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# Recent developments in the payment system

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Payment systems have attracted increasing interest in recent years. They provide important linkages between different parts of the financial sector and support economic activity more generally. The weaknesses and risks in a payment system, however, can also pose a threat to financial stability. Accordingly, international and national initiatives to strengthen financial infrastructures have included the payment and settlement 'plumbing' of the financial system. This article outlines key developments occurring internationally and domestically in the payment system arena, including measures affecting the Bank's operational and oversight activities.

## 1 Introduction

In modern market-based economies, day-to-day activity involves many millions of transactions for goods, services and financial assets, the payment for which results in the transfer of money. In New Zealand, a total of around \$35 billion is processed through domestic payment systems on average every business day, equivalent to approximately 30 per cent of the country's annual gross domestic product. This includes payments, large and small, by financial institutions, government, companies and individuals.

The payment system comprises those entities, instruments, rules and procedures which enable financial institutions, businesses and individuals to transfer money from one to another. For participants to have confidence in their ability to effect transactions and access their funds, it is important that the systems are efficient, reliable and secure. Payment mechanisms, however, may both be an origin and channel through which financial shocks can be transmitted across markets and national boundaries. Accordingly, robust payment systems are a core element in maintaining financial stability and it is in the private and public interest to ensure that, in the event of a shock or disruption, any systemic impact is minimised.

Due to the risks a payment system can pose to financial stability, the Reserve Bank's primary interest in the payment system is in its safety and resilience. In particular, the Bank has sought to reduce payment system risk and improve management of the remaining risks. International developments have also focused on measures that aim to promote sound and efficient payment systems.

In addition, technology can have a major influence on payment systems. Changing technology has enabled new financial instruments to be created as well as presenting new ways for financial business to be conducted. Electronic mechanisms, for instance, have enabled financial transactions to be cleared and settled more quickly and efficiently, and have contributed to a higher level of connectivity and financial market integration.

In New Zealand, cash continues to be important for low value transactions and, while there has been little consumer interest in electronic money, there has been a marked shift in recent years from paper-based payment instruments and channels to card and electronic instruments. The majority of New Zealand's non-cash payments, by value and volume, are now conducted electronically, with the high value wholesale payment systems used for the settlement of financial market transactions being fully electronic.

This article considers current developments in the payment system arena. First, it reviews two major international payment system initiatives and the potential implications for New Zealand. Second, we report on the structure and operational changes occurring at the domestic level. Third, the role of the Reserve Bank in the domestic payment system is outlined, together with some specific oversight measures underway. Finally, we comment on some of the issues and challenges looking ahead.

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## 2 International developments

### 2.1 International standards

Internationally recognised standards for payment systems and securities settlement systems have been developed as part of renewed efforts in recent years aimed at strengthening the global financial architecture and reducing systemic risk.<sup>1</sup> The financial crises in Asian and other emerging economies in the late 1990s were the catalyst for much of the recent international financial stability work, but Y2k concerns and the September 11 2001 terrorist attacks in New York further reinforced the importance of robust arrangements that are able to continue to operate during and after unexpected events.

Two sets of standards – the “Core Principles for Systemically Important Payment Systems”, issued by the Committee on Payment and Settlement Systems (CPSS)<sup>2</sup>, and “Recommendations for securities settlement systems”, issued jointly by the CPSS and Technical Committee of the International Organisation of Securities Commissions (IOSCO)<sup>3</sup> – both finalised in 2001, set out high level principles, guidelines and best practices relating to the design, operation and governance of payment and settlement systems. Both sets update and extend earlier standards and both have safe and efficient systems as the underlying public policy objective.

A third international standard relevant to the payment system is the “Code of good practices on transparency in monetary and financial policies”. This code was developed in 1999 by the International Monetary Fund (IMF) to encourage greater transparency of policy frameworks by central banks and other financial sector regulatory agencies.

The standards have been well received by the international payments community and have gone a long way towards meeting their aim of establishing universal principles applicable to a wide range of systems and circumstances.

The CPSS Core Principles comprise ten standards covering legal, financial (credit and liquidity) and operational risk, and risk management, efficiency, access and governance considerations. There are also four recommended responsibilities for central banks.<sup>4</sup> Systemically important payment systems, which are described as systems that are capable of triggering disruptions or transmitting shocks across the financial system,<sup>5</sup> are expected to conform to all ten principles.

