Oversight Activities during 2008 under the Payment Clearing and Settlement Act

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This report reviews the Bank of Canada's oversight activities during 2008 pursuant to the Payment Clearing and Settlement Act (PCSA). This is the fourth in a series of annual reports that provide transparency and accountability regarding the Bank's activities in this area.[1]

The Bank of Canada has had formal responsibility for the oversight of clearing and settlement systems in Canada since 1996.[2] The PCSA gives the Bank this responsibility for the purpose of controlling systemic risk. In this context, systemic risk is defined as the risk that the default of one participant in a clearing and settlement system 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, spillover or domino effects with broader economic consequences can occur if the system is not properly designed and operated.

Under the PCSA, the Bank has a mandate to identify clearing and settlement systems in Canada 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 of Canada, and must satisfy the Bank that they have appropriate risk controls in place to deal with concerns related to systemic risk.[3]

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-currency transactions.

In the following sections, various aspects of the Bank's oversight activities during the past year are discussed. In 2008, 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 began operation in February 1999. During 2008, it processed, on average, 22,600 transactions per day worth approximately $181.5 billion. In its ten 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 2008, the Bank reviewed eleven rule changes concerning the LVTS, most of which were largely technical in nature. The most significant rule change undertaken in 2008 involved an increase in the System-Wide Percentage (SWP) in the LVTS from 24 per cent to 30 per cent.[4] In approving this rule change, the Bank of Canada assessed that there was no implication of systemic risk arising from this change since the LVTS, by design, is risk-proofed at any value of the SWP. This increase in SWP also has an impact on the Bank's risk owing to its dual role as a participant in the LVTS and as a residual guarantor of settlement in the LVTS. Overall, the Bank continues to view these risks as very manageable.

Another significant change was the relocation of the CPA's primary and alternate operating sites, which was associated with the consolidation of operational staff at the primary site. The Bank approved the move after judging that the potential decrease in risk in day-to-day operations owing to increased knowledge-sharing across operational teams because of the consolidation of staff appears to outweigh the potential risk increase in extreme events. In certain extreme situations, the relocation may increase the risk of delay in the event of an outage at the primary site, since staff would have to be moved to the alternate site. Other arrangements, such as remote access capability and a "proxy service" provided by the CPA's mainframe service provider, mitigate this risk. To confirm that assessment, the CPA is required to provide an impact assessment one year after the relocation.

As a follow-up to the discovery and correction in 2007 of certain LVTS coding errors (see Engert and Maclean 2008), the Bank and the CPA conducted independent reviews of how this episode was managed. The Bank's review concluded that its internal communications and knowledge were satisfactory, and that its decision-making process related to the incident was appropriate. As part of the CPA's review, several changes were proposed by management to the CPA Board of Directors, including the implementation of automatic monitoring of critical LVTS functions. This automatic monitoring is to be established in 2009.

Integral to the Bank's oversight process is the use of Memoranda of Understanding (MOU) with operators of designated systems. The MOU set out the roles and responsibilities of both parties under the PCSA and how they intend to work together to meet these responsibilities. The MOU between the Bank and the CPA, signed in November 2006, added clarity and structure to the relationship between the Bank and the CPA, and improved the oversight relationship between the two organizations. Pursuant to the MOU, the CPA conducts an annual self-assessment of the LVTS against the *Core Principles for Systemically Important Payment Systems*.[5]

Another important element of the Bank's oversight of the LVTS is the audit report on controls related to the operations of the system for the period 1 April 2008 to 30 September 2008. 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, over 25 controls were added to the 2008 audit review, including explicit controls for the central payment queue. Overall, the audit results were positive, 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.

Part of the oversight arrangement with regard to the LVTS, as set out in the MOU, is regular meetings between the Bank and the CPA. 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 2008, 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.

CDSX

Owned and operated by the Clearing and Depository Services Inc. (CDS), CDSX clears and settles securities transactions in Canada. On average, in 2008, CDSX processed about 770,200 trades daily worth about $238 billion. On 18 September, CDSX achieved a record peak volume of 1,587,314 trades.

