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## The Canadian Payments System: Recent Developments in Structure and Regulation

### I. Large-Value Payments System <sup>2</sup>

#### Risks in Clearing and Settlement Systems

During the past decade, there have been significant efforts around the world to develop and improve electronic clearing and settlement systems that handle large-value payments, and those that handle securities and foreign exchange transactions. In part, these efforts have been driven by the need to process efficiently the sharp increases in the volume and value of such transactions. These new systems can speed up the settlement of financial transactions and reduce the costs of these transactions. The other principal factor behind the pressure for change has been the increased understanding of, and concern about, the various risks associated with the concentration of a large number of transactions within clearing and settlement systems that handle large-value transactions, and the recognition of the need to contain such risks.

There are five principal risks that can arise in the process of clearing and settling financial instruments—legal, operational, credit, liquidity, and systemic:

- i. *Legal risk* - The importance of a legal framework<sup>3</sup> that determines the rights and responsibilities of all parties in all circumstances is evident. Uncertainty about the outcome in any particular situation can result in institutions incurring risks that can be large and unmanageable.
- ii. *Operational risk* - It is also important that the system be operationally sound and able to cope with various natural or other disaster scenarios. While it is not possible to cover every contingency, key clearing and settlement systems need to have in place sufficient back-up arrangements to avoid serious disruptions in the economy.
- iii. *Credit risk* - Credit risk refers to the possibility that a payor or its bank will be unable to settle the payment obligation for full value at the time the obligation is due, or at any later time.
- iv. *Liquidity risk* - Liquidity risk refers to the possibility that a payor or its bank will not be able to settle its payment obligation for full value when it comes due, but will be able to do so at some later time. With both credit and liquidity risks, there is a possibility that the receiving institution will have to find replacement funds. However, credit risk involves the potential loss of some or all of the principal owing, while liquidity risk results in the lesser cost and inconvenience of having to find funds at short notice to replace the payment that was not completed at the required time, but that will be completed later. Liquidity risk is, nonetheless, a serious matter for financial institutions since they may have to borrow funds or sell assets in unfavourable circumstances to avoid failing to meet their own payment obligations.
- v. *Systemic risk* - In recent years, systemic risk has been the focus of a great deal of attention by central banks and others. It refers to domino or spillover effects, whereby the inability of one financial institution to fulfil its payment obligations in a timely fashion results in the inability of other financial institutions to fulfil their obligations in that clearing and settlement system or in other systems, or in the failure of that clearing house or other clearing houses. Systemic risk can arise

through either liquidity or credit risk; i.e., liquidity problems at one institution can lead to liquidity problems for other institutions or for clearing houses, or the failure of one institution can lead to the failure of other institutions or to the failure of clearing houses.

### **Public Policy Objectives in Clearing and Settlement Systems**

The principal public policy objectives in the area of clearing and settlement systems are the development and maintenance of systems that are both efficient and safe. Efficiency refers to the appropriate market arrangements and institutional structures for the allocation and management of resources so that users' needs are met in a timely fashion at the lowest possible cost. Safety refers to the appropriate control of risks so that systems can withstand adverse shocks and are governed by reliable and transparent legal frameworks.

If a system handles only small-value retail payments, it is unlikely that it will generate such large inter-institution exposures that the inability of one participant to settle its obligations will lead to the inability of other participants to settle their obligations. Since systemic risk is unlikely in such a system, the need for very extensive risk-proofing is reduced. Nonetheless, other forms of risk (including significant credit or counterparty risk) can be generated in such systems and participants in these systems will want to be satisfied that these risks are managed in an acceptable fashion. Efficiency concerns may result in these systems using certain loss allocation techniques (such as unwinding transactions) that would be unacceptable in systems where greater emphasis is placed on safety concerns, especially on avoiding systemic risk.

For systems that handle large values, and that therefore can generate large credit and liquidity risks and systemic risk, the primary focus of public policy has increasingly been on their safety. These systems will need strong risk-proofing measures to contain systemic risk. A well-designed clearing and settlement system that handles large-value payments will be able to provide the following benefits to participants in, and ultimate users of, the system:

- participating institutions will be certain that once a transaction has been accepted by the system, that transaction has settled or will settle no matter what else happens;
- given this certainty of settlement, the participating institutions will be able to provide customers with unconditional intra-day use of any funds received through such a system.<sup>4</sup>

### **Approaches to Risk Containment and the Provision of Intra-day Credit**

In some systems (including many paper-based small-value payment systems), if a participating financial institution fails, the surviving participants are protected, at least in part, by a reversal or unwinding of the transactions involving the failed institution. But while such an approach may be acceptable in systems that handle low-value, retail-type payments, it has become increasingly unacceptable in systems that handle large-value transactions. Unwinds are unacceptable in such systems because: (i) recipients of funds in a system with unwinds do not receive irrevocable funds; (ii) unwinds can leave participants facing significant liquidity and credit risks; (iii) they do not eliminate systemic risk; (iv) they would be highly disruptive in today's complex financial system; and (v) given the above, expectations can be created that the central bank or government will "bail out" a major clearing and settlement system facing an unwind that could seriously disrupt the financial sector and the economy.