The CPSS/IOSCO Recommendations set out parallel standards for the owners, operators and overseers of securities settlement systems,<sup>6</sup> while the payment system aspects of the IMF Transparency Code mainly deal with the transparency and internal governance practices of the agency responsible for overseeing the payment system.<sup>7</sup>

To promote the use of the standards, the IMF and World Bank have developed a surveillance program known as the Financial Sector Assessment Program (FSAP). The FSAP aims to assess countries’ financial systems, focussing particularly on the adequacy of their regulatory frameworks for promoting financial system stability and assessing potential sources of vulnerability. In the case of the payment system assessment, the primary focus is on assessing the level of national observance with the CPSS standards and using the findings to make an overall assessment of the risks and vulnerabilities of the country’s payment infrastructure, identifying and recommending areas of reform.

New Zealand is scheduled to undergo an FSAP assessment later this year.<sup>8</sup> Preparation for the assessment is underway, with the Reserve Bank undertaking self-assessments of the New Zealand oversight arrangements and key payment systems against the CPSS principles. Sections 4.3 - 4.4 in this article present some initial findings.

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<sup>1</sup> See box 1 for a description of the types of risks that can arise in payment and settlement systems.

<sup>2</sup> CPSS is a forum of central bank payment and settlement system experts that meets under the auspices of the Bank for International Settlements.

<sup>3</sup> IOSCO, in turn, is a worldwide organisation of securities regulators, including the NZ Securities Commission.

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<sup>4</sup> Box 2 sets out the CPSS Core Principles and central bank responsibilities.

<sup>5</sup> CPSS (2001b) paragraph 6.6

<sup>6</sup> CPSS/IOSCO (2001) pages 4-6

<sup>7</sup> IMF (1999).

<sup>8</sup> Mortlock and Woolford (2003)

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## 2.2 CLS Bank

A second international initiative, the Continuous Linked Settlement (CLS) system, aims to reduce the risk associated with foreign exchange transactions.

With average daily turnover of around US\$1,200 billion,<sup>9</sup> the foreign exchange market is a major potential source of settlement risk and, more significantly, systemic risk. Foreign exchange settlement risk arises due to the time lag between the execution of a foreign exchange transaction and its confirmed settlement, and consists of both credit and liquidity risks.

The risk gained worldwide attention following the closure of a small German bank, Bankhaus Herstatt, in 1974, when time zone differences meant some counterparties to the bank had paid away one side of their foreign exchange transactions with the bank but were exposed to the full value of the other side.

Since the Bankhaus Herstatt collapse, the international community has worked to better understand and measure the risks involved and to develop measures, such as the CLS initiative and international standards for cross-border multi-currency arrangements, to reduce and contain the risks.

CLS is an initiative by more than 60 international commercial banks expressly designed to reduce foreign exchange settlement risk. CLS Bank acts as a global intermediary in the settlement of foreign exchange transactions. It uses a type of payment-versus-payment facility, settling both sides of a foreign exchange deal simultaneously, by linking the real time gross settlement (RTGS) systems of the currencies involved. This eliminates the risk of one side being paid but not the other.

Although the system settles each trade individually on a gross basis, each settlement member pays the net difference between what it receives in each currency and what it pays out, thereby reducing the liquidity requirements of the system and participants. Settlement occurs during a five hour, real time settlement window (three hours for the Asia/Pacific region) of the overlapping business hours of the participating RTGS systems, providing CLS settlement with the finality and certainty of these systems.

After several years of development and a number of delays, CLS Bank started live operations in September last year, processing actual foreign exchange trades through the system in seven major currencies (the Australian, Canadian and US dollars, British pound, euro, Swiss franc and Japanese yen). By mid-February, the gross value of trades settled had grown to around US\$600 billion per day. The volumes and values are expected to grow steadily as more settlement banks and currencies join the system.

Most of the major banks in the world are CLS members, including the parents of several New Zealand registered banks. Four more currencies (the Danish and Norwegian krone, Swedish krona and Singapore dollar) are due to join the system later this year, and work is also underway to facilitate the entry of the New Zealand and Hong Kong dollars. The local implications of the New Zealand dollar joining the system are discussed in section 3.4 of this article.

The reduction in settlement risk, however, is not without cost. With CLS Bank likely to become a central international facility, increased operational risk arises, related to the level of concentration and interdependencies. By linking the real time payment systems of participating currencies together through CLS Bank, the payment-versus-payment mechanism creates stronger links than previously between national payment systems, with a consequential increase in vulnerability to disruptions and increased importance of robust contingency arrangements.

CLS members' intra-day liquidity management is also likely to be more challenging due to the tight deadlines for payments, and, in many cases, including New Zealand, the deadlines are outside normal business hours.

