The Swiss Interbank Clearing (SIC) payment system

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Swiss Interbank Clearing (SIC) is the central electronic Swiss payment system in which the participating financial institutions process their large-value payments as well as a part of their retail payments in Swiss francs. SIC is operated on behalf of the Swiss National Bank (SNB) by SIX Interbank Clearing Ltd (SIC Ltd), a subsidiary of SIX Group Ltd.

At the end of 2008, around 350 Swiss and foreign financial institutions were participating in SIC. Over 2008 as a whole, the system handled a daily average of 1.5 million payments with the value of CHF 230 billion. On peak days, SIC processed over 4 million payments totalling up to CHF 343 billion. The majority of cashless payment transactions in Switzerland are thus settled through SIC. In addition, the SIC system plays a central role in the implementation of the SNB's monetary policy. SIC is therefore very important for the functioning of the Swiss financial centre and is a key element in the Swiss Value Chain. The Swiss Value Chain is the term used to describe the fully electronic integration of the trade, clearing and settlement of shares, bonds, derivatives and structured products in Switzerland.[2]

This article aims to familiarise a wider audience with the way SIC works. The first section is devoted to matters of governance as well as the legal provisions. The article then continues with a description of the main features of the SIC system. The third section explains the risks inherent in a payment system and how they may be reduced or eliminated in SIC.

1 Governance and legal provisions

SIC has been operated by SIC Ltd on behalf of the SNB since June 1987. The SNB is the system manager. In this function, it lays down the conditions for admission to and exclusion from the SIC system. It provides the liquidity necessary for settlement in SIC, sets times when operations begin and end, and maintains the accounts of the participating financial institutions. In addition, the SNB monitors daily operations and is responsible for crisis management in the event of disruptions or incidents. SIC Ltd operates and maintains the processing centres as well as the communications and security installations. It also develops and maintains the software and manages the data files as well as the organisational and administrative rules of conduct in SIC.

SIC Ltd is 75% owned by SIX Group Ltd (Swiss Infrastructure and Exchange), while PostFinance holds a 25% stake. The shareholders in SIX Group are the Swiss big banks (30.12%), foreign banks in Switzerland (22.68%), commercial and asset management banks (14.96%), cantonal banks (13.64%), private bankers (10.17%) and regional and Raiffeisen banks (4.09%). Other banks account for 1.23%. SIX Group and its companies hold the remaining 3.11%.

The SNB considers the SIC payment system to be important for the stability of the Swiss financial system. It is therefore subject to SNB oversight.[3]

2 Principal features of the SIC system

This section provides a description of main features of the SIC system. They comprise real-time gross settlement, account management, the process sequence of a settlement day, the supply of liquidity to SIC participants and the links to other payment and securities settlement systems.

Real-time gross settlement

SIC is a real-time gross settlement system (RTGS). In contrast to net payment systems, where incoming and outgoing payments are accumulated and the net amount settled irrevocably and with finality at a later, predetermined time, the process is continuous at SIC, with each payment being settled individually, irrevocably and with finality. RTGS systems have been introduced in many countries in the last few years. In most cases, they are used exclusively for the settlement of large-value payments. In addition to large-value payments, SIC also processes retail payments individually and is, in this regard, an exception.

Account management

The deposits which SIC participants hold in their sight deposit accounts at the SNB serve as the means of payment. Payments are thus settled with central bank money. A sight deposit account consists of a master account and a SIC settlement account. The master account is used for cash withdrawals and direct transactions with the SNB which are routed through the SNB's accounting system. Interbank transactions in SIC are routed via the SIC settlement account. The reason for having a separate master account and settlement account is of a technical nature; from a legal

1 The authors would like to thank Andy Sturm, Philip Haene and David Maurer for their helpful comments.
2 cf. P. Haene, A. Sturm (2009), Behind the scenes of financial markets. A look at the Swiss financial market infrastructure. Available at www.snb.ch.

3 Oversight of financial market infrastructures is an instrument for furthering financial stability. For a description of system oversight, cf. Swiss National Bank (2007), The Swiss National Bank 1907–2007, pp. 409 et seq. and A. Sturm (2009), Behind the scenes of financial markets. A look at the Swiss financial market infrastructure. Available at www.snb.ch.

point of view, both accounts are considered as one. An additional SIC sub-account is available to those SIC participants that are linked to the international foreign exchange settlement system, Continuous Linked Settlement (CLS). In this sub-account, banks can reserve liquidity to be used exclusively for time-critical payments to CLS Bank.[4]

