectation to address this issue because Payments Canada is examining the retail batch payment system to ensure it meets regulatory requirements and ecosystem needs, including identifying and managing financial risks arising from tiered participation.

³ RECS is a service provided by Nexi (the same technology provider supporting Lynx). RECS will provide an alternative platform for Lynx payments in the event of a prolonged disruption in the core Lynx infrastructure (i.e., one lasting longer than 24 hours).

Non-cyber operational risk management

This review covered Payments Canada's third-party risk management framework and practices and its assurance of operational reliability and business continuity for Lynx and ACSS. Payments Canada's operational risk framework was found to be robust and fit for the purpose of managing vendor risks related to critical service providers and utilities. The policies and plans in place to achieve operational reliability and business continuity were also found to be effective. However, the Bank did note concerns related to business continuity, specifically contingency arrangements. Echoing the findings of the cyber resilience review, the assessment confirmed the need for Payments Canada to improve Lynx's ability to withstand an extended disruption of its critical services.

Oversight expectations for CDS and CDCC

This section presents key priorities for CDS and CDCC, the operators of two designated FMI ultimately owned by TMX Group. It includes updates on focus areas identified in previous years as well as priorities identified in the Bank’s 2022 oversight reviews.

Progress on past oversight expectations

In 2022, CDS and CDCC made substantial progress on the Bank’s expectations associated with liquidity risk, operational risk, cyber risk and other risk areas. Some matters require further action, as described in **Table 3**.⁴

Table 3: Progress on past oversight expectations for CDS and CDCC

	Completed	Outstanding
Default management		
CDCC	<ul style="list-style-type: none"> Developed tools to facilitate bidding in default auctions 	<ul style="list-style-type: none"> This expectation is now closed.
Liquidity risk management		
CDCC	<ul style="list-style-type: none"> Put in place backup settlement arrangements with all clearing members Completed analysis on settlement congestion 	<ul style="list-style-type: none"> This expectation is now closed.
CDS	<ul style="list-style-type: none"> Finalized the liquidity risk framework Completed work on ensuring sufficiency of resources across all services, including increasing access to liquid resources 	<ul style="list-style-type: none"> Improve the liquidity stress-testing framework
Cyber risk management		
CDS and CDCC	<ul style="list-style-type: none"> Enhanced cyber recovery frameworks Finalized plans to implement cyber participation requirements 	<ul style="list-style-type: none"> This expectation is now closed.
Business risk		
CDS and CDCC	<ul style="list-style-type: none"> Submitted revised recovery plans for CDS and CDCC Submitted initial wind-down plans 	<ul style="list-style-type: none"> CDS and CDCC must review and update their recovery plans on an annual basis. CDS and CDCC will review, update and enhance their initial wind-down plans on a regular annual cycle.

⁴ See the “Updates at CDS and CDCC” subsection of this report for an update on the CDS Post-Trade Modernization project.

Access and tiering

<ul style="list-style-type: none"> ▪ CDS 	<ul style="list-style-type: none"> ▪ Conducted the first mandatory tiered participation survey ▪ Completed the updated tiered participation framework 	<ul style="list-style-type: none"> ▪ This expectation is now closed.
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Findings of core assurance reviews

In 2022, the Bank completed several reviews for CDS and CDCC: cyber resilience, credit risk (CDCC only), business risk and default management risk.

Cyber resilience

The Bank's assessment shows that CDS and CDCC generally have strong cyber risk management practices. As a result of the review, the Bank identified two expectations for CDS and CDCC. First, the Bank expects CDS and CDCC to strengthen and consistently apply cyber security standards for third-party service providers. Second, the Bank expects CDS and CDCC to build on their previous work and strengthen their capacity to respond to cyber-related disruptions of their business processes. CDS and CDCC should plan for and test the ability of their systems to recover and resume normal operations. The Bank expects key external stakeholders to participate in this work.

Credit risk (CDCC only)

The Bank's credit risk review found that CDCC's models and frameworks for managing core credit risk and collateral are broadly appropriate. However, improvements are needed to help ensure that CDCC is prepared for periods of market volatility. The Bank expects CDCC to:

- first, establish a comprehensive margin procyclicality framework
- second, enhance the validation and review of its margin system

Business risk

CDS and CDCC have made significant progress in addressing the findings from the last Bank review, which were focused on readiness to address financial losses. Specifically, CDS and CDCC have improved their recovery plans to address previous comments from regulators. They must review and update these plans on an annual basis.