Central bank oversight of the system has sought to ensure the CLS arrangements are robust and efficient. A particular concern has been the risk of cross-border knock-on effects resulting from problems or delays in one national payment system. Careful attention has been given to the contingency arrangements in place.

CLS Bank is based in New York and subject to banking supervision by the US Federal Reserve. Prior to commencing live trading, CLS Bank required authorisation from the Federal Reserve to begin operations. This involved detailed scrutiny of the bank's risk management and contingency planning

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<sup>9</sup> BIS, 2002

arrangements, assessing in particular the system's compliance with international standards.

For the bank's ongoing operations, the Federal Reserve Board, supported by the Federal Reserve Bank of New York, is the lead overseer, in consultation with the central banks of the currencies settled by the bank.

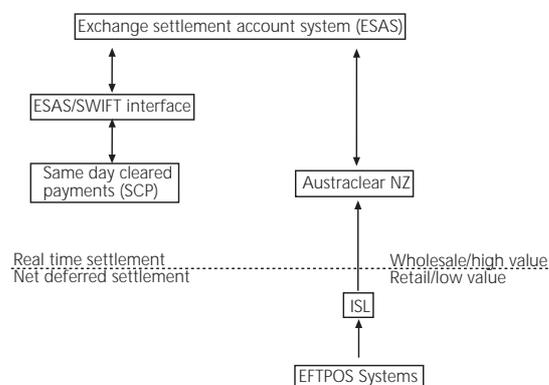
### 3 New Zealand developments

#### 3.1 System overview

At the centre of the New Zealand payment system is the Exchange Settlement Account System (ESAS). ESAS is owned and operated by the Reserve Bank and provides final real time settlement to account holders (all of which are currently registered banks) across exchange settlement accounts at the Bank.

Two interfaces connect to ESAS, passing instructions for

**Figure 1**  
New Zealand payment system



settlement: the Austraclear New Zealand system (AustraclearNZ), which is used for processing securities and funds transfers, and the ESAS/SWIFT interface, which carries instructions directly into ESAS from the Same Day Cleared Payment service (SCP). SCP is used by banks for high-value inter-bank and customer transactions, notably the New Zealand dollar leg of foreign exchange transactions. Instructions received from the systems are settled by ESAS on a real time gross transaction-by-transaction basis throughout the day.

Cheques, ATM transactions, direct debits, electronic credits, and telephone and internet banking transactions are processed by the Interchange and Settlement Limited (ISL)

system. ISL interchanges payment instructions among participants in a batched process each day. The net value of each day's transactions between each pair of participants is calculated and settled at the end of the ESAS day across exchange settlement accounts at the Reserve Bank via AustraclearNZ.

Two EFTPOS systems process domestic credit card and debit card transactions. These systems have some real time elements, but inter-bank positions are settled, together with the ISL transactions, on a net end-of-day basis through ESAS.

The retail systems (ISL and EFTPOS) typically handle low value, high volume payment instructions. These systems process the vast majority of payments made through the New Zealand payment system by number (estimated to total over 3 million per day) and account for around 10 per cent of the total value processed.

Payments through the wholesale systems tend to be high in value but much lower in number. The wholesale part of the payment system accounts for over \$30 billion of the daily value of transactions but less than 1 per cent (around 3,000 on average) of the total number of daily transactions processed each day through the domestic infrastructure.

The last two years have seen some notable developments in the structure and operations of the domestic payment system, with some quite significant changes planned to occur over the medium term. Some of the more important developments are discussed below.

#### 3.2 Decommissioning of SRM and introduction of the ESAS-SWIFT interface

In October 2001, the banking industry decommissioned the Settlement Request Manager (SRM) system, which had been used to monitor and manage liquidity and payment transactions prior to settlement. At the same time, the Reserve Bank introduced the ESAS/SWIFT interface. As part of the changeover, the Bank took over the arrangements which allow SCP participants to pass SWIFT messages amongst themselves with a copy being sent to ESAS for settlement. Enhancements were also made to ESAS to allow that system to replicate the liquidity monitoring functionality available in SRM.

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Decommissioning SRM and introducing the ESAS/SWIFT interface simplified the payment system infrastructure. The changes averted the need for a potentially costly upgrade of SRM and delivered a reduction to the overall costs of processing RTGS transactions. In addition, the new interface between ESAS and SWIFT provides functionality required for the settlement of foreign exchange transactions in a CLS environment.