Process sequence of a settlement day

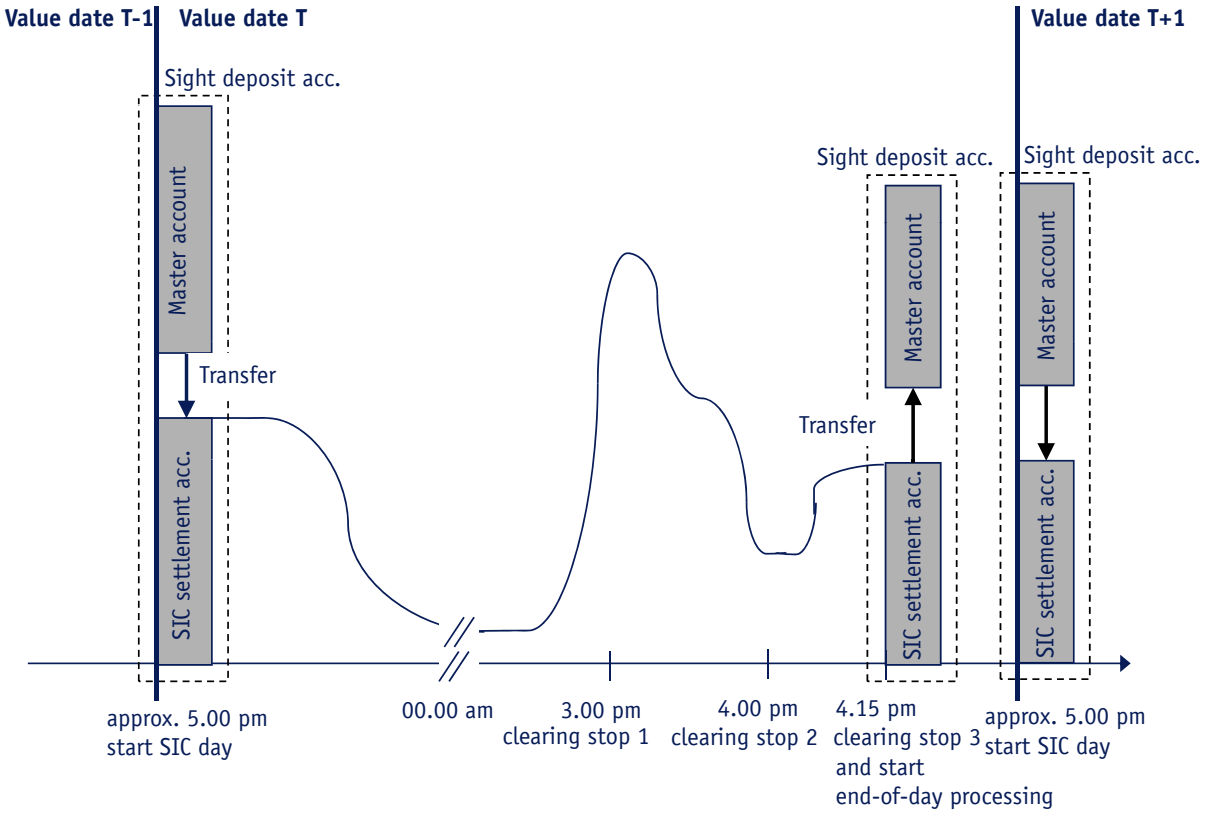
Participants can enter their payment orders in SIC around the clock. Payments are processed for approximately 23 hours. The process sequence of a settlement day in SIC is described in more detail in the chart below.

A settlement day starts at approximately 5.00 p.m. on the previous calendar day and ends on the value date at 4.15 p.m. All payments entered by 3.00 p.m. (clearing stop 1) are settled as of the same value date. Customer payments entered after clearing stop 1, however, will be settled as of the following value date. Cover payments, however, may also be submitted for same-day settlement between 3.00 p.m. and 4.00 p.m. (clearing stop 2).

Cover payments are bank-to-bank payments that are made in the name and on account of the bank issuing the transfer order. The reason for such payments may, for instance, be money market transactions. Consequently, the interval between clearing stop 1 and clearing stop 2 allows those participants whose payments could not be fully processed, to procure the necessary liquidity on the money market. In addition, between 4.00 p.m. and 4.15 p.m. (clearing stop 3), counterparties may also obtain liquidity from the SNB under the liquidity-shortage financing facility via special-rate repo transactions. The SIC day closes with end-of-day processing of payments. The system cancels all payments still pending and transfers the balance from the SIC settlement account to the master account. The next value date begins at approximately 5.00 p.m., and the balances of the individual master accounts are transferred to the SIC settlement accounts.

