
ARTICLES

Evolution of the Reserve Bank's liquidity facilities

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In this article, the evolution of the liquidity management regime over the past few years is detailed. This evolution is placed in the context of the prevailing financial market stresses. The robustness and adaptability of the system to a variety of shocks is discussed. Particular mention is made of the steps taken in the past year to ensure the stability of the New Zealand financial system.

1 Introduction

Central banks have a number of functions. A key function is the provision of cash to the economy and the banking system in particular. Providing cash to the public as notes and coins enables the settlement of payment obligations between individuals. The electronic equivalents of notes and coins, which enable commercial banks to settle wholesale payment obligations, are the balances in the settlement accounts that the Reserve Bank offers to the commercial banks.

The source of funds for the settlement accounts is the various liquidity operations undertaken by the Reserve Bank – the standing facilities and open market operations.

Generically, there are two facilities that effect the provision of cash to the settlement accounts: the standing liquidity facilities, which are on-demand borrowing facilities, and the open market operations. This article discusses developments in the Reserve Bank's liquidity facilities over the past decade. Over this time, there have been two major changes.

The first of these was in 1999 when the way in which the Reserve Bank implemented monetary policy changed to the official cash rate (OCR) regime. The second was in 2006 when the Reserve Bank adopted a 'fully cashed up' settlement account system.^{2,3} This second change was the result of fundamental changes in our framework for thinking about a central bank's domestic market activities. It also enabled the Reserve Bank to be more flexible regarding changes.

The article proceeds as follows. In section 2, we provide

an overview of the purpose of the Reserve Bank's liquidity management system. The way this is put in practice is explained in more detail in box 1, "Assessing the appropriate level of settlement cash", and box 2, "Tools for injecting and withdrawing liquidity".

The motivation for the 2005/6 liquidity management review and the changes made at that time is provided in section 3, "Making liquidity provision systems more robust and scaleable: 2003-2007". The section includes discussion on the development of the 'Kauri' market in New Zealand and the introduction of a tiered approach to remuneration settlement account balances.

With the advent of the current crisis conditions, the liquidity facilities were widened and adapted. The Reserve Bank's approach to this is provided in section 4, "Enhancements to liquidity facilities to address crisis conditions – a question of confidence". Included in this section is a discussion on funding the New Zealand banking system in a crisis.

The article closes with a discussion on the coherence of the facilities and their robustness in section 5 and closing comments in section 6.

2 Overview of the New Zealand liquidity management system

Operationally, the liquidity management role, undertaken by the Financial Markets Department's Domestic Markets team, has three broad elements:

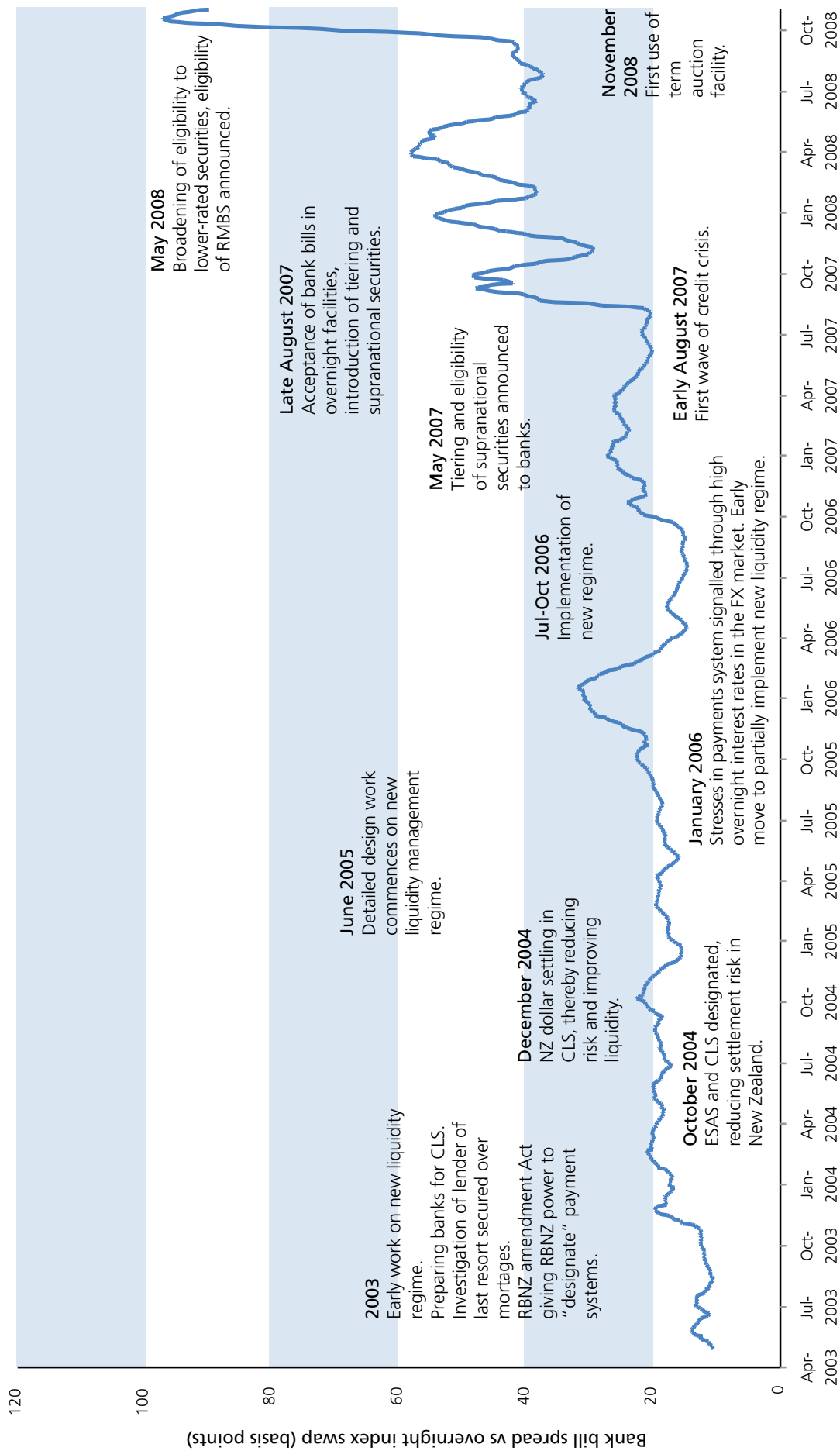
¹ The author gratefully acknowledges the thoughtful comments of Kelly Eckhold, John Groom, Bernard Hodgetts, Tim Ng, Simon Tyler and Tina Sutherland. He is especially thankful to Tina Sutherland for providing the material in boxes 1 and 2.