### 3.3 Austraclear New Zealand system

In our December 2000 *Bulletin* article we referred to negotiations underway between the Reserve Bank and Austraclear Limited regarding the proposed relinquishment by the Bank of the license to operate AustraclearNZ. At the time, the Bank also intended to separate the ESAS functionality completely from that required to operate the AustraclearNZ system, so that ESAS could operate on a "stand alone" basis. Currently, the two systems operate off a common operating platform and shared software.

In March 2001, negotiations for the relinquishment of the operating licence for AustraclearNZ came to an end, with the Bank and Austraclear Limited unable to agree the terms for relinquishment. At the same time, Austraclear Limited and its new parent, SFE Corporation Limited, gave notice that they would cease to provide software support and development services for the AustraclearNZ and ESAS systems from the end of 2002. Datacom Systems (Wellington) Limited now provides these services to the Bank.

The Reserve Bank is one of the few central banks that provide depository and settlement services for wholesale financial markets. Typically these services are provided by public companies or entities which are owned by institutions that actively transact in financial markets.

The Bank does not regard the provision of depository services to be a core central bank activity, but has undertaken to continue to be the operator of the AustraclearNZ system and to keep the system supported until an acceptable new system and system operator offers comparable services to the New Zealand market. A replacement system would be expected to allow open access on competitive terms, be legally, financially and operationally robust, and be acceptable to market participants.

However, the provision of ESAS and exchange settlement accounts to financial institutions is considered to be a core central bank activity and the Bank expects to continue to provide ESAS services for the foreseeable future.

The AustraclearNZ system has operated since 1990 and ESAS since 1998. The systems continue to be functionally sound and secure, but the technology base is now some years old and no longer state of the art. During the first half of 2003, the Bank and Datacom intend to undertake a feasibility study to assess the cost, risk and time implications of implementing an upgrade of some of the software underlying those systems. This is expected to be conducted in consultation with users of the system.

### 3.4 CLS Bank and the New Zealand dollar

With RTGS systems now well established in New Zealand, the main area of wholesale market risk that has still to be addressed is foreign exchange settlement risk. As noted above, this risk arises as the result of timing differences between the paying and receiving of foreign currency transactions, due to time zone and settlement system differences, and can pose substantial risks to parties actively engaged in foreign currency markets.

A survey by the Bank in 2000 on foreign exchange settlement risk<sup>10</sup> indicated that the foreign exchange settlement exposures of New Zealand banks active in the foreign exchange market are potentially very large and can last for an extended period. In some cases, individual bank exposures exceeded that bank's total capital for several hours each day. Foreign exchange settlements were spread over 20 currencies, though they were principally in US and NZ dollars where the time zone differences can be up to 18 hours.

Key among the measures being adopted to better manage and reduce this risk is a joint project by the Reserve Bank and major banks to facilitate the entry of the New Zealand dollar to CLS Bank, possibly as early as 2004, and to ensure the industry is ready for the changes involved. In-principle endorsement of the New Zealand dollar by CLS Bank as an eligible currency in CLS has been received.

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<sup>10</sup> Rodgers (2001)

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Specific criteria to be satisfied for CLS inclusion include a well designed and reliable national RTGS system with overlapping hours with CLS Bank, a robust legal framework, particularly with respect to payment finality, and an effective domestic money market with adequate liquidity providers.

The development of an interface between SWIFT and ESAS, noted earlier, and now in place, provides the functionality to connect CLS Bank and ESAS. Other required system changes to ESAS are relatively minor. Later this year, for instance, the Reserve Bank expects to merge the interim and final end-of-day processes so that ESAS is available continuously from the start of its day at 9am until the close of its day, currently at 8.40am the following business day.

Other requirements to achieve CLS readiness include resolution of legal matters and possible liquidity enhancements. For the former, the Reserve Bank has proposed changes to existing legislation to provide greater certainty over the legal status and finality of payments made within designated payment systems in a winding up or statutory management situation (outlined in section 4.2 of this article).

To address liquidity concerns, the Reserve Bank has agreed to an industry request to amend certain processing rules within ESAS in order to increase the efficiency of the payment process in ESAS and to positively influence system liquidity. The Bank is planning for the introduction of what is known as Auto-Offset and Top-Down Looping to replace the current strict application of First-In First-Out (FIFO) processing of payment instructions queued for settlement. Auto-Offset allows payments between two payers in ESAS to be settled simultaneously. Unlike FIFO, Top-Down Looping allows instructions to be settled ahead of another instruction that has been authorised at an earlier time but is unable to be settled.

