The Swiss Interbank Clearing (SIC)
payment system

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Swiss Interbank Clearing (SIC) is the electronic central 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 2018, 325 Swiss and foreign financial institutions were participating in SIC. Over 2018 as a whole, the system handled a daily average of 2.4 million payments with the value of CHF 156 billion. On peak days, SIC processed up to 7.4 million payments totaling up to CHF 249 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 fully electronic integration of the trade, clearing and settlement of shares, bonds, derivatives, structured products and repo transactions 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 for its part is responsible for operating and maintaining the processing centres as well as for the communication 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 100% owned by SIX Group Ltd. The shareholders in SIX Group are the Swiss big banks (31.1%), foreign banks in Switzerland (15.2%), commercial and investment banks (19.8%), cantonal banks (14.2%), private banks (2.9%) and regional and Raiffeisen banks (8.5%). Further banks account for 5.2%. SIX Group Ltd and ist companies hold the remaining 3.1%.

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 settlement algorithm, the supply of liquidity to SIC participants, the links to other payment and securities settlement systems, the technical access options and the messaging standards.

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 are used in many countries exclusively for the settlement of large-value payments. In

addition to large-value payments, the SIC system also processes retail payments individually and is therefore an exception by international standards.

ACCOUNT MANAGEMENT
The deposits which SIC participants hold in their sight deposit accounts at the SNB serve as the means of payment. The sight deposit account is used for cash withdrawals and direct transactions with the SNB which are routed through the SNB's accounting system. Transactions in SIC are routed via the SIC settlement account. At the beginning of a settlement day, the SNB transfers balances from a sight deposit account to the SIC settlement account. After clearing stop 1, the SNB transfers the entire sight deposit account balance to the SIC settlement account. At the end of the settlement day, the entire balance on the SIC settlement account is transferred back to the sight deposit account at the SNB. The reason for having a separate sight deposit account and SIC settle-

PROCESS SEQUENCE OF A SETTLEMENT DAY
based on the example of a SIC participant
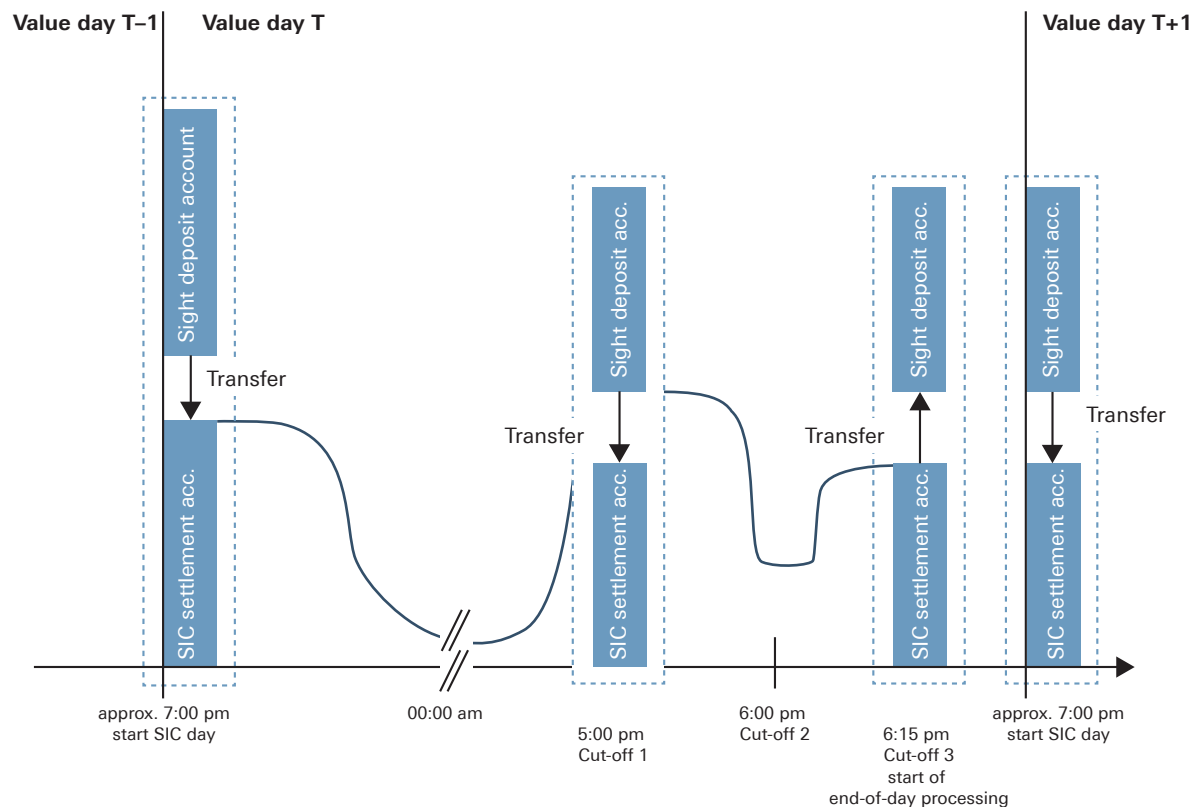
Source: SNB diagram

ment account is of a technical nature; from a legal point of view, both accounts are considered as one. Payments are thus settled with central bank money.

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 chart on the previous page shows a settlement day in diagram form.

