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The Rise in Household Saving

Fiona Price and Richard Finlay*

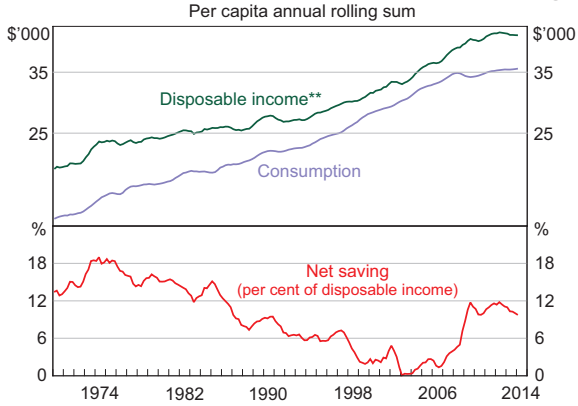
This article investigates household saving behaviour in Australia and the drivers behind the sharp rise in saving that occurred in the late 2000s after an extended period of decline. Saving behaviour is important as, among other things, it influences household consumption, which accounts for a little over half of GDP. The rise in household saving appears to have been underpinned by precautionary motives, a reduction in expected future income gains for some types of households and an effort to rebuild wealth after the global financial crisis. Also, the long transition to higher levels of indebtedness may have run its course over this period, including perhaps because of a change in attitudes to debt. The ageing of the population does not appear to have played a significant role in recent changes in the saving ratio, although it may place downward pressure on saving over the years ahead.

Introduction

Between the early 1970s and the early 2000s, the aggregate household saving ratio in Australia declined steadily, from around 20 per cent to around zero (Graph 1). This trend was driven by a number of factors, including an increased availability of credit, falling real interest rates, more stable economic outcomes and rising asset prices, while changes in household income growth and expectations may also have affected the dynamics of the saving ratio over a run of years.[1] The importance of these various factors waxed and waned over the three decades, but it is likely that all contributed to some extent to a higher rate of growth in consumption compared with income, and so to the fall in the saving ratio.

However, the household saving ratio reversed much of this decline between 2006 and 2010, reflecting both an increase in growth of disposable income and a slowing in consumption growth. The saving ratio is now at a level similar to that of the mid 1980s. This is an important change in household behaviour, particularly given that household consumption accounts for a little more than half of GDP.

Graph 1
Household Income, Consumption and Saving*
Per capita annual rolling sum



* In 2011/12 dollars; deflated using the household final consumption expenditure implicit price deflator; disposable income and consumption are plotted using a log scale; saving is net of depreciation
** After tax and net interest payments
Sources: ABS; RBA

As argued in Browning and Lusardi (1996), it is difficult to draw firm conclusions from aggregate data about what drives household saving behaviour. For that reason, this analysis uses household-level data from the 2003/04 and 2009/10 Household Expenditure Surveys (HES) to examine the saving behaviour of various household types. The HES are cross-sectional surveys of a nationally representative sample of households in Australia and detail

* The authors are from Economic Analysis Department. This article draws extensively on Finlay and Price (2014).

1 See, for example, Stevens (2011) for a discussion of some of these factors.

household income and expenditure, as well as a range of socio-demographic characteristics.[2]

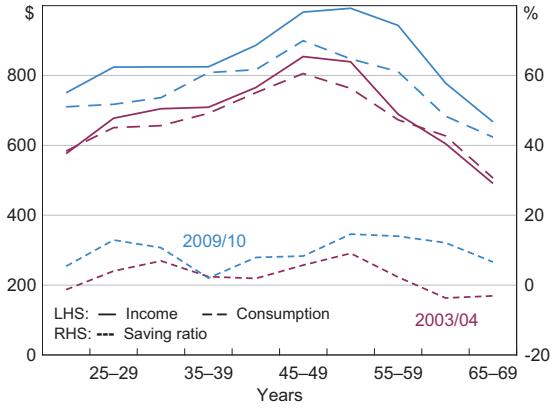
The period between 2003/04 and 2009/10 saw rapidly rising asset prices and strong economic growth, as well as the global financial crisis and times of rising unemployment. The average age of the population rose gradually throughout this time. By considering how the saving behaviour of different households changed, we aim to understand the relative importance of household income, credit constraints, precautionary motives, household wealth and life-cycle factors for saving. To do this, the relationships between saving and various household characteristics that are correlated with these drivers are examined. For example, to the extent that saving varies with household characteristics that are deemed to indicate a higher degree of income risk, we draw the inference that this underlying risk factor has played a role in driving saving behaviour, although this is not conclusive because we cannot measure this risk factor directly.[3]

