

Oversight Activities during 2010 under the Payment Clearing and Settlement Act

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This report reviews the Bank of Canada's oversight activities during 2010 pursuant to the Payment Clearing and Settlement Act (PCSA). This annual report is intended to provide transparency and accountability regarding the Bank's activities in this area.

Under the PCSA, the Bank of Canada (the Bank) has had formal responsibility for the oversight of systemic risk in designated clearing and settlement systems since 1996¹. In this context, systemic risk is defined as the risk that the default of one participant in a clearing and settlement system, or a serious problem arising within the system itself, could lead, through the activities of the system, to the default of other institutions or systems.

A clearing and settlement system brings together various financial system participants in a common arrangement, such as a clearing house, where the participants are explicitly interlinked so that the behaviour of one participant can have implications for others. In such an arrangement, each participant could face potentially significant risks and liabilities, depending on the behaviour of other participants and on the design of the system. As a result, spill-over effects with broader economic consequences could occur if the system was not properly designed and operated.

Under the PCSA, the Bank has a mandate to identify clearing and settlement systems involving Canadian dollars that could be operated in a manner that could pose systemic risk. Provided the Minister of Finance agrees that it is in the public interest to do so, these systems are designated for oversight by the Bank, and must satisfy the Bank that they have appropriate risk controls in place to deal with concerns related to systemic risk.²

Three systems have been designated by the Bank: the Large Value Transfer System (LVTS), which deals with large-value Canadian-dollar payments; CDSX, which clears and settles securities transactions; and CLS Bank, a global system for the settlement of foreign-exchange transactions including the Canadian dollar.

In the following sections, various aspects of the Bank's oversight activities during the past year are discussed. In 2010, the major payment, clearing, and settlement systems continued to evolve in a way that supports the stability and efficiency of the financial system.

The Large Value Transfer System

Owned and operated by the Canadian Payments Association (CPA), the Large Value Transfer System (LVTS) began operation in February 1999.³ During 2010, it processed, on average, close to 24,000 transactions per day worth approximately \$149 billion. The LVTS continued to operate reliably, and was available 99.97 per cent of the time, while overall for the year participants were available 99.90 per cent of the time.

In its eleven years of operation, the LVTS has been a relatively stable system; that is, there have been few significant changes to its design and risk controls. In 2010, the Bank reviewed 14 rule changes concerning the LVTS, most of which were largely technical in nature. However, some of the changes approved by the Bank throughout the year were significant.

One such change was the decision to permit the exchange of any payments between LVTS participants (who bilaterally agree to do so) during the early morning hours (00:00-06:00), which had previously been reserved for payments related to CLS activity. This change could potentially spread out the peaks in payments volume observed at the start of regular payment exchange and allow clients to receive their funds earlier in the day.

Another significant and related change in 2010 was the introduction of a priority payments mechanism. The priority mechanism ensures that any payments to or from the Bank of Canada are submitted for processing by the LVTS prior to other payments awaiting submission to the LVTS. Many payments involving the Bank are time-sensitive and delays to settlement could have negative effects for participants or the operation of other payment clearing and settlement systems such as the CDSX and the CLS Bank that rely on payments to the Bank. Ensuring that these payments are given first priority for processing by the LVTS therefore helps prevent unnecessary delay.

In 2009, the CPA conducted an assessment and review of the payment systems technology for CPA systems, including the LVTS. This review acted as a guide for the CPA in undertaking system upgrades in 2010, which included the renewal of all LVTS workstations and routers. The CPA has also developed a long-term technology strategy to plan the modernization and ongoing renewal of CPA payment systems technology. This ensures that the LVTS remains technologically robust and reliable. The CPA also undertook an Information Security Review, and over the next two years it will be making a number of changes to strengthen its information security policies.

An improvement that has already taken place was the separation of production and non-production regions of the mainframe system. Through introducing improved testing capabilities, the objective of this particular project was to reduce operational risk related to the implementation of system changes. This approach adheres to industry best practices.

In October, ING Bank of Canada began direct participation in the LVTS, bringing the total number of direct participants to 16. This is the first time since 2004 that a new direct participant has joined the system.