In 2022, CDS and CDCC did substantial work on the first iteration of orderly wind-down plans. The Bank expects further substantial work on these plans

in 2023. When completed they must review and update these plans on an annual basis.

Default management risk

In 2022, CDS updated its default management plans, which now adequately cover both cross-border services. CDS and CDCC also implemented a comprehensive default management testing framework and are following a medium-term plan to increase the complexity and realism of the annual default simulations. Both CDS and CDCC are already planning further improvements to take place after the implementation of CDS's Post-Trade Modernization and CDCC's Gross Client Margin projects.

Oversight expectations for *Interac* e-Transfer

This section presents key priorities for e-Transfer, a designated system owned by Interac Corp. It includes updates on focus areas identified in previous years (Table 4) as well as priorities identified in the Bank’s 2022 oversight reviews.

Progress on past oversight expectations

Interac advanced its work to enhance its default rules and procedures and develop a high-level plan for migrating e-Transfer volumes to Payments Canada’s Real-Time Rail payment system, which is currently under development.

Table 4: Progress on past oversight expectations for Interac e-Transfer

Completed	Outstanding
Default management	
<ul style="list-style-type: none"> ▪ Clarified default procedures in three key Interac documents: <ul style="list-style-type: none"> ○ <i>Reconciliation and Settlement Guide</i> ○ <i>Rules for Network Payment</i> ○ <i>Operational Framework</i> 	<ul style="list-style-type: none"> ▪ This expectation is now closed.
Credit risk and operational risk	
<ul style="list-style-type: none"> ▪ Provided a high-level plan outlining how e-Transfer volumes will be migrated to the Real-Time Rail payment system, currently under development 	<ul style="list-style-type: none"> ▪ This expectation is now closed.

Findings of core assurance reviews

In 2022, the Bank completed two reviews for the *Interac* e-Transfer system: fraud risk management and cyber resilience.

Fraud risk management

The fraud risk management review assessed Interac’s level of adherence to the Bank’s expectations for fraud risk management in prominent payment systems.

The Bank’s assessment shows that the *Interac* e-Transfer system generally has strong fraud risk controls, particularly for the identification and detection of fraud. However, the review highlighted opportunities to further improve the governance of fraud risk management. In particular, the Bank has engaged with Interac to obtain greater certainty around Interac’s legal liability for managing fraud risk in e-Transfer through its provision of centralized tools, capabilities and data assets that support these capabilities.

Cyber resilience

Overall, the Bank noted sound cyber risk management practices at Interac but found a couple of foundational areas where it would like to see greater emphasis over the next year. As a result, two new oversight expectations were established for 2023.

First, Interac will be required to provide its board members with cyber resilience training. Second, Interac will be required to improve the governance and stewardship of its information assets and system configurations that support critical business operations.

Other expectations

In addition to core assurance reviews, the Bank may establish expectations based on observations from its day-to-day oversight. In July 2022, a major outage of an internet service provider resulted in the e-Transfer service being unavailable for almost 24 hours. As a result, the Bank identified two new expectations that it expects to be fully implemented in 2023. First, the Bank expects Interac to implement a multiprotocol label switching (MPLS) failsafe by introducing a secondary, independent carrier into the existing e-Transfer network. Second, the Bank expects Interac to implement a contingency based on a virtual private network that will allow e-Transfer participants to connect to the service during any future MPLS outage. The Bank expects that these improvements will be tested periodically and collectively with the participants and in line with Interac's operational objectives.

Additional oversight activities and developments at designated systems

Fraud risk management expectations in prominent payment systems

Fraud is a type of operational risk that, if not managed appropriately, can undermine the operational reliability of a system. In the extreme, widespread fraud can lead to a loss of participants’ confidence in the system and material disruption to economic activity. In 2022, the Bank developed fraud risk management expectations. These are segmented into five streams and outlined in **Table 5**.

