HONG KONG'S PAYMENT SYSTEM

To meet international standards and minimise settlement risks, Hong Kong is moving towards a Real Time Gross Settlement (RTGS) system from the existing next day net settlement system. A new clearing company, Hong Kong Interbank Clearing Limited, has been set up to implement and run the new system. When RTGS is fully implemented by the end of 1996, it will be among the most advanced and robust payment systems in the world with real time PvP[1] and DvP[2] functions.

Background

In order for Hong Kong to maintain its status as an international financial centre, the HKMA has been working closely with the banking community to ensure that Hong Kong has an efficient and robust payment system, which is an essential market infrastructure. Much work has been done in the past two years. In January 1994, the HKMA's Working Party on Payment and Settlement System recommended that Hong Kong should move to RTGS as soon as possible. Since the issue was of strategic importance and involved the whole banking community, a Committee on Payment System (CPS), chaired by the Chief Executive of HKMA with representatives from leading banks in Hong Kong, was set up on 31 May to provide policy input on the implementation of RTGS in Hong Kong. At the same time, the Hong Kong Association of Banks (HKAB) commissioned in June a Project Co-ordinator to undertake RTGS Feasibility Study based on the recommendations of the Working Party. The CPS met four times and guided the Project Co-ordinator on important features of the RTGS design. The final conceptual design of the RTGS system incorporated the following core features:

a) compliance with international standards;

b) final settlement across the books of the HKMA;

c) a single tier system in which all licensed banks would open clearing accounts with the HKMA;

d) banks would be able to obtain intra-day liquidity through repurchase agreement (repo) with the HKMA, using Exchange Fund Bills and Notes; and

e) allowance for domestic and international linkages to facilitate real time delivery versus payment (DvP) and real time payment versus payment (PvP).

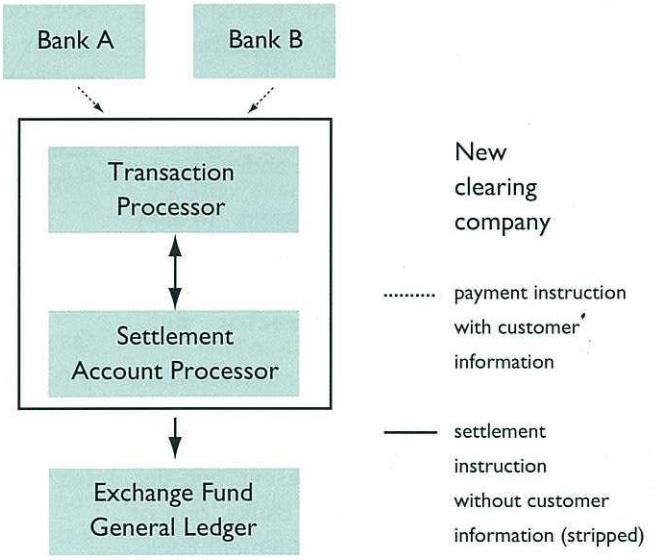
Conceptual design of the new RTGS system

With the view that the new RTGS system should be simple, robust, evolutionary and in full compliance with international standards, the CPS decided that the RTGS system would adopt a Y-shaped topology (Chart 1) with all licensed banks having direct access to the system. The Y-shaped topology of information and payment flow meant that the system would be kept simple and direct, without unnecessarily routing information or value through other intermediaries. While a bank would send in the full details of its payment instruction, including customer information, to a central Transaction Processor, the instruction would be 'stripped' such that only the settlement instruction, i.e. information on the amount, the paying bank and the receiving bank, would be passed onto the Settlement Account Processor and known by the HKMA. No daylight overdraft is allowed for the clearing accounts. Hence, banks without sufficient clearing balance or securities for repo to effect payment instructions would have their instructions queued in the system. Such a queuing mechanism would mean that a payment instruction cleared across the books of the HKMA would be final and irrevocable. The queuing mechanism allows the banks to manage their own queues of payment instructions through cancellation and resequencing.

1 payment vs. payment – settlement of two currencies at the same time for foreign exchange transactions.
2 delivery vs. payment – settlement of cash and securities at the same time for sale or purchase of securities.