² Previously the Reserve Bank had targeted an overnight cash balance in the settlement account system of \$20m. This meant that banks had to make use of the standing liquidity facilities many

times during the banking day to raise cash to effect their payments. The open market operations had to be finely tuned to balance the Crown's income and expenditure. As a result, the operations were highly demanding on both the Reserve Bank and the commercial banks. For further details of how the previous regime worked, see Frazer (2005).

³ For a more detailed discussion on the changes in 2006, see Nield (2006).

Figure 1
Key events timeline 2003-2008



- supporting monetary policy by keeping liquidity conditions consistent with the current setting of the OCR (see box 2);
- providing facilities to registered banks, enabling them to maintain sufficient settlement cash at the Reserve Bank so they can meet payment obligations to other banks; and
- balancing the flows between the government and private sectors.

The standing liquidity facilities are designed to ensure that domestic overnight interbank borrowing/lending rates stay close to the OCR.⁴ The open market operations are designed to ensure that cash is generally supplied to the banking system at a rate that is commensurate with the OCR and in quantities that satisfy the payment demands of the commercial banks. As currently structured in New Zealand,

these facilities also provide a significant buffer of liquidity to assist in the maintenance of a sound financial system.

The liquidity facilities available at central banks tend to be relatively static, changing rarely and slowly as markets evolve. Recently, central banks around the world have demonstrated an ability and willingness to make changes in the face of serious threats to the stability of their financial systems.

⁴ **There is a variety of overnight rates observable for the New Zealand cash market. The Reserve Bank is more readily able to influence the purely domestic market. There are important linkages between the offshore London interbank market for New Zealand dollars (that sets the LIBOR offshore benchmark interest rate) and the foreign exchange (FX) market, in particular the ‘overnight FX swaps’ market. The Reserve Bank has relatively little influence over these ‘implied’ overnight rates in offshore markets.**

Box 1

Assessing the appropriate level of settlement cash

How does the Reserve Bank know there is enough cash in the settlement system? The Reserve Bank uses a number of key market indicators when assessing the appropriate range for the level of settlement cash. These include:

- The level of short-term interest rates. The Reserve Bank monitors market interest rates in the FX swap, overnight cash and short-term bank bill markets. These rates are compared to the market’s expectation of the OCR for the equivalent period (using the overnight interest rate swap rate⁵ – OIS). If these indicators are trading substantially below the market’s expectation of the OCR, it is a signal that there may be too much liquidity in the banking system. On the other hand, rates trading significantly higher may indicate there is not enough liquidity.
- Liquidity in the payment system and monitoring that payment and settlement obligations are being met.

⁵ **The Overnight Indexed Swap (OIS) rate is an interest rate swap involving an exchange of a fixed rate obligation for a floating rate obligation. The OIS provides a good guide to the market’s future expectations for the OCR.**

- Frequency of use of the Reserve Bank’s Overnight and Term Reverse Repurchase Facilities (ORRF and TRRF). These facilities keep interest rates within an appropriate range. If approved market participants are unable to source liquidity from the market, they can access the Reserve Bank’s ORRF/TRRF. If they do, it may be a signal that there is not enough liquidity in the market. It is worth noting that there may be other factors aside from liquidity pressures that may influence a market participant’s use of these facilities. An example may be that the cost of borrowing overnight cash in the market is higher than the cost of borrowing through the ORRF or TRRF, in which case it is cheaper to use the ORRF or TRRF.

Other influences such as government activities (e.g., revenue from taxes, or government disbursements) impact on liquidity in the banking system. The Reserve Bank forecasts the impact of these transactions using cashflow estimates provided by the more active government departments, and aims to offset these transactions through its domestic market operations.⁶

⁶ **Only approved counterparties may participate in the Reserve Bank’s domestic operations. Full documentation is in the Reserve Bank’s operating rules and guidelines, RBNZ (2008a).**

Box 2

Tools for injecting and withdrawing liquidity

This box provides an overview of the tools the Reserve Bank can use to inject or withdraw liquidity to achieve its desired target settlement cash level.

