

Developments, Issues, and Initiatives in Retail Payments

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- *In Canada, retail payments involve various payment instruments and interrelated systems operated by the Canadian Payments Association, the Interac Association, and new Internet payment providers. The efficient, secure, and reliable operation of these retail payment systems is critical to productive commercial activities and well-functioning markets for retail financial services.*
- *Recent structural changes within the broad retail payment system largely reflect the emergence of user-friendly information technologies and substantial changes in financial sector policy aimed at enhancing competition in financial services. The principal results have been growth in the volume and types of electronic payments and increased participation by diverse groups of financial and non-financial institutions as providers of retail payment services.*
- *These innovations are challenging existing public and private sector policies governing retail payments, including the market arrangements for services; customer risks and costs for settling large-value retail payments; the security of payment information and the efficiency with which it is transmitted; and the effects of differing regulatory regimes on competition among providers of retail payment services.*

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Even though Canadians use the retail payment system every day in their various transactions, general information about its role, and about the issues affecting it, is limited. Broadly defined, a payment system has many components. Among these are payment instruments, such as cash, cheques, and credit cards; information technologies used to communicate and process payment information for the transacting parties and their financial institutions; and funds-transfer processes that are involved in the transfer of Bank of Canada funds between the financial institutions that hold the transacting parties' payment accounts. There are a variety of institutions, each specializing in different services, required to initiate and settle a payment obligation. As for "retail" payments, there is no simple definition. They refer generally to obligations arising from retail commercial and financial transactions between individuals and businesses as transfers between them and governments. Not all individual retail payments are for small amounts, but compared to the large-value payments related to financial transactions between institutions, they have a much smaller average value and much greater daily volumes. They also involve a much broader range of payment instruments and transaction systems (CPSS 1999).

While everyone has some knowledge of various retail payment instruments, few have as much information about the infrastructure designed to process these payment instruments and transfer the funds. Yet it is the efficient and reliable operation of these infrastructure systems that is really the engine for the retail payment system.

The purpose of this article is to discuss some of the emerging issues and challenges for the Canadian public

and private sectors with regard to the infrastructure for retail payment systems. The article briefly describes the organization of non-cash systems for retail payments and the structure and conduct of markets for their infrastructure services in Canada. It identifies the significant developments in the sector in recent years and discusses some of the emerging issues and initiatives. For readers unfamiliar with payment systems, a glossary of key terms is appended.

The Organization of Retail Payment Systems

Despite some national and international differences among specific retail payment systems, most have a similar organizational structure (see below). Typically, they include three types of integrated systems: transaction systems, clearing systems, and settlement systems (CPSS 2000).

Chart 1 illustrates the organization of a retail payment system and the routing of the flow of payment information and funds through its transaction, clearing, and settlement systems.

The clearing process for retail payments may be highly integrated with transaction systems where such systems are highly centralized and standardized for participating financial institutions as, for example, with credit cards. This limits the amount of internal processing required of the paying and receiving institutions. The transaction system and the payment-clearing system for card payments are generally operated by the same organization, which sets out the common standards for use by the participating institutions and their data processors. Other payment instruments with more decentralized transaction systems owned and operated by individual institutions, such as cheques and automated direct credits and

The Structure of Retail Payment Systems

Transaction Systems

Use information and communication technologies to deliver payment instructions and information between the parties to a payment transaction and their respective financial institutions.

Principal transaction services include:

- verifying the identity of the parties and their ability to pay
- validating the payment instructions, and
- communicating information among the parties and their financial institutions.

Clearing Systems

Clearing systems are involved in the bilateral exchange of information on individual payments and payment items between financial institutions and the calculation of their settlement positions.

The clearing process principally involves:

- bilateral sorting and matching transactions between member institutions

- processing payment data
- calculating members' settlement claims and obligations, and
- transmitting relevant data to the individual member institutions and to the settlement bank.