Descriptive Analysis

The distribution of household saving is first examined to see how saving varies between different household groups, and whether certain types of households increased their saving by more than others between 2003/04 and 2009/10.

Household consumption and income follow a broadly similar pattern over the life cycle (Graph 2). The increase in consumption around middle age suggests that households do not fully smooth their consumption, although Attanasio (1999) points out that the hump-shaped consumption profile is less pronounced after controlling for family size and composition. Between the 2003/04 and 2009/10 HES, saving increased for younger and older households in particular, with the increase in consumption lagging behind the increase in income for these groups.

Graph 2
Household Income, Consumption and Saving*
By age of household head



* Income and consumption are in 2009/10 dollars and are weekly; saving is as a per cent of household disposable income and before depreciation; weighted averages across age groups
Sources: ABS; Finlay and Price (2014)

Wealthier households tend to save more, although changes in household saving behaviour do not appear to be specific to any particular level of household wealth, with the saving ratio increasing across all wealth quintiles between 2003/04 and 2009/10 (Graph 3).[4] Similarly, saving increases with age-matched income quintiles, and, as with wealth, most age-matched income quintiles saw a rise in saving between 2003/04 and 2009/10, with only the lowest income group recording a fall (Graph 4).[5]

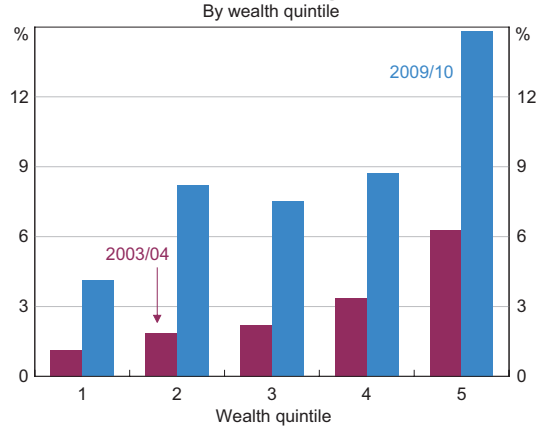
2 The 2003/04 HES surveyed around 7 000 households, while the 2009/10 HES surveyed around 10 000 households. The sample of households used in this article excludes those who give zero or negative values for income, and households where the household head is aged over 75 years. Households in the top and bottom 2 per cent of the saving ratio distribution are also excluded from the sample to minimise the impact of potentially erroneous responses.

3 While other studies have used household-level data to analyse household saving behaviour in Australia (see, for example, Harris, Loundes and Webster (2002) and Berger-Thomson, Chung and McKibbin (2009)), they do not address the rise in the household saving ratio over the 2000s.

4 Note that after controlling for other important variables such as income, education level and age, saving falls with wealth.

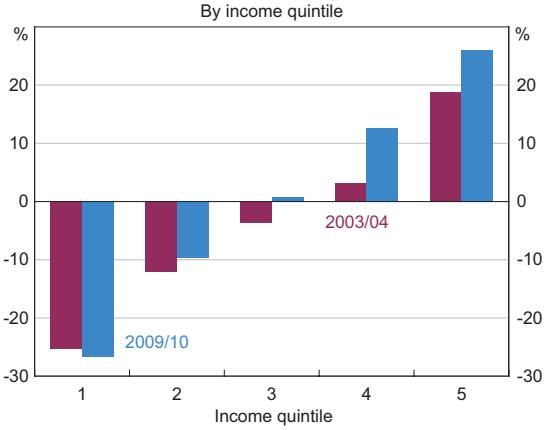
5 Age-matching controls for age-related effects when comparing income quintiles. For example, since post-retirement households are typically in the lower income quintiles, the saving behaviour of older households will have a significant influence on the saving behaviour of the lower (non age-matched) income quintiles. Age-matching is done by splitting the households in each age group into separate income quintiles. Income quintiles from each age group are then recombined, so that, for example, the lowest age-matched income quintile consists of all those households that make up the lowest income quintile within each age group.