FX swaps and basis swaps

In foreign exchange swap transactions (FX swaps) the Reserve Bank and the counterparty agree to exchange two currencies, at the current market spot rate, with an agreement to reverse the transaction at a specified maturity date in the future. For liquidity management purposes, the Reserve Bank transacts in FX swaps for terms from overnight to six months.

Basis swaps are like FX swaps but for longer terms. Floating interest rate payments in the different currencies are made throughout the life of the transaction. The Reserve Bank transacts in basis swaps of durations between one and three years for liquidity management purposes.

FX swaps have become a key tool for injecting liquidity since the move to a cashed-up system back in June 2006 (see text). The Reserve Bank mainly deals directly with approved local and offshore counterparties, but has in the past transacted FX swaps through a tender process.

Repurchase transactions

The Reserve Bank enters into two types of repurchase transactions. Reverse repurchases (reverse repo) are where the Reserve Bank buys acceptable securities in exchange for cash with an agreement to sell them back at a future date (this injects cash into the banking system). A repurchase (repo) transaction is where the Reserve Bank sells New Zealand Government securities in exchange for cash, with an agreement to repurchase them at a future date (this withdraws cash from the banking system).

Repurchase transactions are held through a competitive tender process known as the Open Market Operation

(OMO). Each day at 9.30am, the Reserve Bank announces whether or not it intends to offer an OMO. The Reserve Bank publishes minimum/maximum rates it is willing to transact at and usually offers one to four maturity dates.

In November 2008, the Reserve Bank introduced a Term Auction Facility (TAF), which gives market participants access to longer-term liquidity. The TAF is run in a similar manner to the OMO (as a reverse repo) but is only held once a week. The TAF typically offers between \$500 million and \$2 billion dollars for terms of approximately three, six and 12 months.

Reserve Bank (RB) bill tenders

The Reserve Bank re-introduced⁷ RB bill tenders at the same time as the TAF. This facility is designed to withdraw liquidity from the banking system and sterilise, either partially or fully, the cash injected via the TAF. RB bill tenders are held weekly as required. As with other operations, the Reserve Bank publishes a maximum rate it is willing to transact at.

Standing facilities

The Reserve Bank offers a number of standing facilities for transactions in cash and government bonds. These are outlined below:

Deposit facility

All settlement cash in the banking system is held by Exchange Settlement Account System (ESAS)⁸ account holders and deposited at the Reserve Bank. Each ESAS account holder has an individual assigned tier (see text). The Reserve Bank remunerates account balances at or below the assigned tier at the OCR. For balances in excess of the assigned tier, the remuneration rate is the OCR less

⁷ The Reserve Bank issued RB bills between 1988 and 1999 as part of its domestic market operations.

⁸ The ESAS allows payment obligations between account holders to be irrevocably settled on a real time gross settlement basis.

100 basis points. The Reserve Bank reserves the right to change the rates of remuneration at any time.

Overnight and Term Reverse Repurchase Facilities (ORRF and TRRF)

The ORRF and TRRF allow approved counterparties to access cash on demand. Counterparties normally access these facilities when they are unable to acquire cash from the market, or when the cost of acquiring cash exceeds that at which they can obtain it from the Reserve Bank. The cost of using the ORRF or TRRF is OCR plus 50 basis points. Approved counterparties can borrow overnight or up to a maximum term of 30 days. These are standard reverse repurchase agreements secured against approved eligible security.

Bond lending facilities

The Reserve Bank currently offers two types of bond lending facilities designed to assist in alleviating shortages of bonds that arise in the New Zealand government bond market, which differ in the method by which the deal

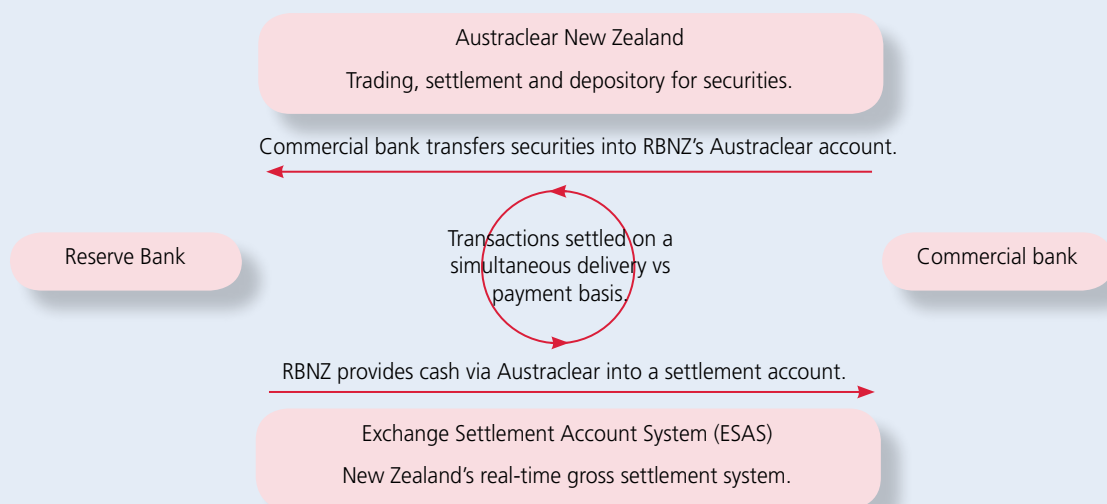
prices are struck. The Reserve Bank holds a portfolio of New Zealand government bonds that it makes available to the market via repurchase transactions. These facilities are limited only by the volume of bonds the Reserve Bank holds and the maximum daily limit across both facilities that the Reserve Bank is willing to secure against cash (currently \$500 million).