Because it is so important that payment systems and other systems that handle large-value transactions provide certainty of settlement to the participating financial institutions and finality of payment to the ultimate receivers of funds, the central banks of the G-10 countries meeting at the Bank for International Settlements (BIS) have developed a set of minimum standards that should be met or surpassed by all such systems. While these so-called Lamfalussy standards were originally developed in the context of cross-border and multi-currency netting schemes, they have also gained widespread acceptance as the minimum standards for domestic large-value clearing and settlement systems (Bank for International Settlements, 1990 and Board of Governors of the Federal Reserve System, 1994<sup>5</sup>).

The mechanism used in most countries to achieve the objectives of certainty of settlement and finality of payment to ultimate receivers in systems that handle large-value payments is the real time gross settlement system or RTGS. An RTGS system permits a payment to be completed if and only if there are sufficient funds in the sending institution's account at the central bank to cover the payment. Since, by the rules of the system, such transfers cannot be unwound, and since funds held at the central bank are by definition "good funds" (i.e., there is no possibility that the central bank will fail), the transfer of central bank funds from the sending financial institution to the receiving financial institution has the attribute of finality<sup>6</sup>. The failure of the sending financial institution subsequent to the transaction being accepted by the RTGS would in no way expose the receiving financial institution or the ultimate recipient to any loss vis-à-vis that payment.

As noted, for a payment to be settled in an RTGS, the paying institution must have funds in its account at the central bank. Since central banks typically pay no interest on balances held in accounts with them, RTGS arrangements can potentially be costly to participating institutions. While careful management of payments can limit to some extent the amount of the needed balances and hence the cost of holding such balances, containing the costs of holding these idle balances is nonetheless a matter of considerable concern to participants. To reduce these costs, many central banks provide arrangements whereby intra-day credit is available at little or no charge to participants, thereby making the RTGS more cost-efficient for the private sector. While provision of intra-day credit reduces costs to participants, it raises the question of how the central bank protects itself against the failure of an RTGS participant to which it has provided intra-day credit.

From this perspective, one can divide existing RTGS's into three types.<sup>7</sup> First is the type of RTGS in which no intra-day credit is provided, as in Switzerland. There is no risk to the central bank, but the cost of holding non-interest-bearing balances can be high for participants. Resources are devoted to forecasting and managing payments so as to minimize the amount of balances needed, and there is some risk of gridlock if these balances are maintained at levels that are too low.

The second type of RTGS, and the one that is most common, involves the provision of intra-day credit at no charge by the central bank, with collateralization of the credit by a repo arrangement or by a pledge of securities. The collateralization of the credit protects the central bank from loss in case of a failure of a participant. However, even though there is no interest charge on the intra-day credit, there may still be a cost to participants of providing collateral. In some cases, such as the United Kingdom, the securities used to collateralize the intra-day credit have to be held in any case at the end of the day in order to meet prudential liquidity requirements set by the authorities. Hence, they are virtually costless from the participants' perspective. In other cases, however, the securities needed could be in excess of those held for liquidity purposes, or the authorities may not permit securities held for liquidity purposes to be used as collateral in the RTGS, and in such cases the collateralization of intra-day credit would be costly to participants.<sup>8</sup> There are therefore still incentives in such countries to minimize the amount of intra-day collateralized credit.

The third category of RTGS is the Fedwire funds transfer system operated by the U.S. Federal Reserve. This system typically does not require collateral to support the use of intra-day credit, and therefore creates exposures to participating financial institutions on the part of the Federal Reserve. However, the Fed believes that it can control its exposure to the institutions to which it is extending credit. All Fedwire participants face limits on their use of intra-day credit. As well, the Fed may impose reduced limits on individual credit exposures, require collateral from an institution, or cease making loans to institutions judged to pose undue risk to the Fed. The Fed has also imposed a very low charge on intra-day credit, which has created incentives for banks to lessen their use of this facility.<sup>9</sup>

Because of the costs to the private sector of holding non-interest-bearing balances at the central bank or of holding significant amounts of securities for use as collateral to support intra-day credit supplied by the central bank, there has been an interest in seeing whether large-value payment systems can be developed that combine the risk-control characteristics of an RTGS with the low costs of a system that uses netting or

some other means of saving on collateral. The Canadian LVTS, which will be discussed in detail in the next section, is one such system. A different approach is taken by the German net settlement system EAF2, in which batch processing carried out during the first half of the day searches, for all pairs of participating banks, for outgoing funds transfers that can be offset as far as possible against incoming transfers. Offset transfers become immediately irrevocable and unconditional and are settled on the central bank's books later in the day.

