



BANK OF CANADA
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Bank of Canada Oversight Activities 2014 Annual Report

March 2015

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Executive Summary

This *Report* outlines how the Bank of Canada (“the Bank”) fulfills its oversight mandate for designated financial market infrastructures (FMIs), and informs key stakeholders of pertinent risk-management and oversight matters for each designated FMI. The *Report* discusses the Bank’s achievements in 2014 and provides an overview of its 2015 priorities.

The Bank’s oversight mandate, which is derived from the Payment Clearing and Settlement Act (PCSA), is part of the Bank’s broader role to promote the safety and efficiency of the Canadian financial system. The Bank oversees FMIs designated by the Governor as having the potential to pose systemic risk or payments system risk to the Canadian financial system. Accordingly, the Bank’s main oversight activities focus on monitoring and evaluating risk in designated FMIs and ensuring that it is adequately controlled. In fulfilling its oversight responsibilities, the Bank works in co-operation with other domestic and international authorities.

Overall, the Bank made significant progress against its 2014 oversight priorities. Together with the Canadian Securities Administrators (CSA), the Bank developed further guidance on the implementation of the Principles for Financial Market Infrastructures (PFMIs). The Bank also reviewed and enhanced its own risk-based approach to oversight, and was given an expanded role to include the oversight of FMIs having the potential to pose payments system risk. In addition, the Bank worked with its domestic and international partners on the initial steps toward developing effective recovery and resolution regimes for systemically important FMIs. Finally, the Bank worked to ensure that the recovery and resolution regimes for Canadian financial institutions take FMI considerations into account.

In 2015, the Bank will build on this progress by providing additional PFMI guidance in coordination with the CSA, implementing the Bank’s enhanced risk-based oversight approach and expanded oversight role, and advancing work on recovery and resolution issues.

Significant progress was made by designated FMIs to address major gaps in their observance of the PFMIs. Implementation of the PFMIs will continue to be a priority in 2015, with FMIs turning their attention to the outstanding gaps. An additional priority for FMIs will be to review and compare their cyber-security practices against industry standards.

The Bank of Canada's Approach to Oversight

As described in the "[Guideline Related to Bank of Canada Oversight Activities under the Payment Clearing and Settlement Act](#)" (Oversight Guideline), the Bank's main oversight activities relate to monitoring and evaluating risk in designated financial market infrastructures (FMIs) to ensure that risk is adequately controlled. These activities include assessing the risk-management practices of designated FMIs and reviewing proposed changes to their operations, rules and procedures; periodic audits and inspections; and regular monitoring and engagement with the owners and operators of designated FMIs.

The Bank co-operates with domestic and international authorities in its oversight of FMIs. In April 2014, the Autorité des marchés financiers (AMF), the British Columbia Securities Commission (BCSC), the Ontario Securities Commission (OSC) and the Bank of Canada entered into a [Memorandum of Understanding](#) (MOU) to facilitate co-operation in carrying out their respective oversight responsibilities for FMIs.¹ The Bank also co-operates with the Department of Finance through the Payments Advisory Committee.

For foreign-domiciled FMIs, the Bank conducts its oversight primarily through co-operative oversight colleges, which are

led by a foreign regulator and consist of central banks and agencies that have designated these FMIs for their oversight.

In 2014, the Bank finalized a review of its oversight framework and practices (see **Box 1** on page 6 for details). The review has led to changes in how the Bank conducts its oversight, including how the Bank communicates its priorities. Starting this year, the Bank will use this *Report* to communicate its oversight priorities and its expectations for designated FMIs for the coming year. This *Report* will also be used to assess progress made by the Bank and designated FMIs against the priorities of previous years.

¹ The MOU relates to the oversight of the commonly regulated clearing and settlement systems, which are the CDSX system operated by the Canadian Depository for Securities and the Canadian Derivatives Clearing Service operated by the Canadian Derivatives Clearing Corporation.

This *Bank of Canada Oversight Activities 2014 Annual Report* explains the Bank's efforts to fulfill its oversight mandate. It also informs key stakeholders of the risk-management and oversight matters relevant for each financial market infrastructure.

The remainder of the *Report* is divided into three sections:

1. Bank of Canada Oversight Priorities
2. Risk-Management Priorities for Designated Domestic FMIs
3. Risk-Management Priorities for Designated Foreign FMIs

Each section discusses achievements against the oversight priorities set for 2014 and provides a forward-looking view of the priorities for 2015.

1. Bank of Canada Oversight Priorities

In 2014, the Bank made notable progress against its oversight priorities. In particular, the Bank:

- reviewed and enhanced its oversight practices;
- developed further policy guidance on the PFMI's;
- acquired an expanded oversight role;
- progressed in developing recovery and resolution regimes for FMI's; and
- identified FMI issues in bank recovery and resolution.

The Bank's oversight priorities for 2015 include:

- commence the development of a resolution regime for designated Canadian FMI's; and
- implement its new oversight role and practices.

Reviewed and Enhanced Its Oversight Practices

To ensure that the Bank's oversight responsibilities are conducted efficiently and effectively, the Bank undertakes periodic reviews of its oversight practices to determine areas of improvement so it can adjust its framework accordingly.

The number and types of systems that the Bank oversees has increased. Given this and other changes in the environment in which FMI's operate, the Bank conducted such a review in 2013–14. The Bank has enhanced its risk-based oversight approach by strengthening its framework for systematically and consistently evaluating the risk profile of each designated FMI, and assessing whether the designated FMI's are adequately managing their risks. This provides a framework for priority setting for domestic FMI's, as well as for the Bank's oversight efforts. For foreign-domiciled FMI's, the risk-assessment tool will help the

Bank to identify and communicate its priorities to foreign overseers.

