

Liquidity and risk management in the RTGS system – the Hong Kong experience

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The Real Time Gross Settlement system allows transactions to be settled deal by deal and in real time, thus eliminating systemic and settlement risks. The real time settlement nature of the system leads to a demand for intraday liquidity. This article aims to approach the issues related to intraday liquidity using the Hong Kong experience with special reference to the huge increase in Hong Kong dollar RTGS system turnover in 2007.

Introduction

The Hong Kong dollar Real Time Gross Settlement (RTGS) system has been operating for more than a decade following its introduction in 1996. Prior to its establishment, banks settled payments by way of netting, at the end of each business day. This meant that each bank would only pay or receive the net difference of the payments payable to (or receivable from) other banks participating in the system.

Although this end-of-day netting mechanism created less funding pressure on banks, it exposed them to systemic risk because the failure of one bank to pay the amount due at the end of the day might expose other banks to unexpected payment obligations and trigger a chain of defaults.

After the introduction of the Hong Kong dollar RTGS system, interbank payments were no longer settled by end-of-day netting, but on a continuous, deal by deal basis through the banks' settlement accounts with the HKMA – the settlement institution of the system. Compared with netting, the RTGS system eliminates systemic and settlement risks, but requires banks to have intraday liquidity to settle payments during the day. Intraday liquidity management has since become an important and critical part of banks'

operations. In particular, three issues have attracted the attention of market participants and central banks: how intraday liquidity is provided, the value of intraday liquidity, and the turnover efficiency of an RTGS system¹. Over the years, the HKMA has adopted system features to help banks manage their intraday liquidity.

Provision of intraday liquidity

Since its launch, the Hong Kong dollar RTGS system has had a seamless interface with the Central Moneymarkets Unit (CMU), which is the debt securities settlement system operated by the HKMA. Among the debt securities cleared and settled in the CMU are the Exchange Fund Bills and Notes (EFBN), which are issued by the HKMA for the account of the Exchange Fund. The bulk of the intraday liquidity is provided by the banks making use of the EFBNs for the intraday repurchase agreement (repo) facility with the HKMA². The banks have found this method of providing intraday liquidity cost-effective and efficient. In any case, they have been holding EFBNs as investment products or liquidity management tools. The intraday repo facility introduced in December 1996 has ensured smooth operation of the RTGS system in Hong Kong.

¹ The RTGS turnover is expressed as a certain multiple of the amount of intraday liquidity utilised – the higher the multiple, the greater the turnover efficiency of the RTGS system.

² Banks sell their holdings of EFBNs to the HKMA in return for Hong Kong dollar liquidity and perform the second repurchase leg of the repo before the close of play. The HKMA applies a haircut to the repo securities to protect itself from market risk, but the intraday repo facility is interest free, hence no impact on a bank's P&L.

Pricing of intraday liquidity

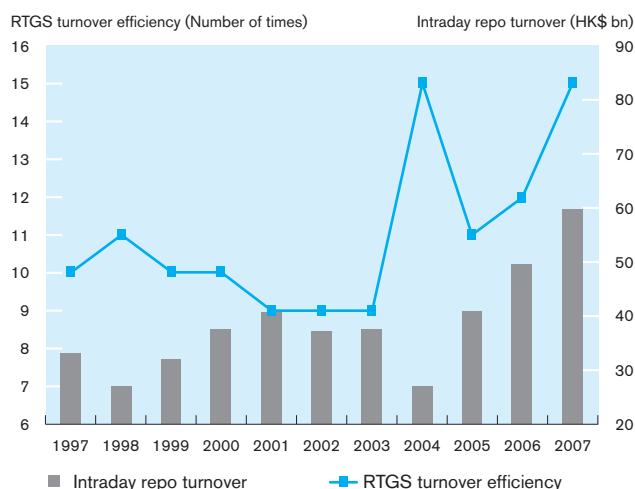
With the increasing use of the RTGS system, intraday liquidity has been invaluable in meeting time-critical payments. Theoretically, the value of intraday liquidity can be traded in the market, but, as yet, no intraday money market of any significance has been developed in any of the major financial centres. In Hong Kong, intraday liquidity has been provided efficiently by the HKMA, making use of the fully secured and interest-free intraday repo facility. As in other financial centres, there is no intraday money market in Hong Kong, although it has been reported that for some money market deals, which require borrowers to repay early in the day, lower interest rates may apply. However, the value of intraday liquidity still cannot be traded as efficiently as the overnight money market.

RTGS turnover efficiency

Chart 1 shows the RTGS turnover efficiency in the past 11 years. The turnover efficiency hovers around 10 times between 1997 and 2003. The system's turnover is a good performance indicator for the economy: faster economic growth is usually associated with higher turnover in the RTGS system. There is also a degree of economy of scale for turnover efficiency. In years when the RTGS turnover is high, the turnover efficiency tends to be near 12 times, which is at the higher end. In times of low RTGS turnover, the turnover efficiency is usually at the lower end, at around eight times. Given the existing business and functional design features of Hong Kong's RTGS system, the extent to which the turnover efficiency can improve is somewhat confined to a range between 8 and 12 times.

CHART 1

Intraday repo to RTGS turnover ratio



2007 was the fourth consecutive year of record Hong Kong-dollar RTGS turnover. This was largely related to a lively stock market highlighted by initial public offering (IPO) activities and buoyant secondary market turnover. The turnover efficiency was as high as 15 times in 2007. This breakthrough in turnover efficiency was made possible by the implementation in recent years of new business and functional design features, known as optimisers. Brief descriptions of the different optimisers are provided in the following boxes.