The first form of lending is via tendered bond repurchase facility. The Reserve Bank holds a bond repurchase tender operation with a maximum rate of 70 basis points below the OCR, every Monday, Wednesday and Friday. The Reserve Bank will lend up to a maximum of \$250 million of bonds in this facility and they must be secured against cash.

The second bond lending facility is available every day for a period of 30 minutes in the afternoon at a fixed price. Transactions are executed on a 'first-come, first-served' basis. Bonds can be secured against cash or bonds and are transacted at a fixed rate of 150 basis points below the OCR.

Box 2 Figure 1

Injecting liquidity via the standing and tender facilities



Standing facilities (ORRF/TRRF) – cash provided at a fixed price over the official cash rate with risk margins applied as appropriate to the type of security.

Tender facilities (OMO/TAF) – cash provided at a price determined in an auction. The risk margins are applied as in the standing facilities.

At the maturity of a loan, obtained through these facilities, the flows reverse.

3 Making liquidity provision systems more robust and scaleable: 2003–2007

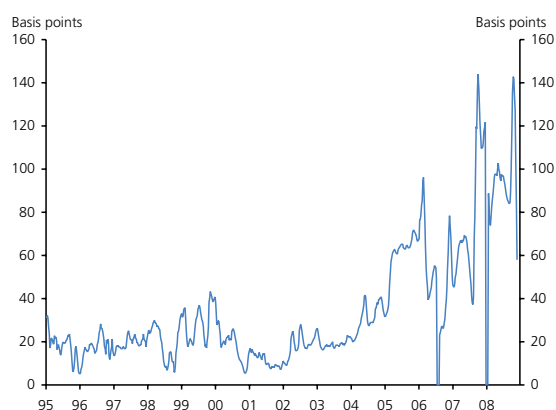
The changes that were effected in 2006 should not be looked at in isolation to the other issues that the Reserve Bank had been working on over some years. For instance, they should be looked at in terms of the wider failure management and prevention work that had been in progress for some years. In particular, the Reserve Bank has for a long period of time worked at implementing measures that reduce risk and enhance certainty in the financial system.⁹

The 2005-06 liquidity management review

Commencing in 2003, a back-to-basics review was undertaken to determine how the Reserve Bank viewed its domestic liquidity management operations. For example, why does the Reserve Bank have domestic market operations? Are they purely for monetary policy implementation purposes? What synergies are there to be gained from these operations and other policy purposes? What are the appropriate market price benchmarks for such operations?

Figure 2

Three-month bank bill versus Treasury bill spread



⁹ The investigations in 2002-03 that the Reserve Bank made into secured lending over mortgages; designation legislation to ensure finality of settlement in payment systems; the consequential designation of ESAS; and the introduction of the New Zealand dollar into the Continuous Linked Settlement (CLS) system are examples that link both risk and liquidity. CLS has been important in assuring that there has been a significant reduction both in risk and need for liquidity. This past year CLS has been critical to the smooth functioning of the world's FX markets. Also see Chan and Irvine (2008) in this edition.

By early 2005, it was clear that a major revision of the Reserve Bank's liquidity operations was necessary. The sign that the prevailing system needed at least partial adjustment was the rising spread between Treasury bills and bank bills (see figure 2). From mid-2005, the spread had risen to over 60 basis points – double the historic norms. Other indicators were failures of tightly timed back-to-back settlements of securities in the payment and settlement systems, which often led to (or were caused by) failed settlement of bond trades and distortions in the bond repurchase market.

The focus of the 2005-06 review was the OMOs. The objectives and constraints borne in mind were: the need for, and level of, a cash target; the impact on monetary policy traction (i.e., the effectiveness of monetary policy transmission through the financial markets); the smooth functioning of the financial markets and provision of intra-day liquidity; the durability of changes to policy; scope of OMO's (i.e., a narrow focus on implementing the OCR, or wider objectives such as facilitating the development of domestic debt markets); the financial risk to the Reserve Bank; the ability to carry on other Reserve Bank business; information gathering; staff training; and implications for the Reserve Bank's balance sheet.

In reaching our conclusion regarding the best way to meet the objectives of the review, we considered a number of factors.

Of concern was the scalability of the system – we needed whatever system that was adopted to be able to grow (and shrink) without being constrained by external factors such as the issuance of eligible collateral by other parties. We were also concerned that it should use liquidity instruments and channels that were used by system participants as part of their normal business. Consideration was also taken of synergies with other Reserve Bank objectives and operations, such as crisis management.

Serious consideration was given to ways of encouraging wider liquidity holdings and the use of supranational ('Kauri') securities, local authority debt, other New Zealand dollar-denominated corporate debt and non-New Zealand dollar-denominated sovereign debt. Credit risk exposure issues and technical difficulties regarding settlement rather than

any objection in principle were the key stumbling blocks to the use of offshore securities. When some commercial banks and issuers of supranational debt approached the Reserve Bank in early 2007, the Bank was already well disposed to facilitating the development of this market.