In 2008, CDS established a new subsidiary, CDS Securities Management Solutions Inc. (CDS SMS), which offers non-core clearing and settlement services to securities issuers and the general marketplace. The Bank approved the proposal after determining that the activities of CDS SMS do not pose risks to the financial soundness of CDS and the operation of CDSX. In 2008, CDS also established a one-way free-of-payment link with CAVALI, the central securities depository of Peru.[6] CAVALI's account at CDS will be used to effect and facilitate the movement of positions in securities issued by Canadian companies that are interlisted on the Lima Stock Exchange (BVL).

Certain changes to CDS's U.S.-dollar contingency liquidity arrangements were put in place in 2008. CDS provides a cross-border settlement service that allows participants to clear and settle transactions in securities issued in the United States. In the event of a default of a cross-border participant, there will be sufficient collateral posted by participants to cover the obligations they have created. However, CDS requires U.S.-dollar liquidity to complete settlement at the Depository Trust Company (DTC). To cover such liquidity requirements, CDS maintained standby liquidity facilities with two commercial banks until October 2008, when one of the lines was withdrawn. At that time, CDS was in discussion with DTC for a replacement facility, but an agreement could not be put in place by the time the secondary liquidity facility was withdrawn. As a result, at the request of CDS, the Bank accepted a deposit of US$80 million from CDS as a temporary store of liquidity, in recognition of the exceptional adverse conditions in global financial markets. These funds were placed in the Bank's General Account at the Federal Reserve Bank of New York, and the Bank of Canada was paid an escalating fee by CDS for this service. On 27 January 2009, CDS terminated its deposit agreement with the Bank and transferred the US$80 million deposit held by the Bank of Canada to CDS's account at a U.S. commercial bank.

The Section 5970 audit report on the controls related to the operations of CDS covering the year 1 August 2007 to 31 July 2008 concluded that CDS's internal controls were described fairly and accurately, the controls were suitably designed to meet CDS's internal control objectives, and the controls had been applied with sufficient effectiveness to meet the control objectives over the audit period. Furthermore, CDS was assessed in 2008 by a private custody and risk-management-rating firm, Thomas Murray, and received a rating of AA, which is "very low risk overall." (This is the highest rating that has been given to a depository clearing organization.)[7]

The bilateral meetings between the Bank and CDS, which examine a range of topics related to the operation of CDSX, are a valuable component of the Bank's oversight of CDSX. These meetings provide the Bank and CDS with an opportunity to explore any concerns or questions related to proposed changes to CDSX on a timely and efficient basis. In this way, the Bank is alerted to possible significant changes early in the process, and can raise any concerns that it may have, so that they can be dealt with efficiently by CDS in the process of developing system changes. During 2008, the Bank held two such meetings with senior CDS officials. Among the issues discussed were the role of CDS in the restructuring of asset-backed commercial paper (the Montreal Accord), the review of CDS's risk policy, its strategic plan, and its U.S.-dollar liquidity arrangements. 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.

The Bank of Canada approved 25 changes to rules and procedures concerning CDSX in 2008.

CLS Bank

CLS Bank clears and settles foreign exchange (FX) transactions in 17 currencies, including the Canadian dollar. In 2008, CLS Bank settled an average daily value of US$4 trillion, which included Canadian-dollar transactions with an average daily value of Can$81 billion. CLS achieved a record value of US$10.3 trillion on 19 March and a daily volume record of 1,554,166 transaction instructions on 17 September. Five of the six major Canadian banks currently use CLS Bank as one means of settling their FX transactions.

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. (CLS Bank is incorporated under U.S. laws, and the vast majority of FX trades involve the U.S. dollar.)

A major accomplishment in 2008 was the establishment of a new CLS co-operative protocol among central bank overseers of CLS Bank. The central banks established a new CLS Oversight Committee (OC) as the primary forum for the participating central banks to carry out their co-operative oversight of CLS. The Federal Reserve, as the U.S. chartering authority and supervisor of CLS, accepts primary responsibility for the oversight of CLS under the Protocol, and the Chairman of the Board of Governors of the Federal Reserve has appointed an official of the New York Fed as the Chair of the OC. Each participating central bank has appointed staff to the OC to discharge its oversight responsibilities.