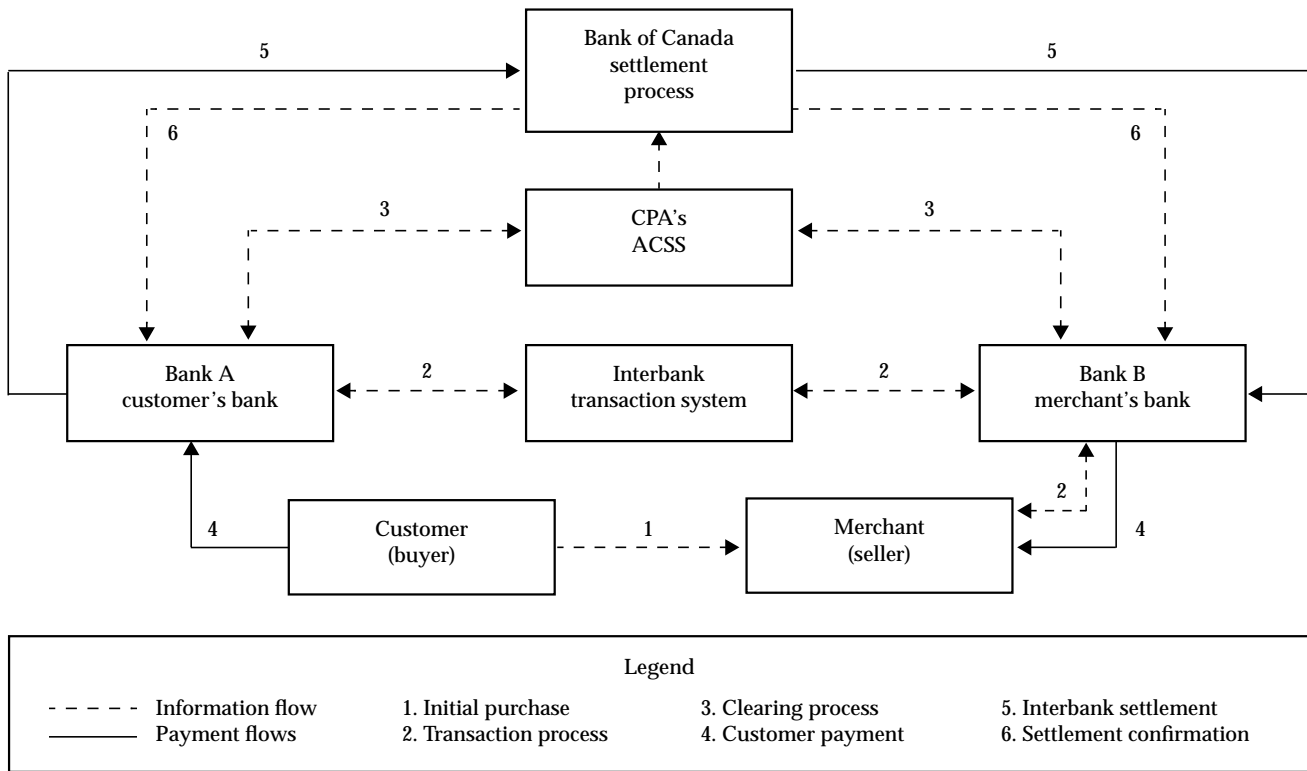
Settlement Systems

Settlement is the process by which previously calculated payment obligations and receivables are discharged through transfers between deposit accounts that the institutions hold at the central bank or at private banks.

Steps in the settlement process are:

- verifying positions for the transfer of funds between banks and the availability of funds in the paying institution's settlement account
- settling the obligations by posting the funds transfers to an institution's settlement account, and confirming the completed settlement with the account holders

Chart 1
Retail Payment Process



debits, may be less integrated organizationally and technologically with their clearing systems. These instruments often require more processing by the institutions providing them or the clearing organization to translate payment information from the formats of the transaction systems into the standardized formats required for the interbank clearing and settlement of the payment obligations. In this case, the clearing systems are generally more closely integrated with the settlement systems than with the transaction systems.

The Retail Payment System in Canada

While the retail payment system in Canada fits well within the generic structure described above, knowledge of some of the unique features of the Canadian system is necessary to understand the emerging issues.

Clearing and settlement systems

The Automated Clearing Settlement System

In Canada, the principal systems for clearing and settling payments between financial institutions are operated by the Canadian Payments Association (CPA). The CPA is a private, member-owned, non-profit organization incorporated under the Canadian Payments (CP) Act. The members of the CPA are the financial institutions that provide payment accounts, instruments, and services to individuals and businesses. They are eligible under the CP Act to participate directly or indirectly in the CPA's clearing and settlement systems. The CPA's retail system is the Automated Clearing Settlement System (ACSS).¹ Direct participants in the ACSS hold settlement

1. See PSAC 1997a for a description of the ACSS prior to the establishment of the Large Value Transfer System (LVTS). A detailed description of the LVTS is provided in Dingle 1998.

accounts at the Bank of Canada and have access to the Bank's credit facilities. ACSS payments are cleared through several streams (or subsystems).² The gross payables and receivables of each participant in each stream are combined and netted over all the participants to obtain their individual net settlement positions.³ The clearing and settlement functions of the ACSS are highly integrated within the system.

Credit card systems

Not all retail payments are cleared and settled through the ACSS. Most notably, Visa® and MasterCard® payments in Canada are cleared and settled in their own systems. In this case, the individual card payments clear through the organizations' systems located in the United States, and Visa and MasterCard systems hold their Canadian-dollar settlement accounts with a direct participant in the Large Value Transfer System (LVTS). The settlement obligations between these central counterparties and the Canadian financial institutions participating in the card systems are transferred to and from the settlement banks for Visa and MasterCard, respectively, over the LVTS.

Transaction systems

Individual financial institutions in Canada operate various proprietary transaction systems for their customers. These range from on-line systems for their Internet banking operations to their branch-banking and ATM (automated teller machines) networks. Most are designed to provide payment and related services only to their own customers. Many of these institutions also participate and invest, however, in transaction systems that allow them to provide payment services to their customers through shared or common networks. Some shared networks are arranged to link the proprietary systems of the participating institutions. Other common networks are operated by an organization that is either independently owned or is jointly owned by its participating members.

Card-based transaction systems

Most global shared transaction systems for credit card payments are operated by organizations such as Visa,

MasterCard, and American Express.® These are typically on-line transaction systems allow the card-holding customers of member institutions to access their credit lines immediately and their retail business customers to acquire authorized payments. The communication services of the transaction systems, along with the standards and protocols for the electronic payment instructions, are designed and operated by the network service providers associated with the credit card organization.

The principal debit and ATM-card transaction systems in Canada are also shared networks. Interac,® for example, connects proprietary ATM networks of individual member institutions via its Shared Cash Dispensing (SCD) system, which allows customers of a deposit-taking institution to withdraw cash from their account using an ATM of another member institution. Indeed, some organizations only participate in the SCD system through the operation of networks of ATM machines, without providing any deposit services to customers. They provide cash to the deposit customers of other institutions and are reimbursed through interbank transfers over the ACSS. Interac also interconnects the networks of participating institutions for point-of-sale electronic funds transfers (EFT/POS) through its Interac Direct Payment (IDP) system. In this case, merchants obtain IDP-equipped terminals from either their deposit-taking institutions or an independent non-financial service provider to allow holders of Interac-enabled debit cards issued by other institutions to make verifiable, real-time payments to the merchant.

Although Interac is the largest operator of shared ATM and EFT/POS systems in Canada, similar but smaller domestic network arrangements operate for specific regions or types of institutions, such as credit unions or caisses populaires. In addition, the major global networks, such as the ATM networks connected through Visa PLUS® and MasterCard's Cirrus,® and MasterCard's Maestro® EFT/POS network, also operate in Canada to facilitate cross-border retail payments for their members' customers.