Integral to the Bank's oversight process is the use of Memoranda of Understanding with operators of designated systems. The Memorandum of Understanding (MOU) between the Bank and the CPA sets out the roles and responsibilities of both parties under the PCSA and how they intend to work together to meet these responsibilities. Pursuant to the MOU, the CPA conducts an annual self-assessment of the LVTS against the CPSS Core Principles for Systemically Important Payment Systems, which are the benchmark international standards for payment systems as agreed by the relevant central banks.⁴

In addition to ongoing communications at staff level, regular meetings between more senior Bank and CPA staff form a key part of the oversight arrangement with regard to the LVTS, as set out in the MOU. This allows the Bank and the CPA to discuss general developments in the payments system, as well as potential changes to the LVTS, early in the process of developing those changes. During 2010, the Bank and the CPA held four such meetings. In addition, pursuant to the terms of the MOU, the Bank's Deputy Governor responsible for oversight met with the CPA Board of Directors to discuss issues of mutual interest.

Another important element of the Bank's oversight of the LVTS is the audit report on controls related to the operations of the system. The audit, completed according to Section 5970 of the Canadian Institute of Chartered Accountants Handbook, assesses whether the LVTS operates as designed. In consultation with the Bank and the CPA's auditor, several controls were added or modified for the 2010 audit review, including explicit tests of collateral requirement calculations and procedures for logging and reviewing potential contraventions of LVTS rules and By-laws. The audit results for the period 1 April 2010 to 30 September 2010 were positive and unqualified, with the auditor concluding that the tested controls were operating with sufficient effectiveness to provide reasonable assurance that the control objectives were achieved during the audit period.

The Bank oversees the LVTS pursuant to the PCSA. The Department of Finance oversees the CPA pursuant to the Canadian Payments Act. To manage coordination and information sharing related to these oversight roles the Bank and Finance meet regularly at the staff level. Periodically the Bank's Deputy Governor responsible for oversight and the Department of Finance's Assistant Deputy Minister for Financial Sector Policy meet to discuss areas of mutual interest.

CDSX

Owned and operated by CDS Clearing and Depository Services Inc. (CDS), CDSX clears and settles securities transactions in Canada. On average in 2010, CDSX processed about 1.23 million trades daily worth about \$283 billion. CDSX continued to operate reliably, achieving 99.9 per cent operational reliability and on-line network availability of 99.9 per cent. The Bank approved thirty-one changes to CDSX rules, procedures, and systems in 2010.

As reported in the Annual Oversight report for 2009, in the second half of 2009 CDS discovered deficiencies in the process used for issuing money market securities. As a result, CDS introduced a range of enhancements in 2010, approved by the Bank, to the set-up, monitoring, and handling of money market issues. The enhancements centred on the definition of participants' roles and responsibilities with respect to eligible securities, the imposition of standards for adequate internal controls, and the segregation of duties in the back-office operations of institutions who undertake these roles.

Following the discovery of the deficiencies in the money market process, CDS ordered an independent review of the enterprise risk management (ERM) function. This review provided a generally positive overall assessment of CDS's ERM program. Nonetheless, several areas for improvement were identified, relating to further clarifying risk management roles and responsibilities, and reinforcing a stronger risk culture and awareness. CDS has developed a project plan based on the recommendations, and it has committed to implementing the ERM enhancements.

In 2010, CDS also introduced improvements to address risk arising through its cross-border services with the United States.⁵ CDS introduced additional controls and related monitoring mechanisms to reduce payment obligations and hence the liquidity risk of sponsored participants in these systems. In addition, CDS fulfilled a previous recommendation that its committed liquidity facility in place to mitigate the liquidity risk that it incurs in CDSX and through its sponsorship of participants in the cross-border services be increased from \$90 million Canadian dollars to \$200 million U.S. dollars.

CDS historically provided collateral value for certain debt and money market instruments on the day of maturity, which facilitated the making of the associated entitlement payments by participants that act as entitlement processors in the system. However, if an entitlement processor were to default and thus fail to make entitlement payments on maturing securities, uncertainty would exist as to the valuation of the maturing instruments. Consequently, as of March 7, 2011, CDS no longer provides collateral value to securities on the day of maturity.