Graph 3
Household Saving Ratio*
By wealth quintile



* Before depreciation; weighted average across quintiles
Sources: ABS; Finlay and Price (2014)

Graph 4
Household Saving Ratio*
By income quintile



* Before depreciation; weighted average across quintiles; age-matched
Sources: ABS; Finlay and Price (2014)

This simple descriptive analysis suggests that relatively young and old households, but not middle-aged households, increased their saving considerably between 2003/04 and 2009/10, while an increase in saving was evident across most wealth and income groups.

Cross-sectional Analysis

While the descriptive analysis gives a sense of which household types are saving the most, and how their saving has changed over time, it does not control for other factors pertinent to the saving decision. Turning to a more comprehensive approach to identify the determinants of saving behaviour, this section presents the results from a model of what influences the median household's saving ratio at a point in time.[6] The potential determinants of saving behaviour considered in the model, and their effect on saving, are discussed below.

Household income

Income is a particularly important determinant of household saving, although there is some debate as to how it affects saving. Our results are estimated under the assumption that it is the deviation of a household's current level of income from its permanent or long-run level of income that affects saving, although the results are robust to relaxing this assumption. In particular, a household's saving ratio is modelled as:

$$saving\,ratio_i = \beta\left(y_i - y_i^*\right) + X_i + \varepsilon_i.$$

Here y_i is the natural logarithm of household i's current income, y_i^* is the logarithm of permanent income, and X_i represents other household characteristics pertinent to the saving decision such as age, employment status and the composition of a household. This model implies that a household will increase its saving ratio if its current level of income rises by more than its permanent level of income, for example due to an unexpected one-off bequest. Conversely, a household will reduce its saving ratio if its current level of income falls by more than its permanent level of income, for example due to a temporary spell of unemployment.

In practice, the permanent income of a household cannot be observed. Instead, it is modelled as the fitted value from a regression of current income on household characteristics that affect permanent

6 See Appendix A for a table of model estimates. Note also that the median saving ratio gives a better indication of how much a 'typical' household saves compared with the mean saving ratio, which can be heavily influenced by a small number of outliers. The mean saving ratio is nonetheless important since it determines economy-wide household saving, and will be considered below when we examine what drove the change in saving behaviour between 2003/04 and 2009/10.

income. This implies that the *average* deviation of current income from modelled permanent income across all households is zero; modelled permanent income will also fail to capture any changes in households' future income expectations. Also included in the model is the household head's level of education; educational attainment is often regarded as a good proxy for permanent income, and, importantly, it is likely to be correlated with households' future income expectations.[7]

As expected, households whose current level of income is above their permanent level of income tend to save more than otherwise similar households would; the effect of education on saving is mixed across the two sample periods.

Credit constraints

Credit constrained households are identified from households' responses to questions regarding financial stress; households are assumed to be credit constrained if they answer in the affirmative to at least two out of seven financial stress questions. An increase in the incidence of credit constraints would be expected to lift household saving, since some households that may wish to borrow to fund consumption would be unable to do so and so would consume less than otherwise; credit constrained households must also save in order to fund large purchases, rather than being able to borrow to make the purchase.[8] In accordance with this, we find that households that are financially constrained tend to have higher saving ratios, holding all else equal.[9]

Precautionary motives

Households that save in case of an unforeseen need for money are said to be saving for precautionary motives. Theory predicts that households that face a relatively high risk of unforeseen increases in expenditure or reductions in income will save more than other households, all else equal (see, for example, the models outlined in Zeldes (1989), Deaton (1991) and Carroll, Hall and Zeldes (1992)).