Internet transaction systems

New forms of transaction systems are emerging from alliances between financial institutions and IT organizations aimed at developing Internet payment schemes. These transaction systems use transmission architectures for payment information that are more open than those of most traditional proprietary systems.

2. Each of the payment streams in the ACSS is specified around common characteristics of various payment instruments. The principal streams are large-value (\$50,000 and over) and small-value cheques and paper items, automated funds transfers (debits and credits), electronic data interchange (EDI) payments, and point-of-sale (ATM and EFT/POS—electronic funds transfer at point of sale) payments.

3. See PSAC 1997a for a numerical example of netting schemes.

Among the most notable in Canada are various electronic bill-presentment and payment (EBPP) systems such as epost,TM e-route, and CertaPay. These systems link participating merchants, customers, and their financial institutions to allow merchants to electronically bill their customers and the customers to electronically deliver the payments in an environment where their information is secure. The interbank settlement of these consumer payments is through the ACSS.

Other emerging Internet payment systems, such as hyperWallet, settle their retail payments through non-CPA systems. Only the funds transferred to and from the customers' "wallets" through their financial institutions' on-line banking systems are cleared and settled in the ACSS with hyperWallet's settlement bank.

The policy problem for payment systems is how best to benefit from efficiency gains while managing payment risks.

Recent Developments in Retail Payments

Both new technology-driven payment applications and changes in financial sector policy aimed at improving competition and efficiency in financial services have been driving developments in retail payments over the past decade. Balancing this drive for greater efficiency in payment-service markets has been an increasing awareness of the legal, financial, and operational risks that new payment technologies and competitors can cause within payment systems. There can be serious adverse financial consequences for users if these systems and their participants fail to adequately contain and manage these risks. The main policy problem for payment systems is how best to benefit from the efficiency gains while preserving, or even enhancing, the ability of participants, financial institutions, and systems to manage payment risks.

In this context, four recent developments are worthy of note: the greater use of electronic payment instruments; the outsourcing of payment processing by

financial institutions; the separation in the settlement of wholesale and retail payments; and the relaxation of regulatory constraints on access to payment infrastructure systems.

Electronic payment instruments

The declining cost and increasing availability of high-quality IT hardware, software, and network communications have encouraged the global development and adoption of new electronic payment instruments and transaction systems. Financial institutions in Canada have led the trend to replace paper-based currency and cheques with lower-cost electronic payment media, including payment cards and automated electronic funds transfers. Chart 2 indicates the trends in the volume and value of the use of non-cash paper-based and electronic retail payment instruments in Canada since 1991.

The shift towards electronic payments prompted financial institutions to invest even further in the development of both proprietary and shared electronic transaction systems and network arrangements, such as their own Internet and telebanking systems and the shared Interac networks. Although costly to develop and install, these systems have comparatively low costs per transaction so that economic benefits are achieved through broad usage. Consequently, the participating institutions have promoted their use among retail and corporate clients through financial incentives and service-bundling.

Outsourcing transaction and payment processing

In developing electronic payment systems, financial institutions and IT and data-processing firms formed alliances to develop specialized applications to provide payment instruments and transaction services to their customers. Financial institutions with insufficient resources or payment business to develop their own proprietary transaction systems contract with other organizations to provide transaction services to their clients. The CPA and many of the direct participants in the ACSS also began to outsource or co-source various payment-processing activities to firms and to establish their own shared-processing organizations for payments (Freedman and Goodlet 1998, 2002). Outsourcing payment processing reduces the operating costs of providing payment services and allows financial institutions to focus on developing and managing payment accounts, instruments, and related client services as the core of their payments function.

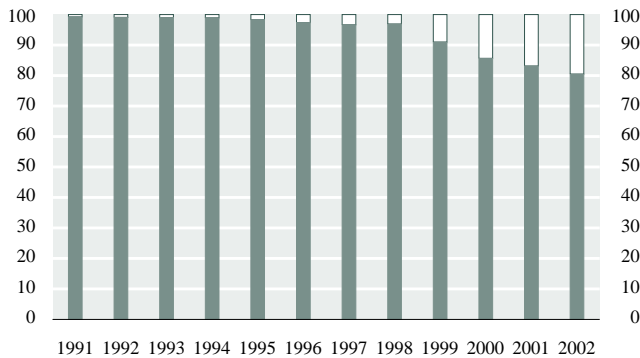
Chart 2

Trends in the Use of Non-Cash Instruments for Retail Payments

Electronic
Paper

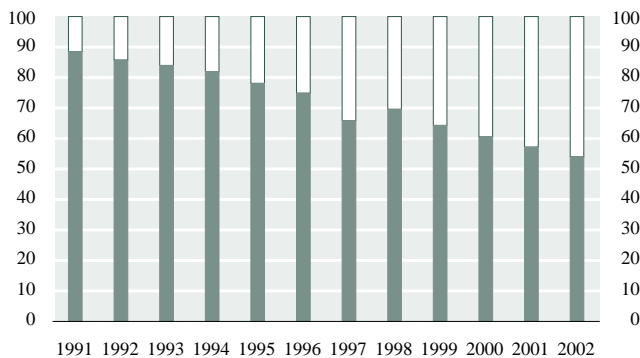
Paper vs Electronic Instruments

Annual value - per cent



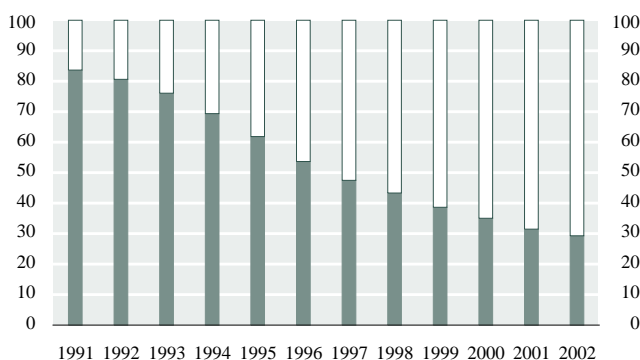
Paper vs Electronic Instruments Excluding Large Cheques

Annual value - per cent



Paper vs Electronic Instruments

Annual volume - per cent



Separation of wholesale and retail payment settlement

The principal financial risks in payment systems arise from uncertainty regarding the ability of institutions to meet their settlement obligations and to manage their liquidity. The new information technologies have allowed financial institutions to reduce, at a cost, some of these uncertainties through access to account information, transfer processing, and settlement of individual payments in real time. Even so, settlement risk still remains and must be managed.