There will also need to be changes in the hours the banks operate their ESAS accounts. CLS transactions will generally be processed between 5pm and 11pm (New Zealand time) depending on the operation of daylight saving in both New Zealand and Europe. In addition, there will likely be a consequential impact on the hours that the AustraclearNZ system will be available for settlement of securities transactions. This reflects the interdependency between

funding (via foreign exchange transactions) and securities purchases, and the high proportion of securities market settlements that involve offshore investors. The Reserve Bank has started a consultation process in order to determine what impact CLS will have on the AustraclearNZ hours of availability.

The intention is to advance the major elements sufficiently to enable a formal decision on entry of the New Zealand dollar to CLS, and likely timing, to be made in the near term.

## 4 Payment system oversight

### 4.1 Reserve Bank objectives

The Reserve Bank has both an oversight and operational role in the payment system. The operational activities include the operation of ESAS, including the ESAS/SWIFT interface, and AustraclearNZ, managing the banknote and coin issue in New Zealand and providing exchange settlement accounts to financial institutions.

The Bank's payment system oversight role is closely related to its responsibilities arising from its bank supervision role. Both aim to promote the maintenance of a sound and efficient financial system. Accordingly, the Bank focuses on the prudential and systemic aspects of the payment infrastructure, particularly the identification, reduction and management of payment system risks. Matters relating to competition and pricing of proprietary systems are subject to the same general competition policy and consumer protection laws as for other industries.

The Bank's principal oversight objectives in relation to the payment system have been in place for some years and are to:

- ensure that payment system risks are reduced to acceptable levels, and are managed appropriately by system participants;
- ensure that the payments system can continue to operate without disruption in the event of the sudden withdrawal of a participant from the system, or following other types of financial crisis, or following natural disasters, etc;
- encourage movement towards delivery-versus-payment

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arrangements in all financial markets, especially with respect to high value transactions;

- help ensure that the status of payments is certain at all times, and, in particular, that the legal environment supports “finality” and “irrevocability” in payment instructions;
- encourage banks and others to offer efficient, reliable and relevant payments services to their customers; and
- maintain an open, flexible and competitive system, and ensure that no unwarranted entry or operational barriers exist.

These overlap to a significant degree with the CPSS Core Principles. The six objectives, supplemented more recently by the Core Principles, are used by the Bank to guide its thinking and policy stance on new initiatives and enhancements in payment systems. The approach to date has been to make progress through a combination of co-operation and consultation with the industry and through the Bank’s ownership and operation of ESAS and AustraclearNZ.

Progress on a number of the objectives has been achieved. A significant reduction in domestic credit risk and greater certainty occurred with the introduction of RTGS in 1998 and delivery-versus-payment in AustraclearNZ. Legislation on netting and payments finality, passed in 1999, clarified the legal status and enforceability of defined netting arrangements, and ensured greater certainty with regard to payments finality.

More recently, work by the banking industry, in collaboration with the Reserve Bank, is well advanced on strengthening the failure-to-settle arrangements in the ISL retail payment system. The work aims to clarify and update the legal, financial and operational arrangements to apply should a system participant fail to meet their payment obligations, and will give greater certainty, in the event of disruption, to the treatment of payments in the system.

A project is also underway on the requirements for the New Zealand dollar to enter the CLS arrangements to reduce foreign exchange settlement risk, and legislative changes to formalise the Bank’s oversight responsibilities are currently being considered by Parliament.

## 4.2 Oversight legislation

In overseeing the payment system, the Bank has operated under an indirect mandate to date, derived from its legislative responsibility to advise on financial sector policy and to promote the maintenance of a sound and efficient financial system.

To improve the transparency of its oversight, a formal authority for overseeing the payment system has been included in the Reserve Bank of New Zealand Amendment Bill presently before Parliament. A new part, Part VB - Oversight of the payment system, has been introduced, formally setting out the Bank’s payment system objectives and powers.

If enacted in their present form, the provisions in Part VB will give the Bank explicit powers aimed at promoting the robustness of the payment system and maintaining a sound and efficient financial system. This systemic focus is consistent with the Bank’s statutory responsibilities relating to the registration and prudential supervision of banks. The proposed powers, however, are more limited than those for the supervision of banks and do not, for instance, include regulation-making or direct intervention powers.

Payment systems are defined in the Bill as systems used for the interchange, clearance or settlement of financial transactions. This is a relatively broad definition that aims to be robust over time and unaffected by changing technology and organisational arrangements.

Formal information collection and publication powers have been included to promote public understanding of the payment system and to build on market disciplines to maintain and strengthen payment system risk management and infrastructure arrangements and, in particular, to be able to highlight areas of specific concern. Safeguards concerning the use of the information have also been proposed, together with audit and offence provisions.