In our model, precautionary motives are captured by variables that describe households with relatively less secure incomes or those who are relatively more vulnerable to income shocks, such as migrant and single-parent households, as well as variables that describe households that are vulnerable to an asset price shock, such as self-funded retirees. Our results suggest that people do save for precautionary reasons, with those households that are more likely to face future income shocks, or are less resilient to such shocks, tending to save more than other households.

Household wealth

Higher wealth has been found to have a significantly positive effect on household consumption in Australia, and therefore a negative effect on saving (Dvornak and Kohler (2003); Yates and Whelan (2009); Windsor, Jääskelä and Finlay (2013)).

Our results suggest that, overall, higher wealth-to-income ratios are associated with lower saving ratios

7 Education is widely used as a proxy for permanent income; Attanasio and Weber (2010), for instance, document that more educated households tend to have steeper income profiles than those headed by less educated individuals.

8 Note, however, that these explanations should only affect a household's saving rate in a transition to being more or less credit constrained, with the long-run rate of saving unaffected.

9 Note that in our model we only capture households that are currently credit constrained. In an overlapping generations framework, Connolly and Kohler (2004) and Kent, Ossolinski and Willard (2007) show that the adjustment to a new equilibrium following a change in credit constraints can take many years to complete. As such, the lowering of credit constraints that occurred in the late 1980s and early 1990s may still have been affecting household behaviour during our sample period. In particular, with a decline in the number of households who purchased housing during the earlier period of elevated credit constraints and relatively low house prices, there will be a decline in the share of households that are likely to experience very large capital gains on selling their homes (and who therefore need to save less than otherwise similar households).

(and therefore more consumption). In general, this wealth effect is smaller for the oldest households, which is consistent with Windsor *et al* (2013), who interpret this as evidence against a traditional wealth effect on consumption. Rather, they suggest that rising household wealth increases consumption by reducing liquidity constraints, which are more likely to be binding on the young than the old.

Owning a dwelling outright tends to be associated with higher saving for younger households and lower saving for older households. For younger households, this effect may be capturing personal preferences rather than wealth, with those who own their home outright early in their working lives being inherently diligent savers. For the older age groups, owning a home is likely to be associated with a higher degree of financial security, reducing the need to save in case of emergency. Regarding debt, our results suggest that the more debt a household has relative to their assets, the less the household saves.

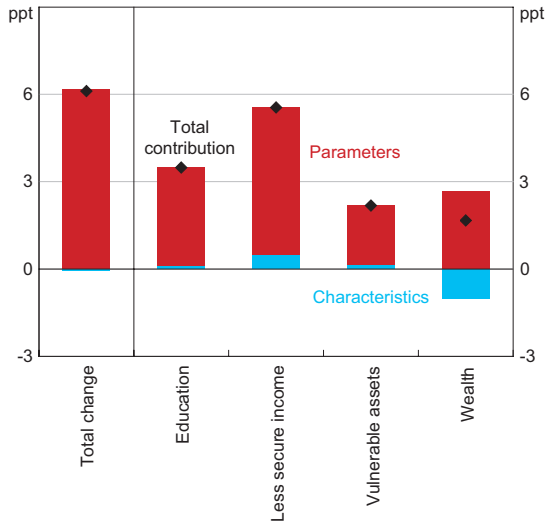
Life cycle

Perhaps unsurprisingly, after controlling for other household characteristics, pre-retirement households (those aged 50 to 64 years) are found to save more than middle-aged households (30 to 49 years), who in turn save the same or more than the youngest households (less than 30 years). Older households tend to save more than younger households would, were they to face similar living circumstances, perhaps due to bequest motives or precautionary saving given an uncertain life expectancy. This suggests that the low level of saving by older households that is evident in the data is predominantly due to their circumstances rather than their age.

The Rise in Saving between 2003/04 and 2009/10

We now turn to the question of what drove the change in saving behaviour between 2003/04 and 2009/10. Graph 5 presents a model-based decomposition of the total change in the saving ratio into changes in households' propensity to save given particular household characteristics (captured by changes in estimated model parameters between the two surveys) and changes in household characteristics.[10] The model used is very similar to that of the previous section, except that it is applied to the mean saving ratio rather than the median saving ratio.[11] Strikingly, the decomposition suggests that changes in the characteristics of households across the two time periods played virtually no role in the increase in household saving between 2003/04 and 2009/10, with changes in model parameters (red bar on the left of Graph 5) accounting for all of the increase.