In sum, large-value payment systems must meet the public policy (as well as private sector) objectives of certainty of settlement for participants and finality of payment for ultimate recipients. At the same time, developers of such systems have to be cognizant of the costs of achieving this risk-proofing, since transactors will avoid an excessively costly system and will try to find alternative, perhaps more risky, means of effecting their transactions. Thus, the efficiency/safety trade-off, while heavily weighted to deal with safety issues in large-value systems, should not lead to an exclusive focus on such issues.

## **II. The Development of a Large-Value Payment System in Canada**

In recent years, Canada has seen the planning and development of an electronic system for the clearing and settlement of large-value payments (the large value transfer system or LVTS)<sup>10</sup>. In light of the Lamfalussy standards, the developers of this system have worked closely with the authorities to minimize the potential for systemic risk arising from the clearing and settlement of large-value transactions on the system. Among the key safety objectives of the system are: (i) no unwinds of payment transactions once they have been accepted by the system; (ii) certainty that the system will be able to settle even in the event of the failure of any number of participants; and, consequently, (iii) the provision of intra-day finality to receivers of funds (given the certainty that a transaction will be settled once it has been accepted by the system). At the same time, efficiency concerns have resulted in considerable effort being devoted to containing the costs of running the system, especially the cost of collateral.

The LVTS will use multilateral netting arrangements to reduce total exposures (for a given volume of payments) in the system and will ensure that each participant faces a cap on the total amount of exposure it can create in the system. Any exposure created by an individual participant through its use of intra-day credit will be fully collateralized, either directly by a participant on its own behalf or by other participants. Thus, through this part of the risk-control mechanism, even if the participant with the single largest payment obligation fails to meet its obligation at the end of the day, the combination of caps and collateral ensures that the liquidity required to settle will be available and that any credit losses can be safely absorbed.

The details of how the LVTS will work are as follows. There are two streams of payments in the LVTS, Tranche 1 payments and Tranche 2 payments, and all payment messages are processed in real time. Under Tranche 2, each participating institution begins the day by granting a bilateral line of credit to every other institution (including zero, if it does not wish to have any credit exposure to a particular institution), and this establishes the maximum intra-day net amount that the latter can owe to the former. The sum of all the bilateral lines of credit extended to an institution, multiplied by a specific fraction (currently anticipated to be 0.3 for the LVTS), establishes the maximum Tranche 2 net debit cap of the sender (i.e., the maximum exposure that can be generated) for each financial institution during the day. A Tranche 2 payment message sent by a participant that wishes to use the intra-day credit provided by other participants has to pass both the bilateral cap and the sender net debit cap tests associated with Tranche 2 before it is accepted. Each participating financial institution pledges to the Bank of Canada collateral equal to the largest bilateral line of credit it has extended to any other institution multiplied by the fraction noted above (0.3). If a participating institution fails, the loss-allocation procedures provide for the division of any losses on the basis of the bilateral lines of credit established by survivors vis-à-vis the failed institution (and not on the actual intra-day credit used on the day of failure). The collateral pledged by the participants is sufficient to deal with the failure of the institution with the largest possible amount owing to the system (i.e., the institution with the largest sender net debit cap). This part of the system has been described as "survivors-pay" since surviving financial institutions largely absorb the losses associated with a failure.<sup>11</sup>

There is also provision in the LVTS for a Tranche 1 payment. The Tranche 1 stream of payments will in the main rely on intra-day credit based on collateral pledged by the sender of the payment. More precisely, this type of payment will be accepted by the system if the payment being sent is less than the sum of any balances a participant had in its account at the Bank of Canada at the beginning of the day, the net of all payments received and sent in Tranche 1 during the day, and any collateral the sending participant is prepared to pledge to support payments in this stream. Thus, the use of intra-day credit to make a Tranche 1 payment requires a participant to pledge its own collateral to the Bank of Canada. Tranche 1 facilitates payments above the maximum level permitted by the risk-control procedures under Tranche 2 and ensures that institutions that are extended small or zero bilateral lines of credit, or that wish to make large payments in excess of the usual Tranche 2 credit granted to them by other participants, can still make payments through the system. An advantage of this arrangement is that institutions which are denied Tranche 2 credit by the other participants are not forced out of the LVTS, since they will always be able to make Tranche 1 payments (assuming that they have sufficient collateral). This tranche can be described as "defaulter-pays", since, in the event of failure, it is the defaulter's collateral that ensures settlement.