The provisions essentially codify the existing arrangements. No major change to the Bank’s mode or method of oversight is anticipated.

In addition, a second new part, providing for the designation of payment systems, has been submitted for inclusion in the Bill. The proposed provisions aim to provide a mechanism

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to remove legal uncertainties associated with transactions effected through payment systems, particularly those associated with the settlement of foreign exchange transactions (involving cross-border flows and jurisdictions) and the netting arrangements in payment systems. As currently drafted, designation would provide finality for the settlement of instructions and payments that are effected through a designated system, and make netting under the rules of a designated system valid and enforceable in the event of insolvency.

The designation provisions are proposals at this stage and subject to the formal legislative process.

### 4.3 Compliance with the Core Principles

The CPSS Core Principles focus on 'systemically important payment systems'. While many payment systems in a country may be important to their users and for the smooth flow of payments, the considerations used to determine if a payment system is systemically important centre on the value and nature of the payments processed by the system, and notably whether the system:

- is the only payment system in the country, or the principal system in terms of aggregate value of payments;
- handles mainly payments of high individual value; or
- is used for the settlement of financial market transactions or for the settlement of other payment systems.<sup>11</sup>

The two payment systems operated by the Reserve Bank, ESAS and AustraclearNZ, both meet the above criteria. ESAS is the core payment system in New Zealand in terms of the aggregate value of payments and settlement finality, while AustraclearNZ handles mainly wholesale high value payments, and is used for the settlement of financial market transactions and for the settlement of other payment systems.

SCP also handles high value payments. However, it is more in the nature of an intermediate facility, using the existing SWIFT and ESAS infrastructure to effect payment between participants. Nevertheless, the Bank sees value in all system owners and operators assessing their systems against

international standards, either independently of, or in collaboration with, the Bank and to use the findings as a guide for future enhancements.

Self-assessments by the Bank of the two systems it operates indicate a high level of compliance with the CPSS principles.

*Core Principle I* aims to minimise legal risk. It specifies that the legal framework should be well defined, setting out the rights and obligations, in normal and adverse circumstances, of each party involved, and that the rules and procedures of a system should be enforceable and their consequences predictable.

New Zealand has a well established general legal framework, encompassing contracts, banking, insolvency, and since 1999, netting and payments finality. System-specific terms and conditions relating to ESAS and AustraclearNZ and the rights and obligations of the parties involved are set out and agreed in a formal contract with participants. New Zealand law applies. Additional legislation is proposed (outlined above) to give greater certainty to the law relating to payment finality.

*Core Principles II and III* deal with financial risks (credit and liquidity risks) in a system. They require that participants have a clear understanding of the risks they run as members of the system, and that there are appropriate incentives and means to contain and manage the risks.

The rules and procedures for ESAS and AustraclearNZ are comprehensive, up to date and publicly available.<sup>12</sup> The responsibilities and obligations of participants and system operator are clearly defined. The rules cover settlement and irrevocability of payments and day-to-day arrangements, as well as failure-to-settle and other abnormal events. The financial risks to participants are low. Both systems provide real time gross settlement, with inter-bank settlement across Reserve Bank accounts. Participants have access to real time information on their account balance and payment flows, and liquidity requirements are managed via a formal repurchase facility provided by the Bank.

*Core Principles IV, V and VI* consider the settlement process, its timeliness and certainty. Settling payments promptly using

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<sup>11</sup> CPSS (2001b), paragraph 6.9.

<sup>12</sup> [www.rbnz.govt.nz/payment/](http://www.rbnz.govt.nz/payment/)

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low risk assets reduces the risks to which participants are exposed.

The minimum suggested standard for final settlement is for settlement to occur not later than the end of the day of value, with a goal that at least one system provides real time final settlement during the day of value. Both ESAS and AustraclearNZ provide settlement for payments on a continuous, real time basis throughout the business day and the settlements are final and irrevocable. This exceeds the Core Principle IV minimum standard and meets current best practice.

The settlement asset used by both systems is account balances at the Reserve Bank, satisfying the preferred asset recommendation under *Core Principle VI*. Central bank claims are preferred for risk minimisation reasons as they carry no significant credit or liquidity risks and are acceptable to all participants. ESAS settles payment instructions by debiting and crediting participants' accounts at the Reserve Bank. Similarly, settlement between AustraclearNZ participant banks is in central bank money across Reserve Bank accounts. Settlement between non-bank participants of AustraclearNZ that are customers of the same bank occurs across AustraclearNZ system accounts.