Table 5: Expectations for fraud risk management in prominent payment systems

Governance	Establish a framework with appropriate policies that state the system operator’s fraud risk management objectives, risk appetite and risk tolerance for the system while explaining how the operator will identify, monitor and manage fraud risk
Identification	Develop the capability to safely collect information from participants to identify and monitor trends related to unauthorized and authorized fraud risk across participants in a system
Protection	Establish system-specific cyber security requirements for participants that are consistent with the operator’s fraud risk management framework and broader cyber resilience objectives
Detection	Provide centralized tools at the system level, through either the operator or third parties, that complement participants’ capabilities to practically and legally prevent and detect fraud
Response	Ensure cooperation among participants for timely detection and response to potential fraud—for example, operators should ensure participants have a forum to share such information as they practically and legally can on emerging fraud threats

Updates at CDS and CDCC

Replatforming of CDSX

The TMX-CDS Post-Trade Modernization project aims to replace the technology infrastructure for CDS’s core clearing, settlement and depository functions. As part of this project, CDS will also improve its financial risk model and introduce an automated central ledger for the cash equity central counterparty. Given the systemic importance of CDSX, the Bank’s oversight focus is to ensure that CDS appropriately mitigates the risk of its operations being disrupted when the new platform is launched. To this end, the Bank and

other regulators are working with CDS to review plans for testing, implementation and independent review of the new platform.

T+1 settlement

Canadian and US financial market participants and regulators are in the early stages of working to shorten the settlement cycle for securities to next-day settlement. Currently, the industry anticipates this transition will happen no sooner than the first quarter of 2024. Shortening the standard settlement cycle is expected to reduce risk for CDS and its participants; however, a substantial amount of coordination and preparation (e.g., testing, upgrading participants' systems and processes) is required.

Updates at Payments Canada systems

Lynx enhanced messaging standard

In 2022, Canada's high-value payment system continued an intensive, multi-year project enabling the acceptance of messages in the internationally harmonized MX (ISO 20022) format. The new, structured, data-rich messaging standard is expected to result in operational efficiencies for Canadian end users and to shorten processing times for international wire transfers. Driving the global migration to the new standard is Swift, the global, member-owned cooperative that is used by most of the world's financial institutions and major payment systems to exchange secure payment messages. Originally, Swift had targeted November 2022 as the deadline for all global Swift users, including those in Canada, to migrate to the new standard. However, because of an external delay, the migration target date was changed to March 2023. As a result, Payments Canada also postponed to March 2023 the release of the new version of Lynx.

Appendix 1 | Annual summary figures of designated FMIs

Domestic systemically important financial market infrastructures

Lynx (payment system | successor to LVTS, August 2021)

Lynx is an electronic funds-transfer system operated by Payments Canada that settles large-value and time-critical Canadian-dollar payments.

Measure	2019	2020	2021*	2022
Daily average value settled	\$189 billion	\$398 billion	\$505 billion	\$440 billion
Daily average volume settled	40,000	41,000	46,000	50,000
Daily average collateral pledged	\$40 billion	\$43 billion	\$44 billion	\$39 billion
Number of direct participants	16	16	17 [†]	17

* Lynx (designated as a systemically important FMI in 2021) replaced LVTS as Canada's high-value system effective August 30, 2021. Measures for 2021 were calculated using weighted averages based on the number of days that each system was in operation.

† Until August 2021, the LVTS had 16 participants. By the end of 2021, Lynx had 17 participants.

CDSX (securities settlement system, central securities depository, central counterparty | designated systemic FMI 2003)

CDSX is a Canadian system operated by CDS Clearing and Depository Services Inc (CDS). It consists of a securities settlement system, a central securities depository and a central counterparty service for Canadian exchange-traded and over-the-counter (OTC) equities.

Measure	2019	2020	2021*	2022
Daily average value of equity and fixed-income securities cleared and settled	\$692 billion	\$782 billion	\$846 billion*	\$963 billion
Daily average volume of equity and fixed-income securities cleared and settled	1.9 million	2.5 million	2.5 million	2.5 million
Average value of securities held at the central securities depository	\$5.8 trillion	\$6.8 trillion	\$7.4 trillion	\$7.0 trillion
Number of direct participants	98	98	100	99

* The figure for 2021 has been updated to reflect more recent data provided to the Bank after publication of the 2021 Annual Oversight Report.