Chart 1
Conceptual design of RTGS system

- Y-shaped topology
- Single-tier system
- Settlement across the books of the HKMA
- Stripping
- Queuing mechanism
- All banks must be members of new RTGS system
- No minimum value for RTGS payments
- Real time DvP and PvP capabilities



Under any RTGS system, it is important to address the issue about how intraday liquidity can be provided to the banks in order to reduce the chance of gridlock being developed since every payment has to be settled on an individual and gross basis. A related issue is whether the overdraft should be clean or collateralised, since the provider of funds may be subject to credit risk. The Hong Kong RTGS design solves these two problems by having a seamless interface with the CMU book-entry securities clearing and settlement service operated by the HKMA so that banks can obtain intraday liquidity through same day repo to fund their payments. It is one of the few RTGS systems in the world to wholly integrate the payment settlement function with the book-entry securities settlement function.

The main findings and recommendations of the Feasibility Study, which took full account of the advice and views of the CPS, were approved by the Exchange Fund Advisory Committee and the HKAB Committee in December 1994.

To ensure the smooth implementation of the RTGS project, the CPS also accepted the Project Co-ordinator's recommendation that the system be built on the existing CHATS inter-bank fund transfer system, so that the design and implementation work can proceed on an evolutionary path.

In view of the co-operative nature of the RTGS project, the CPS recommended the establishment of a new clearing company to be jointly owned by HKMA and HKAB to replace the existing Clearing House managed by the Hongkong Bank (HSBC) or the Management Bank to provide interbank clearing functions. A new company, Hong Kong Interbank Clearing Limited (HKIC) was established in May and is actively involved in the implementation of the RTGS project.

Roles and responsibilities of the HKMA, the HKAB and other parties under RTGS

The RTGS project involves a number of key parties :

(a) the HKMA, the settlement institution, the provider of intra-day liquidity, the current operator of the CMU, the regulator of the payment system and the lender of last resort;

(b) the HKAB, the institution responsible for interbank payment and clearing;

(c) the HKIC, the operator of the clearing house, which is jointly owned by HKMA and HKAB, each with equal shares which is responsible for implementing the RTGS project to its completion and operation;

(d) commercial banks, the users of the interbank payment system; and

(e) users of the CMU system (mainly Recognised Dealers of Exchange Fund Bills/Notes and Members of the CMU Service for private sector debt securities).

Under RTGS, HKMA will take over the Management Bank's role as the settlement institution. Instead of having the present two-tier structure which has ten Settlement Banks, one of which is HSBC, and over 160 Sub-settlement Banks settling across the books of their respective Settlement Banks, all licensed banks will have clearing accounts directly with the HKMA. Settlement will be across the books of the HKMA. This eliminates the risk of the settlement institution(s). Payment instructions, once settled, will be final and irrevocable.

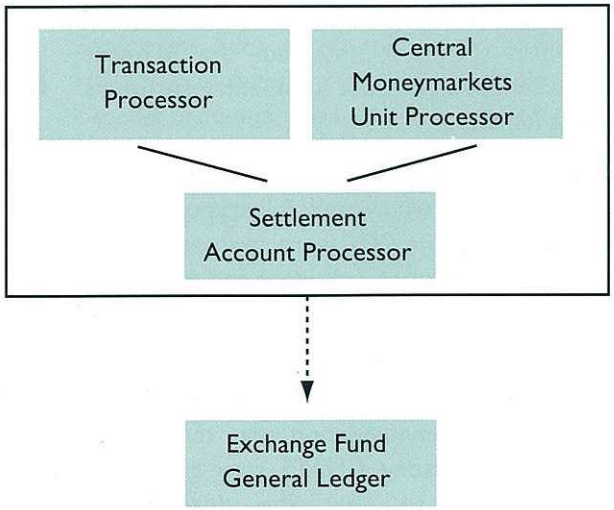
HKMA is the regulator of the payment system and the lender of last resort. Besides overnight liquidity, HKMA will also provide intraday liquidity to banks through intraday repos to allow smooth payment flows and reduce the chance of gridlock developing. A seamless interface is being built between the CMU system and the RTGS system to allow real time delivery versus payment and intraday repo (a special form of real time DvP) to take place. All the overnight and intraday repo facilities are provided by a collateral management system to be operated by the CMU.