As is the case with the LVTS, an important element of the Bank's oversight of the CDSX is the 5970 audit report on controls related to the operations of the system. The Section 5970 audit, which covered the period from August 2009 to 31 July 2010, concluded that internal controls and procedures used by CDS to meet a series of 28 control objectives were accurately described, suitably designed and effective. The auditor assessed CDS as having satisfied all 28 of the control objectives, which pertained to the delivery of CDS services and the security and integrity of information in CDS systems. While CDS met all of the control objectives, the audit report noted three minor exceptions, which have been addressed by CDS to the satisfaction of the Bank.

Under the Bank's Regulatory Oversight Agreement with CDS, semi-annual meetings are held between the Bank and CDS. While there is regular communication on changes and developments at the staff level, these meetings provide the Bank and CDS with a more formal opportunity, and at a more senior level, to explore any concerns or questions related to proposed changes and strategic initiatives on a timely and efficient basis. In this way, the Bank is alerted to possible significant changes and can raise any concerns that it may have so they can be dealt with efficiently by CDS in the process of developing system changes. Among the topics discussed in 2010 were projects on ERM enhancement, International Financial Reporting Standards, and aggregate collateral value for maturing securities. In addition, the Bank's Deputy Governor responsible for oversight met with the CDS Board of Directors in June to review matters of mutual interest.

CLS Bank

CLS Bank is overseen collaboratively by the central banks whose currencies are included in the system, with the U.S. Federal Reserve acting as lead overseer.⁶

CLS Bank settles payment instructions for foreign exchange (FX) transactions in seventeen currencies, including the Canadian dollar. Last year, CLS presented a framework for accelerating the process of adding new currencies to the settlement service. CLS hopes to add a number of currencies in the coming years.

All six major Canadian banks use CLS Bank as one means of settling their eligible FX transactions. BMO joined RBC, CIBC, and Scotiabank as a direct participant in February 2010. Since then, TD has also joined as a direct participant, while National Bank participates indirectly as a "third party user" submitting its trades through a direct participant in CLS.⁷

In 2010, CLS Bank settled an average daily value of US\$4.1 trillion from an average daily volume of 793,000 instructions. Relative to 2009, this represented a 22 per cent increase in daily value, and a 33 per cent increase in daily volume. Settlement of foreign exchange trades involving the Canadian dollar also increased over the year, with an average daily value of Can\$95 billion and average daily volume of 26,000 instructions, representing increases of 23 per cent and 41 per cent respectively.⁸ Record volume for CLS was achieved on 26 November following the U.S. Thanksgiving holiday when CLS settled 1.94 million instructions. CLS continued to operate reliably, completing settlement 100 per cent of the time.

A major initiative in 2010 was the launch of the trade aggregation service on 25 January. The service aggregates individual small value, high volume trades into a single large trade that is then submitted to the CLS Bank for settlement. Peak volumes for the service were achieved on 30 November, when 164,000 gross trades were aggregated into 9,000 trades for settlement in CLS. The aggregation service supports the growing low-value, high-volume market segment in a cost-effective manner. At present, no Canadian banks participate, although the Canadian dollar is an eligible currency for the service.

CLS has continued its efforts to develop a same-day settlement session, with an initial focus on same-day U.S. dollar/Canadian dollar trades. Same-day foreign exchange trades cannot currently be settled in CLS due to the timing of the existing settlement session. Once the additional session is implemented, the service could bring a significant reduction in foreign exchange settlement risk associated with the same-day FX market.

Other developments in financial market infrastructure

The financial crisis underscored the important role that well designed financial market infrastructure can play to keep core markets functioning continuously, including in times of stress, and generally to promote the overall safety and soundness of our financial system. The Bank has been active in international efforts to enhance the standards applicable to financial market infrastructures. The Bank has also been involved in work that is underway to improve the infrastructure supporting over-the-counter (OTC) derivatives markets, as well as the market for Canadian-dollar fixed income repurchase agreements (repo market).

The Bank is an active member of the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements. The CPSS is a committee of central bankers that collaboratively sets standards that guide oversight policies around the world.⁹

The CPSS, working together with the International Organization of Securities Commissions (IOSCO), has been working throughout 2010 to enhance the international standards and recommendations pertaining to systemically important payments systems, security settlement systems and central counterparties.¹⁰ The draft report has been released for public consultation, with the objective that the new standards will come into effect by the end of 2012. Thus, future oversight of designated systems in Canada by the Bank will need to take into account these enhanced standards, once they are in place.