Similarly, the use of non-New Zealand dollar cash and a variety of other instruments (e.g., overnight swaps) were investigated. On the whole, the same issues as above precluded their use. Some of these issues have now been resolved with the Reserve Bank's membership of the CLS system.

Scalability was a key concern. The primary instrument used to liquefy the banking system through daily OMOs was New Zealand government Treasury bills. Treasury bills were in short supply (the Crown had no need to issue them) and sought after not only by the commercial banks but also by overseas investors, who were not particularly inclined to trade them. Thus the scale of the system was at least partially constrained by the quantity of Treasury bills on issue.

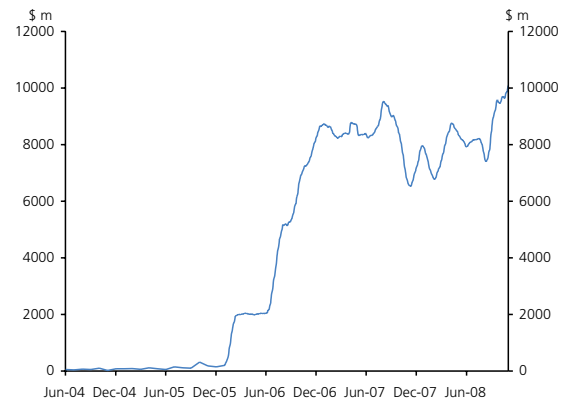
As a result of the review, banks' own demands for cash now determine the overall level of cash in the payment system.

The Reserve Bank provides liquidity in a variety of ways through both open market operations and on demand in the standing facilities. This liquidity is provided at prices linked to the OCR. In the open market operations, cash is injected into the banking system using a variety of mechanisms including FX swaps and loans ('reverse repurchase') – see box 2. Cash balances in the settlement accounts are remunerated¹⁰ at the OCR. Under the previous regime, there was no charge for intraday borrowing secured over acceptable high-quality debt securities such as government bonds. Under the new regime, there is no distinction between intra-day and overnight borrowing, and all borrowing (whether overnight or intra-day) is charged for as if it were overnight.

¹⁰ **Remuneration of balances in the settlement accounts is also known as 'remuneration of reserves' by other central banks. The Reserve Bank of New Zealand does not require a set level of reserves to be deposited with it. There is an expectation that banks hold a variety of liquidity instruments on their balance sheets to enable a bank to cope with a wide range of liquidity crisis events. The Reserve Bank is currently consulting on a proposed liquidity policy that will formalise these expectations.**

As a consequence, non-government securities were to be removed from eligibility in the overnight facility. This was to encourage market participants to borrow from each other rather than the Reserve Bank. In doing so, this ensured that, as a normal practice, the Reserve Bank was not exposed to the banking system.¹¹ There was also an acceptance of a greater tolerance for the variability of the day-to-day settlement cash level due to the Crown's activities (as opposed to those of the Reserve Bank).

Figure 3
Level of settlement cash in the New Zealand payment system

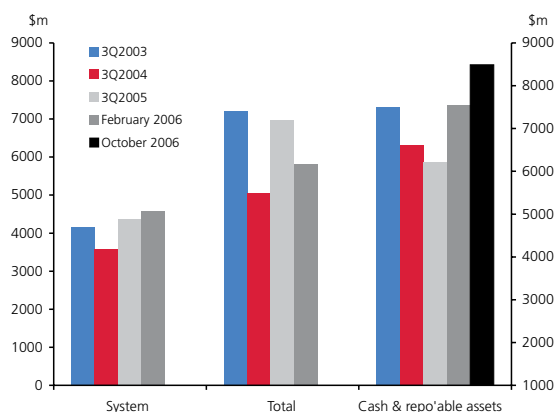


After a period of consultation, the new system was implemented over a three-month period ending in October 2006, with relatively few issues. There were a number of matters that the Reserve Bank monitored carefully; in particular, the revealed demand for cash, whether or not individual institutions held significantly more cash than expected and the willingness of ESAS participants to lend cash to each other rather than approach the Reserve Bank. Because of the flexibility of the new system, the Reserve Bank was also alert to opportunities to make adjustments pre-emptively.

Of concern to market participants (commercial banks, the Treasury and the Reserve Bank itself) was the level of cash in the settlement system. Under the old regime, about \$4,000 million of cash was raised each day in the facilities to enable payments to be made. It was estimated that the likely level

¹¹ **As the Crown's banking crisis resolution agent and regulator of the banking system, the Reserve Bank has a preference to not be already committed to a particular line of resolution management. Being exposed to the banking system on a day-to-day basis can engender moral hazard.**

Figure 4
Capacity for system to raise or utilise cash



Note: 'System' is the peak of the cash raised in the system, 'Total' is the aggregate peak cash raised in the system by each bank, and 'Cash and repurchasable assets' is the total of cash in the system and ESAS participants' holdings of government securities and eligible private sector securities'.

of cash would be about \$7,000 million – but possibly has high as \$10,000 million. Figure 4 depicts the cash usage in the system and the amount of securities and cash held in the system to liquefy it before and shortly after the new system was implemented.