*Core Principle V* concerns settlement risk in a multilateral netting system (where settlement occurs on a net basis among several participants, typically at the end of the day) and aims to ensure the system can withstand the failure of the largest participant. If a participant in this type of system fails to settle its obligations, the other participants can be exposed to large and unexpected risks, which may result in systemic shocks if not contained.

The standard does not apply to RTGS systems, such as ESAS and AustraclearNZ. AustraclearNZ, however, provides for multilateral netting as a contingency arrangement, to be used when real time gross settlement is not available. Should multilateral netting be required, the AustraclearNZ rules set out the netting and settlement arrangements to apply (including loss sharing procedures). The arrangements are legally sound and designed to spread any loss equitably, based on participants' activity levels, in order for the system to be robust to the failure of the largest participant.

Operational risk is addressed by *Core Principle VII*. The standard requires a system to have a high degree of integrity and operational reliability, including effective backup and contingency arrangements.

ESAS and AustraclearNZ have proven operating records, with very low levels of downtime, and the systems are operated by trained and knowledgeable staff. Backup and contingency arrangements have been developed by the Bank in consultation with participants. The arrangements are documented and tested regularly. However, the technology of the systems is ageing, and a project is underway to review the medium-term options for updating or replacing the system.

*Core Principle VIII*, dealing with system efficiency, is probably the most subjective of the ten principles to assess, involving a balance between minimising resource costs and maximising safety. An extremely safe but costly system may, for example, result in users preferring other less costly but riskier systems.

By international standards, ESAS and AustraclearNZ look to be cost effective, reliable and practical for users, and the systems are well accepted and used by participants. Transparent pricing methodologies are applied. Indirect costs, such as the cost of acceptable securities for the liquidity facility, are more difficult to assess. To minimise the indirect liquidity costs, funds received are immediately reusable and parameters in the ESAS liquidity mechanism allow participants a high degree of flexibility and choice.

*Core Principle IX* addresses access and competitive aspects. It calls for the criteria for participation to be objective, open and publicly disclosed and for any restrictions to be based on appropriate risk criteria. This formulation recognises that the efficiency benefits from an open competitive system may need to be balanced with the potential risk of new participants.

The participation criteria for both ESAS and AustraclearNZ are publicly available and aim to facilitate access for institutions providing financial services where there is a business demand or need for settlement at a wholesale level. System rules and procedures provide for the entry of participants and for the withdrawal, suspension or termination of membership.

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The final *Core Principle, X*, considers a system's governance arrangements, particularly the relationships between stakeholders, and the incentives and accountabilities for management.

In the two Bank systems, clear structures and accountabilities are in place, reporting to the Deputy Governor of the Bank. System performance is closely monitored and regular external audits are conducted. Information on the systems is available and up to date, and users are consulted on, and advised of, decisions affecting the operation of the systems. AustraclearNZ user group meetings are held six monthly.

An internal assessment of the AustraclearNZ System against the 19 CPSS/IOSCO securities settlement systems recommendations is also underway. The preliminary assessment indicates a high level of compliance but not full compliance. Of note, the system does not currently meet recommendation 16 on international communication procedures and standards. A full assessment is planned over the coming year and the results will be used to guide the Bank's decisions on future system developments and priorities.

#### 4.4 Central bank responsibilities and the Core Principles

The Core Principles report also identified four specific payment system responsibilities for central banks. Central banks are considered to have a leading public policy role because of their interest in financial stability, their role in providing settlement accounts for payment system participants and their reliance on functioning money markets for implementing monetary policy.

*Responsibility A* focuses on the transparency of the central bank's oversight role and policies.

To date, the Reserve Bank has described its objectives and role in the payment system in official publications, such as articles in the Bank *Bulletin*, information on its website, and press releases on significant developments. More recently, legislation has been introduced, but not yet enacted, to formalise the Bank's oversight mandate and powers (outlined in section 4.2). We have chosen not to differentiate between systemically important payment systems and other system-wide payment systems. While the major measures of the

past few years have tended to focus on the design and operation of the high value wholesale systems, other measures, such as the netting legislation and system consultations, apply across the board.

*Responsibility B* seeks to ensure the systems a central bank operates comply with the Core Principles or that an action plan is in place to achieve compliance within a reasonable time period.

The Bank believes the two systems it operates achieve a high level of compliance with the ten principles. Where a clear assessment can be made (such as for Core Principles IV and VI), the compliance is full. Assessing compliance with the other principles is more subjective and requires judgement, and the planned FSAP should provide independent guidance on this.

