The Evolution of Interbank Settlement in Australia

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Abstract

Electronic payments are ubiquitous in modern economies and result in financial obligations between different financial institutions. These interbank obligations need to be settled in a way that is safe and efficient to promote the stability of the Australian financial system. In Australia, interbank settlement is performed in the Reserve Bank Information and Transfer System (RITS), which is owned and operated by the Reserve Bank. Since the introduction of real-time gross settlement services in 1998, the functionality of RITS has continued to evolve in line with payment innovations and the increasing importance that electronic payment systems play in supporting economic activity in Australia. This article considers key moments in this evolution as well as potential future developments.

Introduction

Interbank settlement resolves the financial obligations created between institutions when consumers, businesses and the government make payments in the economy. Each day, around \$200 billion worth of these payment obligations are processed. In Australia, interbank settlement is performed in the Reserve Bank Information and Transfer System (RITS) through the simultaneous debiting and crediting of Exchange Settlement Accounts (ESAs) that banks and other eligible financial institutions hold with the Reserve Bank. As the funds used to settle the obligations are issued by the Reserve Bank (central bank money), it provides a risk-free method of settlement with finality.^[1]

The introduction of real-time gross settlement (RTGS) in 1998 was a key milestone in the evolution of Australia's payments settlements infrastructure (Gallagher, Gauntlett and Sunner 2010). Prior to this, settlement of non-cash payments was completed on a net basis in 'batches', including for large-value payments. This meant that processes to tally up what was owed were undertaken at the end of the day, with settlement of the resulting obligations carried out in a batch at 9:00 am the next morning. This often resulted in banks accumulating large obligations to each other – and if, for any reason, these obligations could not be met at settlement, institutions might have faced liquidity and solvency risks. RTGS introduced the irrevocable line-by-line settlement of wholesale (large-value) and other time-critical payments in real time, thereby reducing the build-up of settlement risk in the payments system.

Although RTGS meant that wholesale payments were now settled in a timely and effective way, most low-value transactions (generally related to retail payments) continued to be settled on a deferred 'net' basis. The associated settlement risk was considered acceptable because of the relatively lower exposures involved, which were reduced further through netting. Netting allows obligations arising from numerous payments to be combined and offset across several banks, using Exchange Settlement (ES) balances more efficiently than lineby-line settlement. Settlement arrangements for low-value payments have also changed considerably over time to support an evolving payments landscape. Key additions include sameday settlement for direct entry payments (such as direct debits, 'pay anyone' transactions and bulk payments like salaries and bills), enhanced batch arrangements for card payments and new

functionality enabling electronic property settlement.

Further, in 2018, the Fast Settlement Service (FSS) was introduced as an additional service of RITS to support the 24/7 operation of the New Payments Platform (NPP), expanding the use of real-time settlement functionality to low-value retail payments.

This article reviews key changes to interbank settlement in RITS since 1998, covering both RTGS and net settlement methods, and considers some potential future developments.^[2]

The evolution of RITS functionality

The introduction of RITS

When RTGS was introduced in 1998, the RITS environment was designed around the then prevailing needs of Australia's payments system, which were less complex than they are today. At that time, four core transaction types could be settled on an RTGS basis, two of which originated from external 'feeder systems' (Figure 1).

SWIFT payments were submitted to RITS via the High Value Clearing System and included customer payments, foreign exchange settlements, correspondent banking flows and the Australian dollar leg of cross-border payments.^[3] The Austraclear feeder system facilitated the secure exchange of cash and debt market securities in

Net Settlement



Real-time Gross Settlement

Figure 1: Interbank Settlement in 1998

Australia, including private sector and state government debt securities and other money market instruments.^[4] Cash transfers could be entered directly into RITS by members and were primarily used for transacting in the overnight interbank cash market or in contingency scenarios. These three wholesale transaction types are still in use today. Prior to their migration to the Austraclear system, Commonwealth Government Securities were the fourth transaction type and were directly entered and settled in RITS.

In addition to wholesale transactions, retail payments were settled on a net basis in a single deferred '9am Batch'. This included retail card payments, non-government direct entry, BPAY, ATMs, Medicare refund transactions and cheques. Equities transactions processed through the ASX Limited's Clearing House Electronic Subregister System (CHESS) were also settled separately on a net basis around midday each business day.