Developed Further Policy Guidance on the PFMI's

In 2012, the Bank of Canada adopted the Principles for Financial Market Infrastructures (PFMI's) as part of its risk-management standards for designated FMI's.² The Bank has since been developing supplementary PFMI guidance to clarify certain aspects of these new standards in

² Following the global financial crisis, the Committee on Payment and Settlement Systems (renamed the Committee on Payments and Market Infrastructures (CPMI) in 2014) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) developed the Principles for Financial Market Infrastructures (PFMI's), which are new and more rigorous risk-management and efficiency standards for systemically important FMI's (available at www.bis.org/cpmi/publ/d101a.pdf).

the Canadian context, with a view to assisting the FMIs in addressing gaps in their observance.

Box 1. The Bank of Canada's Risk-Based Approach to Oversight

The Bank has undertaken a review of its approach to oversight, which has resulted in the establishment of an enhanced risk-based approach. This will allow the Bank to systematically and consistently evaluate the risk profile of each designated FMI more effectively and determine whether its risks are adequately managed.

The annual risk-assessment process consists of four phases (described below):

1. environmental scan
2. assessment of the risk profiles of FMIs
3. setting priorities for addressing risks
4. monitoring progress

Environmental scan

The environmental scan will assess how changes in the FMI environment (e.g., amendments to laws or regulations, newly emerging risks, or developments in financial markets) may affect the risk profiles of designated FMIs.

FMI risk-profile assessment

The Bank will complete a risk profile of each FMI to identify areas where risk-management practices should be improved.

To do this, the Bank has developed a risk-based tool that takes into consideration two factors: first, the *severity of consequences* in the absence of risk-control measures; and second, the *likelihood of consequences* based on the adequacy and effectiveness of the FMI's risk-control measures. By examining these two factors together, the Bank employs a structured approach to measuring and comparing the different risks faced by each FMI.

Priority setting

The Bank will then set priorities for each designated FMI in consultation with the FMI and its other regulators and set priorities for its own oversight work. Some priorities will be concrete actions aiming to improve the FMI's risk-management practices, while others will involve further analysis to improve the Bank's assessment of a particular risk. The Bank's oversight efforts will focus on areas with the highest relative risk (i.e., those with high severity or high likelihood of occurring) and where a better understanding of particular aspects of the FMI's risk-management process is required.

Progress monitoring

The Bank will monitor how FMIs address high-priority risks and will re-evaluate priorities based on their responses. If required, the Bank may take action (e.g., issue letters from senior officials, meet with the Board of Directors or use its directive power) to ensure that appropriate changes are made to the risk-management practices of FMIs so that systemic or payments system risks are addressed.

In 2014, the Bank, in coordination with the Canadian Securities Administrators (CSA),³ undertook policy analysis to support this guidance, and published draft guidance for public consultation in several areas: collateral, liquidity risk, general business risk, custody and investment risk, and disclosure.

This guidance, together with the supplemental guidance on governance, which was proposed in late 2013, will be finalized in 2015. Once the guidance is finalized, domestic FMIs are expected to comply with all of its elements by the end of the year.

Expectations related to tiered participation and recovery plans will be clarified in 2015. FMIs will be expected to comply with these expectations by the end of 2016.

The full list of guidance under development is available on the [Bank of Canada Risk-Management Standards for Designated FMIs](#) page in the Financial System section of the Bank's website.

³ The Canadian Securities Administrators (CSA) is a council composed of the securities regulators of Canada's provinces and territories. The CSA has proposed National Instrument 24-102 *Clearing Agency Requirements* to adopt the PFMI as its standards for Canadian FMIs and is expected to finalize this national instrument in 2015.

Acquired an Expanded Oversight Role

In February 2014, the Government of Canada announced that it would be expanding and enhancing the Bank of Canada's oversight powers in order to allow the Bank to "better identify and respond to risks to financial market infrastructure in a proactive and timely manner."⁴ To achieve this, the Payment Clearing and Settlement Act (PCSA) was amended to give the Bank the power to designate for its oversight payment systems that have the potential to pose payments system risk.⁵ These "prominent payment systems," while not having the potential to pose systemic risk,⁶

⁴ See Budget 2014, available at www.budget.gc.ca/2014/docs/plan/pdf/budget2014-eng.pdf.

⁵ A system may pose payments system risk if a disruption or failure of the system has the potential to have significant adverse effects on Canadian economic activity through the inability of individuals, businesses or government entities to make payments, or a generalized reduction in confidence in the payments system. The amendments also give the Bank the power to request information and issue directives to systems that pose payments system risk, and to control the participation of foreign institutions in designated systems.

⁶ Systemic risk is the inability of one participant to meet its obligations to the FMI that could, by transmitting financial problems through the FMI, cause other participants to be unable to meet their obligations.

Box 2. Bank Shares FMI Research on Procyclicality

In 2014, the Bank published its new research on reducing the procyclicality of initial margin requirements for central counterparties (CCPs) (Bank of Canada Working Paper 2014-29, “Optimal Margining and Margin Relief in Centrally Cleared Derivatives Markets”). Results suggest that to optimally set margins with lower procyclicality, a balance must be achieved between stabilizing derivatives markets in times of stress and reducing overall market activity.

Market activity is affected because margins that are less procyclical curb margin peaks, and thus reduce the CCP’s protection against member default in volatile periods. This could undermine confidence in the CCP and create moral hazard for members. As a solution, the paper proposes that CCPs should vary their default penalties countercyclically and increase them in stressed periods, which mitigates moral hazard. These findings were communicated to CDCC and CDS during in-person meetings in January and June of 2014 to facilitate the reduction of procyclicality in these systems.

are critical for the Canadian economy. The PCSA amendments came into effect on 16 December 2014.

