

# CLS Bank: Managing Foreign Exchange Settlement Risk

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*Paul Miller, Department of Banking Operations, and Carol Ann Northcott, Department of Monetary and Financial Analysis*

- *Based in New York City and regulated by the Federal Reserve Board, CLS Bank International provides a “continuous linked settlement” (CLS) service for foreign exchange transactions.*
- *The CLS Bank virtually eliminates the credit risk associated with settling foreign exchange transactions.*
- *The Canadian dollar is one of seven currencies settling through the CLS Bank system.*
- *The Bank of Canada provides the CLS Bank with a settlement account and acts on its behalf in Canada’s Large Value Transfer System (LVTS). The Canadian-dollar operations of the CLS Bank are subject to Bank of Canada oversight under the Payment Clearing and Settlement Act.*
- *The CLS Bank began operations on 9 September 2002.*

**W**ith an average turnover of approximately US\$1.2 trillion, the foreign exchange market is the largest financial market in the world (BIS 2002).<sup>1</sup> Settlement of these transactions spans different national and legal jurisdictions, time zones, and domestic payments systems. As a result, counterparties assume various types of risk in the course of settlement, including credit, liquidity, replacement, legal, banker, and operational risks. (See Box 1 for definitions.) Together, these constitute foreign exchange settlement risk, with credit risk being the most significant. It has been internationally acknowledged for some time that disruptions in the settlement of foreign exchange transactions have the potential to pose systemic risk, since the risks taken on by counterparties can extend over several days and be very large, even exceeding their capital (BIS 1996).

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*The CLS Bank virtually eliminates the credit risk associated with settling foreign exchange transactions by providing a payment-versus-payment arrangement.*

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After a decade-long effort by the international financial community, a new bank has been created to address risk in the settlement of foreign exchange transactions. The CLS Bank virtually eliminates the credit risk associated with settling foreign exchange transactions by providing a payment-versus-payment arrangement.

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1. Daily turnover in April 2001.

## Box 1

### Definitions of Types of Risk

#### Banker risk

The risk that the bank where a settlement account is held could become insolvent.

#### Credit risk

The risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter (BIS 2001).

#### Liquidity risk

The risk that a counterparty will not settle an obligation for full value when due but will settle at some unspecified time thereafter (BIS 2001).

#### Operational risk

The risk that deficiencies in information systems or in internal controls, human errors, or management failures will cause or exacerbate credit or liquidity risks (BIS 2001).

#### Principal (Herstatt) risk

A type of credit risk. The risk that one counterparty of a two-way transaction could pay the sold currency without receiving the bought currency (BIS 1996).

#### Replacement risk

The risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the settlement date. This failure may leave its counterparty with an unhedged or open market position. The resulting exposure is the cost of replacing, at current market prices, the original transaction (BIS 1996).

#### Systemic risk

The risk that the failure of one participant in a financial system to meet its required obligations will cause other financial institutions to be unable to meet their obligations when due (BIS 2001).

## History and Evolution

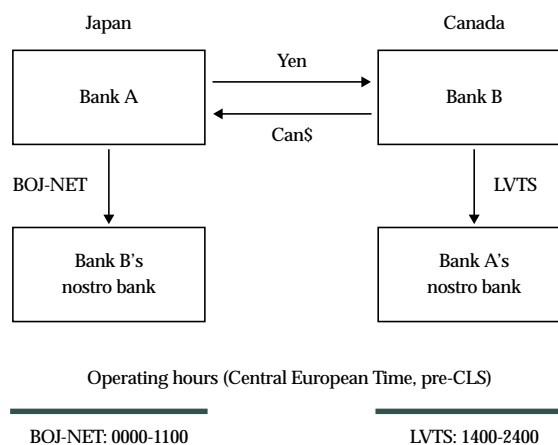
Foreign exchange traders make agreements to exchange one currency for another in various types of transactions. To understand how a typical foreign exchange transaction is settled without the CLS Bank, consider the example in Chart 1, involving two banks. Bank A, in Japan, is a participant in the Japanese large-value payments system, the BOJ-NET. Bank B, in Canada, is a participant in the Canadian large-value payments system, the LVTS. Bank A and Bank B enter into a foreign exchange transaction when Bank A sells yen to Bank B for Canadian dollars.

To settle the transaction, Bank A will pay Bank B the yen through the BOJ-NET. If Bank B is not a participant in the BOJ-NET, it must engage a participating bank to receive the payment on its behalf. This is Bank B's correspondent, or nostro, bank. Likewise, Bank B will pay Canadian dollars to Bank A through the LVTS, to Bank A's nostro bank.<sup>2</sup> Thus, each counterparty pays one currency and receives another in return.