Graph 5
Contributions to Change in Saving Ratio*
Between 2003/04 and 2009/10



* Contributions to the change in the saving ratio that are not statistically significant are not shown, so the bars on the right do not add to the total on the left
Sources: ABS; Finlay and Price (2014)

10 The model-implied mean saving in year i can be expressed as

$$\overline{saving\,ratio}_i = \overline{X}_i'\hat{\beta}_i$$

where $\overline{X}_i$ describes household characteristics and $\hat{\beta}_i$ describes the estimated effect of those characteristics on saving behaviour. The change in the saving ratio can then be expressed as

$$\Delta\overline{saving\,ratio}_{21} = \overline{X}_2'\hat{\beta}_2 - \overline{X}_1'\hat{\beta}_1 = \overline{X}_1'\left(\hat{\beta}_2 - \hat{\beta}_1\right) + \left(\overline{X}_2' - \overline{X}_1'\right)\hat{\beta}_2$$

where the first term captures parameter effects holding household characteristics constant at their 2003/04 level, and the second term captures the effect of changing household characteristics holding model parameters constant at their 2009/10 level, where year 2 represents 2009/10 and year 1 represents 2003/04.

11 Finlay and Price (2014) also examine the changes in households' propensity to save using the median regression model discussed in the 'Cross-sectional Analysis' section; the results from the median and the mean analyses are similar.

As well as the estimated total contribution, Graph 5 also shows the contribution from changes in model parameters and household characteristics related to: households' level of education; the extent of their precautionary motives (split into those related to incomes and those related to assets); and household wealth.

Income

The income variable that we employ (the deviation of current income from modelled permanent income) does not contribute to the increase in the saving ratio between 2003/04 and 2009/10, since by construction the average deviation of temporary income from modelled permanent income is zero in both surveys.[12]

A change in saving behaviour associated with the household head's level of education does contribute to the increase in the overall saving ratio, however. We find that more educated households increased their propensity to save relative to other households between 2003/04 and 2009/10, with this increase largest for the most highly educated households. If education is interpreted as a proxy for permanent income, or equivalently for expectations regarding future increases in income, then the rise in saving for more educated households suggests a downward reassessment by these households of their future income prospects relative to their current income, possibly driven by the financial crisis.

Precautionary motives

We find that those households who appear to have less secure income or are more vulnerable to an asset price shock increased their saving between 2003/04 and 2009/10. This is consistent with a greater degree of risk aversion, or a greater degree of risk, for households with these characteristics.

12 Note that this is a shortcoming of the way the permanent income variable is constructed – in reality, economy-wide deviations of current from permanent income could occur, for example during a temporary terms of trade boom.

Household wealth

Wealthy households tended to increase their saving between 2003/04 and 2009/10, suggesting an effort to rebuild wealth after the effects of the financial crisis. This was also true of households with high debt levels, which may indicate that attitudes to debt had changed, or that the transition to higher debt levels (starting from the late 1980s or early 1990s) had run its course.

Life cycle

With the exception of pre-retirement aged households (which is one of the set of household characteristics suggestive of being vulnerable to asset price shocks in Graph 5), saving behaviour associated with household age was not found to change significantly between 2003/04 and 2009/10.

Summary of results

In summary, the results from this analysis are consistent with a number of factors driving the increase in household saving between 2003/04 and 2009/10. The rise in saving for those groups judged to be vulnerable to income or asset price shocks is consistent with precautionary motives playing a role, with households observing and responding to events overseas, as well as rising unemployment and declines in asset prices domestically. Related to this, the rise in saving for those with high debt levels is consistent with households adopting a more prudent attitude towards debt over this period, or the transition to higher debt levels having run its course. The rise in saving for more educated households is consistent with a downward reassessment of expected future income prospects for these households. Finally, the rise in saving for wealthy households is consistent with a reassessment of expected future capital gains and a desire to rebuild wealth, with declines in asset prices following the global financial crisis both reducing wealth immediately and reminding households that asset prices can fall as well as rise. However, since household preferences cannot be

directly measured, we can only draw inferences based on which household groups changed their propensity to save, and other interpretations of the data are possible.