The operator of the new payment system will be HKIC. Its Management Board comprises eight Directors: two from the HKMA, one each from the three Continuing Members of the HKAB, i.e. the note-issuing banks, and three elected among the other member banks of the HKAB. The HKIC is currently recruiting its General Manager and searching for suitable premises.

The HKAB is co-ordinating banks in all activities relating to RTGS. It has been keeping banks informed of the project's progress and preparing them to get on or switch to the new RTGS system. The HKAB, with the help of the HKMA, the existing Clearing House and the Project Co-ordinator, arranged four seminars in May and June to brief the banks further on the design of the new payment systems. The transaction processor, a key component of the RTGS system which takes care of the clearing functions is being developed under the guidance of HKAB. The

Chart 2
Provision of Intraday Liquidity for RTGS

- No intraday overdraft
- Intraday funding available through same day repo
- Seamless interface between the three components of the new RTGS system:
  - Transaction Processor
  - Settlement Account Processor
  - Central Moneymarkets Unit Processor



software for the new RTGS system is being developed by HSBC and BCSIS Singapore Ltd., based significantly on the existing proven CHATS software.

Impact on banks

Under RTGS, all licensed banks will have direct access to the payment system. Banks that are not members of the existing Clearing House Automated Transfer System (CHATS) will have to become members of CHATS which will start to run on RTGS principles starting from March/April 1996, before full implementation by the end of that year. To prepare banks for the RTGS environment, all banks will have to become CHATS members by the end of 1995.

Under the RTGS system, banks are not allowed to incur an overdraft at any time of the day. Banks will therefore have to manage their payment flows. However, they may obtain intraday liquidity from the HKMA through repos of Exchange Fund paper and other eligible securities. Taking advantage of the seamless interface between the CMU and the RTGS systems, intraday repos can be highly automatic.

Project Progress

The following milestones were achieved in accordance with the agreed schedule:

(a) completion of the User Requirements for the new RTGS system in January 1995;

(b) establishment of the interim clearing company and the arrangement of a bridging loan to fund its start-up costs in February 1995;

(c) completion of the Functional Specifications for the new RTGS system in April 1995;

(d) interim clearing company was named Hong Kong Interbank Clearing Limited ("HKIC") in May 1995;

(e) agreement by the Committee on Payment System in May 1995 on the phasing strategy for RTGS implementation;

(f) consultations with banks on the phased implementation strategy in May/June 1995;

(g) software programming by the HSBC and the Banking Computer Services Information Systems Private Limited from Singapore in progress; and

(h) recruitment of the General Manager of HKIC in progress.

Phasing Strategy of Implementation

There are a number of important issues involved when phasing in the new system.

Preparatory stage (Now to March 1996)

Moving all banks onto CHATS Only about 70 banks out of a total of 170 are now on CHATS. It is necessary for HKAB to alert those banks (about 100) which are not currently CHATS members to the preparatory work involved. Banks will be given a choice between using AS400 or PC as their front end equipment. This process of moving onto CHATS should start as soon as possible and all banks will probably be on CHATS by end 1995.

Introducing limits to CHATS The HKMA is now conducting a study on the existing payment flows based on data provided by the present Clearing House. In order to familiarise the banks with the RTGS environment, net sender's limits will be introduced into the existing CHATS well before adopting the RTGS software. The banks will be alerted if during the day, the value of their total net outgoing CHATS payment messages (after deducting the value of the incoming ones) at a certain point in time exceeds a pre-determined limit. This will also help the banks to manage their intraday payment flows and HKMA to make an assessment on the amount of intraday liquidity required.

Installation of mainframe equipment in HKIC This task will be undertaken in the fourth quarter of 1995, to enable the HKIC to have the necessary equipment to take up the clearing functions of the existing Clearing House step by step during 1996: CHATS in the first quarter,

Electronic Clearing (ECG) mainly for bulk volume low value payments in the second quarter and paper cheques in the third quarter.