The Bank has continued to contribute to work being done both domestically and internationally on the reform of the OTC derivatives market. In October, the inter-agency Canadian OTC Derivatives Working Group, chaired by the Bank, published a discussion paper outlining the group's preliminary recommendations for implementing Canada's G-20 commitments related to OTC derivatives.¹¹ The Bank has been working with the industry on options for the development of central clearing for the Canadian OTC derivatives markets. The Bank has also been actively involved in international work to examine issues regarding fair and open access to central counterparties.

Following a Request for Proposal to develop a more effective central counterparty framework for repo transactions in Canada, the Investment Industry Association of Canada (IIAC) selected the Canadian Derivatives Clearing Corporation (CDCC) as the preferred vendor in December 2009. CDCC currently operates a central counterparty for the clearing and settlement of derivatives traded on the Montreal Exchange, and is now working with its stakeholders to develop a CCP service for repo transactions. Pursuant to the PCSA, the Bank periodically reviews the systemic risk potential of payment clearing and settlement systems that are not currently designated. Given this new development, in 2010 the Bank reviewed the designation status of the system operated by CDCC. Because of the important role that CDCC's new services will play in supporting the repo market, the Bank plans to seek designation of CDCC's system, once the new services commence operation. This would give the Bank formal responsibilities and powers to oversee the system operated by CDCC.

In June 2010, the Department of Finance appointed an independent task force to conduct a comprehensive review of the Canadian payments system.¹² The review will identify public policy objectives to be pursued in the operation and regulation of Canadian payments systems, and will cover topics such as safety and soundness, governance, competition, and innovation. Part of the review involves a holistic mapping of the current Canadian payments landscape, which was completed in September 2010.¹³ The Bank has contributed information to the Task Force on issues where the Bank has particular knowledge and experience. The Bank has also participated in a series of workshops organized by the Task Force to consider possible future scenarios for Canadian payment systems.

In 2010, the Bank participated in a CPSS Working Group on Post-Trade Services. The Working Group published a report that provides a broad overview of the clearing industry in CPSS countries, covering both traditional cash markets and OTC derivatives markets. In addition, it assesses how developments in market structure between 2000 and 2010 may have given rise to new risks, and ways such risks could be managed. The report also outlines practical issues for consideration by central banks, regulators and overseers.¹⁴

Other Oversight-Related Activities

SWIFT

The Bank continues to participate in the co-operative oversight of the Society for Worldwide Interbank Financial Telecommunication (SWIFT). SWIFT is the principal payment-messaging service provider for financial institutions around the world and is used for critical systems such as the LVTS and CLS Bank. This co-operative oversight group monitors and assesses the extent to which SWIFT maintains appropriate governance arrangements, operational processes, risk management, and controls to effectively address potential concerns that may arise for financial stability.

The SWIFT Oversight Group met twice in 2010. The restructuring of SWIFT's global operations centres (the "distributed architecture" project) continued to be a key topic of discussion. Under this project, SWIFT's messaging services are being organized under two processing zones, a European zone and a Trans-Atlantic zone, and Command and Control capabilities were expanded, adding the ability to run SWIFT operations from Asia. Phase 1, which included development of a new Command and Control Centre in the Asia-Pacific area, has been completed. In 2010, progress was made on the second phase of the project, which involves the construction of a new operating centre in Europe to replace an existing but temporary center in the same area. The distributed architecture project is on track for completion in the first half of 2014.

In 2009 and 2010, SWIFT undertook a formal review of its operating model aimed at improving efficiency and instilling a culture focussed on continuous improvement. By the end of 2011Q1, SWIFT forecasts a reduction of its operating costs and staffing by about 20% when compared to the cost base and staffing level at the start of 2009. During the review, emphasis was placed on maintaining processes and controls to ensure compliance with SWIFT security policies.