Acquiring sufficient liquidity to meet accumulated gross intraday payment obligations or collateral to cover risk exposure from peak intraday gross payment receivables is too costly to protect systems from a participant's default. As a result, payment systems began to develop settlement arrangements specifically for the large-value payments that produce much of the intraday liquidity costs and risk exposure. These systems have been separated from those for the high-volume small-value retail payments so that each type of system could find its own appropriate balance between controlling risk and saving liquidity. The CPA, for example, introduced the LVTS in early 1999 to handle large-value and time-critical payments that could impose systemic risk—the risk that a default by one participating institution in the settlement system could cause other participants to default. In retail systems such as the ACSS, there is little prospect of significant systemic risk (Northcott 2002) and the focus is more on cost and liquidity saving than risk control. Accordingly, the CPA has begun to adjust the rules and procedures in the ACSS to improve its operations for retail payments.

Relaxation of regulatory constraints

In Canada, regulatory liberalization in the financial sector has had profound effects on domestic payment systems and service markets. The 1992 legislation to reform the financial services sector produced many of the recent regulatory and policy changes affecting payment systems in Canada, including allowing non-deposit-taking financial institutions to participate in the payment-service markets through deposit-taking subsidiaries (Freedman 1998). In 1996, new policy initiatives further enhanced competition in payment-service markets (Daniel 2002–2003). The new Payment Clearing and Settlement Act (PCSA) strengthened the legal foundation for effective limits on systemic risk in key payment, securities, and foreign exchange clearing and settlement systems. It also requires that the

Bank of Canada designate for oversight clearing and settlement systems that could pose systemic risk. The PCSA supported the development of the LVTS, which allowed the ACSS to concentrate on clearing and settling retail payments.

With regard to competition, the Competition Tribunal issued a Consent Order to Interac in 1996 that required the organization to broaden access to its transaction systems and to alter its pricing policies to facilitate new entry and competition among system participants. In addition, the Interac Association was required to eliminate access fees to its shared transaction networks for ATM and EFT/POS services and is allowed to recover its costs only through per transaction “switch” fees charged to participants.⁴ Since 1996, membership in Interac has almost quintupled, and demand for its services has increased correspondingly.

The government also established two study groups in 1996 to review and advise on public policy in the financial sector. The Payment System Advisory Committee (PSAC) focused on efficiency, risk control, and consumer interests in domestic payment systems, especially retail payment systems (PSAC 1997b). The Task Force on the Future of the Canadian Financial Services Sector took a much broader view of financial service markets, incorporating many of the findings of the PSAC into its recommendations on payment systems (Task Force 1998). These and other studies resulted in legislative changes that allow branches of foreign banks to operate in Canada. Some foreign banks had already been lending in Canada on a remote basis (i.e., without a physical presence).⁵ New shared ATM networks and debit-card systems also emerged as niche-market service providers with small shared regional networks or a broader range of services for specific institutional groups such as credit unions. Some, such as MasterCard’s off-line debit-card system, focus on cross-border retail payment markets with only limited activity in domestic payment markets.

4. Participants pay switch fees to cover the network operator’s cost of routing the payment information through the communication switches that link the individual participants into the network. Participants can also impose interchange fees among themselves to cover their own processing costs for inter-bank transfers, as well as surcharges and other user charges on customers who use their services.

5. Since 1980, foreign banks have been allowed to operate in Canada through wholly-owned subsidiaries. Incorporated in Canada, these subsidiaries, and those of other financial institutions, are legally regarded as Canadian banking firms. Conversely, Canadian branches of financial institutions incorporated outside Canada are not independent legal entities under Canadian jurisdiction.

Additional legislative changes to promote greater competition, efficiency, and responsiveness to consumer needs in domestic financial service markets were enacted in 2002. Changes affecting payment systems were embodied in the CP Act. It opened membership in the CPA and access to the ACSS, which is perceived as contributing to effective competition in the end-user markets for retail payments. Non-deposit-taking institutions, specifically life insurance companies, securities dealers, and money market mutual funds, are now eligible to join the CPA and participate in the ACSS. Some of these institutions were already providing payment services and participating in the CPA through deposit-taking subsidiaries. Others expressed a preference for providing payment services to clients directly through their parent companies, although none have yet chosen to become CPA members. The CP Act also provided broad payment oversight powers to the Minister of Finance. Consequently, the Department of Finance and the Bank of Canada established the Payment Advisory Committee (PAC) to coordinate their individual oversight activities and to advise the Governor of the Bank of Canada and the Minister of Finance on payment issues of common interest.

Issues and Initiatives in Retail Payment Systems

The issues currently emerging in Canada are rooted in the developments of the past decade and in the ongoing search for an appropriate efficiency-risk trade-off as payment systems continue to evolve. The main issues concern the infrastructure and markets for payment services; the application of new payment technologies; and competition among, and access to, infrastructure systems for retail payments. The CPA and other payment-industry organizations, often in collaboration with the authorities responsible for payment oversight, have already begun to address some of these issues.

While the Canadian Payments Association and other public and private organizations are beginning to address many of the key issues, others are just now emerging.