2. The terms "nostro" and "correspondent" are used interchangeably throughout this article. Nostro is the term generally used by the CLS Bank.

Chart 1

### Foreign Exchange Settlement



In settling this exchange, the counterparties assume a number of risks. One source of risk becomes especially clear when payments systems are in different time zones.<sup>3</sup> In the example, Bank A pays the yen through

3. In the example in Chart 1, the operating hours are in Central European Time (CET). For more detail on operating hours and time zones, see n. 8, below.

the BOJ-NET before the Canadian payments system is open. If Bank B defaults in the interim, Bank A will have paid the yen but will not have received the Canadian dollars. This is often termed “principal,” or “Herstatt,” risk, which is a type of credit risk (Box 2). As well, because of limitations on current information-management practices, it can take several days from the time a counterparty initiates the process to pay the “sold” currency until it knows for certain whether it has received the “bought” currency, subjecting it to liquidity risk and replacement risk if the bought currency arrives later than expected. Since countries have different legal and regulatory regimes, legal risk may also be a factor in the event that a counterparty fails to deliver a currency.

The risks associated with foreign exchange settlements and their potential to cause systemic risk (the risk that a failure of one institution to meet its obligations will cause other institutions to fail to meet their obligations) were demonstrated by the high-profile closure of Bankhaus Herstatt in 1974 (Box 2). Since this episode, much has been done to understand and reduce the risks involved in foreign exchange settlements. In 1990, the Bank for International Settlements (BIS) addressed two issues concerning cross-border, multi-currency netting schemes that could be used to settle foreign exchange transactions in its *Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries* (the “Lamfalussy Report”). First, to minimize risk in these systems, the committee formulated six minimum standards for their safe operation.<sup>4</sup> Second, it recognized that cross-

4. Although these standards were originally designed to help ensure adequate risk management of cross-border, multi-currency netting systems, they came to be applied to netting systems more generally and eventually provided the base on which the *Core Principles for Systemically Important Payment Systems* were constructed (BIS 2001).

border transactions involving national payments systems would require increased interaction among various supervisory authorities. The committee therefore recommended that central banks and other relevant supervisory authorities adopt certain principles to coordinate the oversight of cross-border, multi-currency netting schemes. This co-operative framework was eventually adopted for the regulatory approval process of the CLS Bank (see Appendix).

In 1996, the BIS publication, *Settlement Risk in Foreign Exchange Transactions* (the “Allsopp Report”), presented a market survey of banks’ practices for settling foreign exchange trades. There were three key findings.

- The exposures that arise from foreign exchange settlement can extend over several days.
- At any given moment, the amount of risk to even a single counterparty may exceed a bank’s capital.
- Foreign exchange settlement risk is a potential source of systemic risk.

To reduce risk, the report advocated a strategy that included roles for private sector as well as for central banks. The major task was given to industry groups in the financial sector: to develop a risk-proof, multi-currency settlement system that would establish a direct relationship between the payments of the two currencies involved in a foreign exchange transaction.<sup>5</sup>

In July 1997, a group of the world’s largest foreign-exchange-dealing banks joined to create CLS Services Limited to implement their vision of a limited-purpose

5. Industry groups had already been actively investigating foreign exchange risk. See, for example, the 1997 publication from the New York Foreign Exchange Committee, “Guidelines for Foreign Exchange Settlement Netting.”

## Box 2

### Bankhaus Herstatt

The potential for risk in foreign exchange settlement was brought into vivid relief by the closure of a bank in Cologne, Germany, that, although small, was very active in the foreign exchange market. When Bankhaus Herstatt had its licence withdrawn at the end of the German banking day on 26 June 1974, it was 10:30 a.m. for its New York correspondent. Several of Herstatt’s counterparties had irrevocably paid Deutsche Marks to the bank that day

through the German payments system, with the expectation of receiving U.S.-dollar funds through Herstatt’s correspondent bank in New York later that day. However, with the bank’s closure, its New York correspondent froze outgoing U.S.-dollar payments, leaving Herstatt’s counterparties exposed for the full value of the Deutsche Mark payments already made. This type of credit risk has come to be known as “Herstatt” or “principal” risk.

bank to provide a type of payment-versus-payment settlement called “continuous linked settlement” (CLS).<sup>6</sup>

## The Continuous Linked Settlement Service

Based in New York, the CLS Bank is a special-purpose bank designed specifically to settle foreign exchange transactions through its continuous linked settlement service. Currently, seven currencies can be settled through the system: the Australian, Canadian, and U.S. dollars; the euro; the yen; the Swiss franc; and the pound sterling. The CLS service involves various players, all connected by a sophisticated telecommunications infrastructure (Box 3).