The first decade

In the decade following the introduction of RTGS, functionality in RITS remained broadly unchanged, consistent with the settlement needs of domestic payment systems and the ongoing prominence of cash and cheque use. One notable development over this period was the introduction of Continuous Linked Settlement (CLS) in 2002, which facilitates settlement of bought and sold currencies in foreign exchange transactions. CLS connects participating national RTGS systems during a common 'funding and settlement period' when it settles foreign exchange transactions across multi-currency accounts that participants hold with CLS Bank International. This change required RITS operating hours to be extended to overlap with those of CLS members, enabling participating banks to settle foreign currency obligations in a way that greatly reduces foreign exchange settlement risk (RBA 2015).^[5] In the same year, Austraclear became the central electronic depository and settlement system for Commonwealth Government Securities, meaning that securities settlement and depository functionality in RITS could be decommissioned.

The second decade

In the second decade after RTGS was introduced, there were significant changes to RITS to support increasing innovation in electronic payment methods.^[6] These changes involved creating new settlement arrangements in RITS, which moved value previously settled in the 9am Batch to separate batches or the FSS (Figure 2). The key changes were:

- In 2013, the RITS Low Value Settlement Service (LVSS) replaced previous arrangements for the 9am Batch and introduced five intra-day batches to enable the same-day settlement of direct entry payments. This made it possible for bulk payments (such as payroll and dividends) and pay-anyone transactions to be made and received on the same day, although the sameday availability of funds to customers tends to vary between financial institutions. Related changes included the further extension of RITS operating hours and new liquidity arrangements to accommodate the settlement of these obligations later in the day.
- In 2018, the FSS was introduced as an additional service of RITS for the settlement of payments originating from the NPP. The FSS has enabled the 24/7 settlement of many lower-value retail payments on an RTGS basis, which were traditionally settled as direct entry payments on a deferred net basis.

While net obligations settled via the LVSS are calculated in RITS, obligations settled through externally administered batches are calculated outside of RITS by an approved third party. There have been several external batches added to RITS over the past decade:

 In 2014, a separate, externally administered batch for Mastercard payments was introduced, which moved settlement of these obligations out of the 9am Batch. This replaced the previous arrangement where a commercial bank acted as the settlement agent for Mastercard transactions. The newly introduced Mastercard batch also provided more timely settlement than the previous arrangements, bringing



Figure 2: Interbank Settlement in 2022

forward the transfer of funds between participating institutions by one day.

- Also in 2014, new RITS functionality enabled the safe and prompt electronic settlement of multiparty property transactions by linking the cash settlement and title transfer processes (De Freitas and Fitzgerald 2021). Payments related to a property transaction, such as a sale or refinancing, are now mostly settled on a net basis in near real-time. Property Exchange Australia Ltd (PEXA) was the first batch administrator for property settlement to commence operations in RITS.
- In 2017, as part of eftpos Payments Australia Ltd's move to centralised processing of eftpos card payment obligations, a new externally administered batch was introduced, moving settlement of these obligations out of the 9am Batch.
- In 2019, ASX Financial Settlements Pty Ltd (ASXFS), on behalf of network operator Sympli Australia Pty Ltd, became operational as the

second external property settlement batch administrator.

RITS membership has expanded

Broad-based access to settlements infrastructure like RITS promotes competition and innovation in payments services. RITS membership expanded from 54 ESA holders in 1999 to 101 in 2021 reflecting a range of factors including new foreign banks entering the Australian market and an increase in the number of domestic entities classified as banks (Graph 1).^[7] ESA applicants must meet certain eligibility criteria, which have been updated to cater to the modern and more diverse payments industry.^[8] In recent years, a range of non-bank entities – including money remitters, card acquirers and third-party payment providers – have expressed increased interest to operate an ESA.

Agency arrangements were introduced in 2003 to reduce the operational demands for smaller financial institutions of settling their own RTGS payments, allowing these members to settle payment obligations through 'agent' members (i.e. other financial institutions or service providers) (RBA 2021b). While the total number of ESA holders has grown steadily since 1999, many of these use agents to settle their payments such that the number of ESA holders settling payments directly ('active' members) has increased at a slower pace, from 54 to 62, over the same period. Reflecting the trend to broader participation in settlement, the share of total value settled by the four major banks in RITS decreased from around 62 per cent in 1999 to 49 per cent in 2021.

RTGS settlements reflect economic and financial activity

Since the introduction of RTGS in 1998, around 90 per cent of interbank value settled per day has been completed in real-time. In 2021, RITS settled an average \$176 billion of RTGS payments each day (excluding FSS) (Graph 2). The average daily volume of RTGS settlements increased fairly steadily prior to the COVID-19 pandemic, by around 6 per cent on average each year from 1999 until 2019. The main driver of volume growth was an increase in lowervalue SWIFT payments, the majority of which are between customers of financial institutions, including the Australian dollar leg of cross-border payments. Lower-value SWIFT payments have increased five-fold over the last two decades. In 1999, SWIFT payments with a value below

\$100,000 accounted for 43 per cent of RTGS volume and increased to around 70 per cent in 2019.