Clearing House Automated Transfer System (CHATS³) Optimiser

CHATS Optimiser was introduced in June 2004 to settle paper cheques and large-value CHATS payments simultaneously and in an offsetting manner. Paper cheques are settled daily in a bulk run⁴ at a specific time by multilateral netting.

When the amounts required to settle paper cheque payments are substantial, banks, knowing their net cheque settlement positions, may make use of the CHATS Optimiser to make offsetting CHATS payments to their counterparties during the bulk settlement run. This helps the banks to manage their liquidity positions more efficiently and relieves them of the need to sit on substantial amounts of money for meeting their payment obligations in the bulk settlement run. It has been widely used by banks to ease liquidity pressure, particularly during times of large fund flows associated with IPOs.

Cross Currency CHATS Optimiser (CCPO)

The CCPO was introduced in October 2006 to further improve the liquidity efficiency of Hong Kong's clearing systems, especially in times of heavy fund flows. In recycling funds during IPOs, banks might resort to foreign exchange transactions (for example, swaps) to recycle funds in case of constraints posed by credit lines as these foreign exchange transactions settled by Payment-versus-Payment⁵ (PvP) (and hence with no settlement risks) will not consume any credit limit. For a bank in need of Hong Kong-dollar funding to be able to apply the proceeds received

through the foreign exchange transactions to simultaneously clear its Hong Kong-dollar payment obligations arising from cheque settlement, the CCPO can perform simultaneous settlement of Hong Kong-dollar or US-dollar PvP transactions and Hong Kong-dollar cheque clearing settlement. In effect, the CCPO is a combination of the PvP mechanism and the CHATS Optimiser.

RTGS Liquidity Optimiser (RLO)

The RLO is a liquidity-saving device introduced in January 2006 to increase liquidity efficiency through periodic multilateral offsetting of payment instructions queued in the RTGS system at each 30-minute interval. Apart from scheduled RLO runs, a run can also be triggered by the HKMA when needed (for example, to clear outstanding payment queues at times of large interbank payment flows).

Central Clearing and Settlement System (CCASS) Optimiser

The CCASS Optimiser was introduced in January 2008 to allow banks to create payment instructions to be settled together with the CCASS transactions in the daily bulk settlement run at 9:30 a.m. It helps banks expecting to receive money in the CCASS bulk settlement run to recycle the funds to those banks in need of funds for meeting their payment obligations. The CCASS Optimiser will improve the recycling of funds and avoid undue impact on money market activities amid high stock market turnover on the back of equity-related inflows from the Mainland, especially when the Mainland through-train investment programme is launched.

³ A computer-based system established in Hong Kong for the electronic processing and settlement of interbank fund transfers. CHATS operates in an RTGS mode between banks in Hong Kong and is designated for large-value interbank payments. Banks using CHATS are connected to the clearing house computer operated by the Hong Kong Interbank Clearing Limited.

⁴ A settlement run effected through CHATS for the settlement of Articles (e.g. paper cheques, electronic clearing items, JETCO items and Credit Card items) on a bulk clearing or settlement basis.

⁵ A mechanism in a foreign exchange settlement system to ensure that a final transfer of one currency occurs only if a final transfer of the other currency or currencies also takes place.

In addition to settling transactions in the conventional RTGS mode, optimisers can settle RTGS transactions simultaneously on a multilateral offsetting basis. Legally, they are still settled on a gross basis, although these gross transactions are settled simultaneously. Mathematically, this has the effect of offsetting. As these are devices on top of the conventional RTGS mode, the RTGS turnover efficiency will improve compared with what it would otherwise have been. By means of multilateral and bilateral netting, the optimisers have brought the combined advantages of the instantaneous settlement finality of RTGS systems and the liquidity efficiency of the netting system. The following is a generic illustration (Chart 2) of how an optimiser works.

CHART 2

Example of how an optimiser can increase the efficiency of intraday liquidity management

Payment instructions queued in the RTGS system

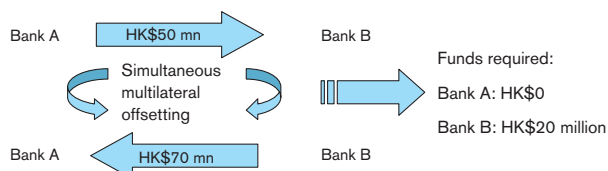
Instruction 1 Bank A to pay HK\$50 million to Bank B

Instruction 2 Bank B to pay HK\$70 million to Bank A

Intraday liquidity required without optimiser

Bank A: HK\$ 50 million Bank B: HK\$70 million

Intraday liquidity required with the help of optimiser



HK\$70 million from Bank B to Bank A is partially offset by the HK\$50million from Bank A to Bank B. Therefore, less overall intraday liquidity is needed for both banks.

Conclusion

There is no doubt that RTGS is the most robust payment system. However, its ability to handle large fund flows efficiently and effectively does not come automatically. The ability of central banks to provide intraday liquidity to market participants and to reflect the value of intraday liquidity has become even more important in securing a safe and efficient RTGS system. In the years to come, the HKMA will continue to explore other measures that can be taken by the RTGS system to ensure turnover efficiency can meet the increasing turnover arising from domestic and cross-border economic activities.