Payments are only settled in SIC if the remitting party has sufficient cover in its SIC settlement account. Any time the participant enters a new payment, it is first queued. If there is sufficient cover in the SIC settlement account, the payment order only re-

Chart: Process sequence of a settlement day, using the example of a SIC participant



4 The smooth settlement of foreign exchange transactions in CLS is conditional upon participants meeting their obligations in the respective currencies in accordance with a prescribed schedule.

mains in the queuing system for a few seconds and will then be settled immediately. If cover is insufficient, the payment remains in the queuing system until there are sufficient liquid funds. SIC participants can manage the settlement sequence of their payments by assigning payments to priority classes. The exact settlement sequence of the payments in the queuing system is then determined by an algorithm, the functioning of which is described in the box to the right.

Payments in the queuing system can be revoked by the remitter at any time up to clearing stop 1 (3.00 p.m.) without the consent of the recipient.[5] Payments remaining in the queuing system at the end of the settlement day on account of insufficient cover will be deleted and must be resubmitted. In such a case, the recipient of the payment that was not settled is entitled to charge the remitter default interest amounting to the prevailing money market rate plus half a percentage point.

Box: Settlement algorithm

Payments pending in the queuing system are settled as follows:

- As a first step, the next-highest priority payment to be settled is determined for each SIC settlement account. If a participant has several payment orders with identical priority in the queuing system, the order remitted first will be next in line for settlement. In other words, the first-in first-out principle applies. The payment determined in this way will be settled provided that the participant has sufficient cover.
- If queues are to be worked off in several SIC settlement accounts, the order in which payments are processed is determined by the time at which the payment order was entered. Priority is inconsequential in this case. For reasons of efficiency, SIC tries to settle not only those payments which have been in the queuing system the longest, but also settle several consecutive payments. If all payments in the queuing system have been settled, or if there is insufficient cover, the next queue with the payment order remitted first will be selected and settled.

5 After clearing stop 1, the receiving bank must consent to the cancellation of a payment. This rule helps banks to better manage their expected liquidity inflows shortly before the end of the SIC processing day.

Liquidity supply

In order to make payments in SIC, participants must have sufficient liquidity in the form of sight deposits at the SNB. From the viewpoint of a participant, there are essentially two sources of liquidity: other system participants and the SNB.

The first source of liquidity are other system participants. In making payments, they supply a participant with liquidity in the course of the day. The incoming liquidity can be used immediately for settling one's own payments. In addition, participants can temporarily borrow liquidity from other system participants on the interbank money market (or lend excess liquidity). Both incoming and outgoing payments and money market transactions merely result in a redistribution of liquidity in the system.

The SNB is the second source of liquidity for system participants. Unlike payments and money market transactions between banks, each transaction between the SNB and a system participant results in a change in the liquidity available in the system. With its monetary policy instruments, the SNB is therefore able to steer the aggregate level of liquidity in the SIC system.

For the SNB's monetary policy instruments, a distinction is made between open market operations and standing facilities.[6] In both cases, repo transactions are the SNB's principal monetary policy instrument. From the viewpoint of the payment transactions in SIC, standing facilities are of central importance. They include the intraday facility and the liquidity-shortage financing facility:

- Intraday facility: In order to facilitate the processing of payment transactions in SIC, the SNB provides SIC participants with interest-free liquidity during the day via repo transactions. Participants may notify the SNB of their intraday liquidity requirements on the preceding calendar day (at approximately 4.00 p.m.). The corresponding repo transactions will then be carried out at approximately 6.00 p.m. Between 8.00 a.m. and 2.45 p.m., SIC participants have another opportunity to obtain additional intraday liquidity. The funds obtained must be repaid to the SNB by the end of the same value date at the latest. In this way, the sight deposit balances at the end of the day are not affected. In the event of late repayment, the SNB will charge penalty interest at the rate of one percentage point above the call money rate.
- Liquidity-shortage financing facility: The SNB provides SIC participants with call money in the form of a liquidity-shortage financing facility, to enable them to bridge short-term liquidity bottlenecks. The interest rate for liquidity provided through this facility is half a percentage point above the call money rate. The prerequisite for using the liquidity-shortage financing facility is that a limit be granted by the SNB and that this limit be covered by collateral eligible for SNB repos. SIC participants may use the liquidity-shortage financing facility between clearing stop 2 (4.00 p.m.) and clearing stop 3 (4.15 p.m.).

Links to other payment and securities settlement systems

SIC is linked to the SECOM securities settlement system.[7] This means that the delivery and payment obligations arising from the purchase or sale of securities can be settled simultaneously. The transfer of securities takes place in SECOM and the corresponding payment is settled in SIC.