The *Core Principles for Systemically Important Payment Systems* will continue to serve as minimum standards against which CLS Bank is assessed by the participating central banks, although CLS is also subject to individual central bank policies. Any proposal by CLS that implies a material change to CLS Bank's activities, rules, or risk controls requires the review or approval of the Federal Reserve. As part of its review and approval process, the Federal Reserve consults with the participating central banks to identify and resolve any issues or concerns they may have with the proposal. The OC meets several times a year to review issues of mutual interest among the participating central banks, particularly with respect to the risk management of CLS Bank and its strategic plans.

The Mexican peso and the Israeli shekel were included as eligible currencies for CLS settlement in 2008. As part of the approval process, the overseeing central banks reviewed the adequacy of liquidity, soundness of risk controls, and operational readiness for the inclusion of the new currencies into the CLS settlement service with regard to the CLS system's compliance with the *Core Principles for Systemically Important Payments Systems* and other applicable policies.

Financial Crisis

The global financial crisis intensified in the latter half of 2008 with the failures of several prominent global financial institutions. On 15 September 2008, Lehman Brothers Holding Inc. (Lehman) filed for bankruptcy under Chapter 11 of the U.S. Bankruptcy Code. Although the filing involved the parent company, and not its broker-dealer subsidiary, Lehman Brothers Inc., it created challenges for various infrastructures in which Lehman participated. However, all Canadian designated systems functioned smoothly. Moreover, they continued to perform well during the period of financial market turbulence that followed.

Effects on designated systems

LVTS

The economic downturn led to a decline in the value of the payments processed by the LVTS, although volume continues to grow at a modest pace. Payment values in the fourth quarter of 2008 declined 3 per cent from the previous year. In contrast, the daily volume of payments averaged 24,000 payments in the fourth quarter, a 6 per cent increase from volumes recorded in the final quarter of 2007. In October 2008, as a temporary measure to support liquidity in the financial system, the Bank began accepting Canadian-dollar non-mortgage loans as collateral for intraday credit in the LVTS and for overnight loans under its Standing Liquidity Facility. The acceptance of Canadian-dollar non-mortgage loans has allowed LVTS participants to use more conventional LVTS collateral for other purposes.

CDSX

Increased market volatility caused a marked increase in CDSX trading volumes in the fourth quarter of 2008 to a daily average of 1.1 million trades. This represents year-over-year growth of almost 60 per cent. For four consecutive days in September, an unprecedented record trade volume was reached, with CDSX settling volumes that exceeded the one-million mark each day. A record peak volume of 1,587,314 trades was set on 18 September 2008. No capacity problems were noted during this period.

Lehman Brothers was not a participant in CDS, and therefore did not generate any direct exposures through CDSX. However, CDS participants subscribing to the U.S. cross-border services of CDS also use the services of the Depository Trust Company (DTC) and the National Securities Clearing Corporation (NSCC) in the United States. They could have been subject to a loss allocation if collateral pledged by Lehman to DTC and NSCC had been insufficient to support its settlement obligations. This did not pose any direct risk to CDS or CDSX. In the event, Lehman's collateral was sufficient and losses were not allocated to participants in CDS's cross-border services. One week prior to the Lehman bankruptcy, CDS applied 100 per cent haircuts to the Lehman-issued securities that were deposited at CDS, meaning that these securities received no value as collateral in CDSX.

In 2008, CDS responded to the market turmoil in a number of ways, including enhancing its stress-testing program, more frequent adjustments to haircut rates applied to equity securities used as collateral, more stringent validation of prices used for measuring market risk and valuing collateral, additional communication with participants regarding potential risks and obligations that could arise in the event of a participant default, and enhancements to its default-management procedures.