RTGS Phase I Implementation (March/April – 4th quarter 1996)

Processing interbank fund transfer messages by RTGS software Through using the RTGS software as early as March/April 1996, the member banks will have about nine months to familiarise themselves with the RTGS functionalities before moving to genuine real time settlement. All banks will have an account in the Settlement Account Processor (SAP). Payment messages will be processed as if in real time but settlement will only take place on a net basis at day end observing the existing two tier structure, i.e. first across the books of the Settlement Banks (for the Sub-settlement Banks), and then across the books of the Management Bank (for the Settlement Banks). The notional (not actual because the final settlement has to wait until day end on a net basis) balances of the banks' accounts with the SAP will change in real time as a result of these payment messages. These notional balances will serve only an advisory function, i.e. the banks will be alerted if their notional balances fall below zero but they can still input new payment instructions into the system.

End of day settlement A second objective of the Phase I implementation in March 1996 is to have same day settlement (at day end) instead of, as under the existing system, at 10:15 a.m. on the next day. The intention is to have CHATS, cheques and ECG all settled at day end at, say, 5:00 p.m. However the cheques settled today are those presented to the Clearing House (or the new Clearing Company) yesterday. All cheques presented to the Clearing House (or the new Clearing Company) on Day D will only be given value to the banks' clearing account balances on Day D + 1 with final settlement at the end of Day D + 1. This will eliminate the systemic risk associated with returned items which should have all been counted and adjusted for by the early afternoon of Day D + 1.

RTGS Phase II Implementation (4th quarter 1996)

RTGS across the books of HKMA Since the HKMA will replace the HSBC as the settlement institution in the new payment system, all banks' clearing accounts will be moved across to the HKMA in the fourth quarter of 1996. By that time the interface between the RTGS system and the CMU, which will be upgraded to include a collateral management system, should have been developed to provide intraday liquidity to the banks through intraday repo of Exchange Fund paper and other qualified securities. It will then be a single tier structure with all banks settling across the books of the HKMA. At this point of transition, the settlement mode will change from day end net settlement to RTGS.

Project time-table

RTGS implementation is planned to commence in the first quarter of 1996 and for full operation before end 1996. During the course of 1996, the new clearing company will step by step take up the functions of the existing Clearing House. It is in Hong Kong's interest to implement RTGS in the shortest possible time frame, having regard to the need to establish real time payment versus payment (PvP) link in 1997 with the US Fedwire when the latter lengthens its operating hours from 12 to 18 hours. The HKMA has also reached agreement with the People's Bank of China to establish PvP link between the HK dollar payment system and China's new payment system (CNAPS), which is scheduled to implement RTGS in 1996. Hong Kong needs to catch up with other East Asian countries in the reform of its payment system. For example, South Korea and Thailand have implemented RTGS in 1994 and June 1995 respectively and Malaysia is also in the process of implementing RTGS. Hong Kong must therefore seek to achieve RTGS as soon as possible in order to remain competitive as an international financial centre.

Domestic and International Linkages

The RTGS system will be the first payment system in the world which operates integrally with a book-entry debt securities clearing system. This integral system not only allows DvP for securities settlement, but also provides a source of intraday liquidity for banks through the form of intraday repo of Exchange Fund Bills and Notes and other eligible securities. It will be the foundation for the key integration of payment and clearing systems

with other securities systems within Hong Kong and internationally.

The RTGS system also allows for PvP functionality for foreign exchange transactions. PvP helps to remove Herstatt[3] risk in cross border multi-currency transactions. The HKMA has already initiated preliminary discussions with other central banks about PvP linkages. The extension of the operating hours of the US Fedwire from 12 hours currently to 18 hours in early 1997 means that PvP between HK dollar and US dollar will be possible, thus eliminating the major Herstatt risk in such payments.

Concluding remarks

The development and implementation of the RTGS System is crucial to maintain Hong Kong's status as an international financial centre. As such, it requires the participation of the entire banking community. The whole-hearted support and the contribution of the HKAB and the HSBC, the Management Bank of the existing Clearing House, to this important project are particularly significant.

Hong Kong is a late starter in the reform of its payment system. But we have moved forward very rapidly in the past two years. Hong Kong's payment system is now undergoing rapid evolutionary changes. By end 1996, Hong Kong will have a world class payment system which is simple, robust and efficient, that will be integrated to the world network of payment systems to deliver future real time DvP and PvP capability.

– Prepared by the Monetary Policy and Markets Department

3 Herstatt risk arises in foreign exchange transactions when one counterparty delivers currency in one time zone and receives value in the other currency in another time zone. The risk is the possibility of failure of the counterparty who is to deliver later.