Implications of Ageing on Household Saving

Although the ageing of the population does not appear to have played a significant role in the change in the aggregate household saving ratio between 2003/04 and 2009/10, life-cycle factors remain an important factor in household saving behaviour. In 2009/10, the oldest people in the large baby boomer cohort were nearing retirement age (65 years).[13] Given older households save less than middle-aged households, the baby boomer cohort transitioning from middle age to retirement may place downward pressure on the aggregate saving ratio in the future.[14]

To estimate the possible future impact of the ageing of the population on household saving, the estimated effects on saving of the age of a household head and their year of birth are combined with population projections from the Australian Bureau of Statistics (ABS 2013).[15] The results suggest that the ageing of the population has subtracted around half a percentage point from the aggregate household saving ratio since 2009/10; over the next 15 years, ageing is expected to subtract a further 2 percentage points. While these effects are non-trivial in aggregate, they are relatively small in any given year and small relative to actual movements in the saving ratio.[16]

Conclusion

We find that the important determinants of household saving behaviour are consistent with theory and previous findings. As might be expected, households' saving ratios tend to increase with income, while saving is found to decrease with wealth and gearing. Financially constrained households and households deemed to be at risk of a future income shock tend to save more than other households, all else equal. While saving differs substantially across age groups, we find that, at least in part, this reflects differences in other features of these groups.

The rise in household saving from 2003/04 to 2009/10 appears to have been driven by changes in saving behaviour associated with certain household characteristics, rather than changes in particular characteristics. The results suggest that the large increase in household saving over that period was underpinned by precautionary saving motives, a reduction in expected future income gains for more educated households and an effort to rebuild wealth after the financial crisis. Changing attitudes to debt (or the transition to higher debt levels having run its course) may have played a role. This suggests that if memories of the financial crisis fade, and asset prices and the appetite for risk increases, one might expect household saving to fall; conversely, if households' reduced expectations of future income gains persist, higher saving may be more enduring.

Finally, while the ageing of the population does not appear to have played a significant role in changes in the saving ratio between 2003/04 and 2009/10, it may place mild downward pressure on the saving ratio over coming years.

13 A baby boomer is defined as someone born between 1946 and 1964.

14 Note that the ageing of the population is in part driven by lengthening life expectancy. One might expect this to *increase* saving among currently working households, given the need to fund more years of retirement, and result in households working later into life, again resulting in higher saving than otherwise.

15 See Appendix A of Finlay and Price (2014) for more detail. In this scenario, the birth cohort effect for those born after 1995 is assumed to be equal to the birth cohort effect for those born between 1990 and 1995.

16 Note that these estimates are partial equilibrium in nature; in general equilibrium, lower saving by the relatively large baby boomer cohort in Australia and overseas would be expected to place upward pressure on real interest rates, encouraging other groups to save more.

Appendix A: Median Regression Results

Table A1: Median Model of Household Saving Ratio – Regression Results[(a)]
Coefficients

Variable	2003/04	2009/10	Difference over time
Income	0.6***	0.6***	0.0
Education			
– TAFE/certificate	–2.6	3.2*	5.8**
– University	–4.3**	4.3**	8.6***
Single-parent household	–3.1	8.4***	11.5**
Government income (>20%)	8.6***	14.5***	5.8*
Financially constrained	4.0*	3.7	–0.4
Risk of unemployment	1.9	0.1	–1.8
Non-English-speaking migrant	6.2***	7.4***	1.2
Self-funded retiree	–13.6***	–1.5	12.1**
Wealth-to-income ratio			
– Young	–0.4	–0.5	–0.1
– Middle-aged	–0.3**	–0.5***	–0.2
– Pre-retirement	–0.4***	–0.1	0.4**
– Old	–0.2**	–0.2***	–0.1
Own a home			
– Young	8.3	9.0	0.8
– Middle-aged	3.3	5.9	2.6
– Pre-retirement	–6.8*	–4.2	2.6
– Old	–12.7**	–3.5	9.2
Gearing ratio			
– Young	–9.0**	0.9	9.9*
– Middle-aged	–10.1	–7.7	2.3
– Pre-retirement	–17.0	–1.7	15.3
– Old	–19.6	–11.6	8.0
Young (<30)	–5.1	–2.4	2.7
Pre-retirement (50–64)	9.6***	7.8**	–1.8
Old (≥65)	6.7	4.6	–2.1

