Discussion Paper 1

The Payments System in Canada:

An Overview of Concepts and Structures

Background Paper for Discussion by the Payments System Advisory Committee
Prepared by
Staff of the Bank of Canada and the Department of Finance

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Foreword

This paper is the first in a series of background papers prepared by staff of the Bank of Canada and the Department of Finance for discussion by the Payments System Advisory Committee. The Advisory Committee will assist the Department of Finance in its review of the payments system in Canada.

This first paper describes the evolution of the payments system in Canada and provides a detailed description of the instruments, services, and institutions of the current payments system. Payments procedures - including clearing and settlement - for each of the payments instruments are examined and the settlement risks associated with the various processes are profiled. Similarities and differences among the payments instruments, their payments processes, and their risk profiles are highlighted. The paper ends with a brief description of significant recent developments in the Canadian payments system, notably the development of the Canadian Payments Association's Large-Value Transfer System, structural changes in the Interac Association, and the passage of the Payment Clearing and Settlement Act.

When they are published, the papers in the series will usually be accompanied by a brief summary of the relevant discussions by the Advisory Committee. A summary of the discussions is not included with this paper, however, as the Committee's comments were composed primarily of suggestions for redrafting an earlier version of the paper, most of which have been incorporated in this document.

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1. Introduction

The payments system in Canada is essentially a network of competing and complementary services that facilitates transactions involving the exchange of a means of payment in return for goods, services, real assets, and financial assets. The means of payment can take on many forms - from traditional instruments such as currency and chequable deposits in banking institutions, through debit and credit cards, to modern electronic vehicles such as stored-value cards and network tokens in an electronic purse. The instruments, rules, institutions, and technical processes that facilitate the transfer of value to discharge the payment obligations, and that govern the intermediary agents involved, form the architecture of the payments system in Canada. As a central element in the economic infrastructure, the payments system has a significant effect on the operating efficiency of the Canadian economy.

New information technologies, new financial services and instruments, an increasing number and widening range of institutions interested in providing payment services, and growing cross-border payments flows are changing the demands on the payments system. The federal government recognizes that a thorough, forward-looking assessment of the payments system framework with the assistance of stakeholders - users, service providers, and government and its agencies - is required. In its consultation paper on proposed changes in financial sector legislation, the government announced its intention to undertake a review of the payments system with the assistance of an advisory committee. The advisory committee, composed of public and private sector members with expertise in the payments area, was formed in late August and is co-chaired by senior officials from the Bank of Canada and the Department of Finance. The committee will discuss a number of fundamental issues such as access to the payments system, the structure of the payments system, and its governance to help the federal government ascertain whether adjustments are needed to achieve public policy objectives concerning, primarily, the efficiency and safety of the payments system.

This is the first in a series of papers on topics of fundamental interest to the advisory committee. This first paper describes the current payments system in Canada and is designed to help provide a foundation for future discussions of the committee. Along with a brief overview of the evolution of the payments system in Canada, the basic elements of the payments system will be

considered. The relative importance of various payments instruments and the associated payments processes will also be discussed.

2. Evolution of the Payments System in Canada

Before proceeding with a description of the existing payments system in Canada, a brief examination of the evolution of the payments system is useful to provide some context. The basic design of any national payments system depends largely on the architecture of the underlying financial system and on the historical evolution of payments processes. Although a range of facilities for clearing non-cash payments exists, a key element of the current payments system in Canada is the mechanism designed to facilitate the efficient clearing and settlement of cheques, the predominant payment instrument.

Although cheques and bank drafts were available to commercial users before Confederation, cash (in the form of private bank notes issued by commercial banks) was the primary payment instrument in use. In the period following Confederation, the clearing of cheques, bank drafts, and interbank note obligations was done locally on a bilateral basis with debtor banks issuing drafts to creditor banks, which were then forwarded to the regional settlement point for collection. Settlement, which was undertaken daily on a bilateral net basis, was achieved by transfers of special large-denomination Dominion notes at a regional settlement point. To streamline the clearing and settlement process, the first regional clearinghouse was privately established in Halifax in 1887. The branch-banking system in Canada facilitated the subsequent expansion of the private regional clearinghouse system to major centres across Canada.

With revisions to the Bank Act in 1900, the Canadian Bankers Association (CBA) was empowered to establish clearinghouses for banks and to make rules and regulations for their operation. Membership in the CBA became compulsory for banks and the CBA was provided with some self-regulatory powers. In addition to standardizing the clearinghouse arrangements, the CBA began centralizing the settlement process. Initially, it instituted a two-tiered clearing and settlement system. Settlement points were established in Montreal, Toronto, Winnipeg and Vancouver where all banks held settlement balances of Dominion notes. Other regional clearing-

houses settled provisionally through bank drafts, which were forwarded to the regional settlement point for final settlement. The CBA further centralized the settlement process in 1927 through an arrangement with Royal Trust Company in Montreal, which acted as the central settlement institution for the national clearing and settlement system. The main clearinghouses in each province telegraphed their clearing positions for banks daily to Royal Trust, which debited and credited the banks' settlement accounts accordingly.

In 1935, the Bank of Canada began operations as the central bank in Canada. At the same time, Dominion notes were replaced by Bank of Canada notes as legal tender and the elimination, over the next fifteen years, of private bank notes as currency instruments began. Banks were required to hold cash reserves on deposit at the Bank of Canada and the Bank of Canada replaced Royal Trust Company as the central settlement institution in the payments system. The Bank of Canada opened branches in nine regional centres across the country and became a member of the clearinghouse arrangement in each centre. The clearinghouse system continued to be operated by the CBA, with the large banks either maintaining a regional clearing branch or using a clearing agent in each major centre. From each of these centres, the Bank of Canada branches telegraphed the net clearing positions of each bank daily to headquarters in Ottawa, where they were netted into national clearing balances and settled by debiting or crediting each bank's reserve account accordingly.

This basic clearing and settlement structure remained in place until the early 1980s. The development of a national clearing and settlement system by the CBA, along with technological advancements in automated cheque processing and the spread of personal chequing accounts at banks and non-bank deposit-taking institutions, had promoted cheques to the position of dominant payment instrument for medium-to-large value payments. However, with the growing presence of non-bank deposit-taking institutions in deposit markets and in the provision of retail payments instruments, as well as the emergence of new electronic payments instruments such as direct funds debit and credit transfers, the government decided that broader access to the clearing and settlement system than that afforded by the CBA was required. Consequently, the Canadian Payments Association Act was proclaimed in 1980, authorizing the Canadian Payments Association (CPA) to establish and operate a national clearing and settlement system with a broad mem-

bership of deposit-taking institutions and to plan the evolution of the national payment system.[1] In 1983, the CBA transferred responsibility for the national clearing and settlement system to the CPA. In 1984, the CPA instituted the Automated Clearing Settlement System (ACSS), which is an electronic accounting, confirmation and settlement system using an on-line, interactive computer network to facilitate the clearing and settlement of various payments instruments, most notably cheques.

In addition to the Bank of Canada, the CPA currently has about 140 members, all of which are regulated deposit-taking institutions such as chartered banks, trust and loan companies, credit union and caisse populaire organizations. For clearing purposes, the membership is divided into two groups: 13 direct clearers (the Bank of Canada and 8 chartered banks, the centrals of two cooperative credit organizations, one trust company and one provincial institution, which hold settlement accounts at the Bank of Canada), and over 120 indirect clearers, which hold clearing accounts at a direct clearer.[2] The direct clearers maintain regional data centres to process payment items for their own accounts and for those of indirect clearers in their area, and to enter electronically into the national ACSS (which calculates the 'net-net' or multilateral net positions for daily settlement) the amounts and volumes delivered in the clearings. They also initiate the transfer of cheques and other paper and electronic payment items to other direct clearers for all other regions in the system and provide a gateway to settlement services for payments cleared initially through specialized organizations such as Visa Canada, MasterCard, the Canadian Depository for Securities, and the International Interbank Payments System. Settlement of the net national clearing balances is achieved through debiting and crediting the direct clearers' accounts at the Bank of Canada on the day following the initiation of the clearing process but, since 1986, with the value backdated one day to achieve settlement value as of the date of clearing.

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1. The Board of the CPA has 5 bank representatives and 5 representatives from non-bank deposit-taking institutions, as well as a senior official of the Bank of Canada, who is also the chairperson of the Board.
2. A member of the Canadian Payments Association must be a federally or provincially regulated deposit-taking institution and either be a member of the Canada Deposit Insurance Corporation or of an equivalent provincial deposit insurance agency, or be a credit union central registered under the Canadian Cooperative Associations Act and a member of the Credit Union Central of Canada. To qualify as a direct clearer, an institution must account for at least 0.5 percent of the volume of all payments items and maintain a settlement account at the Bank of Canada.

3. Basic Elements of the Canadian Payments System

To provide a basis for the presentation of payments processes in Canada, the basic components - instruments, classes of services, legal frameworks, and sources of payments system risks - are outlined below.

3.1 Instruments

Payments instruments basically convey relevant information regarding the transfer of monetary value from one party in a transaction to the other. Such information may, for example, include the face value of the payment, the identity of the parties and their intermediaries, the transaction date, and the value or settlement date. These instruments and their processing systems are generally low-cost relative to the value transferred per item, provide a high degree of confidence in the authenticity of the value transferred, and are generally acceptable as evidence of value received.

Cash

The most elementary instrument is cash in the form of coin and Bank of Canada notes, which are used for a multiplicity of small-value transactions. Because of its bearer form and the anonymity of payment, cash is typically used to discharge a small-value payment obligation of a payor in direct, face-to-face, transactions and with immediate transfer to the other party in a transaction. Cash payments are the least complex of payment mechanisms but are impractical for large-value transactions because of portability and security concerns. Moreover, the handling costs of cash for merchants, as well as for providers of cash to the public such as private deposit-taking institutions and the Bank of Canada, can be substantial. Although there are no estimates on the usage of cash as a payment instrument in Canada, surveys in other countries such as the United States indicate generally that cash provides payment for between 50 and 80 percent of the transaction volume but accounts for less than one percent of the transaction value. At present, there is about $27 billion in Bank of Canada notes outstanding and just over $3 billion in coin. By value, around 90 percent of the notes and almost 95 percent of the coin are circulating outside banks.

Cheques

While there is a variety of non-cash payment instruments, cheques are the most commonly used in Canada. Cheques transfer deposit balances between individual accounts held either in a single deposit-taking institution or in different deposit-taking institutions. They are typically used as a payment instrument in medium-to-large size transactions. As shown in Tables 1 and 2, while cheques account for around 50 percent of the volume of non-cash payments, this represents about 98 percent of the total value of these transactions. Large-value cheques (those over $50 thousand) represent only about one-quarter of one percent of the clearing volume in ACSS but about 75 per

TABLE 1
Volume of Non-Cash Payments in Canada
(in millions)[1,2]

	1989	1990	1991	1992	1993	1994	1995
Cheques and other paper payment instruments	2,186.2 (+ 1.2)	2,220.0 (+ 1.6)	2,188.3 (- 1.4)	2,135.5 (- 2.4)	2,109.6 (- 1.2)	2,022.7 (- 4.1)	1,941.4 (- 4.0)
Credit cards	820.0 (+ 11.4)	887.7 (+ 8.2)	926.7 (+ 4.4)	959.0 (+ 3.5)	1,043.7 (+ 8.8)	1,167.2 (+ 11.8)	1,260.0 (+ 8.0)
Debit cards[3]	24.5 (- 6.5)	28.5 (+ 16.3)	38.7 (+ 35.8)	62.9 (+ 62.5)	110.1 (+ 75.0)	226.9 (+ 106.1)	444.1 (+ 95.7)
Direct funds transfers:							
Credit transfers	79.8 (+21.1)	92.7 (+ 16.2)	104.6 (+12.8)	118.4 (+ 13.2)	152.7 (+ 29.0)	202.8 (+32.8)	254.1 (+ 25.3)
Debit transfers	70.8 (+ 23.1)	92.0 (+ 29.9)	116.7 (+ 26.8)	146.6 (+ 25.6)	178.8 (+ 22.0)	209.6 (+ 17.2)	237.9 (+ 13.5)
TOTAL	3,181.3 (+ 4.4)	3,320.9 (+ 4.4)	3,375.0 (+ 1.6)	3,422.4 (+ 1.4)	3,594.9 (+ 5.0)	3,829.2 (+ 6.5)	4,137.5 (+ 8.0)

SOURCE: Bank for International Settlements, *Statistics on Payment Systems in the Group of Ten Countries*, and the Bank of Canada.

1. Year-over-year percentage changes are shown in brackets below the figures.
2. All figures are estimates.
3. Including bill payments initiated at ABMs.

TABLE 2
Value of Non-Cash Payments in Canada
(in billions of dollars)[1,2]

	1989	1990	1991	1992	1993	1994	1995
Cheques and other paper payment instruments	19,943.9 (+ 13.8)	20,798.8 (+ 4.3)	21,599.7 (+ 3.8)	21,792.0 (+ 0.9)	24,315.4 (+ 11.6)	25,160.0 (+ 3.5)	20,339.3 (- 19.2)
Credit cards	55.3 (+ 24.8)	59.7 (+ 8.0)	62.5 (+ 4.7)	66.4 (+ 6.2)	73.6 (+ 10.8)	84.5 (+ 14.8)	91.2 (+ 7.9)
Debit cards[3]	1.8 (- 5.2)	2.1 (+ 16.7)	2.6 (+ 23.8)	4.0 (+ 53.8)	6.4 (+ 60.0)	12.5 (+ 95.3)	22.6 (+ 80.8)
Direct funds transfers:							
Credit transfers	81.5 (+ 24.4)	100.4 (+ 23.2)	123.1 (+ 22.6)	151.6 (+ 23.2)	170.3 (+ 12.3)	186.1 (+ 9.3)	213.3 (+ 14.6)
Debit transfers	17.3 (+ 47.8)	22.0 (+ 27.2)	28.8 (+ 30.9)	38.3 (+ 33.0)	45.6 (+ 19.0)	53.3 (+ 16.9)	66.5 (+ 24.8)
TOTAL	20,099.8 (+ 14.0)	20,983.0 (+ 4.4)	21,816.7 (+ 4.0)	22,052.3 (+ 1.1)	24,611.3 (+ 11.6)	25,496.4 (+ 3.6)	20,732.9 (- 18.7)

SOURCE: Bank for International Settlements, *Statistics on Payment Systems in the Group of Ten Countries*, and the Bank of Canada.

1. Year-over-year percentage changes are shown in brackets below the figures.
2. All figures are estimates.
3. Including bill payments initiated at ABMs.

cent of the clearing value. The decline in the volume of cheque payments in recent years is due largely to the strong growth in the use of other non-cash payment instruments over the period. The growth in the value of cheque payments has declined primarily because of slower growth in large-value payments due partly to the development of bilateral netting in International Interbank Payment System and to the shift in late 1995 of Government of Canada treasury bills into the Canadian Depository for Securities' Debt Clearing Service, where payments are also netted.

Because cheques are subject to fraudulent presentation and the ultimate settlement of the value of a cheque is deferred, their acceptance by the payee as a payment instrument typically

depends on proof of identity or creditworthiness by the payor. The larger the value of the cheque and the less frequent the occurrence of transactions between specific parties, the less acceptable is a cheque as a payment vehicle without some form of guarantee or certification. Therefore, financial institutions with well-recognized creditworthiness offer certification services for cheques, segregating funds from the payor's deposit account to cover the value of the cheque. Other common payment instruments similar to certified cheques are drafts, travellers' cheques, and money orders issued by a broad range of financial institutions. These are similar to certified cheques in the sense that the issuing institution provides assurance regarding the value of the transfer to improve the acceptability of the non-cash payment instrument.