To fulfill this new oversight role, the Bank has begun to develop criteria to identify prominent payment systems and to set appropriate risk-management standards. These standards will be based on the PFMI and will be proportionate to the risks present in this type of system. Draft criteria and standards will be published for consultation in early 2015.

Progress in Developing Recovery and Resolution Regimes for FMIs

Given their critical role in the Canadian financial system, a disorderly failure of a designated FMI is likely to lead to systemic disruptions to the financial markets that are supported by the FMI and to the financial system more broadly. As such, designated FMIs are required to maintain sufficient resources to cover both losses and liquidity shortfalls with a high degree of confidence during severe stress events. In addition, it is crucial to ensure that designated systems

remain able to execute their critical functions under any circumstance.

With these objectives in mind, the Bank made progress in 2014 in developing supplementary guidance for Canadian FMIs to assist them in preparing their recovery plans.⁷

This draft guidance will provide additional clarity on how the CPMI-IOSCO’s report on the “Recovery of Financial Market Infrastructures” is interpreted in the Canadian context, as well as practical suggestions on the structure of FMI recovery and orderly wind-down plans.

While the Bank and the CSA will publish the supplementary guidance on FMI recovery

⁷ FMI recovery plans must identify scenarios that may potentially prevent an FMI from being able to provide its critical services as a going concern. These plans should include a full range of effective options for recovery or orderly wind-down.

plans in 2015, Canadian FMIs have been asked to begin preparatory work. In broad terms, this includes identifying critical services, stress scenarios and triggers for entering into recovery.

Working with key federal agencies (the Department of Finance, the Canadian Depository Insurance Corporation (CDIC), and the Office of the Superintendent of Financial Institutions (OSFI)), progress was also made in planning for the development of an FMI resolution regime for Canada.

Identified FMI Issues in Bank Recovery and Resolution

Canada's domestic systemically important banks (D-SIBs) depend on access to, and play a number of critical roles in, designated FMIs. In 2014, the Bank and its federal partners continued to work to facilitate the recovery or resolution of D-SIBs in a manner that minimizes disruptions to the financial system and the propagation of risks through FMIs.⁸ In particular, authorities conducted an extensive review of FMI rules and procedures to better understand potential challenges to effective recovery or resolution of FMI participants.

⁸ This work draws on, and is consistent with, guidance provided by the Financial Stability Board (FSB) on the resolution of systemically important FMI participants. See "II-Annex 1: Resolution of Financial Market Infrastructures (FMIs) and FMI Participants" of the FSB's "Key Attributes of Effective Resolution Regimes for Financial Institutions," available at www.financialstabilityboard.org/publications/r_141015.htm.

Commence the Development of a Resolution Regime for Designated Canadian FMIs

The Key Attributes of Effective Resolution Regimes for Financial Institutions ("the Key Attributes"), were finalized by the Financial Stability Board (FSB) in October 2014, and provide international guidance on the development of resolution regimes for FMIs.⁹ The Key Attributes set out the core elements that the FSB considers necessary for the effective resolution of FMIs: to reduce the impact of a failure of a systemically important FMI on the financial system and the broader economy; to limit taxpayer losses in the event of a failure; and to ensure continuity of the FMI's critical functions.

In 2015, the Bank and its federal partners will begin developing an FMI resolution regime that incorporates the Key Attributes, as appropriate, within the context of the Canadian financial system and legal framework. This work will include developing policy proposals for legal, governance and communications frameworks, as well as FMI-specific resolution strategies. This is expected to be a multi-year initiative.

⁹ The FSB's report, "Key Attributes of Effective Resolution Regimes for Financial Institutions," originally published in 2011, was revised to provide additional guidance in certain areas, including the resolution of FMIs. See "II-Annex 1: Resolution of Financial Market Infrastructures (FMIs) and FMI Participants," available at www.financialstabilityboard.org/publications/r_141015.htm.

Implement Its New Oversight Role and Practices

In 2015, the Bank's oversight team will work to implement the changes related to its newly established risk-based oversight approach and its expanded oversight mandate.

The new oversight approach will include a series of changes in how the Bank sets its priorities and how it communicates them. For instance, a risk-based tool will be used as the main input to determining the oversight priorities for the Bank and domestic FMIs. In addition, the Bank will now communicate, through this *Report*, its oversight priorities and those of each designated FMI, in addition to reporting on

progress made on priorities identified in the previous year.

The Bank will release a consultation document on: (i) the criteria for payment systems to be designated as having the potential to cause payments system risk, and (ii) standards that will apply to those systems. In addition, in 2015, the Bank will undertake a formal review of eligible systems and designate for Bank oversight any system that has the potential to pose payments system risk. Following designation, the Bank will work with relevant system operators to prioritize and develop a timeline for meeting the risk-management standards for prominent payment systems.

2. Risk-Management Priorities for Designated Domestic FMIs

The Bank of Canada has designated and oversees three domestic FMIs that are systemically important to the Canadian financial system:

- The **Large Value Transfer System (LVTS)** is a Canadian electronic funds-transfer system that settles large-value and time-critical Canadian-dollar payments. The LVTS is owned and operated by the Canadian Payments Association (CPA).
- **CDSX** is a Canadian system that consists of a securities settlement system, a central securities depository and central counterparty services for eligible Canadian exchange-traded and over-the-counter equities. CDSX is owned and operated by the Canadian Depository for Securities Limited (CDS).
- **Canadian Derivatives Clearing Service (CDCS)** is a Canadian central counterparty that clears transactions in certain fixed-income securities, repurchase agreements (repos), equity derivatives and all derivatives traded on the Montréal Exchange. CDCS is owned and operated by the Canadian Derivatives Clearing Corporation (CDCC).