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*Both sides of a foreign exchange trade  
... are settled simultaneously on a  
trade-by-trade basis.*

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6. In December 1997, CLS Services merged with two other initiatives already in existence, ECHO and Multinet, and, in the process, gave the industry one dominant initiative to reduce risk in foreign exchange settlements.

Both sides of a foreign exchange trade submitted to, and accepted by, the CLS Bank are settled simultaneously on a trade-by-trade basis across accounts that financial institutions (settlement members) hold at the CLS Bank.<sup>7</sup> Settlement members pay currencies owed to accounts the CLS Bank holds at central banks through domestic payments systems that have been approved by the CLS Bank. Currencies that are due to settlement members are paid out by the CLS Bank in the same fashion. Nostro banks make and receive payments for members as necessary. Liquidity providers are financial institutions that enter into arrangements with the CLS Bank to help protect it from liquidity risk and are an important part of the CLS Bank’s risk-management controls.

## Daily operations

The CLS settlement cycle (Box 4) extends over a time period when all the domestic payments systems of currencies settling through the system are open for

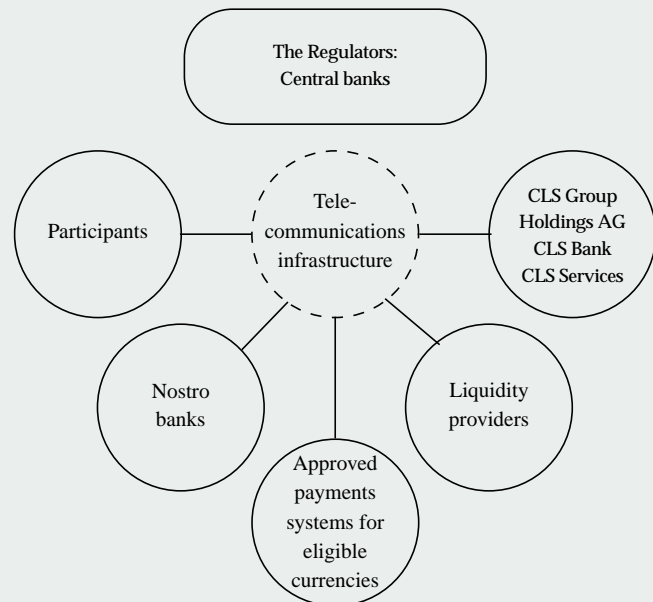
7. Financial institutions can participate in the CLS Bank in three ways: as settlement members, user members, or third-party users. But only settlement members can hold settlement accounts at the CLS Bank. User members and third-party users access the system through a settlement member, and their obligations are settled through the settlement member’s account.

### Box 3

#### The CLS Environment

CLS Group Holdings AG is a private holding company incorporated in Switzerland and regulated in the United States by the Federal Reserve as a bank holding company. Its Board of Directors is responsible for the strategic decisions of the whole CLS group. As of 9 September 2002, there were 66 shareholders, among them the world’s largest foreign-exchange-dealing banks. CLS Group Holdings AG wholly owns CLS UK Intermediate Holdings Ltd., which is headquartered in London and owns two main subsidiaries: CLS Bank International and CLS Services Ltd. The CLS Bank is an Edge Act corporation based in New York and is regulated as a bank by the Federal Reserve. CLS Services is incorporated under British law and provides operational support to the CLS Bank and associated institutions.

#### The Players



business.<sup>8</sup> The accounts that settlement members hold at the CLS Bank are divided into subaccounts, one for each currency approved to settle through the system. At the beginning and end of each settlement cycle, these accounts, and the CLS Bank's settlement accounts at central banks, hold zero value.

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*The CLS settlement cycle extends over a time period when all the domestic payments systems of currencies settling through the system are open for business.*

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Foreign exchange trades submitted to the CLS Bank for settlement in the upcoming settlement cycle must be received prior to a submission deadline. Those trades that are submitted before the deadline and are accepted (i.e., those that pass the CLS Bank's matching and processing filters) are randomly placed in a queue for settlement. Each settlement member's expected final position in each of the currencies is then calculated, assuming that all accepted trades settle.<sup>9</sup> These final amounts are communicated to members via a *pay-in schedule* that outlines for the member the value of the currencies that it owes, when the currencies are due, and the value of the currencies that it will receive.