Even though the payor initiates the payment by presenting a cheque to the payee, it is the payee's deposit-taking institution that initiates the actual transfer of funds by presenting the cheque to the payor's deposit-taking institution for settlement of the payment obligation. Indeed, until presented with the cheque for payment, the payor's deposit-taking institution is, in most cases, unaware of this payment obligation and, before it can complete the transaction, the payor's institution must ensure that the payor's account has sufficient funds, or access to borrowed funds, to meet the obligation. Cheques are, therefore, 'debit-pull' transfers where the payee's deposit-taking institution 'pulls' the value of the transfer through the system, creating a debit on account of the payor and its intermediaries to match the credit it provides to the payee's account.

Direct Funds Transfers

'Paperless' payments instruments describe a range of vehicles used to transfer payment information and monetary value in an electronic financial book-keeping system through some form of electronic communications device. Direct funds transfer systems in Canada include both debit transfers and credit transfers to move monetary value from the payor's deposit account to the payee's account.

Direct debits are generally payments pre-authorized by the payor, with the transfer process initiated by payment instructions from the payee. These payments are payable at a regular frequency for obligations such as rent or mortgage payments, organized savings programs, bill payments and tax payments. Credit transfers are payments transferred on a pre-arranged basis directly into the payee's account at a regular interval. The transfer is initiated by payment instruc-

tions from the payor to its bank to debit its account and forward the payment to the payee's account at its deposit-taking institution. Credit transfers include such payment items as direct payroll deposit, regular government transfer payments, and bill payments by individuals. The credit transfer process proceeds only if the payor has sufficient funds in its account to make the payment and, in contrast to a cheque payment or pre-authorized debit, is described as a 'credit-push' transfer since the payor's institution 'pushes' the value of the transfer through the system to the payee's institution in order to credit the payee's account. Since 1989, the proportion of non-cash payments in Canada using direct debit and credit transfer has more than doubled in volume from about 5 percent to 12 percent. However, even though the value of these transfers has almost tripled over the period, it still represents only 1.3 percent of the total non-cash payments value.

Large-value wire transfer systems in Canada, notably the International Interbank Payment System (IIPS), provide credit-transfer payment arrangements for interbank deposits, for the Canadian dollar component of foreign exchange transactions, and for other large-value Canadian dollar payments. IIPS is a co-operative organization of 67 deposit-taking institutions. There are 23 members of the Direct Participants Group, including 20 chartered banks, a trust company, La Caisse Centrale Desjardins du Quebec, and the Bank of Canada. Direct participants are required to be members of the Society for Worldwide Interbank Financial Telecommunications (SWIFT), an international co-operative of financial institutions that provides specialized electronic messaging services for members, and each must send at least fifty messages daily. The payor's bank initiates the payment through a SWIFT message to the payee's bank. The clearing facility for IIPS is the ACSS. Originally, all the payments were entered into ACSS, on a transaction-by-transaction basis, by the payee's bank in the form of a debit voucher drawn on the payor's bank. Since 1992, however, the largest institutions in IIPS have begun to net their payments positions bilaterally prior to entry into ACSS. Although IIPS payments are less than one-tenth of one percent of the total non-cash payment volume of ACSS, the total value of IIPS payments are equal to over 80 percent of the value recorded in ACSS.

Payment Cards and Electronic Money

Payments cards, which are substitutes for cash and cheques as payments media, include credit cards and charge cards, debit cards, and stored-value cards and are used mostly in small-to-

medium-value transactions. Payment cards, which are used to initiate a payment, have an embedded magnetic stripe (or ‘magstripe’) containing encrypted information relevant for the discharge of the payment obligation such as the card number, expiry date, security data, verification features and other service codes that identify the cardholder and card issuer and route the payment messages. A newer generation of cards currently under development contain an electronic computer chip that provides more functionality, more information and greater security to the payment instrument.

Credit cards provide the holder access to a pre-arranged, limited, line of credit with the issuer of the card. The card can be used as a payment instrument or as an access vehicle for a cash advance. As a payment instrument, the card authorizes the issuer to debit the credit-line account of the cardholder and transfer the value to the account of the vendor. The card is generally issued by a deposit-taking institution under licence from a credit card service organization such as Visa Canada or MasterCard. When the payment is authorized by the card issuer, the issuing institution forwards the payment, which is backed by a guarantee from the collective membership of the credit card organization, to the vendor through its deposit-taking institution.[3] The cardholder’s payment obligation is to the card issuer. Some retailers, such as retail oil companies and retail chain stores, issue credit cards or charge cards for ‘in-store’ use only. The credit cardholder’s payment obligation may be fully paid with some other payment instrument at no interest charge within a specified billing period (typically 30 days) or may be fully or partially rolled into a revolving credit liability. Charge cards are functionally similar to credit cards, except that there is often no set limit and the balance must be fully paid at the end of the billing period. Although credit cards make up about 30 percent of the non-cash transaction volume in Canada, they account for less than one-half of one percent of the value.

Debit cards are issued by deposit-taking institutions and are used either to access services, such as cash withdrawal and bill payment through automated banking machines (ABMs), or to make transaction payments directly and immediately to a vendor through point-of-sale (POS) terminals.[4] The payment instructions are transmitted electronically through the access equipment to

3. While Visa requires its card issuers to be regulated deposit-taking institutions, MasterCard issuers can be any corporate entity legally authorized to engage in financial transactions.
4. Some cards are limited to ABM use only.

the payment network of the card issuer, which results in a real-time debit to the account of the cardholder and a credit to the vendor's account at its participating institution. Even though the electronic accounting for these transactions is in real-time, the actual transfer of value between the financial intermediaries that hold the respective accounts of the two parties in the transaction is deferred until the end of the ACSS clearing and settlement cycle. The value of the payment is lodged in a 'suspense' account at the payor's institution in the interval between real-time debit at the time of the transaction and the interbank settlement transfer. The payment to the merchant (payee) is recorded by its deposit-taking institution at the time of the transaction. However, because of the high frequency of payments received by a merchant, its deposit-taking institution will batch these payments to reduce processing costs, hold them temporarily in a suspense account, and post the accumulated credits to the payee's account on a negotiated schedule during the day. In relation to all non-cash payments in Canada, the volume of debit card payments (including ABM bill payments) has increased to over 10 percent from just under 1 percent in 1989, but the value is still only about one-tenth of one percent of the total.

Stored-value cards have been described as electronic purses for e-money, which is an electronic record of value stored typically in a numerical ledger that can be debited and credited. E-money is essentially a cash substitute and is presently in the pilot stage in Canada. The cardholder electronically transfers value, at least initially, from a deposit account, a credit card account, or through a currency exchange onto either a 'magstripe card' or a 'smart card' (a card with computer chip). The initial generation of stored-value cards were single-purpose or disposable magstripe cards, such as subway cards or telephone calling cards. However, the new generation of cards under development contains a computer chip that allows the 'smart' card to be used in a multiplicity of transactions with counterparties equipped with appropriate electronic transactions devices. The reusable smart card can be 'loaded' either through an ABM or a specially equipped computer or telephone. Subsequent transactions electronically decrease or increase the monetary value stored on the card, when it is inserted in a reading and computing device, through a value transfer to or from a similar stored-value card of another party, or a deposit account. Although experiments with multi-purpose stored-value cards are under way in some regions in Canada, they do not yet account for any noticeable volume or value of payments.

3.2 Payments Services

Non-cash payments instruments involve substantial processing of payments instructions to complete the value transfer. Although the dividing lines among payments services are not always clear, the sequence of payment operations can be decomposed generally into access services, messaging services, clearing services, and settlement services.[5] The inverted pyramid nature of this process (Figure 1) indicates an increasing centralization of operations as the payment moves from its instrument access stage to the settlement stage, where settlement services are provided by the Bank of Canada.

Access Services

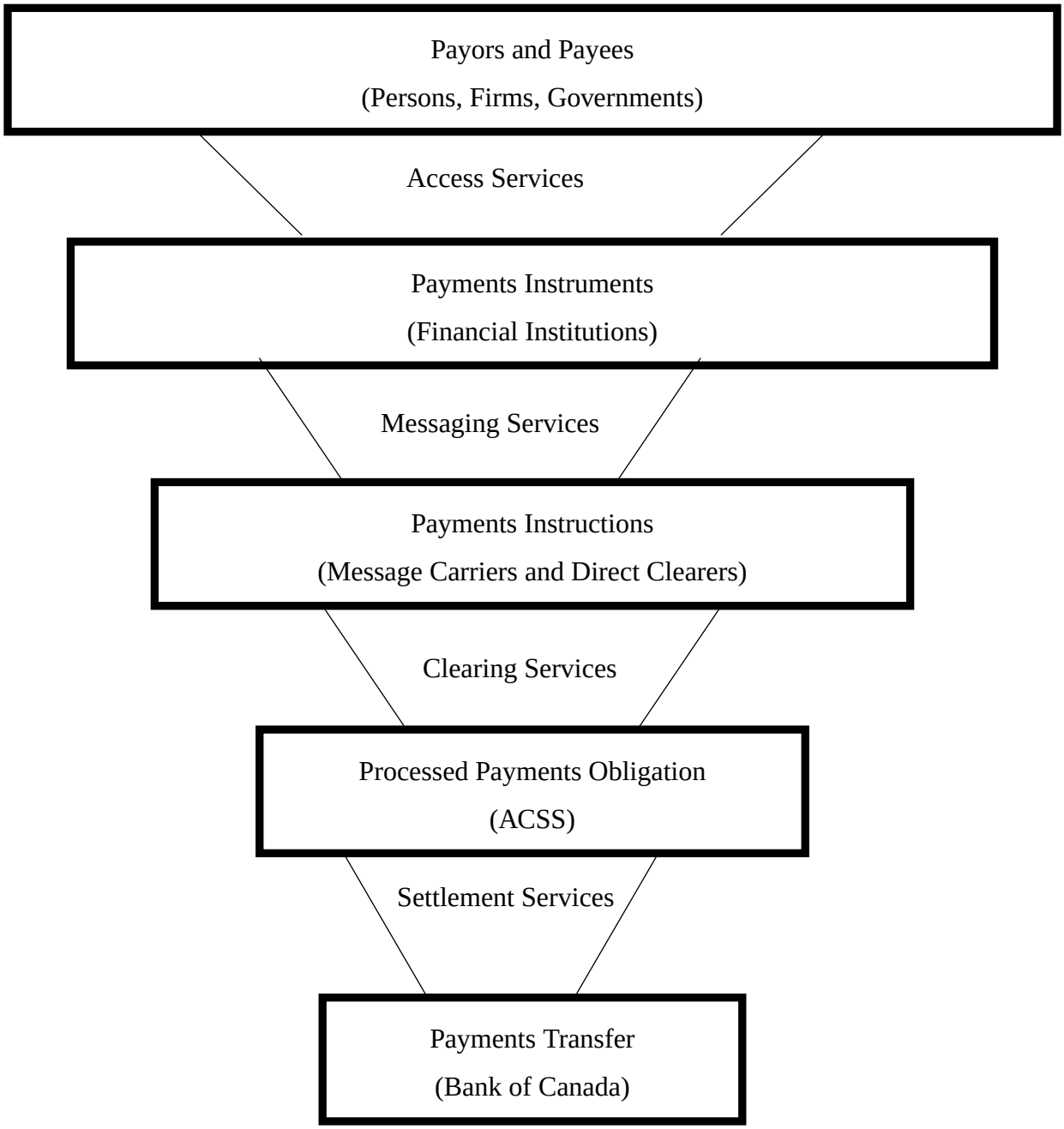
Access services provide the payor with the opportunity to select a payment instrument of choice. In Canada, these services are generally provided by deposit-taking institutions, although there are other service providers as well. In addition to access to cheque payments, there is a range of access modes - especially in electronic modes - to a variety of other retail payments instruments. For wholesale payments, access is offered to EDI systems, via SWIFT for example, and to foreign exchange clearing and settlement systems through on-line networks.[6]

Users gain access to retail electronic payment instruments either directly through proprietary systems of individual deposit-taking institutions or via agency arrangements with financial service, telecommunications and data processing organizations that, in turn, have arrangements with deposit-taking institutions. The major retail direct funds transfer systems, including telebanking and home computer services, are proprietary systems of individual deposit-taking institutions. There are, however, about a dozen shared ABM networks established throughout Canada. The Interac Association operates the largest national network. At present, about 97 percent of the 18 thousand ABMs in Canada, three-quarters of which are bank-owned, participate in the net-

5. Cash payments involve only access services.
6. Electronic Data Interchange (EDI) is essentially an electronic messaging system that allows corporate parties to exchange a large amount of transaction-specific detail. The relevant payment information can be electronically stripped from the payor's message and entered directly into the clearings and settlement systems via computer-based networks established by member financial institutions. The CPA has developed standards on the content and form of EDI payments.

Figure 1

The Non-Cash Payments Process



work.[7] Among the shared ABM networks in Canada are major international networks such as Plus (Visa) and Cirrus (Mastercard). Interac, established independently by a group of direct clearing members of the CPA in 1985, also operates the largest of the ten networks of POS terminals in Canada.

Unregulated financial enterprises, such as Money Mart and Telpay, also provide retail payments services, such as wire transfers and bill payments, through arrangements with independent telecommunications operators and with small deposit-taking institutions that do not offer proprietary direct funds transfer services. They gain access to the clearing and settlement components of the payments system through CPA members. Indirect access to the retail payments system is also provided by CPA members to clients of other financial corporations through sweep accounts and payable-through accounts.

In a sweep account arrangement, a corporate entity, such as an investment dealer, sets up a chequing account with overdraft facility for its client at a CPA-member deposit-taking institution, as well as a deposit account for itself. The client also has an investment account arrangement with the investment institution. At the end of each day the deposit-taking institution automatically transfers the balances remaining in the client's chequing account, after cheques drawn on the account have cleared, into the deposit account held by the investment institution, which credits this amount to the client's investment account. If the client's chequing account is in overdraft at the end of the day, the investment institution debits the client's investment account by the amount of the overdraft and transfers funds from its account at the deposit-taking institution to the client's chequing account to cover the overdraft. Under this arrangement, the investment firm pays interest on the client's overnight balances 'swept back' to it and has the funds available for its own use. Sweep accounts are generally arranged for financially sophisticated clients.

A payable-through account is a deposit arrangement between certain corporate entities, such as a life insurance company, a mutual fund, or a finance company, and a CPA member.

7. Although there is a broader range of banking services offered by some smaller shared ABM networks in Canada, Interac offers only cash withdrawal services on a shared basis in its ABM network. The proprietary systems of each member provide, of course, a very broad range of banking and information services. It is useful to note that proprietary and shared network systems in Canada generally use the same ABM terminals but are differentiated by their software and services.

Although arrangements may differ, the corporate entity would typically maintain a notional deposit account with a CPA member, which would be backed by an overdraft facility and contactual payment guarantees. The client transfers its balances by drawing a payment draft on the corporate entity, payable through the notional deposit account held at the CPA member. Although legally distinct, a payable-through draft is functionally similar to a cheque and is cleared and settled in the same manner.[8] There are only a few types of payable-through arrangements offered in Canada and they are for limited purposes.[9]

Messaging Services

Messaging services transmit payment information in a format that complies with the accepted standards for the entry of that information into the clearing and settlement system. For most retail transfers, payment information is processed for entry into the ACSS or clearing services such as those provided by Interac, Visa and Mastercard, and are transmitted through standard telecommunications lines to link the computer networks of the payor's and the payee's deposit-taking institutions. However, wholesale payments, particularly interbank payments which require greater speed and security, use specialized messaging services. In some large-value payments systems, messaging services may be provided by dedicated communications and data processing systems operated by the clearinghouse. The CPA's ACSS, as well as the cheque delivery and tape exchange procedures between the payor and payee institutions that are governed by CPA rules, are examples of such proprietary messaging systems. In systems like IIPS, messaging is provided by a service provider such as SWIFT.