Infrastructure and services

To reduce the real costs of payment infrastructure services for financial institutions and, ultimately, for their customers, the efforts to improve the efficiency and quality of these services are virtually continuous. There are, however, a number of difficult business issues concerning how best to design and implement these improvements. The principal ones are related to tiered participation in clearing and settlement systems, the efficient use of the LVTS for settling retail payments, and the infrastructure for cross-border retail payments.

Tiered participation

Virtually all transaction, clearing, and settlement systems operating in Canada have a tiered participation structure. Thus, some member institutions in a system access the network services through other institutions that participate directly in the network arrangement.⁶ Since the set-up and operating costs for direct participation in the ACSS can be quite significant, especially for institutions with relatively small payment volumes, indirect participation can be efficient for many members. Some direct participants in the settlement network (called clearing agents) find the provision of clearing and settlement services to indirect participants an attractive business line, as long as they are able to efficiently contain settlement risks that indirect participants may impose on them and on the system.

One issue is the criteria for *direct participation* in the ACSS. With more diverse types of financial institutions participating in the CPA, as well as technological and policy changes in recent years that have altered the processing costs and settlement risks to clearing members, CPA members have requested a review of the conditions for participation as a direct clearer and as a clearing agent in the ACSS. For example, because life insurance companies and money market mutual funds have different regulatory arrangements and legal regimes than deposit-taking institutions, they are currently permitted to participate only as indirect clearers.⁷ While most members would prefer more

6. There may also be institutions that provide payment services to end-users that are not members of a system. They access these services through a contractual arrangement with another institution that participates in the system. Some payment-card issuers, Internet-payment service providers, and wire-transfer service providers are examples.

7. In addition to the institutional restrictions on direct participation in the ACSS, there is, at present, a requirement that direct clearers must clear at least 0.5 per cent of the annual volume of the system. All CPA members are eligible to participate directly in the LVTS.

open conditions for direct participation, some are concerned with the risks and costs that this could impose on the system. Since a change in the participation conditions would require a statutory amendment to the ACSS bylaw of the CP Act, the CPA, the Department of Finance, and the Bank of Canada have established a joint study group to examine this issue. It plans to provide a report and recommendations to the CPA Board and to the Minister of Finance by the end of 2004.

Closely related to this issue is *access to settlement facilities* at the Bank of Canada. Direct participation in the CPA's settlement systems requires access to settlement accounts at the Bank of Canada. The Bank's policy is to provide overnight credit to account holders as well. A key element of this arrangement is that the Bank of Canada must have a legally valid, first-priority security interest in the collateral pledged for the credit. Since some financial institutions are subject to different bankruptcy regimes and pledging restrictions than those that govern deposit-taking institutions, the Bank may find it more difficult to obtain such a valid, first-priority security interest over their pledged assets. Recognizing that having a settlement account without access to overnight credit would reduce the appeal of participating directly in the ACSS for eligible institutions, the Bank of Canada has been examining various options for providing access to settlement facilities for all institutional classes of CPA members that could become direct participants in the ACSS. The fact that the ACSS net obligations are now settled over the LVTS helps resolve this issue (Tuer 2003). The collateral pledged to cover the credit used to settle ACSS obligations would be associated with LVTS payments so that the Bank's security interest in pledges by all types of institutions participating in the LVTS would be legally protected from stays on execution by the PCSA.

Another concern with tiered participation is *risk and market concentration*. As relatively few clearing agents provide clearing and settlement services to indirect participants in a settlement system, the volume and value of payments settled over the accounts of the clearing agent rise relative to those settled over the interbank settlement system. Competition in clearing-agency services helps to ensure that the quality of the services remains high and that the price at which they are supplied closely reflects their true production and risk-management costs.

In Canada, only a few direct participants in the ACSS act as clearing agents for indirect clearers. In effect, they operate their own clearing and settlement sys-

tems (called quasi-systems) within the CPA. An untimely failure of one of the principal clearing agents could severely disrupt the settlement of the ACSS and could cause repercussions in end-user markets for retail payment services. Similarly, the failure of a major indirect clearer could create financial difficulties both for its clearing agent, which may bear some risk for settling the obligations of the failed indirect clearer in the ACSS, and for other participants to which it owes funds.

In addition to maintaining effective competition in the market for clearing-agency services, there is the issue of how to improve transparency and control risks in quasi-systems (CPSS 2003). The CPA's current rules and procedures for the ACSS have some limited application to defaults in the clearing agents' quasi-systems. Also, the Office of the Superintendent of Financial Institutions (OSFI), which supervises and regulates most of the financial institutions currently participating in the CPA, monitors the overall financial risk-management programs of the principal clearing agents. However, the controls specifically developed by clearing agents to manage financial and operational risk for their own quasi-systems are not very transparent. The joint study group on direct participation in the ACSS (the CPA, the Bank of Canada, and the Department of Finance) will examine this issue.

Efficient use of the LVTS for large-value retail payments

A crucial issue for retail payment systems in Canada is the further migration of large-value payments from the ACSS to the LVTS. Not all payments cleared and settled through retail payment systems are small in absolute terms or in relation to the financial resources of the payer or the receiver. For example, individual cheque payments in the ACSS of \$50,000 or more accounted for only 0.15 per cent of the total volume, but made up 57 per cent of the value in 2002, with their aggregate annual value equal to 208 times gross domestic income. The evidence suggests that the ACSS is not presently subject to significant levels of systemic risk, but that particular institutions can, at times, bring substantial settlement risk to the system, or can be substantially exposed to risks that could cause notable losses for participants (Northcott 2002). For this reason, financial risks to the participants in the ACSS that anticipate the receipt of large-value retail payments could be reduced further if the individual large-value payments were to migrate from the ACSS to the LVTS.

Improving the quality of payment infrastructure services and the financial safety of participants in the ACSS must be balanced against the higher per payment costs to the participants and their customers.