CDCS (*central counterparty | designated systemic FMI 2012*)

The Canadian Derivatives Clearing Service (CDCS) is a Canadian central counterparty operated by the Canadian Derivatives Clearing Corporation (CDCC) that clears transactions in certain fixed-income securities, OTC repurchase agreements (repos), OTC equity derivatives and all derivatives traded on the Montréal Exchange.

Measure	2019	2020	2021*	2022
Daily average value of OTC repos cleared	\$25 billion	\$22 billion	\$24 billion	\$32 billion
Daily average notional value cleared (exchange-traded derivatives)	\$144 billion	\$117 billion	\$141 billion	\$102 billion
Daily average notional value cleared (OTC derivatives)	\$8.6 million	\$4.7 million	\$9.7 million	\$6 million
Number of direct participants	38	37	36	37

Prominent payment systems

ACSS (*payment system | designated prominent payment system 2016*)

The Automated Clearing Settlement System (ACSS) is a retail payment system operated by Payments Canada that clears paper items such as cheques and electronic items, pre-authorized debits, direct deposits and Interac debit payments.

Measure	2019	2020	2021*	2022
Daily average value processed	\$29 billion	\$31 billion	\$34 billion	\$36 billion
Daily average volume processed	33 million	32 million	34 million	36 million
Number of direct participants	12	12	12	13

Interac e-Transfer® (*payment system | designated prominent payment system 2020*)

Operated by Interac Corp., Interac e-Transfer® is a Canadian electronic funds transfer system for personal and business bank accounts. It is available 24 hours a day, 7 days a week.

Measure	2020	2021	2022
Daily average value processed	\$673 million	\$896 million	\$1,049 million
Daily average volume processed	2.09 million	2.66 million	2.92 million
Number of direct participants	28	29	31*

* Interac e-Transfer has 31 participants, of which 19 connect directly to the network and 12 connect indirectly.

Foreign-domiciled systemically important financial market infrastructures

CLS Bank (*payment system | designated systemic FMI 2002*)

CLS is a special-purpose bank that offers the settlement of foreign exchange transactions, including those involving the Canadian dollar.

Measure	2019	2020	2021*	2022
Daily average foreign exchange settlement (total)	US\$5,877 billion	US\$5,852 billion	US\$6,209 billion	US\$6,463 billion
Daily average Canadian-dollar foreign exchange settlement	Can\$217 billion	Can\$212 billion	Can\$233 billion	Can\$267 billion
Settlement members	70	71	71	74

LCH SwapClear (*central counterparty | designated systemic FMI 2013*)

SwapClear is an LCH clearing platform for interest rate swaps and other OTC interest rate derivatives denominated in multiple currencies, including the Canadian dollar.

Measure	2019	2020	2021*	2022
Notional outstanding OTC interest rate swaps, in all currencies, as at December 31	US\$316 trillion	US\$333 trillion	US\$352 trillion	US\$374 trillion
Notional outstanding OTC interest rate swaps, denominated in Canadian dollars, as at December 31	Can\$17.5 trillion	Can\$17.8 trillion	Can\$19.3 trillion	Can\$22.6 trillion
Number of direct participants*	118	121	123	124

* SwapClear Global and SwapClear Global FCM

Appendix 2 | Glossary

central counterparty (CCP)	An entity that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer, thereby ensuring the performance of open contracts.
central securities depository	An entity that provides securities accounts, central safekeeping services and asset services, which may include the administration of corporate actions and redemptions. A central securities depository plays an important role in helping to ensure the integrity of securities issues (that is, it ensures that securities are not accidentally or fraudulently created, destroyed or modified).
clearing	The process of transmitting, reconciling and, in some cases, confirming transactions before settlement, potentially including the netting of transactions and the establishment of final positions for settlement. On occasion, this term is also used (imprecisely) to cover settlement. In the context of futures and options, clearing also refers to the daily balancing of profits and losses and the daily calculation of collateral requirements.
clearing fund	A collection of assets prefunded by a CCP's participants that may be used to cover the financial losses or liquidity pressures during a participant default. Clearing funds are typically sized to cover extreme but plausible circumstances.
collateral	An asset or third-party commitment that is used by a collateral provider to secure an obligation for a collateral taker.
credit risk	The risk that a counterparty, whether a participant or other entity, will be unable to fully meet its financial obligations when due or at any time in the future.
default	Generally, an event related to the failure to complete a transfer of funds or securities in accordance with the terms and rules of the system in question.
default-management auction	A default-management auction is one of the tools a CCP may use to transfer a defaulted participant's positions, or a subset thereof, to a non-defaulting participant, thereby removing the position and risks from the CCP and restoring it to a matched book.
designated system / designated financial market infrastructure	A financial market infrastructure designated under the <i>Payment Clearing and Settlement Act</i> for oversight by the Bank of Canada.
financial market infrastructure (FMI)	A multilateral system among participating institutions, including the operator of the system, used to clear, settle or record payments, securities, derivatives or other financial transactions.