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8. With payable-through drafts, the corporate entity - not the CPA member - makes the 'pay/no pay' decision with regard to the sufficiency of client funds to honour the draft.
9. While payable-through arrangements in Canada are not generally used to transfer funds to third parties, this is not the case for payable-through accounts offered by some Canadian deposit-taking institutions to non-resident foreign banks. In these arrangements, non-resident banks open payable-through accounts to provide their own customers with more direct access to the Canadian payments system than available through traditional cross-border payments mechanisms. The customers of the non-resident bank use their Canadian dollar payable-through drafts to transfer funds to third-party receivers in Canada.

Clearing Services

Specific clearing services and arrangements for the processing of payments vary by the type of payments instrument and the institutional architecture. In general, however, clearing systems are designed: to match and verify the accuracy of payment information; to calculate the interbank payment obligations of members for submission to the settlement agent; and to transmit the settlement information to the settlement agent. As suggested by the evolution of the payments system in Canada, the function of a common processing arrangement is to standardize processing and accounting procedures in order to improve the efficiency of inter-institution transfers. In Canada, clearing services for both cheques and electronic payments items are performed partly by the individual direct clearers in the CPA and partly by the ACSS, which links the direct clearers to the settlement process at the Bank of Canada.

The clearing systems for retail and wholesale payments may be separate. Retail payments, which refer generally to small-to-medium-sized payments, are characterized by high-volume, low-value individual payments. The initial clearings of retail payments may be handled by a specialized clearinghouse, which accumulates and possibly nets the payments obligations among member banks, before submitting batch payments into a clearing and settlement system. An example of this procedure is Visa Canada, which nets merchants' payments submissions by card issuers on a multilateral basis and submits the net payment instructions to the ACSS through a direct clearer.[10] Interac also provides clearing services for retail payments through its on-line systems for the networks of shared ABMs and POS terminals. Alternatively, a single clearinghouse system may simply stream retail payments into a specialized batch processor and integrate the subsequent large-value payment into its final settlement request. Clearing procedures of the CPA, for example, had in the past processed large-value and small-value cheques differently to ensure speedier and more secure clearing and settlement of the former, although newer technologies have recently eliminated value-based processing distinctions.

Wholesale payments are composed of low-volume, high-value payments made by finan-

10. As an illustration of the scale and network economies in clearing services, as well as the electronic nature of clearing systems, note that the data processing centres for Visa Canada are located in California and Virginia. MasterCard's data processing centre is in St. Louis, Missouri.

cial institutions either on their own accounts or on behalf of large financial and non-financial corporations. The processing of these large-value payments to facilitate settlement is an important service provided by the clearing system. The clearing facility may provide netting services to members, which would lower their settlement balance requirements. IIPS, for example, calculates the bilateral net value of payments due to and due from each pair of member banks that have accumulated over the clearing cycle in preparation for entry into ACSS at the end of the cycle. In ACSS, payments are netted multilaterally over member institutions to reduce the settlement balance required at the Bank of Canada even more. Table 3 shows the netting arithmetic in a simple example to indicate the savings on net payment requirements associated with netting compared to gross value requirements, while Figure 2 illustrates the payment flows.

As in the case of all small-value non-cash payments, the final clearing and settlement of large-value payments is achieved presently through the CPA's ACSS. As noted, however, some preliminary clearing services for large-value payments arising particularly from financial transactions are also provided by some organizations before entry into ACSS for final settlement. In addition to IIPS, which nets interbank transactions, the Canadian dollar leg of foreign exchange transactions, and other large Canadian dollar payments for its members, the Canadian Depository for Securities Limited (CDS) and the Mutual Funds Clearing and Settlement Service (MFCS) Inc. are notable in this group.

CDS is a depository in which equity and debt securities are immobilized and transferred among holders through an electronic book-keeping system. It acts as the central processor for all transactions among members and provides its members with trade-by-trade settlement of securities transactions as well as continuous multilateral net settlement of stock exchange trades. Settlement for securities transactions is no later than three business days after the transaction date (T+3) and, as the central counterparty, all net payments on that date are due to or from CDS. In its Securities Settlement Service (SSS), which handles all equity and debt securities except those of the federal government, payments are made to CDS by each participant in the system. Failure to deliver a payment obligation on the due date could result either in a call on the participants' fund established under SSS or in an unwind of transactions. The Debt Clearing Service (DCS), which handles federal government bonds and treasury bills, incorporates a delivery-versus-payment

TABLE 3

The Arithmetic of Payments Netting

Gross Due					Total Due From		
By \ To	**A**	**B**	**C**		**Gross**	**Bi-Net**	**Multi-Net**
A	-	$90	$90		$180	$70	$60
B	$20	-	-		$20	-	-
C	$100	$40	-		$140	$50	$50
Total Due To							
Gross	$120	$130	$90		$340		
Bi-Net	$10	$110	-			$120	
Multi-net	-	$110	-				$110

1. *Gross* equals the sum of rows and columns.

2. *Bi-Net* equals the net of the entries for each pair of banks in the *Gross Due* matrix: [e.g. (A to B) - (B to A) = $90 - $20 = $70].

3. *Multi-Net* equals the net of the *Bi-Net* entry for each bank in the *Total Due To* and *Total Due From* matrices: [e.g. (To A) - (By A) = $10 - $70 = $-60].

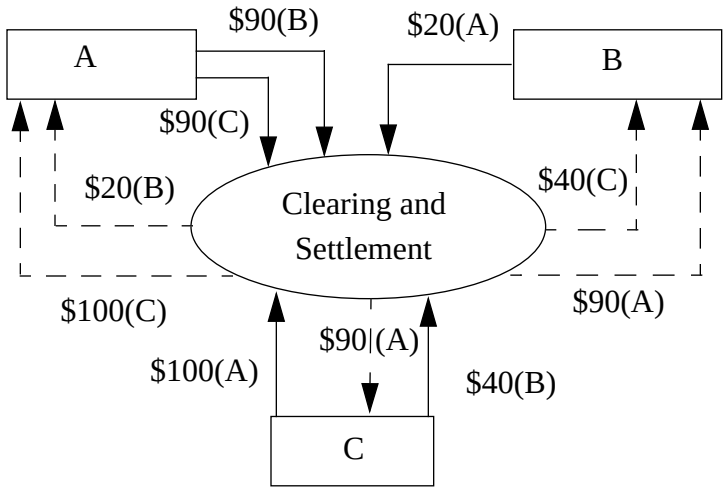
Figure 2

Gross vs. Net Settlement Systems

I. Gross Settlement

Due To: ——

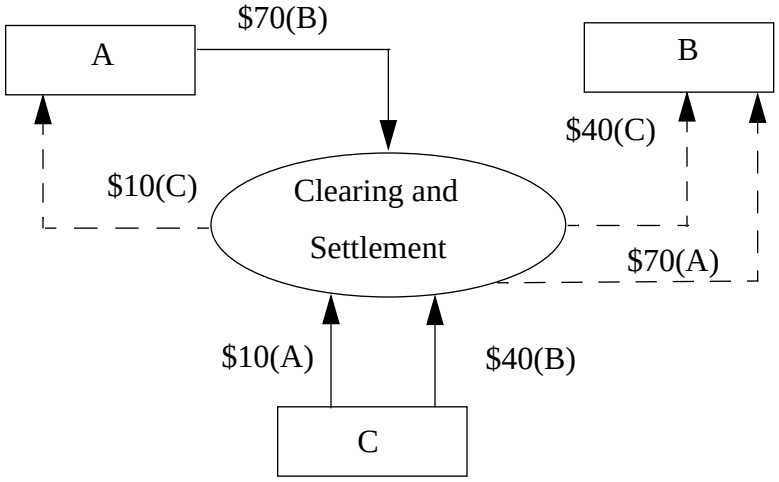
Due From: – –



Transfers: 10

Value: $340

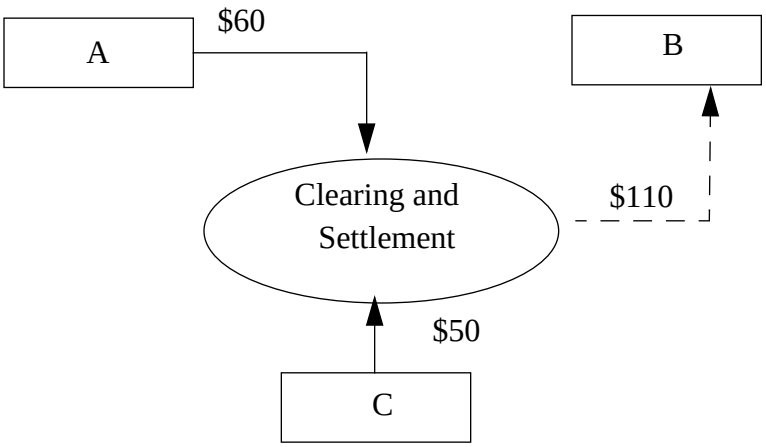
II. Bilateral Net Settlement



Transfers: 6

Value: $120

III. Multilateral Net Settlement



Transfers: 3

Value: $110

mechanism that handles securities transfers on a transaction-by-transaction basis while continuously netting the payment obligations. Settlement of the net payment obligations is made at the end of the day through a small number of financial institutions participating in the system. These institutions, described as 'extenders of credit', provide credit to the other members, as well as collateralized guarantees for the end-of-day payments.[11] The amount that each extender can owe to the system, on its own account and on behalf of other members for which it provides credit, is capped.

Payments to CDS from a participant are made by a certified cheque or a bank draft drawn on an acceptable institution; payments from CDS are also by cheque. All payments due to CDS for a particular settlement service are collected before cheques for payment by CDS to members of that service are released. Cheques for payment to CDS are entered into ACSS by the direct clearer that serves as banker for CDS. In the case of the Debt Clearing Service, all payments due to CDS are collateralized until final settlement of the payment on the accounts of the Bank of Canada around noon the next day. The cheque payments from CDS to members enter the ACSS through the members' direct clearers.

MFCS is owned by CDS, FundServ Inc., and the Investment Dealers Association of Canada and provides clearing and settlement services for mutual fund transactions through FundServ.[12] MFCS matches orders from dealers with fund companies' contracts, nets transactions for members in each fund's shares, and multilaterally nets payments positions for members. Mutual fund transactions are generally settled by T+3, except for transactions in money market funds which are settled by T+1. While MFCS acts as a central counterparty for these transactions, it delegates the processing of its payment settlements to CDS Inc., a subsidiary of CDS. CDS Inc. converts the settlement file prepared by MFCS into an EDI message format instructing members' deposit-taking institutions to make payments to MFCS. Like CDS, MFCS ensures that all payments due from members are received before delivering the payments due to other members.

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11. There are a very limited number of institutions that are allowed to discharge their payment obligations to CDS without using the services of an extender of credit.
12. FundServ is a communications and information organization of mutual fund companies and mutual fund brokers and dealers, which is owned jointly by ten large mutual fund companies and a telecommunications firm.

As suggested in the above examples, multiple clearing systems for different or even for the same types of payments instruments can co-exist for retail and for wholesale payments. For example, with regard to retail payments, ACSS provides clearing services for both small-value cheques and for direct debit and credit transfers while IIPS and ACSS both effectively provide clearing services for wholesale payments in Canada. Different domestic clearing systems typically feature overlapping memberships and may be linked through common membership in international clearing facilities, such as those provided by Visa International, or in foreign clearing and settlement systems through correspondent banking networks.

Settlement Services

The settlement services provided by the Bank of Canada are fundamental to the process. These services include: the verification of available funds in the direct clearers' settlement accounts; the transfer of settlement value from the payor institution's settlement account to the payee institution's settlement account; and the notification of participating direct clearers of completed settlement. All direct clearers in the CPA are required to hold settlement accounts at the Bank of Canada and all clearing systems ultimately funnel into the settlement system to complete the payments process with the transfer of settlement balances. For example, IIPS links into the CPA's ACSS system, which settles through the Bank of Canada.

The payment is completed only if sufficient settlement balances are available. For a deferred net settlement system, such as the ACSS, where settlement occurs at the end of the clearing cycle, the problem of insufficient balances in the settlement account of a solvent direct clearer is usually resolved through collateralized overdrafts from the Bank of Canada. For an insolvent institution with insufficient settlement balances, obligations arising from specific types of payments such as cheques and pre-authorized debits will, if possible, be reversed and the original payments obligation unwound.[13]

13. The process involves partial unwinds in which the obligations of the defaulting institution are withdrawn from the netting scheme and new payments positions are calculated for the other institutions. In the event that this results in a situation where other direct clearers are unable to meet their newly calculated payments obligations, the obligations of those banks must also be unwound and a broader recalculation of payments positions will be required.