In April 2012, the Bank of Canada adopted the PFMI as its risk-management standards for these designated FMIs. Since that time, the FMIs, in consultation with the Bank, have been working to identify gaps in their observance of the PFMI and to prioritize addressing them. In 2014, significant progress was made toward closing these gaps. The Bank and FMIs have identified priorities for 2015, many of which are related to continuing to improve their observance of the PFMI.

Section 2.1 first discusses common priorities for all three designated domestic FMIs; Sections 2.2 to 2.4 address FMI-specific priorities.

- A common priority is one that the Bank has assigned to each systemically important Canadian FMI. Common priorities represent areas of risk management in which all FMIs have been asked to make progress. The following sections summarize the progress made by Canadian FMIs and their expectations for these priorities.
- FMI-specific priorities are those that are relevant to an individual FMI; these priorities may reflect the particular market the FMI serves, the design of the system, or particular areas for improvement in the FMI's observance of the PFMI.

2.1 Common Priorities

A common priority for domestic systemically important FMIs in 2014 was to:

- make significant progress in addressing major gaps in their respective observance of the PFMI.

Common priorities for domestic systemically important FMIs in 2015 include:

- analyze cyber-security practices; and
- begin development of recovery plans.

2014 Priorities

Made Significant Progress in Addressing Major PFMI Gaps

The PFMI are the minimum international standards for risk management, efficiency and transparency for systemically important FMIs.

Since the PFMI are more stringent than the previous set of principles, FMIs around the world are enhancing their risk-management practices and operations to observe the PFMI.

For example, some Canadian FMIs required enhancements to their mechanisms for managing credit and liquidity risks, while others also needed to make changes to their governance arrangements.

In 2014, FMIs implemented several priority elements of the remediation plans they had developed based on detailed assessments against the PFMI.

The Bank worked with other Canadian authorities to closely monitor the FMIs' plans to ensure their timely execution. Authorities also worked together to review and approve relevant rule changes that allowed systemically important Canadian FMIs to observe the PFMI.

In 2014, the FMIs, with direction from the Bank and other Canadian authorities, made significant progress toward addressing the major gaps in their observance of the PFMI. Implementation of the PFMI will continue to be a priority in 2015, with FMIs turning their attention to dealing with any outstanding PFMI gaps.

Examples of work conducted by designated FMIs over the past year to observe the PFMI, and an assessment of this work, are further discussed in Sections 2.2 to 2.4 of this *Report*.

2015 Priorities

Analyze Cyber-Security Practices

Cyber attacks have the potential to pose systemic risk by disrupting the business operations of key participants in Canada's financial system. A cyber attack affecting the core systems of FMIs could have spillover effects on financial markets, owing to the inability of financial institutions to conduct financial transactions. Overall, the financial sector is judged to have improved its cyber defences, but it must keep pace with the growing number and increasing sophistication of cyber attacks. The Bank has required designated domestic FMIs to complete a self-assessment of their cyber-

security practices to ensure that they include the necessary properties and characteristics to protect against elevated threat levels.

Canadian FMIs were asked to complete the self-assessment in the first quarter of 2015. The self-assessment follows the National Institute of Standards and Technology (NIST) “Framework for Improving Critical Infrastructure Cybersecurity,” an outcome-based framework that evaluates cyber defences and an organization’s ability to respond effectively to cyber attacks. Following the completion of the self-assessment, a small number of cyber-security priorities will be identified jointly by the FMI and the Bank.

The PFMI requires operations to be recovered quickly and transactions to be settled by end of day, even in the case of a severe cyber attack. Following the recommendations of the report, “Cyber Resilience in Financial Market Infrastructures” by the Committee on Payments and Market Infrastructures, the Bank is participating in a newly formed CPMI-IOSCO working group on cyber resilience to determine whether

coordinated actions and, possibly, additional guidance on cyber security are needed to complement the PFMI.

Begin Development of Recovery Plans

The PFMI calls for all systemically important FMIs to have a comprehensive and effective recovery plan. The CPMI-IOSCO report, “Recovery of Financial Market Infrastructures,” published in October 2014, complements the PFMI and further discusses the recovery-planning process, the content of recovery plans and a menu of recovery tools.

Canadian FMIs have been asked to begin preparatory work with respect to developing their recovery plans. Broadly, this work includes identifying: (i) critical services provided by the FMIs; (ii) stress scenarios that could lead to recovery or orderly wind-down; (iii) triggers for recovery tools; and (iv) actions taken to wind down critical services in an orderly manner, where applicable. Canadian FMIs were also asked to begin outlining communication and escalation procedures within the FMI, as well as with the Bank and other relevant authorities.

2.2 LVTS-Specific Priorities

In 2014, the Canadian Payments Association, the operator of the LVTS, made progress against its risk-management priorities. In particular, the CPA:

- enhanced the risk-management function;
- continued to build a reserve fund; and
- strengthened its ability to address participants' operational events.

The risk-management priorities for the LVTS in 2015 are to:

- implement the new Enterprise Risk Management Framework;
- enhance intra-day liquidity monitoring;
- begin analyzing and planning for system renewal; and
- implement a new governance and accountability framework.