Individual CPA members that participate in both the ACSS and the LVTS are reluctant, for legal as well as business reasons, to unilaterally require their clients to send through the LVTS large-value payments that are now cleared and settled through the ACSS. Even though there is no minimum value for individual LVTS payments and the migration of large-value retail payments would be safer for all the institutions participating in the ACSS, the higher per payment cost to their clients limits demand for this safety. The added features of payment irrevocability, immediacy of settlement, and real-time payment information in the LVTS are typically more valuable to clients when they are receiving large-value payments than when they are making them. As well, most business clients are subject to significant financial risk only when rare problems of payment default occur in the ACSS settlement. Nevertheless, in July 2002, the CPA mandated that large-value paper payments of \$25 million and over would no longer be eligible for clearing and settlement through the ACSS as of August 2003 because of the substantial settlement risk involved. Although it affects only a few hundred payments per day, the \$25 million value cap is estimated to have already reduced the aggregate value settled by the ACSS by about 16 per cent.

Since this initiative is expected to reduce financial risk for all ACSS participants, proposals have emerged to extend the value cap to all electronic payment streams in the ACSS. Most of the payments in these streams are "bulk" payments—individual payments that have been consolidated for interbank clearing. The issue the CPA needs to address is whether the gains in collective financial safety for all ACSS participants and their clients are sufficient to warrant the restructuring costs imposed on the individual participants and the higher per payment costs imposed on their customers.

Cross-border retail payment systems

Although there is little conclusive statistical evidence available, survey and anecdotal evidence suggest that cross-border retail payments, though still small in volume and value compared to domestic payments, are growing at a noticeable pace (CPSS 2003). In addition to retail payments for cross-border business travel and tourism, business-to-business payments and person-to-business e-commerce transactions are rising as cross-border retail trade rises. In Canada, most of these payments involve U.S. residents and global card-payment systems like Visa and MasterCard for credit, ATM, and debit-card transactions. The inter-bank settlement of these and most other payment obligations takes place through correspondent banking arrangements in which a private bank in one country has a foreign currency settlement account with a private bank in another country. Some of the correspondent relationships for Canadian banks that involve U.S.-dollar and euro electronic payments are part of multilateral cross-border clearing arrangements.⁸ To date, however, these and other initiatives have had little market success. Limited payment volumes and values, along with substantial investments sunk into existing bilateral correspondent banking arrangements, have yet to offer a compelling business case for participation in multilateral clearing systems.

Recent regulatory changes within the European Union (EU) have renewed initiatives for some form of cross-border arrangements between the domestic clearing organizations in the Eurosystem, which is the payment system for countries that use the euro. Clearing organizations in other EU countries with their own currencies but with increasing cross-currency payments with the Eurosystem, as well as some clearing organizations in the United States, are considering participation in some of these initiatives. Also, key global service organizations such as the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which provide standardized payment-messaging services, have begun designing applications for the cross-border transmission of batch-payment files for retail payments. As multilateral standards develop and become more broadly accepted for clearing cross-border retail payments, the business case for

participation strengthens. The issue for Canadian financial institutions will be whether to reconsider their participation in some multilateral arrangements.

Application of new payment technologies

Innovations in information technologies have encouraged the development of more diverse and sophisticated payment applications for retail payments. This is especially so for electronic payment instruments and transaction systems involving the Internet. However, these developments continue to raise issues such as the security of payment information, the development of common standards for interoperability and straight-through processing, and the substitutability of low-cost electronic payments for paper-based payments.

Security of payment information

In retail payment transaction systems, there is a financial impetus to shift away from the closed, dedicated structures for transmitting information used by financial institutions in their proprietary and shared electronic banking systems towards lower-cost, open structures for multiple users, like the World Wide Web. Using a more flexible transmission architecture to transmit a wide range of information can lower overall transaction costs. The two principal problems with this strategy are the protection of the information from unauthorized access both during transmission and within the merchants' and service providers' information storage domains, and the accurate verification of the true identity of all the parties engaged in a payment transaction. Open-architecture systems designed for multiple users are more vulnerable to theft of information and identity than are the dedicated closed systems that can specialize in very high-level protection of all transmitted information.

Credit cards are the traditional payment instrument most used in e-commerce transactions. Consequently, card companies such as Visa and MasterCard have been upgrading their secure transmission protocols—Secure Electronic Transmission (SET) standards—to accommodate information transmission over more open architectures. Upgrades are also progressing in technologies for the payment cards and related devices that contain, read, and initiate transmission of encoded information on the identity of the cardholder, the payment account, and the routing of payment requests and authorizations. Over the past year, some initiatives that have been announced in Canada included using integrated circuit chips—mini-computers—embedded within the payment cards and

8. Canadian financial institutions already participate in some arrangements for the delivery and clearing of cross-border retail payments, such as the Federal Reserve System's International Automated Clearing House (IACH) Service and the Transferts Interbancaires de Paiements Automatisés Network (TIPANET) operated by the TIPA Group S.C.

using the Europay-Visa-MasterCard (EMV) standards for chip-card security. This technology can also lower user cost by supporting multiple information functions in addition to payments on a single chip card.

Although payment cards with enhanced information security are considered well suited for remote payments over the Internet, other secure electronic credit and debit-payment instruments are being developed for this purpose. Over the past few years, the CPA and other organizations have established frameworks for public key infrastructures (PKI)—arrangements for managing processes and programs required for secure transactions over the Internet. The CPA also published a set of principles and guidelines for payments over open-communication networks (CPA 2000). The federal government passed legislation protecting the privacy of electronic information and validating electronic documents and digital signatures. It also established codes of practice for consumer protection in e-commerce and e-payments. Finally, in the past year, a joint public-private working group involving the CPA, Industry Canada, and interested private organizations published a discussion draft of a set of principles for electronic authentication (Industry Canada 2003).

New payment technologies and standards for infrastructure services can help to improve the quality of services, lower real payment costs, and reduce some existing payment risks while introducing new ones.