Value settled by RTGS shows a similar pattern, having increased by an average of 4 per cent each year between 1999 and 2019. Over these years the composition of transactions changed. Austraclear transactions increased as a share of value from around 19 per cent in 1999 to 33 per cent of total RTGS value in 2019, in part due to the integration of Commonwealth Government Securities in 2002. The SWIFT share of value decreased from 68 per cent to 60 per cent of total RTGS value, while still growing in absolute value terms. Although customer-to-customer payments make up the bulk of SWIFT volumes, it is payments made between financial institutions that contribute most to SWIFT values.

These patterns changed in 2020, however, with the onset of the COVID-19 pandemic. The pandemic is only the second time there has been a notable slowdown in RTGS value growth over 23 years of operation in Australia, with the first triggered by the global financial crisis. The change in settlement activity since the pandemic is explained in Appendix A.

Most RTGS payments now settle earlier in the day



Source: RBA

Graph 1

Since 1998, there has been a strong peak in volume and value of RTGS settlements occurring after

Graph 2





| | Batch commenced operation ^(a) Year | Growth in average settlement value per financial year ^(b) Per cent | Share of net settlement value in 2021 Per cent |
|------------------------------------|--|--|--|
| 9am Batch | 1998 | -1 | 8 |
| CHESS (equities) | 1998 | 8 | 6 |
| Intraday direct entry | 2013 | 7 | 53 |
| Mastercard | 2014 | 20 | 7 |
| Property settlement ^(c) | 2014 | 105 | 24 |
| eftpos | 2017 | -1 | 2 |
| | | | |

Table 1: Growth in Net Settlement Batches

(a) Stated from the start of RTGS in RITS in 1998.

(b) Growth is measured from the first full year of settlements for all batches excluding the 9am and CHESS batches, where growth is measured from 1999.

(c) Includes both PEXA and ASXFS property batches.

Source: RBA

9:15 am (Graph 3).^[9] The bulk of this peak comprises SWIFT payments that are sent into RITS overnight and through the early morning, and are queued to become eligible for settlement at this time. This morning peak has continued to grow over the last two decades, from settling around 16 per cent of daily RTGS volume in 1999 to 41 per cent in 2021. In general, this earlier settlement of payments is beneficial in reducing liquidity risks that can arise late in the settlement day and assists in redistributing liquidity between banks.

In the early years of RTGS settlement, there was also a peak in value settled in the late afternoon around 4:00 pm, when banks are typically engaged in endof-day settlement activities. However, over the last two decades, as settlement of RTGS payments has shifted to earlier in the day, this late-afternoon peak has flattened to the point where it has mostly disappeared.

Net settlement activity reflects innovation in electronic payments

Lower value payments continue to be settled in RITS on a net basis (where not settled in FSS). These batches collate a large number of payments but only account for around 10 per cent of settlement value in RITS due to their generally lower value and the effects of netting, averaging around \$19 billion per day in 2021. The value of most of the individual net settlement batches have grown strongly since commencing operation (Table 1).

The creation of five intraday direct-entry settlements comprising non-government bulk payments and pay-anyone transfers, as well as new external batches for Mastercard and eftpos payments, had a significant impact on net settlement values (Graph 4). Up until 2013, the value of the 9am Batch had grown steadily in line with the adoption of electronic payments, to reach around \$4 billion per day. Over 2013 and 2014, as payments moved out of the 9am Batch to the new individual batches, the average daily value declined to around



\$1.2 billion. While these new batches provided advantages such as more timely settlement for some transaction types, the relocation of settlements to separate batches has reduced the benefits of netting, resulting in the less efficient use of ES balances (Fraser and Gatty 2014). For example, in 2014, after the disaggregation of the 9am Batch, the combined net settlement value of the 9am and the new batches increased to a daily average of \$7.4 billion.

Since its introduction, property settlement in RITS has grown strongly to become the largest of the external batches, comprising settlements of around \$4.6 billion per day. Unlike other externally administered batches, which are typically settled in RITS once per day, property batches are settled throughout each business day with each batch commonly representing a single property transaction. Growth in electronic property settlement has been driven in part by state and territory government mandates for electronic conveyancing, encouraging the shift from paperbased settlement using cheques. As cheques are typically used for large transactions such as property settlements, the uptake in electronic conveyancing has contributed to the decline in the use of cheques (Graph 5).