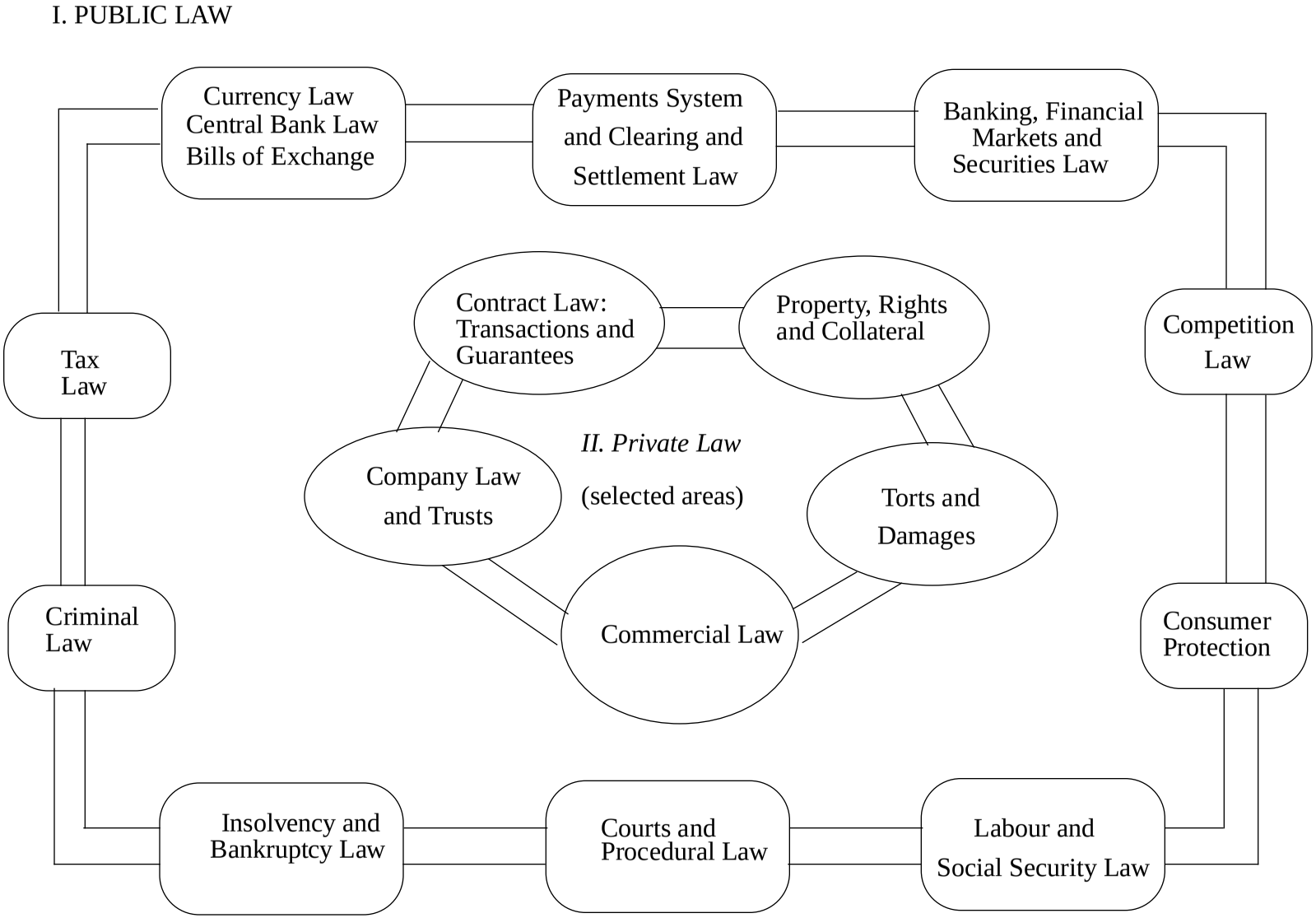
3.3 Legal Frameworks

The payments process is constructed on a foundation of rules, standards and procedures that form the legal basis necessary to ensure uniformity, continuity and legal validity. The general legal framework, which is illustrated in Figure 3, involves 'public' laws as well as 'private' laws. Public laws are rules that have compulsory application by statute and are designed to promote the public interest. They include the Canadian Payments Association Act and the Payment Clearing and Settlement Act, the Bank of Canada Act, the Bank Act, the Currency Act, provincial securities laws, federal insolvency laws, and federal and provincial consumer protection and competition laws. Private laws are those rules that establish the legal framework of voluntary arrangements and are created to define and promote individual responsibilities and rights. These laws include, for example, property law, commercial law, and contract law. They relate, among other things, to the autonomy of contracting parties, the liability for contractual commitments, and good faith in mutual relations. For example, the deposit agreements and payments service contracts between individuals and their deposit-taking institutions, as well as the membership criteria, by-laws, procedural rules and operating standards of Interac, Visa and SWIFT, are legally validated through private law. However, the by-laws and procedural rules of the CPA, which is a statutory body, are defined under both public and private laws.

A non-cash payment sets up a 'chain' of claims and obligations. The links in the chain are typically a sequence of bilateral contracts between 'near' or adjacent counterparties in the transfer process. In fact, a non-cash payment typically involves two sets of contracts: the contract for payment between the ultimate buyer and seller in a transaction; and, the chain of contracts between parties and their deposit-taking institutions and between these institutions and other financial institutions in the payment chain. Failure of one link in the chain to perform its contractual duties in the payment process will typically leave the payor still liable for the payment; however, depending on the contractual arrangement, it may also allow the payor an offsetting claim against the defaulting institution in the payment system. A key consideration is 'finality' of payment - the point at which a payment transfer becomes irrevocable and unconditional so that the various participants in the payment chain are deemed to have discharged their obligations. Payment finality for any non-cash payment instruments is not a feature in the legal framework of the current payments system in Canada. However, settlement finality - where a transfer of settlement

Figure 3

Legal Framework for Payments Systems



Source: Bank for International Settlements and Bank of Canada

balances from the account of the payor's institution to that of the payee's is irrevocable, or is certain to occur because of a guarantee of transfer, even in the event of default by the payor's institution - is a feature of the CPA's Large-Value Transfer System that will begin operations in the second half of 1997.

Finally, as indicated by the evolution of the Canadian payments system, legal reforms and policy changes have direct effects on the architecture of a payments system. However, they also have indirect effects through their influence on commercial incentives related to alternative payments processes. The phase-in of a zero reserve system on deposits of chartered banks at the Bank of Canada, beginning in 1992 and completed in 1994, encouraged banks to minimize their holdings of settlement balances at the Bank of Canada and provided a strong incentive for the CPA members, when designing a multilateral netting scheme for large-value transfers, to choose one that would economize on settlement balances. Rapid changes in information technologies are blurring distinctions in Canada among financial institutions and other service providers, and imposing stress on the legal framework. These developments are particularly notable in retail payments.

3.4 Payments System Risks

The description of the basic elements in (non-cash) payments processes - the instruments, the institutions and services, and the legal framework - indicate the complexity of the payments system in Canada. In such complex systems, there is scope and prospect for breakdowns that leave the participants in the payments system exposed to economic losses. A crucial element in a payments system is, therefore, payments system risks.

Sources of Risk

At its most fundamental level, risk arises because of imperfect information about future events, and private costs in obtaining and processing existing information that may provide insights about likely outcomes. As a result, no agent is perfectly informed and not all agents are necessarily equally informed. Financial losses by at least one party are incurred when unforeseen events with adverse consequences arise. In a more immediate sense, the risks in the payments system arise from institutional interdependency in the payments process that creates different

risks among parties in the payment chain and from timing delays between the transaction and the final settlement of the associated payment. As a result, relative to the transaction point, the final settlement of a payment is a future and not a present event.

Two of the basic financial risks in the payments process are *liquidity risk and credit risk*. Liquidity risk arises from the possibility that the sending party (the payor or the payor's financial institution) may fail to meet its payment obligation on the due date because of an unforeseen shortfall in available funds. Following some future transaction that provides sufficient funds, the failing party is expected to discharge the outstanding obligation. Liquidity risk involves a loss to the receiving party (the payee or its institution), which must now seek alternative and typically costly sources of funds to meet its payment obligations due on that date, or must incur a loss of interest income and capital gain on planned investments that were to be financed with the proceeds of the anticipated payment. Credit risk also arises with the prospect that the payor may fail to meet a payment on the due date. However, with credit risk, the failure to meet a payment on a due date is typically related to insolvency by the payor (or some payment intermediary) and the likelihood of full payment in the future is virtually nil. In this event the receiver loses all or part of the principal amount of the payment.

Liquidity and credit risk may create *systemic risk*. Systemic risk refers to the possibility that the failure of one participant to meet its payment obligations in a timely fashion will cause other participants (including clearinghouses) to fail to meet their payments obligations when due. These domino or knock-on effects can produce liquidity problems and, possibly, even solvency problems for other institutions in the payments system. When one institution defaults on its payment obligations to other financial institutions, the latter may become squeezed on liquidity and be forced, themselves, to default on their payment obligations, which could mushroom into problems for the clearing and settlement system in general. If institutions become insolvent, others in the system with which they deal may be faced with liquidity problems or may even be forced into bankruptcy. Indeed, even the threat of a failure at one institution, with the possibility of knock-on effects, may be sufficient to disturb the functioning of the payments system.

Operational risk relates to the integrity of the payments system with respect to the processing of payments. It refers to the prospect that human error, equipment malfunctions, natu-

ral disasters, or system design flaws can result in payment errors or incompletion that would impose financial costs on some participants. Closely related are *security risks* such as the risk of fraud, which can leave a party subject to financial loss, or the risk to privacy when a third party illegally gains access to confidential payment information that can be used to exploit the financial position of another party.

Legal risk generally refers to the uncertainties or gaps in the legal framework for payments systems that can impose liquidity or credit risks on participants. Gaps and a lack of clarity in public laws and private arrangements can lead to uncertainty about, and misinterpretations of, the legal enforceability of parties' rights and obligations, especially with regard to finality. Consequently, a payments transfer may be accompanied by inappropriate documentation of contractual arrangement between counterparties, which may distort commercial incentives. Unforeseen liability in the event of a payments incompletion is the consequence.

Risk Control and Risk Allocation Mechanisms

Because of the one-day lag between clearing and settlement of domestic payments in Canada, the value of the risk exposure can be significant, especially for large-value payments. Retroactive settlement of these payments - the backdating of settlement by one day to match the clearing date - eliminates settlement float, but does not eliminate liquidity, credit and systemic risks. For cross-border payments, such as those associated with foreign exchange transactions, the risk exposure may be several days in duration and, with the accumulated value of the transactions in process, the level can be larger than for domestic payments. Typically, the strictest risk controls in a payments system are imposed where the systemic threat becomes the greatest, namely the clearing and settlement of large-value transfers.

Risk control mechanisms are closely related to the architecture of the payments system. For example, Visa, Mastercard and Interac systems impose value limits on credit cards and ABM cards. In ACSS and related debit-pull systems, risk controls include: physical verification of the cheque-writer's signature at the payor bank (to authorize the payment transfer); personal and corporate identification numbers for direct credit transfers; and, ultimately, 'reversal' of unacceptable payment items. The cost of unwinding (or reversing) some payments in terms of both processing

costs and risk exposures can be substantial in net settlement systems.

A number of studies, particularly those prepared by the Bank for International Settlements, have considered the appropriate architecture for wholesale payments systems and their risk control mechanisms. These reports propose a transparent process with a strong legal foundation that clearly defines finality, as well as the legal obligations and rights of parties at each stage in the payments process. They suggest that payment lags should be shortened as much as possible; and, for cross-border payments, that there be an overlap in operating hours on a real-time basis that would facilitate virtually simultaneous settlement of both legs of a payment. Also, payments for securities and foreign exchange transactions should involve delivery-versus-payment and payment-versus-payment, respectively, to protect the originating parties from failures to deliver financial assets or payments. Systems should have clear and transparent rules for access that ensure the financial viability of participants, and netting systems should have well-defined risk control and risk allocation rules compatible with private incentives to manage risk. Moreover since netting schemes involve deferred settlement, some mechanism to ensure completion of the payment is required. Finally, appropriate back-up facilities and computer systems must be designed to parallel and, if necessary, replace the primary system to guard against operating failures. Although prepared in the context of cross-border payments and large-value net settlement schemes, the standards and recommendations produced by these reports are of more general applicability.

Indeed, risk control measures are also appropriate for small-value transfers. With the exception of systemic risk, the same risks generally arise for small-value as for large-value payments. Systemic risks in small-value payments systems are much less significant than in large-value payments systems because of the low settlement value for aggregate retail payments. The risks in small-value payment systems are typically controlled privately by quantity limits (such as ceilings on credit cards and overdraft facilities on deposits), pricing mechanisms (such as overdraft charges and NSF charges on cheques - charges imposed on the payor and payee for returned cheques), and access restrictions based on the creditworthiness of participating individuals and institutions.

4. Payments Processes and Associated Risks in the Canadian System

Some simple examples of payments using different instruments illustrate the interaction of the basic elements in the Canadian payment system. In discussing the risks associated with these payments, the incidence of these risks on participants will vary in accordance with CPA rules, conventions and legal interpretations within the existing Canadian system.

Cash Payments

Figure 4 illustrates a simple cash transaction. The payor obtains cash through a debit on the deposit at its bank, makes the payment, and the payee deposits the cash to obtain a credit on its deposit at its bank. The most notable features of a cash payment are that settlement is immediate upon transfer of the cash instrument and that none of the parties are subject to financial risks. There are, however, security risks involved.

Cheque Payments

Figure 5 illustrates a domestic cheque payment where the banks involved are direct clearers in the CPA's ACSS facility. This process is clearly more complex than a cash payment. Most notably, net settlement is deferred until the end of the clearing and settlement cycle; the payee receives only provisional credit for the cheque deposit; and intraday credit is implicitly provided without limit by direct clearing members in a net credit position on their net settlement balances to those members in a net debit position. Also, messaging services are provided through the cheque transfer process and electronically through the ACSS.

A detailed description of the process is helpful, especially for the timing. Suppose the payor (an individual or corporation) purchases some commodity from a merchant or producer (the payee) on the morning of day T and uses a cheque as payment. The payee deposits the cheque in its account at the local branch of its deposit-taking institution early on the afternoon of that day and obtains a provisional credit in its account for the value of the cheque. The branch records the deposit and cheque information, bundles the cheque with others and forwards them, by 6:30 pm, to the institution's regional data centre.[14] The cheques received at the centre are sorted and bun-

Figure 4

Cash Payment

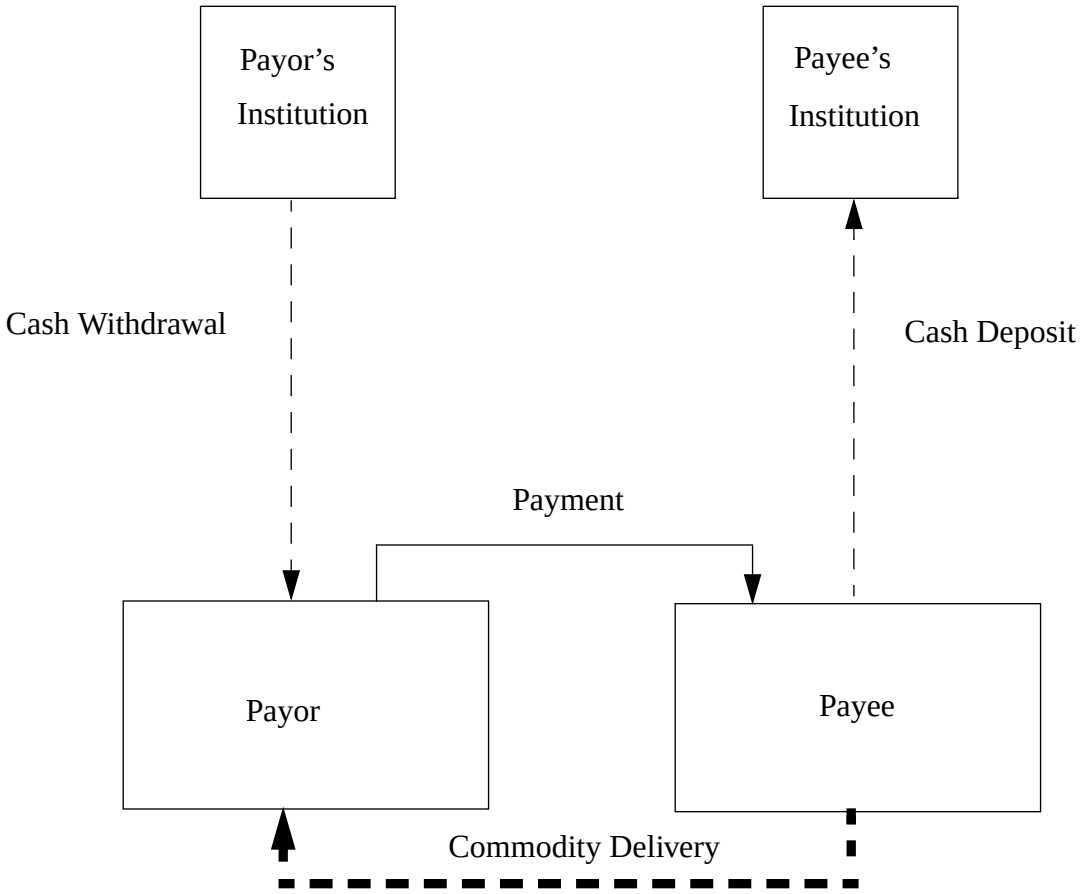
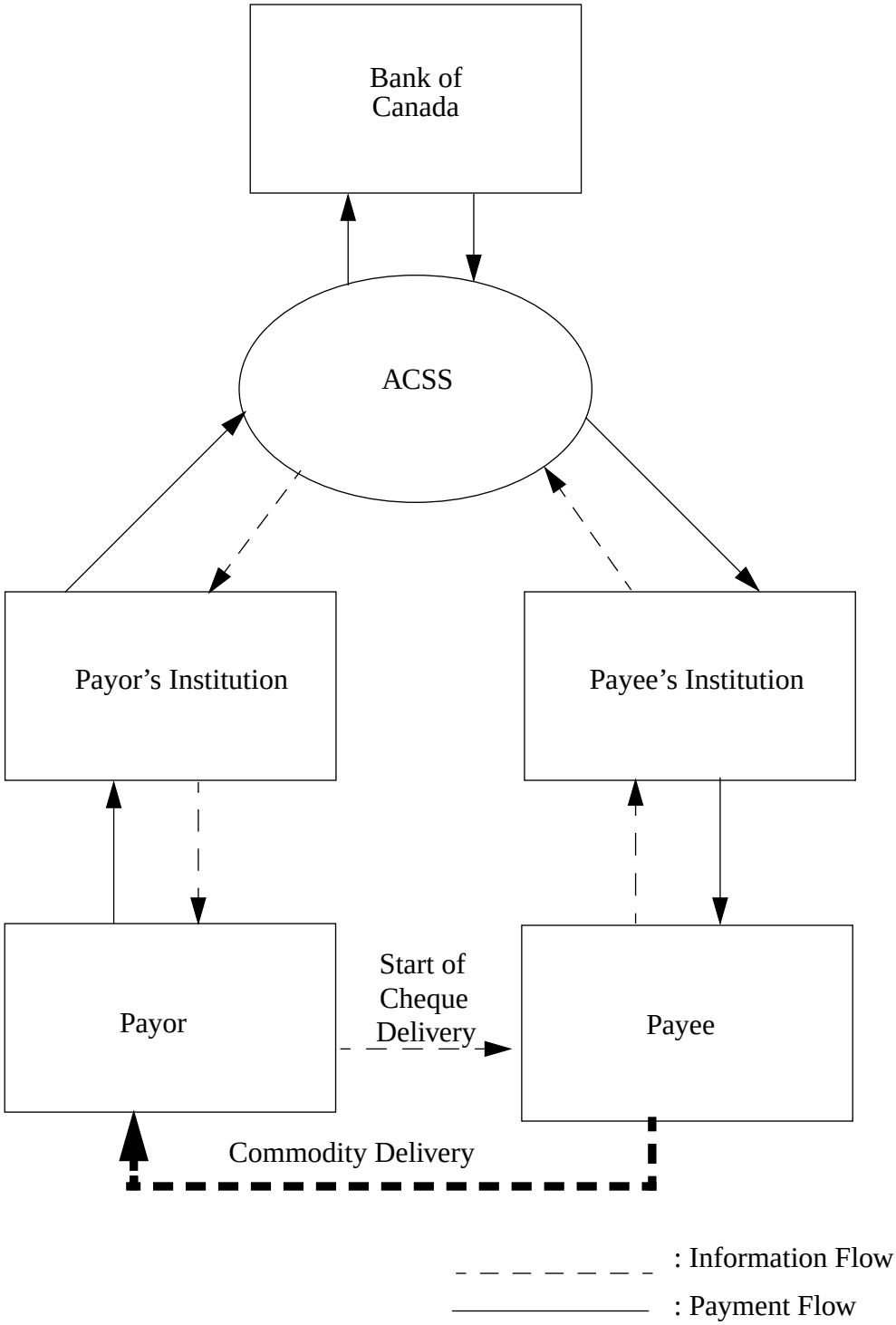