Settlement members pay the owed currencies, called *pay-ins*, to the CLS Bank's accounts at the various central banks through the appropriate CLS Bank-approved payments system (APS) that supports intraday finality of payments.<sup>10</sup> If a member is not a participant in the APS of a particular currency it must have a participating institution (its *nostro agent*) make and receive payments on its behalf. After a *pay-in* is received in its central bank account, the CLS Bank

adjusts the member's CLS Bank subaccount accordingly.

Once the *pay-ins* to the CLS Bank begin, the trades start to settle on a trade-by-trade basis. Each trade is subject to three risk-management controls, discussed in the next section. After a trade passes these controls, the CLS Bank simultaneously adjusts the subaccounts of the bought and sold currencies for both settlement members. Settlement of the trade is then final. The next trade in the queue is then tested against the risk-management controls, and so on. Any trade that does not pass the tests is left in the queue and is tested each time the process cycles through. The system is designed so that if all members make the required payments to the CLS Bank, all accepted trades will settle.

The CLS Bank pays the expected final balances of currencies owed to settlement members from its central bank accounts throughout the settlement cycle according to a process that incorporates the risk-management controls. As these *pay-outs* are completed, both the CLS Bank's central bank account and the receiving settlement member's CLS Bank subaccount are adjusted accordingly.

Once the CLS settlement cycle is complete, there should be no value left in the CLS Bank's central bank accounts or in members' CLS Bank subaccounts. As a result, the CLS Bank holds no assets or liabilities vis-à-vis central banks or settlement members once a settlement cycle is completed.

## Risk Management

The CLS Bank settles foreign exchange transactions across settlement accounts it provides to its members. Since the CLS Bank is a private sector enterprise, as opposed to a central bank, there is a risk that the CLS Bank could fail (i.e., banker risk). For this to be acceptable to participants and to the central bank community, this risk must be minimized. In the CLS Bank, transactions will settle with finality, and *pay-outs* of some long positions will be made before all the amounts due to the CLS Bank to support the settlement are received. Therefore, the CLS Bank must be protected from the various risks that could arise throughout the process: credit risk, liquidity risk, legal risk, banker risk, and operational risk.

To address credit and liquidity risk, three risk-management controls are applied to each trade before it is settled. These mechanisms ensure that, in virtually

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8. Because the CLS Bank settlement cycle crosses several different time zones, it has set its hours of operation to maximize the overlap when the domestic payments systems are open. The Central European Time zone (CET) is typically used when discussing CLS Bank operations.

9. These final balances are analogous to the results that would be obtained from multilaterally netting all trades.

10. Intraday finality means that final settlement (the irrevocable transfer of funds) occurs within a very short period of time.

## Box 4

### The CLS Bank's Settlement Cycle

The following gives the target times for CLS processing under normal conditions for value date V.

Sydney	Frankfurt	Ottawa	
			Submission of instructions, processing, and matching <sup>1</sup>
0800	0000	1800 (midnight, V)	Initial pay-in schedule sent out <sup>2</sup>
1430	0630	0030	Revised pay-in schedule sent out <sup>2</sup>
1500	0700	0100	Pay-in, <sup>2</sup> settlement, <sup>3</sup> and pay-out process <sup>4</sup> begins
1600	0800	0200	First pay-ins due <sup>2</sup>
1700	0900	0300	Settlement complete <sup>3</sup>
1800	1000	0400	Pay-ins <sup>2</sup> and pay-outs <sup>4</sup> completed for Asian Pacific currencies
2000	1200 (noon)	0600	Pay-ins <sup>2</sup> and pay-outs <sup>4</sup> completed for all currencies

### The Processing Schedule for Canada (EDT)

#### 1. Submission of instructions

The process is ongoing. Participants submit payment instructions for foreign exchange transactions to be settled that value date (V), usually before 1800, but instructions are permitted up to the 0030 deadline.

CLS Services processes the instructions; for example, it authenticates and validates specific information fields and then passes the instructions through a regulatory filter. Pairs of eligible instructions are matched based on members, type and quantity of currency, and value date. Members are notified whether or not the instructions matched. Unmatched instructions can be amended (by 0030) or removed.

#### 2. Pay-in process

Settlement members receive two pay-in schedules: an initial one at 1800 and a revised schedule after 0030. The specified amounts must be paid at or before the specified times.

The pay-in deadlines are spread throughout the settlement cycle in one-hour intervals, beginning

at 0200. The final payment deadline for the Asian Pacific currencies is at 0400 to ensure that all pay-ins and pay-outs are completed before the close of the payments systems for these currencies. All other currency pay-ins are completed by 0600.