Since the legal foundations for open-system electronic payments and the industry standards for information security and authentication are still evolving, the payment applications for these technologies are largely in their infancy. Also, further public and private initiatives to develop these technologies will continue, as there is yet no clear indication of which new payment technologies and products will ultimately become commercially viable. One difficult issue to consider in this regard is the question of interoperability—the capacity for users in one system to access that system through the services of another system.

Interoperability and straight-through processing

Technical innovation challenges established standards and, if successful, establishes new standards for commercial applications. To a large extent, the commercial success of new technical standards developed by the private sector depends on the ease with which they can be incorporated into new applications by a broad range of service providers. Key challenges for the public sector in this process are to identify and remove remaining legal barriers to the development of open-system electronic payments and to facilitate the development of fundamental principles for such applications.

Technical standards for the “backbone” of open systems are designed for widespread use. This is not always true for payment applications. Service providers customize their payment products and contractually limit access to them to generate the required commercial returns on investments and to fund future projects. The incentives for extending interoperability to other payment infrastructure systems can therefore be limited. For example, the standards and technologies of many PKI infrastructures are not fully compatible with the CPA’s PKI, and the systems are thus not interoperable. Without interoperability, only some systems and products can survive competitively, and the expansion of user demand is often slowed. In fact, the CPA recently decided to postpone further development of its PKI until a greater need for this service emerges. Discussions among private and public sector PKI operators have recently begun to address this issue. The challenge for the private sector is to determine the minimum extent to which a new open-architecture payment application and system needs to be interoperable and accessible to other retail providers of similar services to make it profitable.

Another form of interoperability, called straight-through processing, takes place between the infrastructure systems and applications that provide complementary services at different levels of payment processing. These include the proprietary payment marketing and processing systems used by payment providers and their outsourced processors, shared transaction networks, and clearing systems. Although standardizing these systems can reduce operating costs, security risks, and operational risks, it is difficult to coordinate when institutions have sunk extensive investments in already existing systems, and the success of any new system is uncertain. The CPA’s recent initiatives as well as its published standards and guidelines for open-architecture systems, are

aimed at finding broad open standards to help make the front-end marketing, processing, and transaction systems compatible with the communication and operating standards for clearing and settlement.

Cheque truncation and electronic cheques

Given the uncertainty about the acceptability of new retail payment instruments, a common strategy is to innovate around established instruments. The single most established retail payment instrument in Canada is the cheque, and two strategies for lowering the cost of using and processing retail-cheque payments are paper-cheque truncation and electronic cheques.

Cheque truncation would allow financial institutions receiving paper cheques for deposit to transform the instructions into digital form for internal electronic processing, clearing, and settlement. At present, the payment information on cheques is recorded electronically by the receiving institution for daily clearing and provisional settlement through the ACSS. However, the paper cheques must also be delivered daily to regional locations of the financial institution on which they are drawn and then sent overnight to the branch holding the customer's account to verify the signature and the availability of funds. This is a costly procedure.

Transmission and storage costs for electronic images are significantly lower than for the paper items. The truncation of paper cheques means that digital images of the cheques can be delivered electronically from the receiving institution to the paying institution to verify customer signatures and payment obligations through centralized on-line account information systems. Some of the major participants in the ACSS have already invested in digital-imaging technology to avoid transporting paper items to their branches, and the CPA is currently developing ACSS operating rules and standards for receiver truncation of cheques. The federal government has also begun to assess the necessary legislative changes.

An *electronic cheque*, rather than a paper-based cheque, is one instrument for Internet payments used in some electronic bill-presentment and payment schemes. Early in 2003, the CPA published a policy framework for clearing and settling one-time debit and credit payments, including electronic cheques (CPA 2003). To expand the range of cost-efficient electronic cheque payments acceptable for clearing and settlement over the ACSS, the financial, legal, and operational risks will need to be addressed. These include credibly securing the information contained in electronic pay-

ment instruments, clarifying the legal status of the instruments, and standardizing their design. Recent private and public initiatives have already begun to address some of these issues.

Access and competition

A degree of co-operation among participating institutions in member-owned shared-transaction systems and clearing and settlement systems, such as Interac, Visa, and the ACSS, is necessary for the management of payment risk and the efficiency gains related to product and system innovation, standard-setting, and networking. However, the incentives to allocate the risks, costs, and benefits appropriately among the various payment-service providers and users participating in retail payment infrastructure systems and end-user markets depend on effective competition in many of these payment-service markets (PSAC 1997c). End-user markets, where financial institutions vie with each other to provide retail payment instruments and services, are the most open to competition, followed by some common transaction systems for similar payment instruments and services, and various payment-processing and IT outsource providers used by individual institutions and the CPA.

Co-operation in organizing and operating transaction, clearing, and settlement systems is necessary, yet efficient markets for payment services depend on competition among their members.

The recent legislative changes, regulatory efforts, and policy initiatives to open access for a broader range of financial and non-financial institutions to Interac, the ACSS, and the Bank of Canada's settlement facilities were aimed at further enhancing competition and efficiency in retail payment-service markets. The continuing market pressure for even more open access to payment-infrastructure organizations and service markets raises some questions, however. Two of the most difficult issues are differential regulation among similar infrastructure systems and remote access to domestic infrastructure systems.

Regulation of infrastructure systems

In Canada, some transaction, clearing, and settlement systems for retail payments are regulated, while others are not. For example, payment-infrastructure systems for retail services such as the ACSS and Interac's SCD and IDP systems are regulated under the CP Act and the Consent Order of the Competition Tribunal, respectively. As the predominant national providers of infrastructure services for particular instruments, they are considered essential systems for retail payments. To be competitive, institutions that offer, or wish to offer, these instruments and services to end-users need access to them. As new retail payment instruments and expanded menus of payment services have emerged, new infrastructure systems that compete against the national systems in providing infrastructure services have begun to develop. Some examples are the Exchange ATM network, MasterCard's off-line debit card system, and CertaPay, an Internet bill payment system. Unlike the CPA and Interac, these new systems are typically unregulated. However, they generally operate predominately in local, not national, markets and offer services only through a limited number of financial institutions.