Figure 5

Cheque Payment



dled into ‘on-us’ and ‘on-other’ items. The ‘on-us’ items refer to cheques drawn on branches of its own institution or branches of indirect clearers for which it provides clearing services. The ‘on-other’ items are sorted into bundles for ACSS data entry and subsequent delivery to the data centres of each of the other direct clearers on which they are drawn. These local transfers are typically completed by midnight of day T.

At the same time, the payee institution’s data centre has stripped the payment information from the MICR encoded cheque and entered the on-other items, in batched value, ‘on-line’ into the ACSS computer network. The on-us debit and credit items are posted directly into the accounts of payors and payees at their institutions and the payment information for the accounts of indirect clearers is forwarded to them for their postings.[15] As the on-other items are obtained by the payor’s institution from the local data centres of a payee’s direct clearer, the debit is posted to the payor’s account. The payor’s direct clearer also sorts the on-other items obtained from the local data centres of the other direct clearers into bundles for delivery to the other regional data centres of its institution on T+1, where they are fine sorted by branch in the region and delivered by the morning of T+2 for final verification and payment authorization. Any items entered into ACSS for inter-institution collection before midnight on day T by the receiving (payee’s) institution will enter the settlement process unless contested by the sending (payor’s) institution. The settlement process begins on the morning of day T+1, following the Bank of Canada’s entry into ACSS of payments related to the Government of Canada’s accounts or its own account at 8:15 am. Final corrections and processing of the multilateral net settlement obligations are completed that morning and the Bank of Canada posts the net transfers to each direct clearer’s settlement account by around noon, backdated for value to day T.

While settlement on the accounts at the Bank of Canada is generally perceived to be final

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14. The branches of indirect clearing members would forward their cheques to the regional data centre of their direct clearer.

15. With cheque truncation, the receiving institution’s data centre would not be required to forward the paper cheques to the sending institution’s data centre, after electronic entry of the information into ACSS. It would, however, be required to electronically transmit an image of the cheque to the sending institution’s data centre for verification of the payment order and for storage. However, because of legal limitations imposed by the Bills of Exchange Act and the Canada Evidence Act, cheque truncation for inter-institution clearings, which is technologically feasible, is not possible in the Canadian payments system.

payment, there are circumstances under which these payments may be reversed. An obvious reason for reversal is that the payor has insufficient funds in its deposit account to make the payment. Other common reasons for reversal are 'stop-payment' instructions by payors, fraudulent cheques, post-dated or stale-dated cheques, and cheque processing errors. Reversal of payment (unwinding) is the primary risk control procedure in this system for large-value as well as small-value cheques. For example, reversals because of insufficient funds are required under CPA rules to begin in the clearing cycle on the day following receipt of the cheque by the payor's institution. The original debits and credits to the direct clearers' settlement accounts at the Bank of Canada are simply reversed by the Bank in the next day's settlements. The actual returned cheques are placed in a specially designed and encoded "returned item envelope" at the data centre of the payor's direct clearer and routed back to the payee's institution through the regular exchange of clearing items for that day.

Should a disruption occur in this process, the loss allocation depends largely on which participant defaults in the payment chain and when that default occurs relative to crediting the payee institution's settlement account at the Bank of Canada.[16] For example, suppose the payor has insufficient funds in its account to cover the payment obligation. As indicated by the description of the cheque clearing process, the payor's deposit-taking institution may know this circumstance by T+1. If the institution decides not to provide overdraft credit to the payor, it will return the cheque. The value of returns is reflected in the net settlement value for that day's clearing cycle. The payor continues to have a liability for the payment and the payee generally bears the risk since its deposit-taking institution will reverse the credit to its account. The payee's institution is also at some risk in this event since the payee could have withdrawn the funds after initial settlement and before the reversal.

Alternatively, suppose that the payor's institution fails and is declared in default by the CPA on information received from the Bank of Canada with respect to its ability to meet its settlement obligations. Even if the cheque payment had been confirmed and debited from the payor's account but the payor's institution subsequently defaults within the clearing and settlement cycle,

16. The assumptions in these scenarios are that a default by a deposit-taking institution has no systemic implications for the payments system and that the surviving participant on which the legal liability for completion of the payment falls will not renege or otherwise default on that obligation.

the cheque is returned to the payee as a ‘dishonoured item’ and the debit to the payor’s account is reversed. The payor is subject to the usual risk of a depositor in a failed institution but is still required to make the payment.[17] Even though the payor bears the payment liability, the payee is ultimately subject to liquidity and credit risk until the payment is completed.

The payee’s institution may also be at risk if the payor’s institution fails when the latter has delivered the cancelled cheques to its corporate clients on the morning of T+1, before it is declared in default. Since the defaulting direct clearer no longer has the payment item in its possession, it cannot be returned and the debit to the payor’s account cannot be reversed. The payee’s institution will have to honour its credit to its client’s account and will become an unsecured creditor of the failed institution.

If the payee’s institution fails within the clearing cycle but before settlement, the payment will be completed and, as usual, the risk is borne by the payee.

In the event of a default by a direct clearer, an associated indirect clearer is at risk for the amount in its account after reversals. The defaulting direct clearer is required, under the CPA’s clearing by-law, to reverse credits to the settlement account that the indirect clearer holds with it and return the items received from the indirect clearer. However, any funds due to the direct clearer to cover debits to the indirect clearer’s settlement account are paid by the indirect clearer. If the indirect clearer defaults, the direct clearer will credit all clearing gains to the indirect clearer’s settlement account. However, if the indirect clearer is in a net debit position and has insufficient funds in its clearing account to meet its settlement obligation, the direct clearer reverses the debit and returns to the other direct clearers all the payment items still in its possession drawn on, or payable by, the defaulting indirect clearer.[18] The payor with an account at the indirect clearer is, as usual, liable for the payment and at risk of deposit loss.

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17. At least part of this risk may be absorbed by a deposit insurer such as the Canada Deposit Insurance Corporation.
18. In the event of default by an indirect clearer or its direct clearer, electronic payments due to or from indirect clearers are generally treated in the same manner as cheques. Also, the direct clearer bears the risk for items delivered before settlement to an indirect clearer that is subsequently declared in default.

Cheque Payments in U.S. Dollars

Cheques drawn on individual's U.S. dollar deposit accounts at the six largest Canadian deposit-taking institutions for settlement in U.S. funds are cleared in Canada through the CPA's U.S. Bulk Exchange System (USBES), which nets the payment obligations bilaterally among the members. The payor's and payee's institutions instruct their correspondent banks in New York, through SWIFT, to begin settlement of the net payment position. The payment is cleared through the Clearinghouse Interbank Payment System (CHIPS), which would net the payment against others for final settlement of the net value through Fedwire at the end of the clearing cycle. Because the process involves the use of correspondent banking networks, the clearing and settlement cycle is longer than that for domestic cheques. An illustration of this cross-border payment is provided in Appendix along with some brief comments on the use of other instruments for cross-border payments.

Direct Debit Transfers

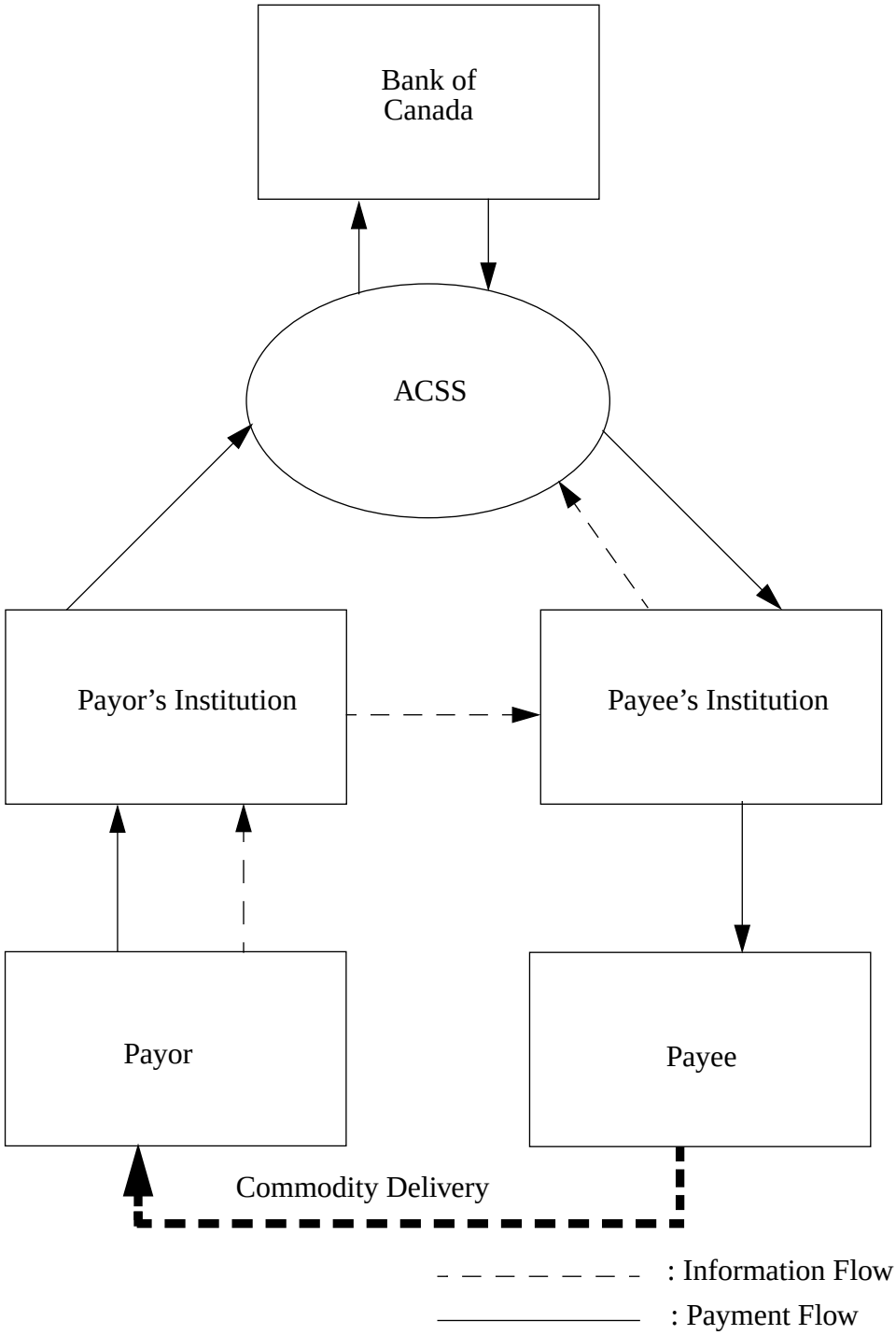
The payment process for direct debit transfers such as pre-authorized bill payments is somewhat different than that for cheques with respect to the information flow. Pre-authorized debits, recorded individually on magnetic tape, are entered into the system by the payee's institution on the morning of day T. The originating tapes were delivered by the payee to its institution at an authorized 'automated funds transfer' point according to a predetermined lead-time for settlement. The maximum lead-time for direct debit transfers is two days. The tapes are delivered to the processing centre of the payee's direct clearer at a regional settlement point and are exchanged bilaterally among direct clearers in order for the payor's bank to confirm the payment item and verify that the payor has sufficient funds in its account to cover the payment. From this point on, the process is similar to that for a cheque payment, with the payee's direct clearer entering the payments on-line as debit items into the ACSS for settlement. Figure 5 illustrates the payment flow. Except for legal risks (including differences for the timing of returns under CPA rules), the liability and risk allocation for these direct debit transfers is similar to that for cheques.

Direct Credit Transfers

Direct credit transfers such as direct payroll deposit enter the payment system on magnetic

Figure 6

Direct Credit Transfer



tapes at the regional data centre of the payor's direct clearing institutions on the morning of day T. The originating tapes were delivered by the payor on a specified lead-time schedule for processing with the maximum lead-time set at four days and pre-release set at no more than one day before the scheduled entry to the clearings. As a result, there is virtually no risk that the payment will be submitted to the ACSS when the payor has insufficient funds in its account. However, since ACSS is a debit-pull system, the payee's institution enters the payment items into ACSS as on-line electronic debit vouchers against the payor's institution for settlement. Figure 6 illustrates the payment process.