Settlement liquidity changes with economic events and funding requirements

The amount of liquidity available for settlement purposes ('settlement liquidity') is the total funds held in members' ESAs overnight plus intraday liquidity sourced through repurchase agreements (repos) from the Reserve Bank. ES balances must remain positive at all times as members need to hold sufficient ES balances to settle their payment obligations. As with other RITS functionality, the provision of liquidity has evolved as the use of payments and system funding needs have changed, particularly with the trend towards settlement of electronic payments after hours. Liquidity levels can also be influenced by monetary policy settings and, more generally, by payments made to and from the Reserve Bank. Average settlement liquidity across the day has increased from around \$7 billion in the early 2000s to \$300 billion in 2021, following systemic changes involving the different components (Graph 6):

- In the late 1990s/early 2000s, settlement liquidity was mostly provided through intraday repos. Settlement liquidity grew broadly in line with settlement activity, averaging \$9 billion in 2006.
- At the onset of the global financial crisis in mid-2007, the increased use of intraday repos, and to a smaller extent larger precautionary ES balances held by members, resulted in settlement liquidity nearly doubling between



Graph 5

2006 and 2009, while RTGS settlement values only increased by around 10 per cent (RBA 2008). Settlement liquidity subsequently remained steady at around \$17 billion until 2013.

- In late 2013, 'open repos' were introduced to support the after-hours settlement of direct entry obligations when other sources of liquidity were unavailable, and largely replaced intraday repo use (Fraser and Gatty 2014).
 Settlement liquidity averaged \$28 billion by 2016.
- Since early 2020, the Reserve Bank's policy measures to support the Australian economy through the COVID-19 pandemic have injected substantial liquidity into the financial system, meaning RITS members now hold large ES balances (Debelle 2021). Settlement liquidity averaged \$300 billion over 2021.
- From September 2021, RITS members settling after-hours FSS and direct entry obligations were allowed more flexibility in how they fund these payments, with open repo use no longer mandatory. Soon after, the majority of open repo positions were unwound; however, because of the large ES balances held, settlement liquidity has remained high, averaging over \$400 billion in January 2022 (Dowling 2021).

Changes in liquidity levels can have an impact on how quickly transactions are settled in RITS (time

spent waiting on the queue) and, consequently, on how guickly funds become available to members. If liquidity is low relative to the value of transactions being settled, then gueue times are typically higher as payments wait for sufficient funds to settle. Over the history of RTGS, the amount of liquidity has generally risen relative to the value of settlements, contributing to lower queue times (Graph 7). For example, before open repos commenced in 2013, the ratio of settlement liquidity to value settled (the liquidity ratio) was around 7 per cent, while average gueue times were around three minutes. Between 2014 and prior to the COVID-19 pandemic, the liquidity ratio was around 17 per cent and queue times were closer to one minute. As of 2021, average gueue times were around 10 seconds.

With increased liquidity there is less need for liquidity-saving mechanisms in RITS, one of which automatically offsets outstanding payments between two members. This mechanism (Auto-Offset) allows payments to be made using less funds as payment obligations are netted off against each other prior to settlement. Before the introduction of open repos in 2013, up to 30 per cent of value each day was settled this way, reducing to around 8 per cent after open repos and to around 1 per cent more recently (Graph 7).

The ongoing modernisation of RITS



The payments industry is undergoing rapid change as consumers and businesses demand faster, more



Graph 7 RITS system queue (RTGS)*

accessible and innovative payment methods. The Reserve Bank plays an important role in supporting this innovation by advancing RITS functionality in line with these changes. Some current and emerging areas of work for RITS include:

- Maintaining a high level of security and resiliency in RITS as systemically important payments infrastructure. For example, development of a thirdsite data bunker was recently completed, further minimising the risk of data loss in the event of a disruption to existing Reserve Bank systems. New security standards were also released in December 2021 to set additional requirements on RITS members for the effective management of RITS-related cyber risks.
- Modernising RITS systems. This will include expanding the support of payment messaging in RITS by adopting ISO 20022 – a modern and open messaging standard that encourages payments innovation through richer data and better interoperability with other payment systems in Australia and globally (Major and Mangano 2020).
- Monitoring global developments to inform potential enhancements to RITS. Current exploratory work includes participating with other central banks in initiatives led by the Bank for International Settlements Innovation Hub to explore the potential use of central bank digital currencies, and investigating the potential linkage of national fast payment systems. These have the overarching goal of facilitating faster, more transparent and cost-efficient cross-border payments.