CLS Bank

During the week of 15 September 2008, when extreme market turbulence occurred, CLS Bank settled 4.4 million instructions for a value of US$26.9 trillion. This included a single-day peak volume of 1.55 million instructions on 17 September, owing to the quarterly rollover of forward and futures contracts. The average daily volume settled by CLS reached a new record high of 728,000 instructions in October and, for 2008 as a whole, was 549,218, a 48 per cent increase over 2007. Following the record-setting months of September and October, for the rest of 2008, settlement volumes in CLS Bank returned to levels more in line with the steady growth experienced during 2008. During the record-setting months, capacity surges were managed effectively.

During the week of 15 September, there was some uncertainty in Canada regarding the risk arising from the settlement of foreign exchange transactions outside of CLS Bank. In response, the Bank of Canada and the Office of the Superintendent of Financial Institutions (OSFI) are developing a joint work plan to address these issues.

Other Oversight-Related Activities

CPA and other payments-system issues

As part of the regulatory framework governing the Automated Clearing Settlement System (ACSS), the federal Department of Finance regularly consults the Bank of Canada with regard to proposed rule changes and other developments affecting the ACSS.[8] In this regard, the Bank reviewed nine ACSS bylaw and rule changes during the year.

More generally, to facilitate the Bank's interaction with the Department of Finance on payments issues, including broader policy developments affecting payment, clearing, and settlement systems, senior and working-level officials meet on a quarterly basis to exchange information and analysis.

Central bank committees and working groups

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. The CPSS also conducts analysis and research on a range of issues relevant to clearing and settlement systems.[9]

In 2008, Bank staff were also actively involved in several working groups established by the CPSS. One CPSS working group is developing guidance on standards relating to operational risk and business continuity. Another examined considerations related to enhancing the operational arrangements of central banks involved in the international distribution of liquidity. The emphasis in this work is on short-term actions to improve the cross-border mobilization of securities, particularly in emergency situations. This work recognizes that a central bank's policies and operational arrangements are driven by the needs of its domestic market, and encourages central banks to help each other in establishing and enhancing cross-border liquidity arrangements. In 2008, other CPSS working groups published a global survey conducted in 2006 on the management of FX-settlement risk at major international banks and a report on the interdependencies that exist between payment and securities settlement systems in CPSS-member countries, as well as the potential role of these interdependencies in the transmission of risk across systems and across countries.

SWIFT

The Bank also 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 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 2008. The restructuring of SWIFT's global operations centres (the so-called "distributed architecture" project) continued to be a key topic of discussion. To be introduced in two phases, distributed architecture will organize SWIFT messaging services into two processing zones, the European zone and the Trans-Atlantic zone, with pairs of operating centres for each zone. Phase 1, targeted to be completed by the end of 2009, includes a new temporary operating centre in Europe, and a new command and control centre in the Asia-Pacific area. In the second phase, a new, state-of-the-art operating centre will replace the temporary operating centre. Current plans are for the second phase to be completed by the end of 2012.

Distributed architecture will improve resilience, add capacity, control the long-term average costs of messaging, and alleviate concerns about data protection raised by subpoenas issued by the U.S. Treasury Department for access to information on global payments using SWIFT messaging services (see Goodlet 2007). All SWIFT traffic among Canadian members will be processed at the European operating site.

Business-continuity planning (BCP)

The Bank of Canada 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. In January 2008, the Bank met with the operators and participants of systemically important Canadian clearing and settlement systems to discuss approaches to strengthening integrated arrangements for continuity of operations. The Bank, together with the CPA and CDS, is working to develop a framework for information sharing regarding key risks and mitigation strategies affecting the Canadian clearing and settlement systems.

High-Availability Banking System

The Bank of Canada is committed to improving its ability to deliver its unique banking services to critical clearing and settlement systems and financial institutions on a high-availability basis. The Bank's new high-availability banking system was implemented in October 2008.