2014 Priorities

Enhanced Risk-Management Function

In 2014, the CPA developed an Enterprise Risk Management (ERM) policy that provides a comprehensive framework to identify, measure, report and manage risks. Such a framework expands on and clarifies how risks should be escalated and managed, as well as highlighting the responsibility of all staff to manage risk.

The CPA has made good progress against this priority and has developed action items for 2015 to implement the ERM policy and further develop the ERM Framework.

Continued to Build a Reserve Fund

The PFMI on General Business Risk calls for FMIs to establish a reserve from which they can draw funds to continue to provide critical services in the face of materialized business risks, such as unexpected losses.

In 2013, the CPA established such a reserve and agreed to fully fund it by the end of 2017. By the end of 2014, the CPA had

acquired approximately 40 per cent of the target amount through special dues assessments on members.

Strengthened Its Ability to Address Participants' Operational Events

The CPA undertook a review of its Participant Incident Management Framework and proposed various rule amendments affecting the monitoring and reporting of participant incidents, as well as adding new requirements for participant change management. These amendments to the rules came into effect in early 2015 and will improve the CPA's ability to manage participant incidents.

2015 Priorities

Implement the New Enterprise Risk Management Framework

As mentioned above, during 2014, the CPA developed an ERM policy that enhances the CPA's risk-management practices. Throughout 2015, the CPA will begin to implement this policy. Some of the activities

the CPA plans to undertake in 2015 are clarifying roles and responsibilities, the development of an internal audit function, enhancing operational risk policies , developing a risk appetite that takes into account the new strategic plan, enhancing risk reporting, and conducting training such that employees are fully aware of new and existing risk policies.

Enhance Intra-Day Liquidity Monitoring

While the CPA does not face liquidity risk from the LVTS, the participants do. Therefore, to observe the PFMI, the CPA will need to develop additional tools to monitor the liquidity risk of participants in the LVTS. For example, the CPA could enhance its monitoring of participants' adherence to throughput guidelines that discourage participants from unnecessarily delaying their payments.

While this was identified as a priority for 2014 in this *Report* last year, the CPA, with agreement from the Bank, has deferred this work until 2015 in order to address higher priorities.

Begin Analyzing and Planning for System Renewal

The two CPA systems, the Automated Clearing Settlement System and the LVTS, have been upgraded from time to time to allow them to continue to function smoothly and soundly. Nevertheless, technological change and evolving end-user expectations have given rise to demands for further improvements. As a result, there are opportunities to renew these systems so that they are better placed to serve the payment needs of Canadians now and into the future. As part of its oversight, the Bank has an interest in ensuring that any system

renewals meet the risk management standards.

One of the long-term desired outcomes of the CPA's Strategic Plan is modernization, in particular, modernizing the CPA's retail and wholesale systems. This includes implementation of ISO 20022, an international payment messaging standard that would allow more information (such as invoice information) to be sent with a payment message. Standardized messaging formats and additional information can offer efficiencies and increase the ability to develop straight-through processing. In 2015, the CPA will continue to plan for the adoption of the ISO 20022 standard.

Further, the CPA is considering the modernization of the core infrastructure(s), which may include updates to the ACSS, the LVTS, or both. The intent is to have core infrastructure that will meet the needs of Canadians for years to come.¹⁰ This project is being led by the CPA and will require input from stakeholders. The Bank will contribute by providing clear risk-management expectations for the systems and by contributing technical expertise to the CPA's research program.

Implement a New Governance and Accountability Framework

The Department of Finance, in consultation with the Bank, has reviewed the governance of the Canadian payments sector to ensure the continued safety and soundness of the payments system, spur

¹⁰ Schembri (2014) provides a vision for the structure and oversight of this new system.

innovation and promote the consideration of user interests.

As a result of this review, the Department of Finance has made amendments to the Canadian Payments Act, which establishes the CPA, to change its governance structure and introduce new accountability measures.¹¹ The CPA will be implementing this new framework in 2015.

¹¹ In terms of governance, the CPA Board of Directors has been made smaller and more independent from the CPA membership in order to facilitate greater input from the broader stakeholder base. In terms of accountability, the CPA will be required to submit to the Minister of Finance an annual five-year corporate plan and publish an annual report. See the Canadian Payments Act, available at <http://laws.justice.gc.ca/PDF/C-21.pdf>.

2.3 CDSX-Specific Priorities

In 2014, CDS, the operator of CDSX, made progress against its risk-management priorities. In particular, CDS:

- made substantial progress on the coverage of credit exposures;
- enhanced liquidity safeguards; and
- established the CNS Default Fund.

The risk-management priorities for CDSX in 2015 are to:

- implement enhancements to the equity CCP;
- adjust the recovery-time objective.

2014 Priorities

Made Substantial Progress on the Coverage of Credit Exposures

To observe the PFMI, securities settlement systems need to collect sufficient collateral to cover each participant's credit risk fully and simultaneously to at least a 99 per cent confidence level. Credit exposures should therefore be supported dollar-for-dollar by collateral value.

Prior to January 2015, the collateral requirements for CDSX's securities settlement system only covered the credit risk from the largest potential defaulter and could therefore have been insufficient if more than one participant defaulted on the same day. The Canadian Depository for Securities Ltd. (CDS), the owner and operator of CDSX, consulted with its stakeholders in 2014 and implemented changes in January 2015 to meet the 99 per cent confidence level for most of its participant categories. These changes represent 96 per cent of the overall collateral increase required to fully meet the requirement. CDS plans to implement further changes in 2015 to ensure that the

requirement is met for all of its participant categories.