Conclusion

RITS continues to underpin Australia's payments ecosystem and support the evolution and uptake of electronic payments in Australia. Key changes since the introduction of RTGS include same-day direct entry settlement, new external batches, property settlement functionality and extended settlement hours. The addition of the FSS to support the NPP has made 24/7 settlement available for a wider range of payments. RITS has also continued to operate reliably, including through periods of economic stress such as the global financial crisis and the COVID-19 pandemic. In doing so, it has supported safe and efficient settlement of payments between Australian consumers, businesses and government agencies. In coming years, the Reserve Bank will continue to uplift settlement services in line with the changing needs of the payments industry.

Appendix A: The impact of the COVID-19 pandemic on settlement activity

In the early stage of the pandemic in March 2020, RTGS activity in RITS spiked, reflecting a sharp increase in market volatility (Graph 8). Daily interbank settlement value reached a historical peak of around \$360 billion on 18 March 2020, which was about 73 per cent higher than the daily average value settled during 2019. After the initial spike, settlement activity fell and remained subdued, with declines in Austraclear and RITS payments accounting for around 85 per cent of the \$32 billion decline in daily average RTGS value between 2019 and 2021. In volume terms, daily average transactions fell 8 per cent over this period, mainly driven by a lower number of SWIFT customer-tocustomer payments.

A brief comparison of RTGS settlement activity around the global financial crisis and the COVID-19 pandemic highlights the key difference between these two economic events (Graph 9). While the



financial crisis was triggered by systemic failures within the global financial system, COVID-19 is a public health emergency, which has also deeply impacted various aspects of the global economy. Settlement values initially increased at the onset of both events, reflecting volatility in financial markets and uncertainty among consumers. In line with global economic and market conditions, the period of heightened settlement activity was more drawn out during the financial crisis, lasting from mid-2007 to early 2009. In comparison, the COVID-19 pandemic resulted in a spike in activity, immediately followed by a sharp fall. In the period after the global financial crisis, wholesale settlement patterns were relatively stable at a lower level for a number of years before picking up again. With COVID-19, settlement values have largely remained subdued since early 2020, though look to have picked up in recent months.



Endnotes

- [*] The authors are from Payments Settlements Department. The authors would like to thank Emilie Fitzgerald, John Bagnall, Kylie Stewart and Sean Dowling for their helpful comments and suggestions.
- [1] RITS is an approved RTGS system under the *Payment Systems and Netting Act 1998*. Payments settled in RITS cannot later be unwound. See RBA (2021a) for further details.
- [2] Excluding details of the FSS that have been discussed in previous Bulletin articles. See FSS articles Rush and Louw (2018), Fitzgerald and Rush (2020).

While RTGS settlements in RITS declined noticeably with the onset of the pandemic, net settlement activity levelled out briefly and then guickly resumed growing (Graph 10). Although the value of net settlements can fluctuate for a number of reasons, some changes in spending habits related to the pandemic can be observed from the data. For example, as non-urgent elective surgeries were suspended in Australia in early 2020, there was a significant reduction in the value of Medicare refund payments settled in RITS. Similarly, as public health measures restricted movement, settlements related to cash withdrawals from ATMs declined temporarily around April 2020. Other net settlement activity such as direct entry payments decreased slightly in value in early 2020, but soon recovered to pre-pandemic levels and continued to broadly trend upward despite subsequent lockdowns and pandemic restrictions.



- [3] Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a co-operative organisation that operates a network for the exchange of payment and other financial messages between financial institutions.
- [4] The Austraclear feeder system is operated by Austraclear Limited, a wholly owned subsidiary of ASX Limited.
- [5] Foreign exchange settlement risk is the risk that one party to a foreign exchange transaction will pay the currency it sold but will not receive the currency it bought. See BIS (1996).

- [6] See also 'The Reserve Bank's Strategic Review of Innovation in the Payment System' in RBA (2012).
- [7] This excludes a number of RITS members that do not hold an ESA but belong to RITS for the purpose of being an eligible counterparty of the Reserve Bank in its domestic market operations or being a Batch Administrator. At present, five members administer external batch arrangements. Until 2018, banks were required to hold an ESA whether or not they used an agent to settle their RTGS transactions (RBA 2018).
- [8] Members are required to settle payment obligations using their own ESA if their aggregate high-value payments exceed 0.25 per cent of the total value of RTGS payments settled in RITS. See RBA (undated).
- [9] RITS opens at 7:30 am each weekday, although the majority of RTGS transactions are settled between 9:15 am and 4:30 pm. See 'Box B: The RTGS Operating Day' in Gallagher, Gauntlett and Sunner (2010).

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