A settlement day starts at approximately 7.00 p.m. on the previous calendar day and ends on the value date at 6.15 p.m.[4] All payments entered by a participant by 5.00 p.m. (clearing stop 1) are settled as of the same value date. Only compensation payments may be submitted for same-day settlement between 5.00 p.m. and 6.00 p.m. (clearing stop 2). Compensation 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 window between clearing stop 1 and clearing stop 2 allows those participants whose payment could not be fully processed to procure the necessary liquidity on the money market. In addition, between 6.00 p.m. and 6.15 p.m., counterparties may also obtain liquidity from the SNB under the liquidity-shortage financing facility via special-rate repo transactions. The value day ends at 6.15 p.m. immediately after clearing stop 3, after which the end-of-day processing (EDP) sets in.

The system transfers the balance from the SIC settlement account to the sight deposit account. The next value date begins at approximately 7.00 p.m. with the balances of the SIC participants' sight deposit accounts being transferred to the SIC settlement accounts.

SETTLEMENT ALGORITHM

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 remains 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 below.

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 'settlement candidate' 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, the SIC system 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.

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4 All times are expressed as Central European Time (CET), and in Central European Summer Time (CEST) when applicable.

SIC participants can call up the payment sequence in the queuing system at any time and change the priority of their own payments (and thus their sequence) if so required. By changing the priority payment which has not yet been settled, the payment concerned is moved to the end of the queueing system of the new priority order. Moreover, SIC participants can move a payment coming up next for settlement to the end of the queuing system of the same priority order. Payments in the queuing system can be revoked by the remitting party at any time up to clearing stop 1 (5.00 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 remitting party default interest amounting to the prevailing money market rate plus five percentage points.

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 for the settlement of payments in the SIC system: 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. Participants can immediately use incoming liquidity to settle their own payments. In addition, participants can temporarily borrow liquidity from other system participants on the money market (or lend excess liquidity). Both incoming and outgoing payments and money market transactions merely result in a redistribution of liquidity in the SIC 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 fluctuation 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.

Within its set of monetary policy instruments, the SNB distinguishes 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 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 its 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. Between 7.30 a.m. and 4.45 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 working day 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 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 continuously covered by collateral eligible for SNB repos. SIC participants may request the liquidity-shortage financing facility between clearing stop 2 (6.00 p.m.) and clearing stop 3 (6.15 p.m.).

Moreover, SIC participants may reserve liquidity on their account to be used for certain payments (e.g. time-critical payments to CLS Bank). A reservation is possible only for the current clearing day and only up to clearing stop 2. Within this period, participants may change or cancel their reservation at any time. Once clearing stop 2 has been reached, reservations are automatically deleted.

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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.

6 More detailed information on monetary policy instruments can be found in the Guidelines of the Swiss National Bank (SNB) on Monetary Policy Instruments. Available at www.snb.ch/en

LINKS TO OTHER PAYMENT AND SECURITIES SETTLEMENT SYSTEMS

SIC is linked to the SECOM securities settlement system of the central depository SIX SIS Ltd.[7] This means that the delivery and payment obligations arising from the purchase or sale of securities in Swiss francs (including repo transactions) can be settled simultaneously. The transfer of securities takes place in SECOM and the corresponding payment is settled in SIC on a delivery-versus-payment basis.

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 18 currencies via their accounts. The other SIC participants can therefore use SIC to transfer funds to their Swiss franc accounts at CLS Bank, where this liquidity is used for the delivery-versus-payment settlement of foreign exchange transactions.

TECHNICAL ACCESS OPTIONS AND MESSAGING STANDARDS

Since July 2016, SIC participants have moreover had the possibility of switching to the internationally widespread ISO 20022 (XML) messaging standard. In 2018, SIC participants and their corporate customers switched to ISO 20022.

Via the web portal, SIC participants can also trigger certain applications such as checking the current balance on the SIC settlement account or altering the priority of a payment on the queuing system. The web portal is optional for SIC participants that have access via the proprietary Finance IPNet network. The web portal is compulsory for SIC participants with access via SWIFTNet.

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 clearing institution 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 with no access to SIC can manage this risk by choosing an account-holding institution that is as creditworthy 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 in SIC 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

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7 For a description of SECOM, the securities settlement system operated by SIX SIS Ltd, cf. www.snb.ch/en.

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, incoming and outgoing payments and payments pending in the queue at any time, they can also manage the queue by prioritising, changing priorities and cancelling payments as well as reserving liquidity on the SIC settlement account for certain payments, thus optimising the payment stream.

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

– In accordance with the rules of SIC Ltd, SIC participants must split payments in excess of CHF 100 million into smaller tranches to prevent any gridlocks in the queuing system.

– In case of a system-wide gridlock, SIC activates its automated 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 remitting party of a payment pays a fixed transaction fee. In the course of a settlement day, a rising surcharge for customer payments and payments to other payment and securities settlement systems is levied. This creates an incentive for the participants to transfer payment orders to the system early and to provide sufficient liquidity so that settlement can occur equally early.

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.

The SIC system is technically updated at regular intervals. In April 2016, SIC Ltd launched its new settlement platform SIC4. The goals pursued by the introduction of SIC4, including harmonisation of Swiss payment transactions, reduction of operating costs and scalability, are based on an agreement between SIC system participants, the SNB and SIC's Board of Directors.

4 SUMMARY

In addition to large-value payments between banks, the SIC payment system also settles a part of the bulk payments in Swiss francs. Moreover, SIC is extremely important for the implementation of the SNB's monetary policy. SIC is operated by SIX Interbank Clearing 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 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.