Although there is virtually no risk of insufficient funds, there is still the risk that the payor's deposit-taking institution may fail before settlement or that the payee's institution may fail within the clearing and settlement cycle. If the payor's institution fails before settlement, the debit to the payor's account is reversed and the payor is still liable for the payment and subject to the usual risk of a depositor in a failed institution. If the payee's institution fails, the payment is completed, although the payee now bears the usual risk of a depositor in a failed institution.

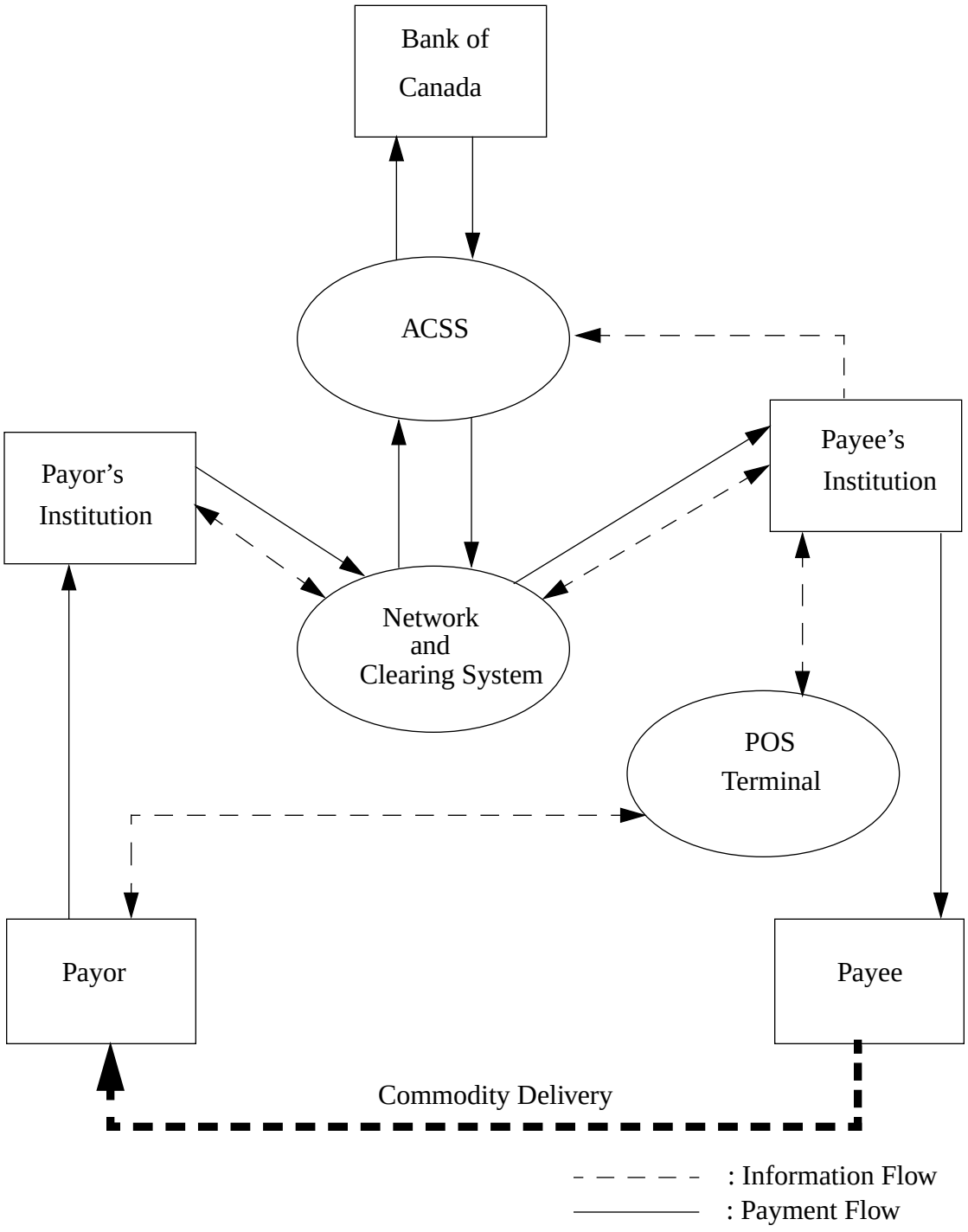
Credit Card Payments

The payment process for credit card transactions has two stages: an authorization stage and a clearing and settlement stage. The authorization stage is typically an on-line process where the merchant (payee) initiates the authorization process for a purchase electronically through the point-of-sale device provided by its deposit-taking institution (the acquiring institution).[19] The merchant's identity is verified by its institution and the authorization request is routed into a centralized international authorization facility where the validity of the card is confirmed. The central system, upon card validation, routes the request into the card issuer's electronic bookkeeping system for approval of the authorization. At this point, the deposit-taking institution issuing the card ensures that the cardholder (payor) has sufficient credit under its limit to meet the payment obligation. Upon approval, the payment is debited to the open-to-buy balance on the cardholder's

19. There are still some paper-based transactions where the merchant obtains authorization through a telephone call to a central processing facility. The paper vouchers acquired by the merchant are batched and deposited at its deposit-taking institution, which scans these vouchers at its data centre in an optical reader to create an electronic entry into the clearing and settlement system.

Figure 7

Credit Card Payment



credit account at its institution.[20] The merchant's deposit account is credited on a daily schedule defined in the agreement with its institution.[21] The authorization process typically takes under two seconds.

The payee's (acquirer's) institution electronically submits the credit card payment records in the late afternoon of day T to the clearing centres for Visa and MasterCard for matching, confirmation and netting. The member institutions are informed by the clearing centre, which is effectively the central counterparty for the credit card transactions, of their net settlement debit or credit positions. These positions are entered into ACSS by the end of day T, through magnetic tape as electronic pre-authorized debits, by the direct clearers for Visa and MasterCard. Figure 7 illustrates this process. Payments which are not confirmed by the payor's institution because of error are returned to the payee's institution for correction and 'representment' (resubmission for settlement). If the error was due to lax compliance with procedures by the merchant, its institution may reverse the credit to its account; otherwise the credit to the merchant's account is sustained. Similarly, if debits to the cardholder's account were due to fraudulent payments from a stolen or lost card, debits can be reversed if the cardholder follows appropriate reporting procedures, and payments liabilities are absorbed by the members. If the payment is still in dispute after representment, the credit card organization arbitrates the dispute between the payor's institution and the payee's institution.

Even if the payor's institution fails after it has debited the open-to-buy balance on the payor's credit account at the time of the transaction but before settlement, the payment has been guaranteed to the merchant or its deposit-taking institution. The risk falls, therefore, onto the

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20. A credit card account has two balances - a liability balance, which is the credit balance due to the card issuer from the cardholder, and an open-to-buy balance, which is the difference between the credit limit on the account and the liability balance. The open-to-buy balance is immediately debited when a credit card payment is authorized to ensure that the credit limit on the account is not breached. However, the liability balance is debited only when the payment to the merchant is settled, the point at which credit for the payment amount is extended by the card issuer to the account holder.
21. Although credit card organizations generally impose a time limit of a few days - 3 days for Visa Canada, for example - for the submission by merchants of their credit card receipts for clearing and settlement, most merchants that are on-line submit their receipts daily for clearing and settlement within the one-day cycle. However, payments to merchants that are off-line and in remote areas may not settle until 4 or 5 days following the transaction.

members of the credit card organization, although the payor is still liable for the payment to the surviving members of the credit card organization. To cover the risk, members of Visa, for example, contribute to a contingency fund on a market share basis so that any loss is allocated according to their share of credit card sales. If the payee's institution fails before settlement, the payment is completed. In this case, as in the case when the payee's deposit-taking institution fails after settlement, the payee bears the usual risk of a depositor in a failed bank. Finally, if the credit card organization's settlement bank fails before settlement, debits and credits to the organization's clearing account at the failed bank are reversed and the members of the organization bear the risk.

Debit Card Payments

Figure 8 illustrates debit card payments through an EFTPOS terminal.[22] Typically, the access reading and messaging system at the point of sale is the property of the payee's (acquiring) institution and the payor initiates payment through this facility by swiping its card through the reader of a terminal and entering a personal identification number. The terminal transmits the payment information to the payee's institution, which verifies the merchant's identity and routes the payment information to the payor's bank through the Interac network. The payor's bank verifies the payor's identity and establishes the availability of funds in the account selected by the payor at the point of sale. If funds are available, the payment is authorized and the payor's account is immediately debited. The authorization is routed back through the network and the initial transfer of the retail payment is completed. As with a credit card transaction, the entire process takes just a couple of seconds. The credit for the payment is posted to the merchant's account, upon reconciliation of the payment information, on a schedule stipulated in the merchant's agreement with its deposit-taking institution. Both the payor's and payee's institutions maintain an electronic log for each of these transactions. The payment information is entered on-line into the ACSS by the payee's direct clearer as a batch entry, usually after 9:30 pm on transaction day, although the CPA's deadline is 5:00 am on T+1.

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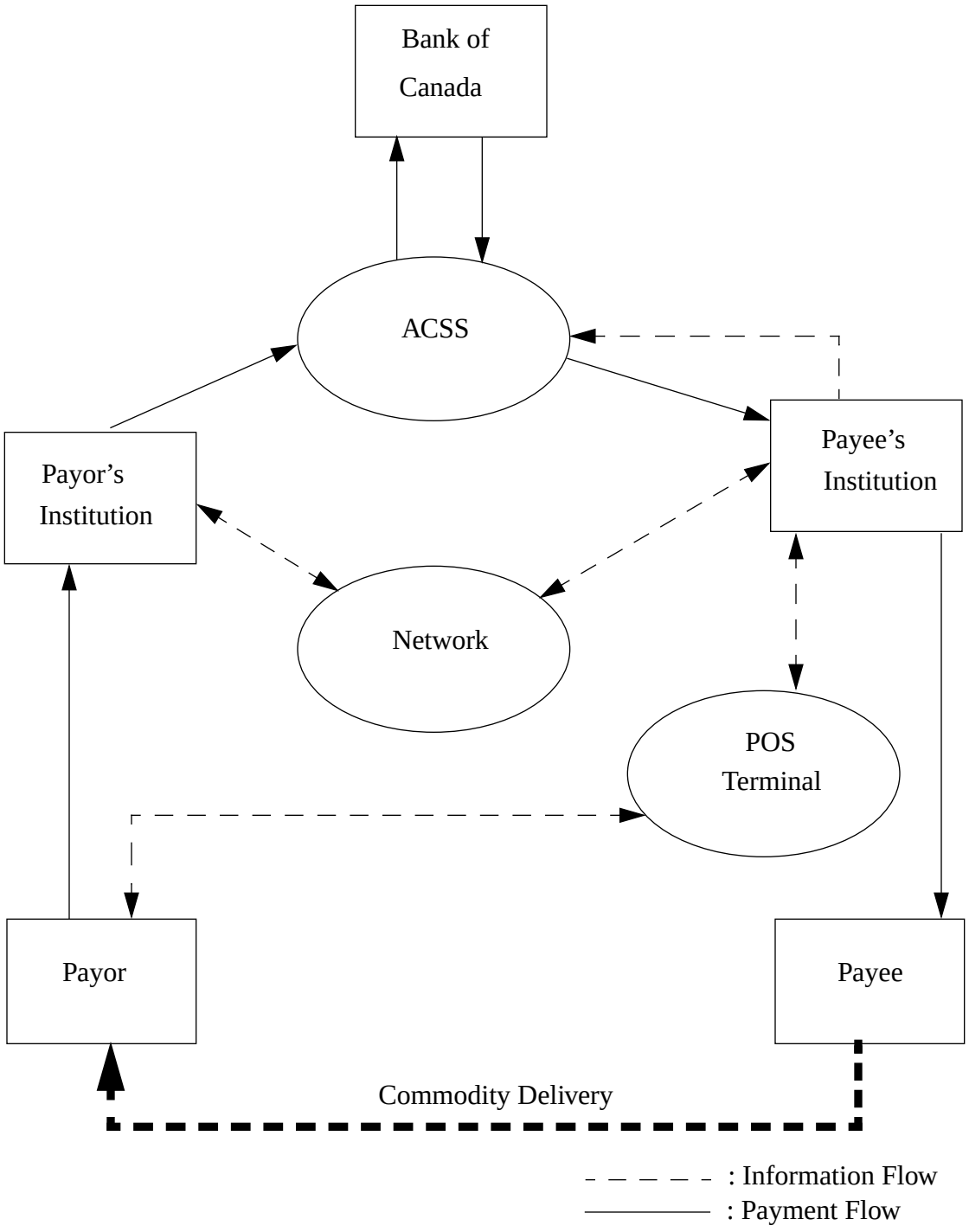
22. The process for a cash withdrawal from a shared ABM is very similar to this process. The main difference is that the merchant in an EFTPOS transaction is replaced by the deposit-taking institution in the ABM network that owns the machine.

Figure 8

Debit Card Payment



With regard to loss allocation, the existing CPA rules indicate that a payment, once authorized, is irrevocable by the payor and its deposit-taking institution. Therefore, if the payor's deposit-taking institution defaults before settlement, the debit to the payor's account cannot be reversed. Although the payee's deposit-taking institution may have already credited the payment to the payee's account, depending on the merchant agreement, it may be able to reverse the credit if the payment is not settled. Consequently, the loss in this case may be borne either by the payee's institution or by the payee.[23] If the payee's deposit-taking institution fails after the payment has been debited to the payor's account, the payor's institution will complete the settlement transfer. The payee is, of course, still at risk as a depositor in a failed institution.

Because of the broader membership structure established in November 1996, Interac introduced new regulations that require a member institution, which is not also a CPA member, to arrange a special account with its settlement agent (a CPA direct clearer). The special account holds the balances owing to merchants that access Interac networks through the non-CPA Interac member (an acquirer) that are received as payment for authorized debit card payments. On behalf of the merchants, Interac holds a security interest in this special account, which makes it a preferred creditor, so that the risk of loss to them is lower than otherwise in the event of a default by the non-CPA member. In the event of a default by the CPA member acting as settlement agent for the non-CPA acquirer member of Interac, settlement would be completed but the Interac member would bear the usual risk of a depositor in a failed institution.