Regulation has both benefits and costs. Regulated disclosure requirements, restrictions on operating practices, and a greater need for legal services can impose a cost burden. However, regulated organizations often have greater access to the public authorities and their services than do unregulated entities. They can use regulation to help develop initiatives and coordinate actions that benefit all participants in the system and to instill confidence in the users of the payment systems. The entry of new infrastructure systems to these markets therefore raises concerns about the ability of regulated and unregulated providers of similar infrastructure services to compete evenly.

The key challenges for the public sector are to specify criteria for regulation that are clear enough to eliminate potentially disruptive policy uncertainty and to remove the unintended regulatory barriers to effective competition among regulated and unregulated service providers. The challenge for private sector infrastructure organizations is to develop a business strategy flexible enough to accommodate the emerging service needs of even small groups of their members.

Remote participation

At present, remote participation—the provision of retail payment services by organizations incorporated

and located in other countries—in Canadian retail payment systems is limited to payment-processing and clearing services, principally for global card payments. Most other payment services can be provided only by branches of Canadian firms and incorporated subsidiaries of foreign firms. Recently, however, there have been requests from foreign institutions to remotely access settlement facilities at the Bank of Canada and to participate remotely in the CPA's settlement systems. Although most requests were initially for participation in the LVTS, remote participation in the ACSS would facilitate clearing and settlement of the growing number of cross-border retail payments as well. Foreign institutions specializing in Internet banking and payment services to clients, some of which can already remotely provide limited banking services in Canada, could eliminate the intermediation costs associated with cross-border clearing and settlement through correspondent banks. Remote participation by Canadian financial institutions in foreign retail payment infrastructure systems would involve similar cost savings. Currently, remote participation in Canadian clearing and settlement systems is prohibited, although similar barriers do not exist in all other countries, notably those in the EU.

The prohibitions on remote participation in Canada and other countries such as the United States reflect concern over legal risks. Unforeseen legal problems caused by a default by a remote participant can potentially disrupt the operation of domestic payment settlement systems and impose payment risks on domestic participants. For example, the legal validity of the CPA's default rules and procedures may be unrecognized in the jurisdiction of the remote participant. Also, the credit claims of Canadian entities participating in the ACSS against a failed remote participant may be subordinate to similar claims of residents of the foreign jurisdiction of the remote participant. As some of these concerns are resolved and remote participation becomes more acceptable in principle and practice in more countries, the authorities in Canada will likely wish to review their policies governing remote participation in retail payment infrastructure systems as well.

Conclusions

Although retail payment systems may not pose a systemic threat to the Canadian financial system, they are critical to a well-functioning Canadian economy. They must operate efficiently and reliably to avoid

disruptions in infrastructure systems that can prove costly for retail commercial and financial activities. Innovations in basic information technologies, in payment applications, and in global market availability have produced fundamental changes in retail payments. There are increasing demands for more and better low-cost electronic payment instruments and services. In response, we have observed significant new investment in infrastructure technology and a strategic reorganization in market arrangements with a widening range of retail payment services and service provid-

ers. Also, re-regulation in markets for retail payment services has addressed issues of provider access, the operations and security of infrastructure systems, and consumer protection. Operators of retail payment systems, system participants, and public oversight agencies in Canada, as elsewhere, have begun dealing with many of the issues these developments raise. All share the same strategic objective: achieving the right systemwide balance among competing efficiency needs, risk-control mechanisms, and consumer interests to best serve evolving retail payment systems.

Glossary

Electronic authentication is a process for verifying the identities of the parties communicating remotely over an electronic network like the Internet and the integrity of the message being communicated.

Infrastructure systems for payments consist of the array of underlying organizations, procedures, installations, and other facilities that financial institutions require to provide payment instruments and services to their customers. The services provided by organizations that operate infrastructure systems are infrastructure services.

Networks link participating institutions by means of their communications equipment so that users can access the proprietary data and services of each participating institution through its own or shared equipment at remote locations. The *network operator* provides and maintains the services that interconnect the network.

An **open-architecture system** is a network operated by a service provider that directly links multiple users (e.g., buyers, vendors, and their financial intermediaries) for jointly interactive communication sessions. It can typically be used to transmit a variety of types of information almost simultaneously and can possibly ensure different degrees of security for the information, depending on the level of confidentiality required. It contrasts with a *closed system*, which is a two-way connection, often over dedicated communication lines or frequencies.

A **payment service provider** specializes in providing a particular type of payment-related service and can be either a financial institution that provides payment

accounts, instruments, and transfer services to its customer or a provider of payment infrastructure services, such as a transaction network operator or a clearing system operator.

Provisional credit refers to the posting of a payment value (the credit) to the receiver's account as soon as the payment item is presented for collection with the financial institution that provides the customer with a deposit account. Effectively, provisional credit is a payment receivable. It is granted on the agreement that, if the funds are not forthcoming from the financial institution on which the payer has drawn the item, the receiving institution will void the payment credit to the receiver's account.

A **security interest** refers to a contractual agreement between two parties indicating that one has a prior legal interest in some of the assets owned by the other. It secures, for example, a lender's claim on specific assets pledged as collateral by a borrower to cover the lender if the borrower defaults on the terms of the loan agreement.

A **stay on execution** is a court-ordered delay on the transfer to a lender of collateral pledged by a defaulting borrower under the terms of the lender's security interest. The immediate consequence to the lender is an unanticipated cost to finance the loss of cash flow owing to the default on the loan without liquidation of the pledged collateral. The ultimate consequence may be a credit loss if the lender's security interest is not upheld by the court.

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