At the end of the day, the overall multilateral net amounts to be paid and received are settled among the participants on the books of the Bank of Canada.

The structure outlined above, while consistent with the Lamfalussy minimum standards for risk-proofing, had two drawbacks. First, while capable of dealing with the failure of the institution with the single largest possible net debit (or largest possible amount owing to the system), the system might have been unable to cope with the failure, during the business day, of two or more large institutions with very large net debit positions at the time of failure. This left open the remote theoretical possibility that a participant would not have received a payment that it expected because of multiple failures. Hence, participating financial institutions might have been unwilling to extend intra-day finality to their customers, since they could not be absolutely certain that their own claims would have been settled at the central bank at the end of the day. Second, the requirement for large amounts of collateral to be provided by the private sector participants to back the LVTS (even though the amount would be less than would have been required in an RTGS because of netting and the use of survivors-pay arrangements in Tranche 2) would have implied a significant cost of operation for the system.

To deal with these problems, the Bank of Canada took two initiatives. First, the Bank will provide a guarantee to all participants that the LVTS will settle under all circumstances. This resolves the problem raised by the extremely unlikely possibility of the *unanticipated* failure, during the operating hours of the LVTS, of more than one participating institution with the total amount owing to the system at the time of failure greater than the available collateral.<sup>12</sup> This guarantee by the Bank to the LVTS is akin to the provision of an insurance policy against a catastrophic event that is highly unlikely to occur, and on which there is an extremely large deductible (in this case the collateral put up by the institutions to cope with the failure of the participant with the single largest possible net debit to the system). Furthermore, there is no moral hazard in these arrangements, since the loss arrangements under Tranche 2 ensure that the participating institutions have the incentive to continue to behave prudently in monitoring each other's risk because so much of their own collateral is at stake before the Bank suffers any loss.

The second initiative taken by the Bank was to establish a new form of collateral for use in the LVTS, which should be considerably less costly for the participating financial institutions than pledging treasury bills. This collateral takes the form of "Special Deposit Accounts" (SDAs) at the Bank of Canada, which will pay a rate of interest slightly less than the market cost of one-day funds to the largest banks. For financial institutions that raise one-day funds in the market and invest them in the SDAs, the overall cost will be, at most, a few basis points. However, it may involve them in borrowing and rolling over large amounts of funds in the overnight market. The extent to which the participating financial institutions use this new type of account therefore remains to be seen.

When the LVTS was originally being planned, the cost of pledging Government of Canada treasury bills as collateral was on the order of 15 to 25 basis points, calculated as the spread between the rate on treasury

bills and the cost to the most creditworthy banks of borrowing funds of the same term from the market. Recently, with the reduction in the supply of treasury bills (in part the result of the sharp improvement in the Government of Canada's fiscal position), and an increased role for Government of Canada securities in repo transactions and as collateral in a variety of arrangements, the differential between treasury bill rates and deposit rates has at times been considerably higher, resulting in sharply increased costs of using treasury bills as collateral. The Bank is currently considering the possibility of accepting a wider range of collateral<sup>13</sup>, including instruments that otherwise sit "idle" on the books of the participating financial institutions. If it should prove practical to accept a wider range of collateral, it could considerably reduce the overall costs of operation of the LVTS. Moreover, such a development might result in a greater use of Tranche 1 rather than Tranche 2 and hence make the LVTS closer in practice to an RTGS.

Another recent initiative is intended to reduce the cost of collateral needed to make end-of-day LVTS payments to settle amounts owing in the securities clearing and settlement system. With the advent of the LVTS, certain participants in the securities clearing and settlement system (the Debt Clearing Service, or DCS) will have to make final and irrevocable payment to the clearing house (the Canadian Depository for Securities, or CDS) via the LVTS to discharge payment obligations that have arisen from their purchases of securities (either for themselves or their clients) or those of other DCS participants<sup>14</sup>. The risk containment arrangements in the DCS requires the DCS participants permitted to make payments to CDS to fully collateralize their payment obligations to CDS during the day, until their payment obligation has been discharged. These DCS participants were concerned that there would be some "doubling up" of collateral requirements when payment was being made to CDS, since the Government of Canada securities purchased on their own behalf and used to collateralize part of their payment obligation to CDS during the day could not be used in the LVTS to support payment to CDS.