Enhanced Liquidity Safeguards

The PFMI call for FMIs to have sufficient liquid resources to cover various stress scenarios, including the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme, but plausible, market conditions. In 2014, CDS worked on improving its stress testing to account for this additional requirement. In addition, in December 2014, CDS increased the size of its private liquidity facility, and has raised the number of liquidity providers that jointly offer the facility.

Established a CNS Default Fund

The continuous net settlement service (CNS) is CDS's central counterparty for equities. In order to observe the PFMI, CDS strengthened risk management at the CNS by establishing a default fund in January 2015. While the margin requirements for CNS ensure that there is sufficient collateral to cover losses from a participant default at least 99 per cent of the time, the default fund is meant to cover exposures beyond

99 per cent, including the exposure from the single largest default under extreme, but plausible, market conditions.

2015 Priorities

Implement Enhancements to the Equity CCP

The Bank undertook analysis to explore whether the design of the CNS would be consistent with international best practices for CCPs, even after all the CNS gaps against the PFMI have been remediated.

Three priority issues were identified for action by the end of 2015. Addressing these issues will make risk management at the CNS more consistent with international best practices.

To resolve the priorities, CDS should achieve the following in 2015: (i) become the counterparty to transactions sooner than is

currently the case; (ii) advance the deadline for participants to provide collateral to CDS; and (iii) provide a portion of its own funds as part of the financial resources used to absorb credit losses from a defaulting participant (i.e., losses beyond the defaulter's collateral).

Adjust the Recovery-Time Objective

The PFMI call for FMIs to ensure that critical information technology (IT) systems can resume operations within two hours of a disruptive event. CDSX's recovery-time objective has historically been measured from the point of declaration of a disaster, which can be up to one hour after the disruptive event. CDS expects to have policies and procedures in place by the end of 2015 to achieve the two-hour recovery objective as defined in the PFMI.

2.4 CDCS-Specific Priorities

In 2014, CDCC, the operator of CDCS, made progress against its risk-management priorities. In particular, it:

- established an Enterprise Risk Management Framework;
- enhanced measures to manage credit and liquidity risk; and
- developed a model to facilitate participation from the buy-side.

The risk-management priorities for CDCS in 2015 are to:

- implement operational-risk and default-management aspects of the PFMI; and
- establish a buy-side participation model.

2014 Priorities

Established an Enterprise Risk Management Framework

A sound risk-management framework to comprehensively manage risk is a crucial component of the PFMI. The establishment of an ERM Framework ensures that the CDCC's risk-management policies and procedures are integrated and that risks are comprehensively managed. The CDCC developed a preliminary ERM Framework that contains the fundamental components of an effective framework, including: defining the organization's risk appetite, clearly assigning risk responsibilities, and establishing policies and procedures for each of the major risks.

The majority of the progress in 2014 focused on integrating the CDCC ERM Framework within the TMX Group (CDCC's parent company), and updating policies and procedures to reflect changes in risk-management practices. Integration was accomplished by aligning CDCC risk policies and embedding the CDCC within the new risk-management governance structure of

the TMX Group. Concurrent with these efforts, the policies and procedures were updated to reflect enhanced measures to manage credit and liquidity risk.

Enhanced Measures to Manage Credit and Liquidity Risk

In 2014, the CDCC made significant progress in addressing major gaps against the PFMI by developing enhanced measures to manage credit and liquidity risk. These measures included improved risk models to manage concentration and wrong-way risk, as well as more rigorous stress-testing and back-testing processes. The CDCC is currently in the process of implementing these enhanced risk measures.

Developed a Model to Facilitate Participation from the Buy-Side

The CDCC launched its fixed-income CCP in February 2012. Since that time, average daily values cleared through the system have grown steadily, but additional participants are required to significantly increase CDCS's currently small share of overall repo market activity. In 2014, the CDCC and industry stakeholders made significant progress in addressing challenges

associated with achieving the direct participation of “buy-side participants” within the repo service.¹² Potential buy-side participants have certain characteristics that must be accommodated by the clearing model, such as restrictions on loss mutualization, the use of custodian banks to settle transactions on their behalf and limited capacity to pledge margin throughout the day. The concerted efforts of the CDCC and the industry resulted in the development of a model that addresses the unique challenges faced by buy-side participants and helps to manage systemic risk.

The CDCC and the industry continue to finalize the details of the clearing model and work toward implementing the model. The Bank is working closely with stakeholders to ensure that the model is consistent with the PFMI.

2015 Priorities

Implement Operational-Risk and Default-Management Aspects of the PFMI

In 2014, the CDCC’s efforts to meet the PFMI focused on the implementation of an ERM Framework and enhancements to financial risk-management practices. Once this has been achieved, the CDCC must turn its attention to other gaps in the observance of the PFMI.

The CDCC’s specific priority areas for 2015 are operational risk management and default management. The CDCC has a number of procedures and processes in place to manage its operational risks; however, there is no framework that integrates and outlines responsibility for the various operational risks that the CDCC faces. The CDCC is planning to conduct two default simulations in 2015 to address various complexities within the default-management process that have not been previously tested.

Establish a Buy-Side Participation Model

A concentrated effort by the CDCC and industry stakeholders in early 2015 will be required to finalize the details of a clearing model that allows buy-side participants to join the repo CCP without compromising the CDCC’s risk-management standards.

Once the details of the clearing model have been agreed to, both the CDCC and industry stakeholders will focus on implementing the system changes needed to operationalize buy-side participation. As a first step, the establishment of business requirements will help to determine implementation timelines. Implementation will involve operational changes at the CDCC and significant time and effort on the part of industry stakeholders. CDCC is expected to implement changes, and to support the adoption efforts of buy-side participants.

¹² Buy-side participants are investing institutions, such as mutual funds and pension funds. Current efforts are focused on large pension funds active in the repo market.