#### 3. Settlement process

After the initial pay-ins occur, ongoing settlement of the individual instructions across the books of the CLS Bank begins. Given the timing of pay-ins and the risk-control mechanisms, the settlement of all instructions should be completed by 0300.

#### 4. Pay-out process

All pay-outs are to be made before the close of the respective payments systems. By 0600, each settlement member should have zero value in its CLS Bank settlement account, and the CLS Bank should have no funds in its central bank settlement accounts.

all circumstances, participants in the CLS Bank are guaranteed receipt of either the currency transacted for if the transaction has settled, or a refund of the amount they contributed if the trade does not settle.<sup>11</sup>

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*To address credit and liquidity risk, [for the CLS Bank] three risk-management controls are applied to each trade before it is settled.*

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## Controls

Two controls protect the CLS Bank from credit risk.

- First, and foremost, each settlement member's overall balance across all its subaccounts must always be positive, even though at any time during the settlement cycle some accounts will have positive balances and some will have negative balances. A member cannot owe value to the CLS Bank overall. The bank calculates the balances in a base currency using current exchange rates. A discount (haircut) is applied to the current rates to protect the CLS Bank from exchange rate volatility.
- Second, a limit is imposed on the aggregate negative position that can be maintained across a member's subaccounts with negative balances. This limit is assessed separately for each member and reflects its credit, liquidity, and operational characteristics. Settlement members considered at higher risk than others will have more stringent limits on their aggregate negative position.

A third and final control protects the CLS Bank from liquidity risk.

- A limit is applied to the negative position a settlement member can have in the subaccount of each currency. All members face the same limit for a given currency.<sup>12</sup> These limits support the CLS Bank's ability to maintain the currencies

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11. In rare cases, the refund may be in a third currency, as discussed below.

12. For example, the limit with respect to the Canadian dollar is currently \$400 million. No settlement member can have a negative position in its Canadian-dollar subaccount greater than this amount.

required to meet its pay-out obligations and are based on the value of the commitments from liquidity providers, discussed below.

To protect itself from legal risk, the CLS Bank has received legal opinions that the legal systems of all jurisdictions with currencies settling through the system can support the finality of transactions settling across its books. In addition, all payments to the CLS Bank from settlement members are made through well-designed payments systems that support intra-day finality. The CLS Bank holds these payments in accounts at central banks, thus protecting itself from banker risk.

Operational risk is another important risk that must be managed. The CLS process requires a communications system that links it to numerous participants and payments systems across countries, time zones, and technologies. The CLS Bank shifts foreign exchange settlement from a decentralized world to a highly centralized environment with explicit linkages. This, along with the tight timeline necessary to complete settlement, means that the outage of one component could quickly cause problems throughout the system. The CLS Bank, its member institutions, and central banks all recognize the potential for operational risk and have worked together to alleviate such concerns. The CLS Bank has an explicit management plan for operational failure that covers its various components (technology processes, settlement members, approved payments systems, etc.). All key components of the CLS system have backup arrangements that can be up and running within one hour. In addition, the operators of approved payments systems have developed their own procedures for managing operational risk, and they consider these issues together with the CLS Bank to ensure common understanding and effective coordination and communication in the event of a problem.

## Participants' risk

Although the CLS Bank's principal contribution to risk management for its participants is the virtual elimination of their credit risk, it also has the potential to decrease replacement risk. Trades may fail to settle in the CLS Bank, just as they do outside the system, but the failure of CLS trades to settle will be known sooner. This allows participants more time to make alternative arrangements and thus decreases the risk that the market will move against them in the interim.

Participants also continue to face some liquidity risk, although this has been addressed in various ways.

- Since payments to the CLS Bank are based on the expected final balance in each of a member's sub-accounts, less liquidity is required than in a system where payments are made on a gross basis.
- Payments of final amounts to and from the CLS Bank are spread out over the settlement cycle. This increases the efficiency of liquidity in the domestic markets, since liquidity will continue to circulate throughout the cycle.

Despite these advantages, some liquidity concerns remain. The payment obligations may still be quite large, and payments must be made according to a specific schedule. Therefore, large payments may be required during a narrow window of time. There are also concerns that during the initial period of the CLS Bank's operations, with relatively few settlement members, there could be large spikes in the amounts owing.