The Bank of Canada, along with LVTS and DCS participants, have worked out arrangements whereby such Government of Canada securities can be earmarked in the LVTS to support an LVTS payment to CDS via Tranche 1. The legal arrangements permit those securities (used as collateral in the DCS) to be pledged to the Bank of Canada in anticipation of an LVTS payment to CDS. The securities, however, remain subject to the priority security interest of CDS and the DCS participants. If the LVTS payment made by a participant to discharge its obligation to CDS requires the use of intra-day credit, the securities pledged to the Bank can be used to support that payment, and CDS and the other DCS participants surrender all claims to the collateral. If the DCS participant fails to make the LVTS payment to CDS, the securities are returned by the Bank to CDS for use in support of its risk-containment mechanisms (i.e., to generate liquidity to allow the DCS system to settle), and the Bank of Canada surrenders all claims to the collateral. The legal arrangements are carefully crafted to ensure that the collateral in question is supporting only one payment obligation at any point in time and to ensure, in the case of a participant failure, that the appropriate parties are entitled to use the collateral to generate the needed liquidity to settle the relevant system. Since the payment obligations of individual participants in DCS can amount to several billion dollars on a given day, this arrangement reduces potential collateral needs in the LVTS. It also helps to reduce concerns that time-critical payments to CDS might be held up in the LVTS.

An interesting issue for the LVTS (and other major Canadian clearing and settlement systems where systemic risk is a significant concern) is the recent federal government policy decision to permit foreign banks to operate as branches in Canada. When the LVTS was designed, all potential participants were Canadian-incorporated entities. This provided the assurance that, in the event of a participant failure, Canadian laws would be applied to deal with the insolvency. Greater certainty in the application of domestic laws was provided by the Payment Clearing and Settlement Act (PCSA, discussed further below), which ensured that the netting mechanisms and the settlement rules of major clearing and settlement systems would be legally enforceable in the event of an insolvency. Direct access by foreign bank branches to Canadian clearing and settlement systems raises potential choice of law and conflict of law issues in the event of an insolvency of the foreign bank. In particular, there may be concerns that the application of foreign law might render netting measures used in these systems ineffective, or make it difficult for surviving participants or the Bank of Canada to realize on collateral pledged by the defaulting participant. To



deal with these potential issues, a branch established in Canada by a foreign bank that wishes to be a direct participant in a major Canadian clearing and settlement system will be required to provide a legal opinion regarding a number of issues, especially the enforceability of netting and collateral arrangements in the event that the foreign bank should fail. (In addition, such branches would have to meet any other access criteria imposed by a particular clearing and settlement system.) This type of arrangement is not inconsistent with arrangements in other countries and represents the minimum required assurance regarding the legal effectiveness of the risk-containment measures in large-value systems such as the LVTS.

In sum, the LVTS controls systemic risk differently from the typical RTGS system, but it has all the essential attributes of an RTGS system (Freedman, 1996). The key characteristic is that each payment message will be processed in "real time" and be subject to risk-control mechanisms. The LVTS will provide certainty of settlement even in the event of the failure of one or more participating financial institutions, and consequently, participating institutions can offer intra-day finality to their customers who are receiving payment (and in fact they will be required to do so). In addition, the system design creates the incentives and capabilities for participating financial institutions to monitor their positions in real time and to limit their maximum exposures to other financial institutions. Although the LVTS relies upon a Bank of Canada guarantee, in all but the most extreme situations the participating institutions themselves will bear the loss resulting from a participant failure.

### **III. The Bank of Canada's Role Vis-A-Vis Large-Value Clearing and Settlement Systems <sup>15</sup>**

#### **The Payment Clearing and Settlement Act (PCSA) and the Role of the Bank**

The Bank of Canada has taken the lead in working with the private sector to develop appropriate risk containment mechanisms in the LVTS and other major clearing and settlement systems in Canada. This involvement reflects a number of factors. (i) Final settlement of payment obligations among participants in these systems takes place through the transfer of funds in accounts at the Bank of Canada. (ii) The Bank has strong links to the Canadian Payments Association (CPA), which operates the existing payments system and is building the LVTS. (iii) The Bank is the ultimate source of liquid funds to the financial system and is naturally concerned about the safety and soundness of these systems. Poorly designed systems could generate significant liquidity risks for participants and would likely involve the Bank in helping to resolve any disruptions. (iv) The Bank implements monetary policy, and poorly designed clearing and settlement systems could seriously impact this responsibility. (v) The Bank participates in international groups, particularly the Group of Ten (G-10) countries, which have attempted to identify the types of risks in clearing and settlement systems and to establish minimum standards for the management and control of these risks.