3. Risk-Management Priorities for Designated Foreign FMIs

For foreign-domiciled FMIs, the Bank conducts its oversight primarily through co-operative oversight colleges led by a foreign lead regulator. Priorities for these FMIs are set by this foreign regulator in consultation with the members of the co-operative oversight colleges. The Bank has designated and oversees two foreign-domiciled systemically important FMIs.

- **CLS Bank** is a global payment system for the settlement of foreign exchange transactions, including those involving the Canadian dollar. CLS Bank is supervised by the Federal Reserve Board and overseen by the CLS Oversight Committee, which is composed of central banks whose currencies are included in the CLS arrangements (including the Bank of Canada).
- **SwapClear** (operated by LCH.Clearnet Limited (LCH.Clearnet)) is a global system for the central clearing of interest rate swaps and other over-the-counter (OTC) interest rate derivatives denominated in multiple currencies, including the Canadian dollar. The Bank is actively involved in the oversight of SwapClear through participation in a multilateral arrangement for oversight co-operation led by SwapClear's lead regulator, the Bank of England.

3.1 CLS Bank's Priorities

In 2014, CLS Bank made progress in ensuring its observance of the PFMI's.

In 2015, CLS Bank will work toward compliance with new requirements under Regulation HH.

2014 Priorities

Made Progress in Its Risk-Management Standards

During 2014, CLS Bank, with inputs from its overseers, worked on ensuring its observance of the PFMI's.

In particular, CLS Bank published its responses to the CPMI-IOSCO disclosure framework for financial market infrastructures on 30 December 2014. The disclosure framework aims to improve the transparency with respect to an FMI's operations, governance and risk-management framework.

2015 Priorities

Work Toward Compliance with New Requirements Under Regulation HH

On 28 October 2014, the Board of Governors of the Federal Reserve System issued a final rule amending their risk-management standards for financial market utilities (called Regulation HH). CLS Bank is subject to Regulation HH and, as such, has been working toward compliance with its requirements, including the finalization of a Recovery and Wind-Down Plan.

3.2 SwapClear's Priorities

In 2014, SwapClear:

- made the necessary changes to be re-authorized under the European Market Infrastructure Regulation (EMIR); and
- made good progress on other risk priorities.

In 2015, SwapClear will need to

- make progress on key risk-management priorities.

2014 Priorities

Made the Necessary Changes to Be Reauthorized Under EMIR

A key focus for LCH.Clearnet in 2014 was to complete the changes required for reauthorization under EMIR, thus permitting it to continue to operate as a central counterparty (CCP) in the European Union (EU). LCH.Clearnet successfully completed these changes, notably in the areas of governance, margin, and segregation and portability, and was reauthorized by the Bank of England on 12 June 2014.

Made Progress on Other Risk Priorities

In its March 2014 *Annual Report*, the Bank of England set forward-looking priorities for all United Kingdom CCPs, including LCH.Clearnet, in the areas of credit and liquidity risk, recovery and resolution, and operational risk management.¹³

¹³ *The Bank of England's Supervision of Financial Market Infrastructures—Annual Report*, March 2014, available at www.bankofengland.co.uk/financialstability/Documents/fmi/annualreport2014.pdf.

LCH.Clearnet has made notable progress in a number of these areas, which are discussed in *The Bank of England's Supervision of Financial Market Infrastructures 2015 Annual Report*, published on 11 March 2015.

2015 Priorities

Make Progress on Key Risk-Management Priorities

During 2015, LCH.Clearnet will address several priorities, including the following:¹⁴

- operational risk management;
- liquidity management;
- strengthening the waterfall for default losses; and
- cyber risk.

These efforts will help to ensure LCH.Clearnet's ongoing compliance with the PFMI, a key pillar of the Bank of England's regulatory regime for FMIs.

¹⁴ The Bank of England's 2015 *Annual Report* has more information on its priorities for FMIs, including central counterparties, available at www.bankofengland.co.uk/publications/Documents/fmi/annualreport2015.pdf

Appendix 1: Designated Systems

LVTS (payment system – designated 1999)

The Large Value Transfer System (LVTS) is a Canadian electronic funds-transfer system that settles large-value and time-critical Canadian-dollar payments.

Measure	2013	2014
Daily average value settled	\$150 billion	\$154 billion
Daily average volume settled	30 thousand	31 thousand
Daily average collateral pledged	\$37 billion	\$37 billion
Number of direct participants	16	16

CDSX (securities settlement system, central securities depository, central counterparty – designated 2003)

CDSX is a Canadian system that consists of a securities settlement system, a central securities depository, and central counterparty services for eligible Canadian exchange-traded and over-the-counter (OTC) equities. The Bank oversees all of these elements of CDSX.

Measure	2013	2014
Daily average value of equity and fixed-income securities cleared and settled	\$452 billion	\$475 billion
Daily average volume of equity and fixed-income securities cleared and settled	1,372 thousand	1,671 thousand
Average value of securities held at the central securities depository	\$4.3 trillion	\$4.6 trillion
Number of direct participants	100	100

CDCS (central counterparty – designated 2012)

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

Measure	2013	2014
Daily average value of OTC repos cleared	\$19.7 billion	\$22 billion
Daily average notional value cleared (exchange-traded derivatives)	\$101 billion	\$109 billion
Daily average notional value cleared (OTC derivatives)	\$15.1 million	\$16.2 million
Number of direct participants	36	37

CLS Bank (payment system – designated 2002)

CLS Bank is a global payment system for the settlement of foreign exchange transactions, including those involving the Canadian dollar.