liquidity risk	The risk that a counterparty, whether a participant or other entity, will have insufficient funds to meet its financial obligations as and when expected, although it may be able to do so in the future.
orderly wind-down	The ability of an FMI to cease operating a business or service without a disruption in critical services to the financial system, when recovery of that business or service has failed. The objective of an orderly wind-down plan is to generally ensure that the non-viable critical services offered by an FMI could be transferred to an alternate entity.
payment system	A set of instruments, procedures and rules for the transfer of funds between or among participants. The system includes the participants and the entity operating the arrangement.
payments system risk	The risk that a disruption to or a failure of an FMI could cause a significant adverse effect on economic activity in Canada either by impairing the ability of individuals, businesses or governments to make payments or by producing a general loss of confidence in the Canadian payments system.
payment-versus-payment (PvP)	A settlement mechanism that ensures that the final transfer of a payment in one currency occurs if and only if the final transfer of a payment in another currency or currencies takes place.
procyclicality	The mutually reinforcing (positive feedback) mechanisms through which the financial system can amplify business fluctuations and possibly cause or exacerbate financial instability. In the context of CCPs, used to describe how market volatility can feed into increases in margin requirements, which in turn could create more market volatility.
recovery	The ability of a financial institution, including an FMI, to resume operations after a threat to its viability and financial strength so that it can continue to provide its critical services without authorities having to use resolution powers. More specifically, in the context of an FMI, recovery is defined as the actions of the FMI that are consistent with its rules, procedures and other ex ante contractual arrangements to address any uncovered loss, liquidity shortfall or capital inadequacy, whether arising from participant default or other causes (such as business, operational or other structural weaknesses), including actions to replenish any depleted pre-funded financial resources and liquidity arrangements, as necessary, to maintain the FMI's viability as a going concern and the continued provision of critical services.
resolution	The set of actions that a resolution authority can take when recovery efforts of a financial institution or FMI have been unsuccessful, when authorities deem recovery measures to be insufficient to return the entity to viability, or when authorities deem that allowing the entity's continued implementation of recovery measures threatens financial stability.

securities settlement system	An entity that enables securities to be transferred and settled by book entry according to a set of predetermined multilateral rules. Such systems allow the transfer of securities either free of payment or against payment.
systemic risk	<p>The risk that the inability of a participant to meet its obligations in an FMI as they become due or that a disruption to or a failure of an FMI could, by transmitting financial problems through the FMI, cause:</p> <ul style="list-style-type: none">▪ other participants in the FMI to be unable to meet their obligations as they become due▪ financial institutions in other parts of the Canadian financial system to be unable to meet their obligations as they become due▪ the FMI's clearing house or the clearing house of another FMI within the Canadian financial system to be unable to meet its obligations as they become due▪ an adverse effect on the stability or integrity of the Canadian financial system

Appendix 3 | Abbreviations

ACSS	Automated Clearing Settlement System
CCP	central counterparty
CDCC	Canadian Derivatives Clearing Corporation
CDCS	Canadian Derivatives Clearing Service
CDS	Canadian Depository for Securities
CPMI	Committee on Payments and Market Infrastructures
FMI	financial market infrastructure
IOSCO	International Organization of Securities Commissions
LVTS	Large Value Transfer System
OTC	over the counter
PCSA	Payment Clearing and Settlement Act
PFMI	Principles for Financial Market Infrastructures
PPS	prominent payment system
PvP	payment-versus-payment
RTGS	real-time gross settlement
RTR	Real-Time Rail