Until July 1996, the involvement of the Bank of Canada in the oversight of these systems was informal. With the passage of the PCSA, in July 1996, the Parliament of Canada formalized the role of the Bank in the oversight of clearing and settlement systems for the purpose of controlling systemic risk. This legislation resulted from the recognition by the federal government of the essential role of major clearing and settlement systems in the Canadian economy and the conclusion that these systems require regulatory oversight. Because the central bank is naturally concerned about systemic risks in clearing and settlement systems, it was the obvious choice to carry out this oversight responsibility. In essence, the Act requires systems that have the potential to be operated in such a manner as to pose systemic risk to satisfy the Bank that appropriate arrangements are in place to manage and control such risk. In addition, the Act provides greater legal certainty to the enforceability of netting, and to the enforceability of the settlement rules of certain systems, and also provides new powers to the Bank that it can exercise in its dealings with clearing and settlement systems.

#### **Implementation of the Oversight Responsibility Under Payment Clearing and Settlement Act**

Under the PCSA, the Bank will: (i) review all eligible clearing and settlement systems for their potential to pose systemic risk; (ii) designate those systems with the potential to create systemic risk as being subject to the Act; and (iii) regulate designated systems on a continuing basis for the appropriate control of systemic risk.

A system is eligible for review by the Bank if:

- i. it has three or more participants, one of which is a bank;
- ii. it clears or settles Canadian dollar payment obligations; and
- iii. the payment obligations are ultimately settled through accounts at the Bank of Canada.

Systems having these characteristics will be examined by the Bank to determine whether they have the potential to pose systemic risk. The Act provides a definition of systemic risk that is consistent with the definition used in many international reports. If the Governor of the Bank forms the opinion that a system has the potential to pose systemic risk, he may designate the system as being subject to the Act, provided that the Minister of Finance is of the opinion that it is in the public interest to do so. Once designated, the Bank will have to be satisfied that the system has risk-control mechanisms in place to appropriately control systemic risk. Under the Act, the Bank can enter into agreements with the operators of clearing and settlement systems concerning the control of systemic risk, the Governor may issue directives to the system operators or participants in extreme situations where he judges that systemic risk is being inadequately controlled, and the Bank may conduct audits of any designated clearing and settlement system.

It is clear that systems handling small-value payments (either as individual payments or aggregate payment obligations) are unlikely to be designated since these systems typically do not pose systemic risk.

Nevertheless, the Bank will continue to monitor such systems for changes in their situation. By contrast, systems which handle large-value payment obligations are much more likely to generate systemic risk, and hence are much more likely to be designated.

While not the only factors that will be considered when deciding if a clearing and settlement system should be designated under the PCSA, the Bank will pay particularly close attention to:

- i. the size of individual payment obligations and the size of the aggregate value of payment obligations on any given day;
- ii. the size of payment obligations owed to and by participants in the system relative to each participant's capital;
- iii. the role played by the system in supporting transactions in the financial markets or in the economy more generally.

To date, the Bank has identified all clearing and settlement systems operating in Canada and is reviewing all eligible systems for their potential to cause systemic risk. Only one system has thus far been designated under the Act—the Debt Clearing Service operated by CDS. One can expect that the LVTS will also be designated under the Act once it commences full-scale operations. The Bank has issued a Guideline outlining how it intends to operate under the Act, particularly in gathering information to identify eligible systems and in determining whether eligible systems will be designated under the Act. The Guideline also indicates the minimum standards that the Bank intends to apply to designated systems. While these minimum standards incorporate the standards set out in the Lamfalussy Report, they have been modified slightly so that they can be applied to all designated systems, whether or not these systems use multilateral netting.

An important feature of the Bank's regulatory role is that the Act directs the Bank to be concerned only with the oversight of systems, and not with the regulation of any financial market or the supervision of the affairs of individual financial institutions that may be members of these systems. Any matter that is not directly related to an institution's participation in a designated clearing and settlement system is not subject to the Bank's oversight under the Act. For example, the PCSA specifically precludes the Governor from issuing a directive in respect of a participant's capital adequacy, the management of its investments, or its relations with its own customers.

**Greater legal protection is provided to netting arrangements and settlement rules**



The PCSA contains provisions, which, when combined with recent amendments to federal insolvency legislation, recognize the legal enforceability of netting both for transactions handled by clearing and settlement systems and for certain other transactions among financial institutions. The Act also contains provisions to ensure that the settlement rules of designated systems (including the rules related to the pledging and possible realization of collateral and the processing of entries to settle payment obligations) are immune to legal stays or other legal challenges, even in cases where a participant in one of these systems has failed. Increasing the certainty that the legal arrangements governing the operation of a clearing and settlement system will produce the expected outcome in periods of financial stress is an important objective of the PCSA and has been an important means of dealing with legal risks. When this is combined with appropriate risk-containment mechanisms, the participants and other users of a designated clearing and settlement system can be assured that once a payment message has been processed and accepted by these systems, the funds received will be unconditional and irrevocable, i.e., final. Although the value of finality is often underestimated in periods of financial calm, it can be extremely important in times of financial stress.