To address these concerns, participants can enter into trades with each other to reduce their pay-in requirements. A settlement member that owes a large amount of a particular currency can be matched with another member that expects to receive a large amount of another currency. The two can enter into a currency trade that, when settled *inside* the CLS Bank, decreases their final owing and receiving positions, respectively. An offsetting transaction is conducted and settled *outside* the CLS Bank through the traditional foreign exchange settlement arrangement so that, overall, each member continues to hold its original position in each currency. Together, these two transactions are called an *inside/outside swap*. While the outside leg of the swap is subject to credit risk, it is estimated that the amount of risk reintroduced will be small compared with the overall risk reduction, and it is hoped that this will only be a transitory feature.

## Failure Management

A "failure" in the CLS process would occur if a settlement member did not meet its obligations to pay for currencies owed. This could have serious repercussions for all settlement members if not adequately controlled.<sup>13</sup> Even in the event of such a failure, the CLS Bank itself has protection from credit risk and, in virtually all circumstances, can guarantee that settlement members receive settled currencies or can make refunds to members whose trades do not settle.

13. This could happen for operational or credit reasons. Although the tools discussed here can be used in either event, if the failure is operational, a series of operational contingencies is also available.

When a settlement member does not meet its obligations, the CLS Bank can take the following steps.

- First, it will try to settle as many trades as possible between non-failing institutions by recalculating members' positions and asking them to pay the additional amounts indicated by the recalculation.

The original pay-in schedule outlined the expected final positions assuming all trades settle. If there is a pay-in failure, all trades may not settle, and the amounts owed to and due by members change. The recalculated amounts, and who must pay them, are determined according to criteria set out in the CLS Bank's rules.<sup>14</sup> Although this procedure provides members with the benefit of settling trades that would otherwise remain unsettled, the potential for unexpected pay-ins contributes to members' liquidity risk.

- Liquidity providers support the CLS Bank's ability to make payments in the required currencies.

Although the CLS Bank can continue to meet payment obligations to members because of the risk-management control requiring all members to maintain positive balances overall, in the event of a failure it may not have enough of a specific currency. To mitigate this, the CLS Bank has entered into agreements with liquidity providers, financial institutions in each country with a currency eligible for settlement. These agreements commit the liquidity provider to sell or swap a domestic currency with the bank up to a specified amount.<sup>15</sup> Thus, even if the CLS Bank does not have enough of a required currency, it will have sufficient value in another currency to enter into a swap with the relevant liquidity provider for the required amount.

- A third currency can be paid out.

In the rare circumstance of more than one failure, or if a liquidity provider does not meet its obligations, the CLS Bank may have to meet its obligations by paying out a third currency rather than one that was bought or sold. Since they still receive value, settlement members are protected from credit risk. They still experience liquidity risk, however, in not receiving the expected currency. As well, if they need to enter into

14. The CLS service is governed by CLS Bank International rules, which are subject to English law.

15. The value of these commitments for a given currency determines the limit applied to the negative balance that settlement members can have in their subaccounts for that currency, as discussed earlier.



foreign exchange transactions outside the CLS Bank to get the desired currency, they may also experience replacement and credit risk.

- A loss allocation can be assessed on members.

In the extremely rare event that a settlement member fails and at the same time there is a foreign exchange movement in excess of the haircuts, the CLS Bank may not have enough value to meet its obligations. In this case, a loss allocation can be assessed on settlement members to make up the shortfall. This is the only possibility—a very remote one—of members in the CLS Bank incurring credit loss.

In sum, in a failure situation, members may face liquidity pressures from unexpected increases in the amounts that they may have to pay to the CLS Bank and from the possibility of receiving an unexpected currency. These liquidity pressures could be concentrated when a nostro agent acts for multiple settlement members. If a settlement member fails and the surviving members are faced with recalculated pay-in requirements, it may be more difficult for a nostro to provide the required liquidity and to make the necessary payments on behalf of all its clients. During its development, the CLS Bank performed various simulations of failures in the system, and settlement

members and nostro agents agreed that the additional liquidity demands should be manageable.

## Regulation and Supervision

The collective regulatory approval process for the CLS Bank and its associated systems is based on the principles of co-operative oversight set out in the Lamfalussy Report. Since the CLS Bank is subject to banking regulation by the Board of Governors of the Federal Reserve, the Federal Reserve Board, supported by the Federal Reserve Bank of New York, is the lead overseer of the system in consultation with the central banks of the currencies that will settle in the bank. In that capacity, the Federal Reserve Board has worked closely with the CLS Bank throughout its development. General regulatory matters were addressed within a committee of the Bank for International Settlements that included all the central banks whose currencies, the so-called first-wave currencies, would settle in the CLS Bank as it began full commercial operations. Central banks of potential second-wave currencies (Box 5) were also involved in the discussions.