Measure	2013	2014
Daily average foreign exchange settlement (total)	US\$4,987 billion	US\$5,093 billion
Daily average Canadian-dollar foreign exchange settlement	Can\$126 billion	Can\$138 billion
Settlement members	63	63

SwapClear (central counterparty – designated 2013)

SwapClear is an LCH.Clearnet Ltd. clearing platform for interest rate swaps and other over-the-counter (OTC) interest rate derivatives denominated in multiple currencies, including the Canadian dollar.

Measure	2013	2014
Notional outstanding OTC interest rate swaps in all currencies as of 31 December	US\$426 trillion	US\$362 trillion
Notional outstanding OTC interest rate swaps, denominated in Canadian dollars, as of 31 December ¹⁵	Can\$13.2 trillion	Can\$12.2 trillion
Number of direct participants	86	98 ¹⁶

¹⁵ SwapClear reported U.S. dollar equivalent, which has been converted into Canadian dollar based on the Bank of Canada's closing spot exchange rate for 31 December 2013 and 31 December 2014, respectively.

¹⁶ Based on the list of Global Service Members on SwapClear's website, available at www.swapclear.com/service/our-members.html.

Appendix 2: Glossary of Terms

Central counterparty	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 and 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, and plays an important role in helping to ensure the integrity of securities issues (that is, ensures that securities are not accidentally or fraudulently created or destroyed or their details changed).
Clearing	The process of transmitting, reconciling and, in some cases, confirming transactions prior to 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. For the clearing of futures and options, clearing also refers to the daily balancing of profits and losses and the daily calculation of collateral requirements.
Core systems	The technology, networks and data that support the operations of financial entities.
Collateral	An asset or third-party commitment that is used by a collateral provider to secure an obligation vis-à-vis 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.
Cyber defences	The strategies, tools and technology deployed by an entity to prevent, detect, and recover from cyber attacks.
Default	An event stipulated in an agreement as constituting a default. Generally, such events relate to a failure to complete a transfer of funds or securities in accordance with the terms and rules of the system in question.
Default fund	A pre-funded default arrangement that is composed of assets contributed by a CCP's participants that may be used by the CCP in certain circumstances to cover losses or liquidity pressures resulting from participant defaults.
Enterprise risk management	A process put in place by an entity's board of directors, management and personnel that is applied in setting strategy across the enterprise.

	ERM is also designed to identify potential events that may affect the entity and to manage risk so that it remains within the entity's risk appetite.
Financial market infrastructure	A multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling or recording payments, securities, derivatives or other financial transactions.
Initial margin	Collateral that is collected to cover potential changes in the value of each participant's position (that is, potential future exposures) over the appropriate close-out period in the event that the participant defaults.
Key Attributes	"Key Attributes for Effective Resolution Regimes for Financial Institutions," Financial Stability Board, October 2014, available at www.financialstabilityboard.org/wp-content/uploads/r_141015.pdf .
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	Orderly wind-down involves the set of actions and procedures to effect the wind-down of the functions of an FMI in an orderly manner.
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.
Procyclicality	The changes in risk-management requirements or practices that are positively correlated with business or credit cycle fluctuations and that may cause or exacerbate financial instability.
Recovery	<p>Recovery concerns the ability of a financial institution, including an FMI, to recover from a threat to its viability and financial strength so that it can continue to provide its critical services without requiring the use of resolution powers by authorities.</p> <p>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.</p>
Resolution	Resolution is the set of actions that a resolution authority can take when recovery efforts have been unsuccessful, or when recovery measures are deemed by the authorities to be insufficient to return the financial

	institution or FMI to viability.
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.

Appendix 3: Abbreviations

CCP	Central counterparty
CDIC	Canadian Deposit Insurance Corporation
CDCC	Canadian Derivatives Clearing Corporation
CDCS	Canadian Derivatives Clearing Service
CDS	Canadian Depository for Securities Limited
CNS	Continuous net settlement service
CPA	Canadian Payments Association
CPMI	Committee on Payments and Market Infrastructures
CSA	Canadian Securities Administrators
D-SIBs	Domestic systemically important banks
EU	European Union
FMI	Financial market infrastructure
EMIR	European Market Infrastructure Regulation
ERM	Enterprise risk management
IOSCO	International Organization of Securities Commissions
LVTS	Large Value Transfer System
FSB	Financial Stability Board
OSFI	Office of the Superintendent of Financial Institutions
OTC	Over-the-counter
PCSA	Payment Clearing and Settlement Act
PFMI	Principles for Financial Market Infrastructures

Appendix 4: Relevant Research and Publications Issued by the Bank of Canada in 2014

Gallagher, H., W. McMahon and R. Morrow. 2014. "[Cyber Security: Protecting the Resilience of Canada's Financial System.](#)" Bank of Canada *Financial System Review* (December): 47–53.

Raykov, R. 2014. "[Optimal Margining and Margin Relief in Centrally Cleared Derivatives Markets.](#)" Bank of Canada Working Paper No. 2014-29.

Rempel, M. 2014. "[Improving Overnight Loan Identification in Payment Systems.](#)" Bank of Canada Working Paper No. 2014-25.

Taylor, V. and N. Labelle. 2014. "[Removal of the Unwinding Provisions in the Automated Clearing Settlement System: A Risk Assessment.](#)" Bank of Canada Discussion Paper No. 2014-4.

Schembri, L. 2014. "A Dual Vision for the Canadian Payments System." Speech to the Canadian Payments Association, Charlottetown, Prince Edward Island, 27 June. Available at www.bankofcanada.ca/2014/06/dual-vision-canadian-payments-system.