#### **Additional Powers Granted to the Bank of Canada**

The PCSA provided the Bank with a number of powers that it can exercise in its dealings with clearing and settlement systems. Two of the most important of these powers have been discussed above in reference to the LVTS: the ability to provide a guarantee of settlement to the participants of a designated system and the ability to pay interest on special deposits accepted from a clearing house or from the participants in a clearing and settlement system. The ability to guarantee settlement has been used only for the LVTS and deals with the extremely remote possibility of multiple participant failures during the same business day, thus promoting the safety of the system. The ability to pay interest has also only been used for the LVTS and is intended to provide a cost-effective form of collateral that can be used as part of the risk proofing of the LVTS.

Another power that is provided to the Bank under the PCSA is the ability to act as a settlement agent in major clearing and settlement systems. If the Bank acts as settlement agent for a clearing house, it would be possible to eliminate "banker risk". This type of risk arises where a private sector financial institution acts as the banker in a clearing and settlement system arrangement, receiving payments from participants that owe funds to the clearing house and making payments to those participants entitled to receive funds from the clearing house. The risk is that the institution acting as banker could fail between the time it receives payments from participants owing funds and the time it is supposed to make payments to those owed funds. Using the Bank of Canada as settlement agent would eliminate this risk, since the Bank is free of default risk. The Bank is discussing the possibility of acting as settlement agent with the operators of systems that handle securities and foreign exchange transactions and is prepared to play this role, provided it is not exposed to any liquidity or credit risks and that appropriate cost-recovery arrangements can be developed.

The PCSA also gives the Bank explicit powers to be a direct participant in a clearing and settlement system (which includes sharing in loss allocation mechanisms), to act as custodian of financial assets for these systems, to act as a central counterparty to the participants in a designated system, and to provide liquidity loans to a clearing house or central counterparty of a designated system.

#### **IV. Summary**

There have been two major developments in recent years in Canada related to large-value payments. The first is the development of a system for handling large-value payments (the LVTS) that will provide certainty of settlement for participants, along with intra-day finality for recipients of funds transferred through the system. Unlike other G-10 countries, this system is not a real-time gross settlement system. Although the primary focus was on containing systemic risk in this system, efficiency concerns (primarily related to the cost of collateral) resulted in a different arrangement, but one that nonetheless fully addresses the safety objectives. The Bank of Canada was able to facilitate the development of this system through the use of newly received powers. Of particular importance in this regard are the ability to guarantee settlement of the LVTS in the remote event that there are multiple participant failures during the LVTS operating day, and the

ability to provide a special interest-bearing deposit account which has the potential to reduce collateral costs for the participants in the LVTS. Thus, while the LVTS is not an RTGS system, it has all of the essential attributes of such a system.

The second significant development is the legislative requirement in the Payment Clearing and Settlement Act that the Bank of Canada exercise formal oversight of major payment and other clearing and settlement systems with a view to controlling systemic risk. This Act requires the Bank to identify eligible systems operating in Canada, to determine if these systems could be operated in such a manner as to pose systemic risk, and where the Governor of the Bank judges this to be the case, to designate these systems as being subject to the Act. Once designated, systems must satisfy the Bank that they have appropriate arrangements in place to control systemic risk. The PCSA also provides greater legal certainty regarding the enforceability of netting and the enforceability of the settlement rules of designated clearing and settlement systems as well as new powers for the Bank of Canada that can be used in its dealings with clearing and settlement systems.

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### Footnotes

1. The authors are respectively, Deputy Governor and Regulatory Policy Adviser, at the Bank of Canada. The views expressed in this paper are solely those of the authors and do not necessarily reflect those of the Bank of Canada.
2. This section and the next section update and expand upon C.Freedman and C. Goodlet (1996).
3. This framework is composed of public as well as private laws. Public laws are rules created by statute, have compulsory application, and are typically designed to promote the public interest (e.g., bankruptcy laws and laws governing securities transactions). Private laws, such as property law or contract law, are rules that establish a legal framework for voluntary arrangements that define and promote individual rights and responsibilities. The agreement among participants in a clearing and settlement system would be governed by this legal framework.
4. Thus, the ultimate receivers of funds through the system (the participants or their customers) will have irrevocable and unconditional use of these funds whenever they are received during the day (i.e., the system will have the property of intra-day receiver finality).
5. In November 1997, the Board of Governors released for comment a document intended to integrate its policies on large and small value clearing and settlement systems. This proposal explicitly recognizes that risk management measures should be appropriate to the nature and magnitude of the risks present in a system, and that these measures may be designed differently in different types of systems. In particular, it recognizes that the efficiency/safety trade-off will be different for systems depending on the degree of systemic risk present in a system. See Board of Governors of Federal Reserve System (1997).
6. While payment messages are irrevocable in systems which provide for finality, the amounts that have been transferred by these messages may be recoverable in certain circumstances, for example through recourse to the courts for reimbursement in case of fraud or misdirected payments. System rules will often permit the return of payment messages in circumstances where errors prevent the receiving institution from acting on the payment message or in cases where there is an obvious