*Responsibility C* extends the central bank's role to include overseeing compliance of other systems with the Core Principles. While the designers and operators of systems bear the primary responsibility for compliance, Responsibility C focuses on the central bank's oversight – the effectiveness of the oversight framework, the tools and actions.

In the Reserve Bank's case, action is underway to replace the current indirect regime with an explicit statutory authority and power to oversee payment systems. The planned information collection and disclosure powers will give the Bank a formal mechanism to review and highlight areas of concern, and encourage actions to remedy deficiencies. However, the Bank will not have the authority to impose regulatory requirements on payment system operators.

The final central bank responsibility, *Responsibility D*, calls for cooperation among the authorities that have an interest in financial stability. Complementary payment system oversight, supervision of banks and market surveillance is considered to be particularly important.

In New Zealand, a Financial Regulators' Co-ordination Group, comprising representatives from the Bank, the Securities Commission, Registrar of Companies and Government Actuary, meets regularly to share information and discuss current and planned developments. The Bank also participates in regular meetings with regional central banks on national and international developments in payment

systems and contributes to payment system discussions on an ad hoc basis with other overseas authorities.

Notwithstanding the above, there will invariably be scope for improvement in the design and operation of the existing payment systems and in the Bank's oversight, due in part to technological and other developments and to advances in our understanding of the risks and of international best practice. The FSAP assessment by external reviewers later this year, for instance, is expected to extend the self-assessments conducted by the Bank and should contribute to a broader understanding of the strengths and weaknesses of our payment system.

## 5 Future developments and challenges

There is a full work agenda on payment system issues for the Reserve Bank and payments industry. In the coming year, new legislation concerning the payment system is expected to be passed, an FSAP review against international standards conducted, and a decision made regarding the New Zealand dollar and CLS. Operational changes are also expected, and international anti-money laundering requirements may put additional obligations on the payment system.

Overlaying the known agenda are dynamic markets and technologies and the implications these may have for the structure and mode of payments and their systems. Technology improvements have the potential to contribute to the reduction of risks, and open the way for innovation, greater choice and improved efficiency. They can also shift and transform the existing risks. Understanding the implications of changes is critical. Increasing cross-border links, for instance, will test legal frameworks and lead to a greater level of standardisation and integration among systems and markets.

It is certain the payments infrastructure will continue to develop and evolve. The Reserve Bank, for its part, will continue to monitor developments and, together with the industry, seek measures to encourage the development of robust systems that function smoothly and effectively and are able to absorb and manage shocks.

### Box 1 Financial system risks in payment and settlement systems<sup>13</sup>

**Credit risk:** the risk that a counterparty will not settle an obligation for full value either when due or at any time thereafter.

**Custodian risk:** the risk of loss of securities held in custody due to the insolvency, negligence or fraudulent action of a custodian or of a sub-custodian.

**Foreign exchange settlement risk:** the risk that one party to a foreign exchange transaction will pay the currency it sold but not receive the currency it bought.

**Legal risk:** the risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced.

**Liquidity risk:** the risk that a counterparty will not settle an obligation for full value when due, although it may be able to do so at some time in the future.

**Operational risk:** the risk that deficiencies in systems or internal controls could result in unexpected losses and cause or exacerbate credit and liquidity risks.

**Systemic risk:** the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations, or a disruption in the system itself, could cause other participants or financial institutions to be unable to meet their obligations when due. Such a failure could cause significant liquidity or credit problems and, as a result, could threaten the stability of the system or of financial markets.

<sup>13</sup> Derived from CPSS (2001a)

**Box 2**  
**Core Principles for Systemically Important Payment Systems<sup>14</sup>**

**The Core Principles and central bank responsibilities**

Public policy objectives: safety and efficiency in systemically important payment systems.

**Core Principles for systemically important payment systems**

- I The system should have a well-founded legal basis under all relevant jurisdictions.
- II The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.
- III The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.
- IV\* The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.
- V\* A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participants with the largest single settlement obligation.
- VI Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

- VII The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.
- VIII The system should provide a means of making payments which is practical for its users and efficient for the economy.
- IX The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.
- X The system's governance arrangements should be effective, accountable and transparent.

**\* Systems should seek to exceed the minima included in these two Core Principles.**

**Responsibilities of the central bank in applying the Core Principles**

- A The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.
- B The central bank should ensure that the systems it operates comply with the Core Principles.
- C The central bank should oversee compliance with the Core Principles by systems it does not operate and it should have the ability to carry out this oversight.
- D The central bank, in promoting payment system safety and efficiency through the Core Principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

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<sup>14</sup> CPSS (2001b).

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