SWIFT has also commenced a project to renew the core infrastructure supporting its messaging services. This project is intended to reduce technology risk and costs, and improve strategic alignment with other SWIFT services. The Oversight Group reviewed SWIFT management's risk analysis to identify and mitigate key risks associated with the project and will continue to focus on monitoring project risks.

Business-continuity planning (BCP)

The Bank works with the operators and participants of systemically important Canadian clearing and settlement systems to enhance arrangements for continuity of operations. These systems are at the centre of Canada's financial system, and serious economy-wide repercussions could arise if their operations were not extremely reliable. Consequently, the Bank has been participating in a committee on joint business continuity planning with the operators of designated clearing and settlement systems (CPA and CDS). The focus of the first-half of 2010 involved preparations to ensure uninterrupted service around the G20 summit held in Toronto in June. During the year, the joint BCP group also presented and discussed the results of a survey of key LVTS and CDSX participants, to help assess the current state of planning, preparedness and standards from a system-wide perspective. The Bank is involved in developing a future workplan for continuing to examine operational risk management in financial infrastructures from a system-wide perspective.

Publications in 2010

During 2010, Bank staff published the following work related to clearing and settlement systems:

Bech, M., J. Chapman, and R. Garratt. 2010. "Which Bank is the 'Central' Bank?" *Journal of Monetary Economics* 57 (3): 352-63.

Chande, N., N. Labelle, and E. Tuer. 2010. "Counterparties and Systemic Risk." *Bank of Canada Financial System Review* (December): 43-50.

Chapman, J., J. Chiu, and M. Molico. 2010. "Central Bank Haircut Policy." *Bank of Canada Working Paper* 2010-23.

Chapman, J. and Y. Zhang. 2010. "Estimating the Structure of the Payment Network in the LVTS: An Application of Estimating Communities in Network Data." *Bank of Canada Working Paper* 2010-13.

Hossfeld, T., and Y. Zhang. 2010. "Losses from Simulated Defaults in Canada's Large Value Transfer System." *Bank of Canada Working Paper* 2010-14.

Selody, J., and C. Wilkins. 2010. "The Bank of Canada's Extraordinary Liquidity Policies and Moral Hazard." *Bank of Canada Financial System Review* (June): 29-32.

Wilkins, C., and E. Woodman. 2010. "Strengthening the Infrastructure of Over-the-Counter Derivatives Markets." *Bank of Canada Financial System Review* (December): 35-41.

1. A clearing and settlement system is the set of instruments, procedures, rules, and technical infrastructure for the transfer of funds or other assets among system participants.
2. For a discussion of the Bank's approach to the oversight of designated systems, see Engert, W. and D Maclean. 2006. "The Bank of Canada's Role in the Oversight of Clearing and Settlement Systems." Bank of Canada *Financial System Review* (June): 57-64.
3. For detailed information on LVTS, see Arjani, N. and D. McVanel. 2006. "[A Primer on Canada's Large Value Transfer System](#)."
4. These core principles are available at <http://www.bis.org/publ/cpss43.pdf>
5. CDS sponsors participants into the Depository Trust Company (DTC) and National Securities Clearing Corporation (NSCC) in the United States.
6. CLS Bank is incorporated under U.S. laws, and the vast majority of foreign exchange trades involve the U.S. dollar.
7. BMO and TD had previously participated indirectly as third-party users, prior to joining as direct participants.
8. For every foreign exchange trade, CLS receives one instruction for each counterparty.
9. For more on the CPSS, see <http://www.bis.org/cpss/index.htm>
10. For more information on the review of standards, see <http://www.bis.org/publ/cpss94.htm>
11. OTC Derivatives Working Group. 2010. "Reform of Over-the-Counter (OTC) Derivatives Markets in Canada." The OTC Derivatives Working Group is an interagency group composed of members from the Office of the Superintendent of Financial Institutions (OSFI), the federal Department of Finance, the Ontario Securities Commission, the Autorité des marchés financiers, the Alberta Securities Commission and the Bank of Canada.
12. For more information on the task force review, see <http://paymentsystemreview.ca/index.php/home>
13. The landscape review is available at <http://paymentsystemreview.ca/wp-content/uploads/Payments-Landscape-Full-Report-e3.pdf>
14. The report is available at <http://www.bis.org/publ/cpss92.pdf>