Initially, the system was assessed according to the Lamfalussy Report's minimum standards, since these

### Box 5

#### Eligible Currencies in the CLS Bank and the Relevant Approved Payments System

- |                     |  |                  |   |
|---------------------|--|------------------|---|
| • Australian dollar | Reserve Bank Information and Transfer System (RITS)  | • Pound sterling | Clearing House Automated Payment System (CHAPS) |
| • Canadian dollar   | Large Value Transfer System (LVTS)   | • Swiss franc    | Swiss Interbank Clearing System (SIC)           |
| • Euro              | Trans European Automated Real Time Gross Settlement Express Transfer System (TARGET) through the ECB Payment Mechanism (EPM) | • U. S. dollar   | Fedwire   |
| • Japanese yen      | Bank of Japan Network (BOJ-NET) through the Foreign Exchange Yen Clearing System (FEYCS)                                     |                  |   |

#### Other currencies expected to gain approval in the near future

- Singapore dollar
- Swedish krona
- Danish krone
- Norwegian krone

were the generally accepted principles in place during its early development. Eventually, however, the core principles for systemically important payments systems will likely also be applied (BIS 2001). Assessments carried out by the BIS committee and by the CLS Bank itself show that the system is designed to meet the Lamfalussy standards that apply to it.

Regulatory approval began with formal approval from each of the first-wave central banks to include its currency in the CLS Bank. Following successful trials, final regulatory approval from the Federal Reserve Board was given on 5 September 2002 to allow the system to begin commercial operations. The Federal Reserve Board will continue to supervise the CLS Bank and its operations. Coordination with other central banks will be ongoing.

Central banks have also addressed the creation of the CLS Bank within their own regulatory environment. In Canada, the CLS Bank has been designated under

the Payment Clearing and Settlement Act (PCSA) for oversight by the Bank of Canada, since it is clearly a systemically important payment system (Box 6).<sup>16</sup>

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*The CLS Bank has been designated under the Payment Clearing and Settlement Act (PCSA).*

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The Bank of Canada's particular interest is in the arrangements used to settle the Canadian-dollar portion of foreign exchange transactions. Any actions taken under the PCSA by the Bank of Canada will be

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16. See Goodlet (1997) for details on the Bank of Canada's role in the oversight of payments systems designated under the PCSA. The formal notice of designation was published in the *Canada Gazette*, Part 1, 7 September 2002.

## Box 6

### Defining Systemic Risk in Canada

Under the PCSA, systemic risk is defined as the risk that the inability of a participant to meet its obligations in a clearing and settlement system could cause

- other participants in the system to be unable to meet their obligations when due
- financial institutions in other parts of the Canadian financial system to be unable to meet their obligations when due, or
- the clearing and settlement system's clearing house or the clearing house of another clearing and settlement system to be unable to meet its obligations when due

Characteristics that may indicate a system whose failure could have substantial implications for the

financial system and therefore bring it under close scrutiny for designation:

- individual transactions on a given day in excess of \$200,000 and an aggregate value of all transactions on any given day in excess of \$500 million, determined on a gross basis, or
- the size of the payment obligations owed to and by the participants is significant relative to the participants' capital. This would include systems in which participants are owed funds in excess of 25 per cent of capital or in which they can owe funds to a clearing and settlement system in excess of their capital, or
- the system plays a central role in supporting transactions in the financial markets or the economy

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Source: *Guideline Related to Bank of Canada Oversight Activities under the Payment Clearing and Settlement Act (1997)* (available at: [www.bankofcanada.ca/en/guide97.htm](http://www.bankofcanada.ca/en/guide97.htm)).

with respect to Canadian participants rather than with the CLS Bank itself. The Bank of Canada is satisfied that the system meets the minimum standards it has set for designated systems and will continue its coordination with the Federal Reserve Board and other central banks.

## **The CLS Bank and the Canadian Financial System**

### **The Canadian players**

The Canadian dollar is one of the first seven currencies settling through the CLS Bank. The approved payments system is the Large Value Transfer System (LVTS), which is owned and operated by the Canadian Payments Association (CPA).<sup>17</sup> The Debt Clearing Service (DCS), operated by the Canadian Depository for Securities Ltd., will continue to support LVTS collateral operations. Since the CLS settlement cycle will take place during the North American overnight period (Box 4), both the LVTS and the DCS have extended their operating hours to begin 6.5 hours earlier, at 0030 (EST).