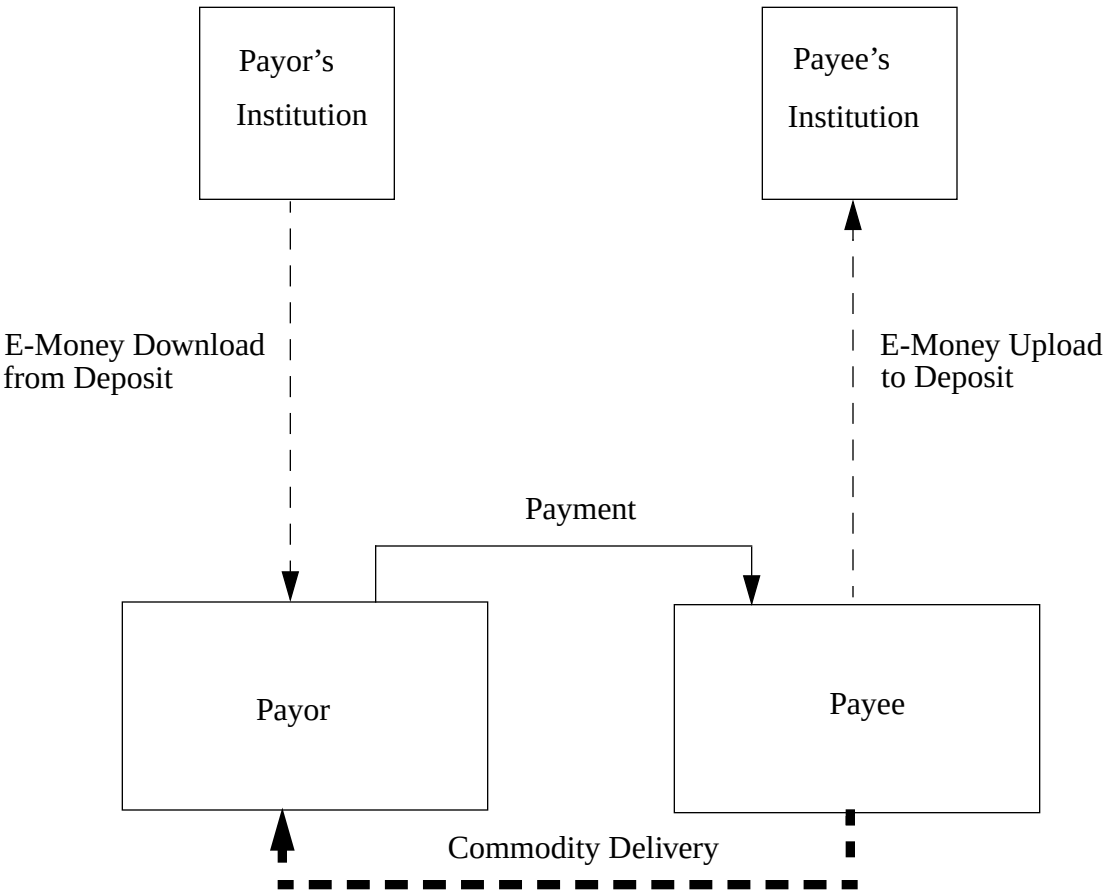
Stored-Value Cards and E-Money Payments

Figure 9 illustrates a payment through a stored-value card issued by a card provider. It has virtually the same features as the cash payment in Figure 4 with the addition of operating, legal, and possibly settlement risks. Although the card's user is not required to enter any personal identification number to make a payment, the card terminal, which is provided by the merchant's deposit-taking institution, does verify that the card meets the criteria for acceptance and has avail-

23. Under CPA rules, the point in real time at which the debit card payment is authorized by the payor's institution and debited to the payor's account is also deemed to be the point in time of the delivery of the payment instrument to the payor. Consequently, the payment item is no longer in the possession of the payor's institution and cannot be returned in the event of default. Accordingly, the debit to the payor's account cannot be reversed.

Figure 9

E-Money Payment



able funds for the transaction.

Under some e-money schemes, such as VISACash, the value is transferred from the payor's card, which is issued by a Visa member, to the merchant's (payee's) terminal at the time of the transaction and credited to the payee's account at its deposit-taking institution during the clearing and settlement cycle of the day that the value on the terminal is downloaded into the account. When the card is 'loaded' by the holder from its deposit account, its deposit-taking institution debits its account for the full value of the transfer and holds the proceeds as part of a suspense account for the outstanding amount of e-money balances issued. The suspense account is debited in the daily clearing and settlement cycle in which the merchant downloads the value on its terminal into its deposit account. However, not all e-money schemes operate in exactly the same fashion. For example, Mondex permits value to be transferred directly from the smart card of one individual to that of another individual without processing the transfer through a financial institution. The Mondex system also does not require that cards, and the e-money value on them, be issued only by financial institutions.

For some smart cards, the collective membership of the card organization guarantees the remaining value on the card and the payment to the merchant as with credit cards and, therefore, bears the financial risk in the event of a default by the payor's institution. This guarantee covers the payor after the card has been loaded but before its full value has been depleted, and the payee after the value has been transferred into its terminal but before it is credited to its deposit account. If the payee's institution fails after the value has been transferred into its account, the payee bears the usual risk of a depositor in a failed institution.

There are the same security risks for the holder as with cash - the prospect of loss, theft or counterfeit of the card. However, in schemes where accounting for individual transactions is available to cardholders, some security risks for cardholders in the event of lost or stolen cards may be reduced. Finally, there is the prospect of operational failures that could impose additional risk on a cardholder.

5. Overview of the Structure and Risk Profile in the Payments System

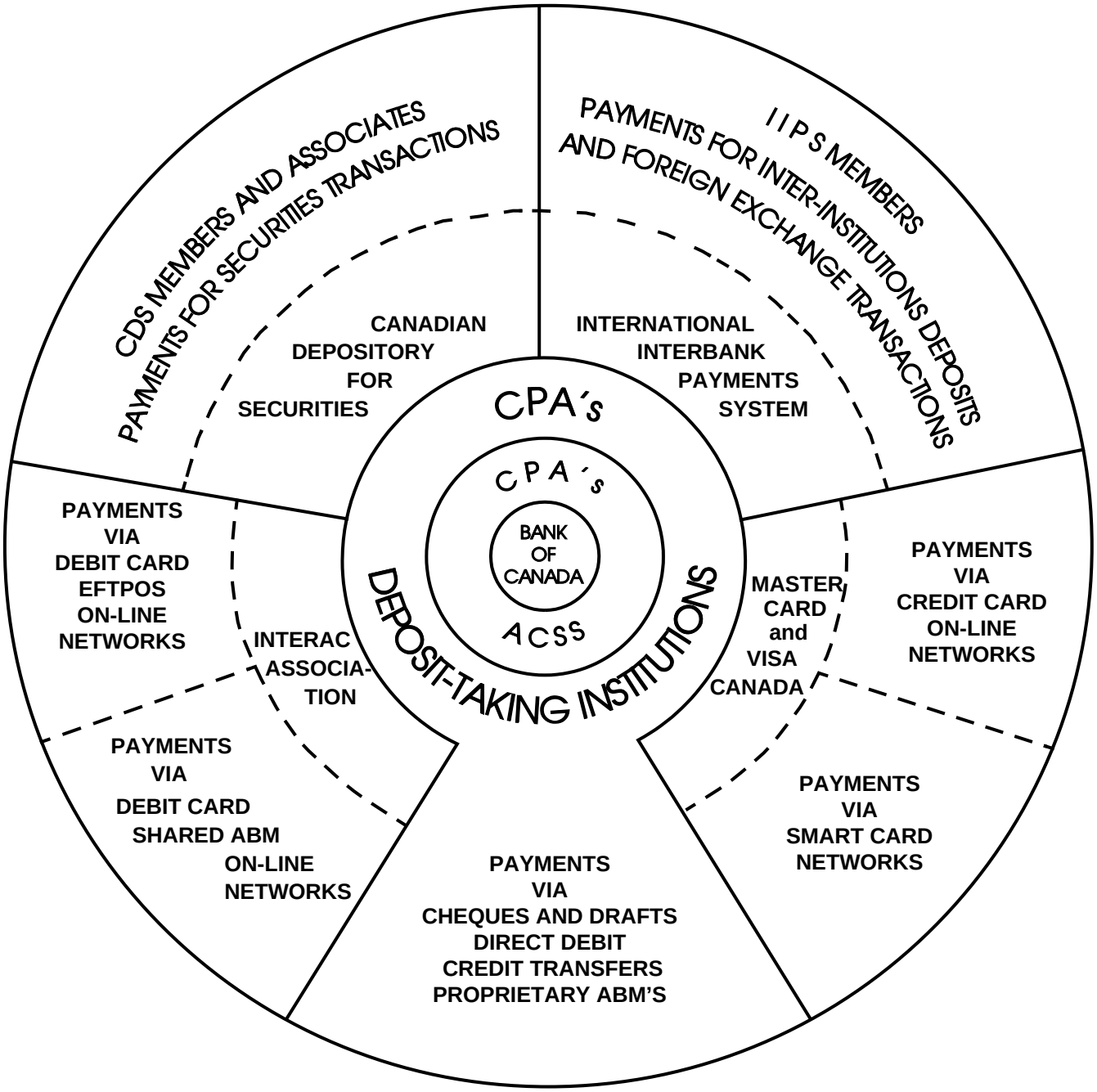
The details of the instruments, institutions, services, processes and risks of the Canadian payments system indicate the many different ways of accessing the various payments instruments and of organizing clearing and settlement services for payments in Canada. To demonstrate that some coherence exists in the complex nature of the payments system, Figure 10 illustrates the access, clearing and settlement structure for some specific payments.

At the core of the Canadian system is a structure in which all access and preliminary clearing services for retail and wholesale payments converge for final clearing and settlement. At the centre is the Bank of Canada, which provides settlement services, and the CPA's Automated Clearing and Settlement System in which the value of payments obligations between direct clearers is entered for settlement. Access to these core clearing and settlement services is obtained through deposit-taking institutions that are clearing members of the CPA.

Ringed around the central core of clearing and settlement services are a number of organizations providing clearing and access services for a variety of large-value and small-value payments. Although not all such organizations are represented in Figure 10, a number of the key organizations are considered. For example, payments by cheque or through direct debit and credit transfers are accessed through the proprietary systems of deposit-taking institutions and are entered directly or indirectly into the ACSS by these institutions, which are CPA members. Credit card payments, through Visa or MasterCard for example, are accessed by the communications equipment of the merchant's financial institution, on-line through the card organization's network. The payments are authorized, processed and netted into settlement obligations among Visa or MasterCard members for entry into ACSS through a direct clearer. Similarly, large-value payments for securities transactions are netted by CDS, which acts as a central counterparty, for payment through cheques that enter the ACSS system for settlement through a direct clearer. The key feature of this complex of competing and complementary access and clearing services (provided initially either by member deposit-taking institutions of the CPA or by other clearing facilities such as IIPS, CDS, and Visa) is that all payments enter the ACSS through a direct clearing member of the CPA for ultimate settlement.

Figure 10

Payments System Networks



The initial routing of payment information is another of the main differences among the payments processes for the various instruments. The information for cheque payments flows from the payee institution to the payor institution through two channels: part of an electronic batch entry of value and volume into ACSS by the payee institution and the delivery of the cheques to the payor institution. Information for direct debit transfers, such as pre-authorized debits, also flows from the payee institution to the payor institution but through the exchange of magnetic tapes rather than batches of cheques. Conversely, information for direct credit transfers, such as bill payments and payroll deposits, enters the system initially through the payor institution on magnetic tapes that are also exchanged with the payee institution. The information on credit card and debit card payments is processed in real time on a transaction-by-transaction basis although the settlement obligations are not entered into ACSS until the end of the clearing cycle. The net settlement obligations for credit card payments are entered into ACSS through a direct clearer for the card organization as part of a batch entry of paper items while the debit card payment obligations are entered as on-line batch items into ACSS. Regardless of the initial routing of payment information, there is, however, one common characteristic for the entry of this information into ACSS. Since ACSS is a debit-pull system, the information is always entered into the settlement system by the payee's direct clearer.

Another notable difference among the various payments instruments is the allocation of risk under a variety of default scenarios. These differences, as well as the commonalities, are summarized in Table 4. For example, even though cash and e-money are close substitutes for small-value payments, their risk profiles are substantially different. The only risk identified for cash as a payment instrument is security risk. However, in addition to security risk, stored-value cards face operational risks and, in the absence of any specific legislation regarding e-money, legal risk as well. Moreover, unless the outstanding e-money value and payments are guaranteed by the card franchise organization on the basis of some loss allocation rule for members requiring collateral or a reserve fund, stored-value cards will leave cardholders (payors) and payees subject to credit and liquidity risk in the event of a default by the card's originator.

All non-cash payments are subject to structural risks such as operational, legal and security risks, which are shared by all participants. Moreover, because typical large-value payments in

Table 4
Risk Profile of Payments

Type of Payment	Source of Failure	Settlement Risks: Credit PYE	Credit DI	Liquidity PYE	Liquidity DI	Structural Risks: Operation	Legal	Security	Systemic Risk
Cash								*	
Cheque	Payor	*	*	*		*	*	*	
	Payor DI	*	*	*		*	*	*	*
	Payee DI	*		*		*	*	*	*
Direct Debit	Payor	*		*		*	*	*	
	Payor DI	*		*		*	*	*	
	Payee DI	*		*		*	*	*	
Direct Credit	Payor								
	Payor DI	*	*	*		*	*	*	
	Payee DI	*		*		*	*	*	
Credit Card	Payor								
	Payor DI		*			*	*	*	
	Payee DI	*		*		*	*	*	
Debit Card	Payor								
	Payor DI	*	*	*	*	*	*	*	
	Payee DI	*		*		*	*	*	
S-V Card		*		*		*	*	*	

PYE: Payee
DI: Deposit-Taking Institution

Canada are, at present, made either by cheque or through IIPS, systemic risk exists in situations where the payor's deposit-taking institution fails within a clearing and settlement cycle.

With respect to credit and liquidity risks for non-cash other than e-money payments, the incidence of these risks depends on the type of instrument and the source of failure. A general rule with regard to payment reversal and the unwinding of settlement obligations in the event of a default by a direct clearer, which helps determine the incidence of risk, is that payments entered into the ACSS that are due to the defaulting institution are completed while payments due from such institutions can be unwound. Consequently, if the payee institution fails, all payments due to the institution are completed and the payee bears the credit and liquidity risk associated with holding a deposit in a failed institution.

If the payor institution fails, the payee generally bears the risk for payments by cheque, direct debit transfer and direct credit transfer, although the payor is also at risk as a depositor in a failed institution.[24] However, there are some notable exceptions to this rule. With cheque payments, if the item is no longer in the possession of the failing payor institution, it cannot be returned and the payee institution bears the credit and liquidity risk. For credit card payments, the payee institution, along with the other members of the credit card organization, bear the risk if the payor institution fails, since all authorized real-time payments are guaranteed by the organization. For debit card payments that are deemed irrevocable under the rules of the CPA, the payee institution may be unable to reverse the credit to the payee under some merchant agreements and would bear the credit and liquidity risk if the payor institution was unable to settle its payment obligation.[25]

Finally, if the payor fails, the payee is subject to credit and liquidity risks for payments made by cheque and direct debit transfer. However, if the payment is made by credit card, debit card, or direct credit transfer, the payment is authorized for entry into the clearing and settlement process only if the payor has sufficient funds or credit to cover the payment so that no credit and liquidity risks arise during the clearing and settlement cycle.

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24. The payee institution is also at risk if the payee withdraws funds in its deposit account before settlement, including those payments in the process of collection that were credited to it during the clearing cycle.

25. Under some arrangements, the payee institution may be able to reverse the credit, leaving the payee at risk.

6. Some Recent Developments in the Canadian Payments System

The Large-Value Transfer System

The CPA's Large-Value Transfer System (LVTS) will begin operations in the second half of 1997. This system is an electronic credit transfer system for large-value payments that features real-time multilateral net accounting for settlement balances with certainty of final settlement on an item-by-item basis in real time, but with deferred settlement on the accounts of the direct participating group at Bank of Canada.[26] The system will incorporate a number of risk containment measures and will allow the payor institution to access intra-day credit supported by two types of loss allocation mechanisms when sending a payment: either a tranche 1 payment based on a defaulter-pays allocation rule, or a tranche 2 payment that uses a survivors-pay rule.