In addition, SIC is linked to CLS, a foreign exchange settlement system. CLS Bank is a participant in the SIC system. CLS participants can settle foreign exchange transactions in 17 currencies via CLS's accounts. CLS participants can therefore use SIC to transfer funds to their Swiss franc accounts at CLS Bank, where this liquidity is needed to settle foreign exchange transactions.

6 For more detailed information on the monetary policy instruments, cf. Swiss National Bank (2004), Guidelines of the Swiss National Bank (SNB) on Monetary Policy Instruments. Available at www.snb.ch.

7 cf. P. Haene (2009), SECOM, the securities settlement system. Available at www.snb.ch.

3 Risk management

The settlement of payments involves certain risks. The following is a description of the individual risks and the instruments and measures provided in SIC to reduce or eliminate them.

Credit risk

Credit risk is the risk that a party will not be able to meet its financial obligations either when they fall due or at any time thereafter. In connection with payment systems, a distinction is made between two types of credit risk:

- Credit risk between direct participants: In the case of net payment systems, incoming and outgoing payments are accumulated, with the transfer taking place at a later, predetermined time. Up to the time of the final transfer, credit relationships can be established between participants, and this gives rise to a credit risk. In the case of SIC, no such credit relationships are established because, owing to the use of real-time gross settlement, all payments are settled individually, irrevocably and with finality.
- Settlement bank risk: Financial institutions that are not able or do not wish to participate in SIC directly, incur the risk that their settlement bank will default, causing them to lose their deposits. The SNB counters this risk by providing access to the payment system for as wide a range of participants as possible. Those financial institutions without access to SIC can minimise this risk by choosing an account-holding institution that is as solvent as possible.

Liquidity risk

Liquidity risk is the risk that a system participant does not have enough liquidity to meet its financial obligations when they fall due (but can do so at a later date). Different measures help to keep the liquidity risk for participants and the danger of a system gridlock as low as possible.

First, participants can access different sources of liquidity, which allows them to react to fluctuating liquidity situations quickly and flexibly. The intraday and liquidity-shortage financing facilities, in particular, are worth mentioning in this regard (cf. chapter 2, section on liquidity supply).

Second, SIC supports the efficient use and active management of the available liquidity. Participants are not only able to check their account balances and the pending incoming and outgoing payments in the queue at any time, they can also manage the queue by prioritising and cancelling payments, thus optimising the payment stream. The option of being able to enter payments in the system up to five days prior to their due date also facilitates liquidity planning.

Finally, the following measures help to reduce system-wide liquidity requirements:

- In accordance with the agreement with SIC participants, payments in excess of CHF 100 million must be split up into smaller tranches, to prevent any gridlocks in the queuing system.
- In case of a system-wide gridlock, SIC automatically activates its optimisation routine to unblock it. The system searches for any pending cross-payments from sending and receiving banks. If this is the case, and if sufficient cover is available, the payments are offset simultaneously and on a bilateral basis.
- The remitter of a payment pays a dual-component fee. One component depends on the time of initiation of the payment, the other on the time of settlement. Both fees increase in the course of the day. This creates an incentive for the participants to transfer payment orders to the system early, while at the same time providing sufficient liquidity so that settlement can occur equally early. The aim is to prevent participants from delaying their payments and waiting for incoming payments to finance their own outgoing payments.

Operational risk

Operational risk is the risk of losses or disturbances as a result of the inadequacy or failure of internal procedures, employees and systems, or due to external events. Payment systems must satisfy high security standards with regard to availability, integrity, confidentiality and traceability throughout the entire processing of transactions. An operational disruption or indeed a temporary failure of the SIC system would greatly impair cashless payment transactions in Swiss francs.

A whole range of organisational and technical measures help to reduce the likelihood of an operational disruption of the SIC system, and ensure that normal processing operations can be resumed quickly in the event of a disruption. Should the need arise, a semi-automatic back-up system (Mini-SIC) is available. In the event of technical disruptions affecting individual participants, the SNB can access the participants' SIC settlement accounts directly and execute payments on their behalf.

4 Summary

In addition to large-value payments between banks, the Swiss Interbank Clearing (SIC) payment system also settles a part of the retail payments in Swiss francs. Moreover, SIC is extremely important for the implementation of the SNB's monetary policy. SIC is operated by SIC Ltd on behalf of the SNB. As system manager, the SNB defines the conditions for admission to and exclusion from the system, provides the necessary liquidity, keeps the participants' accounts and monitors daily operations.

The settlement of payments is associated with credit, liquidity and operational risks. A number of instruments and measures ensure that these risks are reduced or even completely eliminated in the SIC system. Real-time gross settlement, the flexible supply of liquidity and its efficient use, as well as a various measures to guarantee the smooth functioning of SIC operations, are of particular importance.

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