When moving to cash up the system, banks gradually unwound their holdings of Treasury bills and used FX swaps to purchase New Zealand dollars to leave in their settlement accounts. Thus, at least initially, there was a replacement of one type of asset with another in approximately equal amounts. Since the cash was being lent through the FX swap market at rates consistent with the OCR, this was not inflationary. As can be seen in figures 3 and 4, the ability for commercial banks to liquefy themselves improved significantly as the system was cashed up.

There were a number of matters that had been left open; in particular:

- a phased and not disjointed approach to crisis liquidity management;
- a robust method of risk and exposure management that was not discontinuous when moving from normal to crisis conditions;

- linkages to the wider remit of the Reserve Bank to facilitate the development of the New Zealand capital markets;¹² and
- the development of a liquidity policy for the institutions that were supervised by the Reserve Bank.

It was expected that these would be clarified and articulated more clearly as the system became bedded in and the need for any action became more widely appreciated.

The development of the Kauri market

The new system had been operational for about nine months when a number of private sector groups approached the Reserve Bank regarding the acceptance of supranational debt in its operations. From those discussions it became clear that the issuers were prepared to issue the debt on New Zealand registers and have the securities lodged in the Austraclear system.

With this settlement obstacle removed, the Reserve Bank was able to move relatively quickly and announce that appropriately rated supranational securities issued in New Zealand and lodged in Austraclear would be eligible in the Bank's operations.

Another reason that the Reserve Bank was well disposed to encouraging the development of a local market in supranational securities was to broaden the range of liquidity instruments that the domestic banks could trade amongst themselves. With dwindling transaction volumes for New Zealand government securities, there were very few other high-quality instruments available. One possibility that had been considered was local authority securities, but there was (and still is) a lack of depth to the market due to co-ordination issues in that sector.

To give the supranational issuers time to issue, the change in policy was notified in May 2007 for implementation of the acceptance of supranational securities in early September. Within a short period of time, about \$3,000m of securities had been issued. This has steadily increased since then and

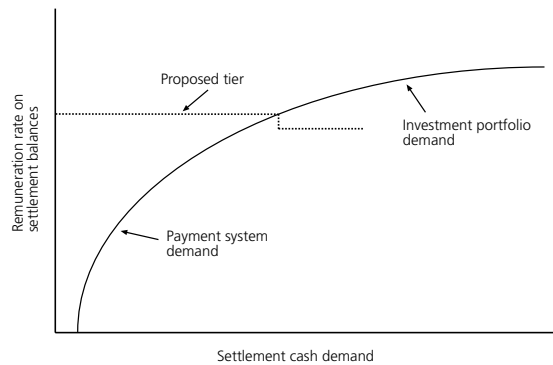
¹² Although there was no explicit remit to facilitate the development of the capital markets per se at that time, there is one now (see RBNZ, 2008b, at p.13).

currently stands at somewhat over \$7,000m. Ownership of the securities has been spread both domestically and internationally, with domestic banks owning a significant proportion.

The introduction of tiered remuneration of settlement balances – encouraging banks to hold a diverse range of liquidity instruments

In principle, there is no reason why the level of cash should not be allowed to rise to accommodate the needs of the financial system. However, the Reserve Bank did not see its role as being that of providing the primary on-call investment needs of financial institutions and the public more generally. The Reserve Bank considered that its role was to satisfy the demand for settlement account balances that were required for payment system purposes. A stylised diagram of the demand for payment system purposes and investment is depicted in figure 5.

Figure 5
Stylised settlement cash demand



We therefore considered a pricing mechanism to discourage holdings of settlement balances beyond those needed for payment system purposes. A number of issues were considered in determining how to tier the settlement account balances; in particular:

- what role does the Reserve Bank have as 'depositor of last resort'?
- the method of discriminating between payment system demand and investment demand – this would be particular to each ESAS participant;

- how to balance the needs of the Reserve Bank, those of the Crown generally and those of payment system participants; and
- what would encourage settlement members to invest in other liquidity instruments.

To assist with this task, the Reserve Bank analysed the payment system flows of each participant for the period 1999-2006. The flows through the CLS system were isolated and analysed separately. From these analyses, a relatively simple method of discriminating between payment system and investment demands was identified.

The price discrimination was determined by the need to balance a penalty rate with the investment rates provided by the Crown for shorter-dated instruments. The penalty rate of 100 basis points below the OCR ensures that the rate offered by the Reserve Bank is not normally competitive with that offered by the Crown. This provides an incentive for ESAS account holders to seek alternative investments for balances that are expected to persist in excess of the allocated tier limit.

This method of tier allocation linked to payment system needs ensures that a bank is allocated an ESAS tier that should satisfy its cash requirements for all but the most extreme circumstances. The Reserve Bank monitors the needs of each bank and formally reviews the entire allocation system annually. To cater for extreme events, banks were expected to hold a range of liquid assets other than cash – that is, assets that can be readily exchanged for cash either with other system participants or, if necessary, the Reserve Bank.

The key attributes of the tiering system as implemented are:

- tier allocation determined primarily by revealed demand and behaviour in the payment system – individually allocated tiers up to \$100 million, \$250 million, then increments of \$250 million to \$1500 million, and in steps of \$500 million thereafter;
- remuneration of settlement account balances at the OCR up to the tier limit and then at 1 percent per annum less than the OCR; and

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- periodic reviews of the appropriateness of an individual bank's tier allocation.