Five Canadian banks are shareholders of CLS Group Holdings AG: the Bank of Montreal, the Bank of Nova Scotia, the CIBC, the Royal Bank of Canada, and TD Canada Trust. To be a settlement member, a financial institution must be a shareholder and have a settlement account with the CLS Bank. At this time, the Royal Bank of Canada is the only Canadian shareholder that is a settlement member, although others intend to become settlement members in the future. In addition, several LVTS participants currently provide nostro services. The Royal Bank of Canada and the CIBC are Canadian-dollar liquidity providers.

### **Contingency arrangements in Canada**

The explicit links created between payments systems and participants in different countries by the design of the CLS system have the potential to quickly spread the impact of operational failures both domestically and internationally. Therefore, during the development of the CLS Bank, system resiliency, backup, and contingency arrangements have been a major focus of the CLS, APS operators, participants, and central banks.

Despite these arrangements to prevent or mitigate operational failures and their impact, problems could

occur in the LVTS or within a Canadian participant's proprietary CLS- or LVTS-related system. Given the narrow time frames for settlement, it may not always be feasible, for example, for a settlement member to make alternative arrangements for pay-ins, or for a participant in the LVTS, or the LVTS itself, to move operations to a backup site in the desired time frame. There may also be circumstances where software problems might be replicated on both sites. The Bank of Canada is prepared to assist in these situations, if necessary, by entering payments directly across the CLS Bank's and participants' settlement accounts with the Bank of Canada, in effect circumventing the normal payment infrastructure.

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*The Bank of Canada acts as banker  
for the CLS Bank  
[for Canadian dollars].*

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### **The Bank of Canada's role**

The Bank of Canada acts as banker for the CLS Bank, providing it with two main services. The first is a settlement account that the CLS Bank uses to make and receive Canadian-dollar payments arising from the continuous linked settlement service. Because of the design of the CLS Bank, its settlement account will never be negative, and it will not have overnight balances except in very rare circumstances. Second, because the CLS Bank is not a member of the Canadian Payments Association, the Bank of Canada makes and receives payments through the LVTS on its behalf. To provide these services to the CLS Bank during the settlement cycle and to perform other routine services related to the operation of the LVTS, the Bank of Canada has extended its operating hours to begin 7 hours earlier. The Banking Services section of the Bank of Canada now operates from midnight to 1930 (EST) each business day.

### **Conclusion**

Through the co-operative efforts of private sector financial institutions, central banks, and domestic payments systems operators, the CLS Bank has been

17. See Dingle (1998) for a more complete discussion of the LVTS.

created to address the risks associated with settling foreign exchange transactions, particularly credit risk, which is virtually eliminated for transactions settling through its system. The world's largest foreign-exchange-dealing institutions are shareholders of CLS,

and it is expected that most will interact directly or indirectly with it. The addition of several other currencies and growing participation have the potential to position the CLS Bank as the dominant global mechanism for settling foreign exchange transactions.

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## Appendix:

### The Lamfalussy Report

#### Minimum standards for the design and operation of cross-border and multi-currency netting and settlement schemes (BIS 1990)

1. Netting schemes should have a well-founded legal basis under all relevant jurisdictions.
2. Netting scheme participants should have a clear understanding of the impact of the particular scheme on each of the financial risks affected by the netting process.
3. Multilateral netting systems should have clearly defined procedures for the management of credit risks and liquidity risks which specify the respective responsibilities of the netting provider and the participants. These procedures should also ensure that all parties have both the incentives and the capabilities to manage and contain each of the risks they bear and that limits are placed on the maximum level of credit exposure that can be produced by each participant.
4. Multilateral netting systems should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single net-debit position.
5. Multilateral netting systems should have objective and publicly disclosed criteria for admission which permit fair and open access.
6. All netting schemes should ensure the operational reliability of technical systems and the availability of backup facilities capable of completing daily processing requirements.

#### Principles for co-operative central bank oversight of cross-border and multi-currency netting and settlement schemes

1. All central banks with an interest in the prudent design and management of the scheme should be informed of the netting or settlement system. This would normally include (i) the central banks associated with the currencies operating in the system; (ii) the “host-country” central bank, the central bank of the domestic market in which the scheme is located or operating; and (iii) the “home-country” central bank(s) of the charter or incorporation of both the participants and the netting scheme provider.
2. One central bank should be the primary overseer of the scheme, presumably but not necessarily, the central bank of the host country.
3. The primary overseer should review the design and operation of the system as a whole and consult with other relevant authorities initially and on a continuing periodic basis.
4. The determination of the adequacy of a system’s settlement and risk-management procedures should be the joint responsibility of the central banks whose currencies are included in the system as well as the primary overseer.
5. In the absence of confidence in the soundness of the design or management of the scheme, a central bank should discourage its use by those institutions subject to its authority.