Publications in 2008

During 2008, the Bank published the following staff work related to clearing and settlement systems:

- Bech, M., J. T. E. Chapman, and R. Garratt. 2008. "Which Bank Is the "Central" Bank? An Application of Markov Theory to the Canadian Large Value Transfer System." Bank of Canada Working Paper No. 2008-42.
- Chande, N. 2008. "A Survey and Risk Analysis of Selected Non-Bank Retail Payments Systems." Bank of Canada Discussion Paper No. 2008-17.
- Chapman, J.T.E. 2008. "Policy Coordination in an International Payment System." Bank of Canada Working Paper No. 2008-17.
- Chapman, J.T.E., J. Chiu, and M. Molico. 2008. "A Model of Tiered Settlement Networks." Bank of Canada Working Paper No. 2008-12. This work is summarized in the Bank of Canada *Financial System Review*, June 2008.
- Embree, L. and K. Millar. 2008. "The Effects of a Disruption in CDSX Settlement on Activity in the LVTS: A Simulation Study." Bank of Canada Discussion Paper No. 2008-7. This work is summarized in the Bank of Canada *Financial System Review*, June 2008.
- Engert, W, T. Gravelle, and D. Howard. 2008. "The Implementation of Monetary Policy in Canada." Bank of Canada Discussion Paper No. 2008-9.
- O'Connor, S. and G. Caldwell. 2008. "What To Do about Bilateral Credit Limits in the LVTS When a Closure Is Anticipated: Risk versus Liquidity Sharing among LVTS Participants." Bank of Canada Discussion Paper No. 2008-13.

- O'Connor, S., J.T.E. Chapman, and K. Millar. 2008. "Liquidity Efficiency and Distribution in the LVTS: Non-Neutrality of System Changes under Network Asymmetry." Bank of Canada Discussion Paper No. 2008-11.

References

Arjani, N. and D. McVanel. 2006. "A Primer on Canada's Large Value Transfer System." (Available at <http://www.bankofcanada.ca/en/financial/lvts_neville.pdf>.)

Committee on Payment and Settlement Systems (CPSS). 2008. "The interdependencies of payment and settlement systems." Bank for International Settlements, Report No. 84 (June).

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Engert, W, T. Gravelle, and D. Howard. 2008. "The Implementation of Monetary Policy in Canada." Bank of Canada Discussion Paper No. 2008-9.

Engert, W. and D. Maclean. 2008. "Bank of Canada Oversight Activities during 2007 under the Payment Clearing and Settlement Act." Bank of Canada *Financial System Review* (June): 43-49.

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.

Goodlet, C. 2007. "Bank of Canada Oversight Activities during 2006 under the Payment Clearing and Settlement Act." Bank of Canada *Financial System Review* (June): 33-37.

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1. The first three such reports were published in the Bank of Canada's *Financial System Review* (June 2006, 2007, 2008). Prior to this practice, an account of the Bank's oversight activities was included in the Bank's *Annual Report*.

2. 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.

3. For a discussion of the Bank's approach to the oversight of designated systems, see Engert and Maclean (2006).

4. The SWP, together with the bilateral credit limits (BCLs) that participants grant each other, is a key parameter of the risk controls in the LVTS.. The amount of collateral that each participant must pledge to the Tranche 2 collateral pool is equal to the largest BCL that they extend to any other participant multiplied by the SWP. As well, each participant's Tranche 2 Net Debit Cap – which constrains a participant's capacity to present risk to the system – is calculated as the sum of all BCLs granted to it multiplied by the SWP. For a straightforward explanation of these aspects, see Engert, Gravelle, and Howard (2008); for a detailed account, see Arjani and McVanel (2006).

5. These core principles are available at <http://www.bis.org/publ/cpss43.pdf?noframes=1>. The CPA's self-assessment is available at <http://www.cdnpay.ca/publications/pdfs_publications/lvts_self_assessment_2008.pdf>.

6. Free-of-payment links involve the delivery of securities with no corresponding payment of funds.

7. CDS's 2008 rating is unchanged from the rating it received from Thomas Murray in 2007.

8. The ACSS, which is owned and operated by the CPA, is used for payments not handled by the LVTS; generally, small-value items, such as paper cheques, automated bill payments, and debit card transactions. The ACSS is subject to oversight by the federal Department of Finance.

9. For more on the CPSS, see <http://www.bis.org/cpss/index.htm>.