The tiering system and the opening of the liquidity facilities to approved supranational debt issues took place at the end of August 2007.

4 Enhancements to liquidity facilities to address crisis conditions – a question of confidence

When the Reserve Bank was in the final stages of its decisions relating to the ESAS tiering, in the US there were the first significant signs of what was to be a major global financial crisis. By late July 2007, early signs of stress on the New Zealand money market were appearing. The key signs of stress were: elevated overnight rates in London for New Zealand dollars – expressed particularly in the overnight FX swap market; the domestic bank bill market with a fall in volumes offered, and a rise in yields; and widening in the difference between bank bill yields and the market expectation of the future path of the OCR (the 'bank bill – overnight index swap' spread).

The stresses both domestically and internationally all had one thing in common – confidence in the financial system. Confidence in the banks is paramount to a well-functioning financial system. There were no doubts within the Reserve Bank that the New Zealand system was sound, but the growing global panic had created an air of unease in the domestic system. This was compounded by the failures that had occurred in the domestic finance company sector.

There was no need to make any changes to the liquidity system itself. However, to instil confidence that liquidity would continue to be available, the Reserve Bank considered re-accepting domestic bank bills in its overnight standing facility. As a temporary step, the Bank decided to accept bank bills at a risk margin¹³ of 10 percent and a price

of 100 basis points over the OCR. This was, in effect, a secondary discount window that banks could access as a standing liquidity facility. At the same time, the date for introducing remuneration tiering and the eligibility of supranational securities was brought forward to coincide with the acceptance of bank bills. By accepting bank bills, the Reserve Bank was signalling two things:

- confidence in the banks (i.e., a preparedness to accept bank credit risk in its operations); and
- a level of interest rates (i.e., OCR + 100 basis points) above which the Reserve Bank perceived the inter-bank overnight lending rate using bank bills as security to be dysfunctional.

The combination of tiering and acceptance of bank bills had an immediate effect which, broadly speaking, re-normalised the domestic bank bill market. In particular, the bank bill spread to OIS, which had risen to over 80 basis points, fell back to about 30 basis points, some 10 basis points above the more usual level of around 20 basis points. However, the overnight foreign exchange forward market continued to exhibit a degree of dysfunction – in particular, implied overnight rates from the FX market well in excess of those prevailing in the domestic overnight cash market.

The Reserve Bank prefers not to transact in significant volume in the overnight FX forward market, primarily because of the settlement risk involved in these transactions. If the Reserve Bank was more able to transact in that market, it would be better able to address such dysfunctional pricing that is evident there from time to time.

The pressures that arose in August 2007 had not dissipated by early 2008. There continued to be serious disruption to the US and European commercial paper markets. Confidence in the credit quality of a number of institutions was significantly degraded and several major banks in the US and Europe were on the brink of insolvency. At that time, the Reserve Bank commenced more detailed work on planning for a prolonged disruption to global capital markets; in particular, providing back-up for a loss of access by New Zealand banks to offshore funding.

¹³ In repurchase transactions, additional security is usually lodged in addition to the security required to cover the loan. This extra margin is called variously: 'risk margin', 'cover factor', 'cover ratio' and 'haircut', to name a few.

The Reserve Bank's concern was focussed on the high reliance of the New Zealand banking system on the smooth functioning of the overseas capital markets.¹⁴ Despite the banks being fundamentally sound institutions, their lack of access to the offshore markets could eventually cause significant disruption to the New Zealand financial system.

The Reserve Bank released its proposals for consultation in late May. The final details as released were:

- extension of the range of securities eligible for acceptance in the Reserve Bank's domestic liquidity operations to include: New Zealand-registered New Zealand dollar AAA-rated securities, including Residential Mortgage-Backed Securities (RMBS), and AA-rated New Zealand government sector debt – including that of Government agencies, state owned enterprises and local authorities;¹⁵
- the discount margin applied in the Bank's ORRF to be standardised at 50 basis points above the OCR for all eligible securities (i.e., a 'single discount window');
- a graduated risk margin regime ('haircut') to replace the prevailing limit structure for all securities eligible for domestic liquidity operations; and
- extension of the ORRF to allow loans to a maximum maturity of 30 days.

These measures were aimed at bolstering the liquidity of the New Zealand markets in the event of further significant disruption to global markets.

As well as providing a funding channel for the banking system, the Reserve Bank was keen to demonstrate that it was prepared to promote the development of the domestic

debt market by widening the range of eligible securities. Broadening the pool of eligible securities gives comfort to investors that they can liquefy their holdings if necessary (albeit indirectly, through a commercial bank's ability to use the securities to access the Reserve Bank's standing facilities).

Funding the New Zealand banking system

If the New Zealand banks were unable to access the key capital markets for more than a few weeks, there would be serious repercussions for both the banks and New Zealand. The key issue would be to replace the funding that the banks were obtaining from offshore markets.

The Reserve Bank could, in principle, fund the entire banking system. But to do this, and preserve market mechanisms to the extent possible, such funding needs to be over a sufficiently high-quality asset base. Hence, the knowledge gained some five years earlier on secured lending over mortgages proved to be very useful.