error.

7. See [Bank for International Settlements \(1997\)](#) for a comprehensive discussion of the important features of RTGS systems.
8. If one thinks of the cost of providing such securities for collateral purposes as the difference between the marginal cost of funds to the financial institution (including the cost of reserve requirements, if any) and the yield on the types of securities acceptable as collateral, a differential of 15 basis points or more would not be unusual.
9. The Fed's charge of 15 basis points on the actual borrowing (accounted on a minute-by-minute basis) is actually less than the cost of collateral used to support intra-day credit in most countries, since the cost in the latter case is for the whole period in which collateral is lodged with the central bank (typically the whole banking day) and enough collateral has to be available to cover the maximum intra-day debit position of the bank.
10. The LVTS is being developed by the Canadian Payments Association (CPA) and its member institutions. It is currently undergoing a series of user tests, which will last through the summer. It is expected to be fully operational in the fall of this year. Initially there will be 16 direct participants. A CPA bylaw, governing the operations of the LVTS, has been approved by the Canadian government, and has the force of law. This bylaw: (i) governs the relationships among LVTS direct participants; (ii) specifies the various risk controls to which payment messages are subject, loss allocation arrangements among participants, and the role of the Bank of Canada in the system; and (iii) imposes certain requirements on participants for the treatment of payment messages, including the provision of intra-day finality of funds to recipients.
11. By mutualizing the losses from a failure, the financial institutions take on an exposure to each other that is absent in a defaulter-pays RTGS. However, a system using survivors-pay loss sharing arrangements considerably reduces the total amount of collateral needed by all participants. Moreover, the system provides participants with the means to reduce their potential exposure to participants whose credit worthiness may be of concern, since they can cut back on the line of credit they are prepared to grant to a perceived problem institution. This judgement will be made at the beginning of each day, and will determine the amount of Tranche 2 credit available to each participant and the share of any losses that a Tranche 2 credit grantor would bear in a failure situation. In addition, there is scope for participants to reduce Tranche 2 credit to another participant during the day provided that the latter participant has not used this credit. This intra-day capability permits participants to take action to reduce the size of the loss they might, as a group, be exposed to, but it does not permit Tranche 2 credit grantors to affect their share of any losses resulting from a participant failure on any given day, since that is based on the start-of-day Tranche 2 line of credit they provided.
12. It should be noted that the uncollateralized Bank of Canada guarantee will only be called upon in a multiple failure situation in which the failing participants have received and used Tranche 2 credit. To the extent that failures are anticipated and LVTS participants do not extend Tranche 2 credit, the

Bank is not exposed to any losses, since in these situations the suspect institutions would only be able to operate using Tranche 1 intra-day credit (i.e., they would only be able to use intra-day credit if they pledged their own assets).

13. Government of Canada securities (direct and guaranteed) and provincial government securities (direct and guaranteed) are the types of collateral eligible for use in the LVTS and for routine lender of last resort loans from the central bank. Operational considerations result in Government of Canada securities being used as collateral in most cases. Government of Canada securities are held in a book-entry system (the Debt Clearing Service) operated by the Canadian Depository for Securities Ltd., making it easier to pledge these securities. This system is ultimately intended to clear and settle trades in all bonds and money market instruments.
14. A small group of the largest DCS participants, called extenders of credit, are permitted to make payments directly to CDS at the end of each day. Extenders of credit make payments on their own behalf and for other participants to whom they have extended credit during the day. The extenders of creditor will all be direct participants in the LVTS. All other DCS participants must make their payments to CDS through these extenders of credit, with the exception of a very small group of DCS participants (called settlement agents) who are permitted to make payments to CDS only on their own behalf. The risk-proofing arrangements in the DCS involve caps on the size of exposures a participant can create in the system and a largely defaulter-pays collateralization of intra-day net payment obligations.
15. This section updates Goodlet (1997).