Tranche 2 is expected to be used for the majority of payments. This mechanism features collateralized credit limits and net debit caps for participating members. Each member sets a net credit limit on other participants in LVTS to establish the maximum intra-day credit that it is willing to grant to each counterparty. Each member provides collateral in an amount of 30 percent of the largest net bilateral credit limit that it has extended to a counterparty. The sender's net debit cap for an institution is calculated as 30 percent of the sum of bilateral limits extended to it by all other participants. In the event of a default, the defaulting institution's collateral is used first to cover its settlement obligations. If this is insufficient, the collateral of the surviving members, on a pro-rata basis relative to their bilateral credit lines with the defaulting institution, is available to cover the shortfall. In the context of multiple failures within a single day, if the collateral is insufficient, the Bank of Canada guarantees to provide the residual amount of required settlement balances. Since a central bank cannot default, the Bank of Canada's guarantee ensures that settlement will always be completed.[27]

Tranche 1 payments are expected to account for a lower volume of payments since risk containment for these payments requires more collateral. Under this mechanism, the institution

26. The value of payments processed through cheques and ACSS is expected to decline significantly with the introduction of LVTS with a corresponding increase in direct credit transfers outside of ACSS. The relative volume of payments will also be affected but only to a slight extent.

must collateralize the full amount of the payments it sends. However, this mechanism allows an institution that obtains no bilateral credit limits from other institutions to send a payment through the system if it has sufficient collateral. The tranche 1 mechanism also permits an institution with available collateral to make a payment when there is no room for another tranche 2 payment under either its bilateral credit limit with another institution or its net debit cap. Under these circumstances, a tranche 2 payment would be rejected by the system and would be queued for resubmission at a later point in the clearing cycle.

At the end of the clearing cycle, participants in the system with net debit and credit positions in their settlement accounts can, if they choose, engage in inter-institution overnight loans to flatten out their net positions. Those that choose not to flatten their position will earn interest on their positive settlement balances at the Bank of Canada at a rate equal to the lower limit on the official overnight interest rate band set by the Bank while those with negative outcomes will pay interest at a rate equal to the upper boundary of the band.

The Interac Association Agreement

In December 1995, the Interac Association reached an agreement with the federal government's Bureau of Competition Policy to open access to its electronic payments network to non-deposit-taking institutions such as retailers, insurance companies, and insurance and securities brokers. The Interac Association has been controlled by its nine charter or founding members - the six largest banks, Canada Trust, the Confederation des caisses populaires et d'economie and the Credit Union Central of Canada - through which members of the Association accessed the shared ABM and EFTPOS networks. The agreement followed a three-year investigation, under the authority of the Competition Act, of complaints about restraint of trade practices. When Interac and the Bureau reached an agreement, the Director of the Competition Bureau filed an

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27. Because of the combination of real-time accounting, settlement finality features and the loss allocation rules that ensure the completion of settlement at the end of the cycle, LVTS is said to be a 'real-time gross settlement equivalent' system. A real-time gross settlement system, such as Fedwire in the United States, settles each large-value payment on the accounts of the central bank on a transaction-by-transaction basis, in real time. Since the payment is a credit transfer, it does not enter the settlement system unless there are sufficient funds in the settlement account of the payor institution or unless the institution has access to intra-day credit.

application for a Consent Order from the Competition Tribunal, a federal quasi-judicial body, requiring the organization to broaden access to its POS and ABM networks, alter its pricing policies, and become more responsive to new service demands and new members. The Consent Order, which was issued in June 1996, covers the essential issues that had been addressed in the agreement.

The new Interac agreement, which came into force in November 1996, revoked the earlier restriction that only CPA members are eligible for Interac membership. There are now three classes of Interac members: direct connector financial institutions; direct connector non-financial institutions; and indirect connectors. A direct connector institution (financial or non-financial) is licensed to use the software for direct connection with other members in the networks. Direct connector financial institutions include only deposit-taking institutions; all other direct connectors are classified as non-financial institutions. Indirect connectors are members that are connected to the networks through direct connectors. A member of the Association may also perform one or more of four functions by acting as: an issuer; an acquirer; a connection service provider; or a settlement agent. Issuers, which may be direct or indirect connectors, must be deposit-taking institutions. Acquirers are any corporate entities that operate ABMs or POS terminals, or process payment information. Connection service providers are organizations that connect other Interac members (described as ‘indirect’ connectors) to the ABM or POS networks. Card issuers can be acquirers; and direct connectors that are issuers or acquirers can also be connection service providers, providing access to the networks for indirect connectors. Indirect connectors, such as insurance companies, can obtain access to the networks for their customers through sweep accounts held at deposit-taking Interac members that are also CPA members. Also, acquirers and indirect connectors must have a settlement agent that is a direct clearer, or group clearer, in the CPA.

As a result of the agreement, the corporate structure of Interac has changed. Originally, Interac Inc. was a for-profit company jointly owned by the nine founding financial institutions. Interac Inc. owned the software for the ABM and EFTPOS networks, licensed its use to the nine charter members of the Interac Association (a voluntary unincorporated organization), and provided service support for the networks. Under the new corporate structure, there are three organi-

zations. Acxsys Corporation is a for-profit company owned by the original nine founders that owns the network software. Interac Inc. is a non-profit corporation owned by the nine founders. It owns the trademarks, oversees the licensing of the software, and services the networks. The Interac Association, with its broad membership, is the non-profit organization that operates the networks. The Board of Directors for the Interac Association will be expanded to fourteen members of which two are guaranteed to direct connector non-financial institutions and three are for indirect connectors. Access charges are eliminated and all the Interac Association's revenues will be earned through switch fees on a per-transaction, cost-recovery basis. Members may also apply surcharges to customers for use of proprietary ABM and POS terminals. Acquirers are free to set these fees competitively. Finally, new shared services may be offered by members through Interac networks on the basis of bilateral or multilateral member agreements to encourage competition through financial innovation.

The Payment Clearing and Settlement Act

The proclamation in July 1996 of the Payment Clearing and Settlement Act gives the Bank of Canada explicit oversight responsibility in Canada for control of systemic risks related to payments in clearing and settlement systems, including the payments system itself. The Act provides the Bank of Canada with broad regulatory and participatory powers and reflects the increased awareness about systemic risk and concern about how it is controlled in major clearing and settlement systems for payments, securities, and foreign exchange transactions.

Appendix: U.S. Dollar Payments

U.S. Dollar Cheques

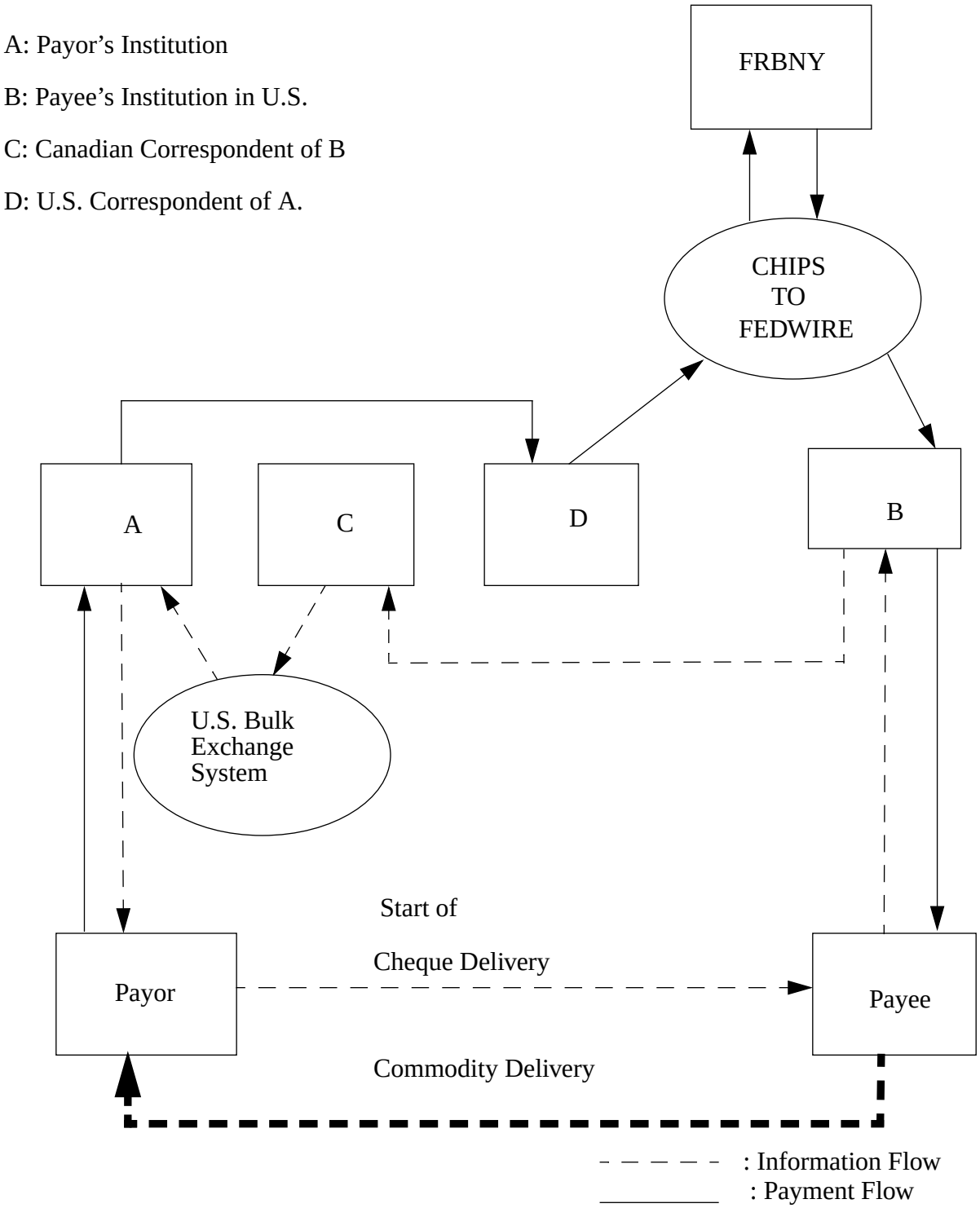
Figure A1 illustrates the process for clearing and settlement of U.S. dollar cheques drawn by Canadian residents on Canadian banks. The U.S. dollar cheque is an important instrument for cross-border payments between Canada and the United States and the complex process of clearing and settling these cheques requires the use of a correspondent banking network.[1] This illustration features the CPA's U.S. Bulk Exchange System (USBES). The six largest banks in Canada that are involved in a high volume of U.S. dollar payments flows are members of this clearing system.[2] With the USBES, clearing services are through Clearing House Interbank Payments System (CHIPS) and messaging through SWIFT. As with all other interbank payments through CHIPS, eventual settlement is via Fedwire.

The scenario in Figure 1A considers the payment process for a U.S. dollar cheque drawn on a large Canadian bank and deposited in a large New York bank in the United States, which acts as a correspondent bank in the United States for another Canadian bank.[3] Typically, the U.S. payee does not receive provisional same-day value for these funds and the U.S. deposit-taking institution imposes a 'hold' on deposits of cheques drawn on foreign banks until settlement occurs.[4] The payee's bank in the United States, which is a member of CHIPS and has a settlement account at the Federal Reserve Bank of New York, requests its correspondent bank in Canada, through SWIFT, to begin collection on the cheque and transfers the cheque to that correspondent bank. The payee bank's Canadian correspondent submits the cheque to the USBES of which the payor's bank is a member, and the bulk clearing system nets the U.S. dollar items bilaterally on

1. Canadian dollar cheques drawn on a bank in the United States are rare enough to ignore in these illustrations. However, Canadian dollar cheques drawn on a Canadian deposit-taking institution and deposited in a bank in the United States are more common. Once they are delivered to the Canadian correspondent bank of the payee's U.S. bank, these cheques are cleared and settled in the same fashion as other domestic currency cheques drawn on and deposited in Canadian deposit-taking institutions.
2. A few other regional direct clearing members of the CPA also participate in this clearing system at the regional settlement point in their home province.
3. The case of a U.S. dollar cheque drawn on a bank in the United States and deposited in a Canadian institution is similar to the case where the cheque is drawn on a Canadian deposit-taking institution except for the direction of information and payment flows with the correspondent banks.

Figure A1

U.S.$ Cheque Drawn on Canadian Bank



the same day it enters the USBES clearings (which is typically the day following receipt by the payee bank). The cheque is delivered through the clearing process as part of a batch payment item to the payor's bank and the payor's U.S. dollar account is debited by the next day. Upon notification of their net positions in USBES, the Canadian banks instruct, via SWIFT messages, their respective correspondent banks in the United States to begin their leg of the clearing and settlement process.

The payor bank's U.S. correspondent, which also has a settlement account at the Federal Reserve Bank of New York, initiates the funds transfer through CHIPS. Simultaneously, the payor bank notifies the payee bank's Canadian correspondent of the settlement instructions through SWIFT and it, in turn, notifies the payee's bank in New York. At the end of the clearing day, CHIPS enters netted payment values into Fedwire for settlement that incorporates the value of the cheque. The settlement account of the payor bank's U.S. correspondent at the Federal Reserve Bank of New York is debited and the account of the payee's bank is credited. The Federal Reserve Bank notifies the payor bank's correspondent bank and the payee's bank of final settlement. The payee's bank removes the hold on the value of the cheque in the payee's account and provides final credit to the account. The payor bank's settlement account at its U.S. correspondent bank in New York is debited by the amount of the cheque.

If the payor has insufficient funds in its U.S. dollar account at its Canadian bank to cover the payment, the cheque is returned and does not enter the settlement process. The payor is clearly liable for the payment and the payee bears the risk. If the payor's bank fails after the payment has been debited from the payor's account but before settlement in the United States, the payment is reversed and the net bilateral settlement positions of the participants in the USBES are unwound. The payor's bank will reverse the debit, but the payor is at risk as in the case of all bank failures (as, of course, is the payee until it receives final credit for the payment in its account). If

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4. In Canada, retail deposits of U.S. dollar cheques drawn on foreign banks and deposited in Canadian institutions involve a holding period that is generally longer than the actual clearing and settlement period. This 'availability schedule' favours the receiving bank since it provides that bank with float earnings at the expense of the payee. This, together with high service charges, reduces the demand for cheques as a cross-border payments instrument relative to other less costly instruments such as wire transfers for large-value payments and credit cards for retail payments.

the payor bank's correspondent fails before settlement, the situation becomes more complex since the default now involves the legal system of the United States. The USBES rules indicate, however, that the payor's bank must unwind the payment and reverse the debit on the payor's account. The payor's bank is at risk if its clearing account at its failed correspondent bank has already been debited, but not yet settled. It is useful to note, however, that if settlement is completed in the Federal Reserve System, the payor, its bank, and the payor bank's correspondent in the New York have discharged their payment obligations irrevocably.[5]

The payment takes a couple of days to complete and, if the payee's bank is not a member of CHIPS and must use U.S. correspondent banks in the clearing and settlement process, it could take longer. Consequently, the risk exposure for the settlement of a cross-border payment is generally greater than for the settlement of a domestic payment.

Other Cross-Border Payments Instruments

Large Canadian businesses generally maintain accounts in U.S. banks for operating purposes. However, in addition to cheques, medium-sized businesses use wire transfer services and, for high frequency payments, direct funds transfer services for payments to counterparties in the United States. These electronic payments instruments are provided by Canadian deposit-taking institutions and are generally used for business-to-business payments. The payments are cleared and settled through correspondent banking networks of deposit-taking institutions in Canada and the United States.

Individuals also use credit cards for cross-border payments in addition to U.S. dollar personal and travellers' cheques. Credit card payments made by Canadian residents are cleared and settled in the United States, with the Canadian card issuer using its correspondent banking system in the United States. Visa, for example, settles such payments through Chase Manhattan in New York. Finally, individuals also use debit cards to access foreign currency through shared ABM networks operated by Cirrus and Plus.

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5. The by-laws of CHIPS dealing with defaults define the process and liabilities. Settlement is final once the CHIPS payment has been executed on Fedwire.

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