The key aspects of facilitating the replacement of offshore funding, if necessary, are:

- availability of securitised mortgage assets;
- a price that encourages banks to seek commercial market funding if it is available;
- tenders to ensure a market-driven price; and
- if desired (though it is not strictly necessary in the current system), the ability to withdraw any excess cash by issuing Reserve Bank securities (i.e. to 'sterilise' the funding flow into the banking system).

It was understood at the time that the decision to accept RMBS was taken that none of the major banks had active securitisation programmes for their mortgages. It was accepted that there would likely be a significant time lag (possibly six months) between the Reserve Bank announcing acceptance of RMBS in its facilities and the commercial banks being able to deliver them. Most of the banks were well placed to make use of the Reserve Bank's facilities that accepted RMBS by late November 2008.

¹⁴ **The high reliance on wholesale funding, in particular from one or two offshore capital markets, has been discussed in *Financial Stability Reports* in the past several years. Also see the discussion in Bedford (2008) in this edition. Although raised as a concern, it would be true to say that few envisaged a situation where there was a co-ordinated freeze in the world's major capital markets.**

¹⁵ **Although these were the securities that the Reserve Bank was readily prepared to extend eligibility to, it was prepared to go further if required. This has subsequently been the case with the acceptance of a broad range of lower-rated credit quality securities, primarily with the aim of supporting the domestic corporate debt market.**

Open market operations typically have maturities of three months or less. Much larger and longer-dated operations are required to provide stable funding for the banking system. To distinguish between the two, the Reserve Bank decided to create a new facility, the Term Auction Facility (TAF), which would specialise in such longer-term funding transactions. This new facility was publicly announced on 7 November, with the first tender held on 12 November (see RBNZ, 2008c).

As at 1 December 2008, the Reserve Bank had undertaken three tenders in the TAF. Through the tenders, some \$3,450 million of medium- and longer-term funding was provided to the New Zealand banking system. In parallel with these tenders, the Reserve Bank has issued \$2,475 million of RB Bills to partially sterilise the impact of this funding on the level of settlement cash.

5 Assessing the coherence of the facilities

The liquidity management system adopted in 2006 provides a robust and stable but flexible framework. As the disruption to the global financial system deepened, the Reserve Bank broadened the eligibility criteria to its facilities and changed the risk framework it uses. Although the recent changes are subject to review once credit markets return to normal, they do indicate the possible shape of future arrangements in the medium term.

The key change that has been made is more to do with the risk framework than the eligibility of securities. The risk-margining approach is more suited to crisis conditions, when provision of liquidity to the system might need to be increased very quickly and in large volume – but that does not mean that there should be a different system during normal times.

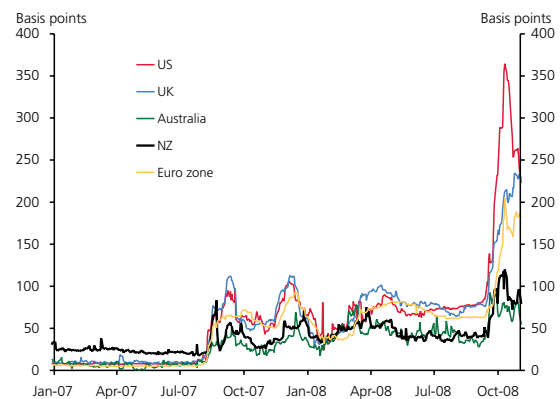
It is possible that when reviewing the recently introduced facilities the Reserve Bank will look to retain a core framework comprising: a cashed-up system, flexible methods of adjusting system liquidity, and a risk margin regime that discriminates between different types of credit exposure.

Robustness of New Zealand's approach to liquidity management

When the current system was introduced in 2006, two of the changes were an acceptance that the Reserve Bank should use as liquidity instruments those assets that were held as a natural part of a commercial bank's business, and that price signals should be used as a primary indicator of what, and where, action needs to be taken.

Typically, in the past 15 months, the Reserve Bank has been able to act pre-emptively to prevent serious disorder from occurring. When we did act, stresses in the form of elevated pricing were clearly evident, but disorder in the form of disrupted liquidity conditions was not.

Figure 6
The difference ('spread') between relevant market rates and expectations of policy rates in Australia, Europe, New Zealand, the UK and US



The cashed-up liquidity system was able to act as a significant buffer for the financial system, absorbing the shock and giving the Reserve Bank the time to act in a considered manner.

The way in which the New Zealand system was able to withstand and adapt to the global situation compares favourably with other systems. After the initial shock in August 2007, the New Zealand dollar inter-bank versus OIS spread has been broadly similar to that of Australia, and significantly lower than that of other markets. It is notable that the relative change in yield spread between bank bills and the OIS has generally been less in New Zealand than in the other key markets we monitor (see figure 6).

6 Conclusion

The past 15 months have been a severe test of New Zealand's financial system. It is not possible at this juncture to determine whether or not the measures put in place have been fully successful, but the early indications are encouraging. The new facilities appear to be operating as intended. New Zealand, like Australia, has been fortunate that its banks were not as exposed to the same problems as the US and European banks. However, as they source significant funds from offshore capital markets, they have experienced serious liquidity pressures as a result of the global credit market turmoil.

The domestic financial system has coped well in this environment, but will need to continue to adapt with the markets. As the Reserve Bank's liquidity management systems continue to evolve, they will be kept relevant to the needs of the financial system, while ensuring that the Reserve Bank's risk is controlled.

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