(a) ***, ** and * represent significance at the 1, 5 and 10 per cent level, respectively; HES household weights used; 500 repetitions of bootstrapped weights are used to obtain the standard errors; reference household is a single middle-aged male, born in an English-speaking country, not financially constrained, same or better standard of living compared with a year ago, working in a high-skilled occupation, with high school as highest level of education and lives in urban New South Wales

Sources: ABS; Finlay and Price (2014)

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Foreign Investment in Residential Real Estate

Maurice Gauder, Claire Houssard and David Orsmond*

The available data, while incomplete, suggest that for much of the past decade or so approvals granted for foreign investment in the residential sector have remained around 5–10 per cent of the value of dwelling turnover in Australia, and perhaps half that share of the total number of dwellings turned over. The actual level of foreign purchases of dwellings has been significantly lower. Foreign purchases appear to be most concentrated in new rather than established dwellings, in higher- rather than lower-priced dwellings, in medium- and high-density dwellings rather than detached dwellings, and in inner-city areas of Sydney and Melbourne rather than other locations.

Introduction

While most housing transactions in Australia are between domestic residents, foreign residents also participate, both as developers and purchasers of dwellings. This article summarises the Bank's recent Submission to the House of Representatives Economics Committee Inquiry into Foreign Investment in Residential Real Estate. The article outlines the legislative framework for foreign residential investment in Australia and the data available on the flow of foreign investment. While incomplete in several regards, these data suggest that foreign residential purchases have fluctuated a bit from year to year but remained relatively low as a share of housing turnover measured by both value and number, and that foreign demand is more concentrated in some parts of the housing market than in others. On balance, foreign residential demand has probably resulted in an increase in the supply of dwellings in Australia by more than would otherwise have been the case, and hence stimulated construction activity. However, the inherent sluggishness of the housing supply response suggests that some of the increase in foreign demand for housing may have spilled over into higher prices, especially for higher-priced dwellings.

* The authors are from Economic Analysis Department.

Legislative Framework and Available Data

Australia's foreign investment laws seek to channel foreign residential activity into new dwellings to promote local construction. The laws cover three broad groups: foreign developers of new residential projects; foreign purchases of new dwellings; and temporary resident purchases of new and established dwellings. In short:

- foreign-developed new residential projects are permitted and the resultant dwellings can be sold to either foreign or domestic buyers
- foreign individuals and temporary residents are permitted to purchase any new dwelling
- temporary residents with visas that allow them to stay in Australia for a continuous period of more than 12 months (such as some foreign students and people on skilled business visas) are permitted to purchase one established home provided it is used as their principal place of residence while in Australia and is sold once vacated.[1]

Foreign investors and temporary residents require approval from the Foreign Investment Review Board (FIRB) prior to purchasing a dwelling or site for development, and most such applications are

1 Foreign-owned companies can also purchase established properties to house their Australian-based staff; for a full set of definitions and the legal restrictions and allowances, see the Foreign Investment Review Board website (www.firb.gov.au).

approved. FIRB is also responsible for monitoring compliance, and to this end works with relevant members of the business community, government authorities, legal community and other government agencies (such as the Department of Immigration and Border Protection, Australian Taxation Office, Australian Securities and Investments Commission and the Federal Police). To strengthen the administration and oversight of the regulations, foreign purchase rules were tightened in 2010 and data-matching was expanded using FIRB data, state and territory lands and property office transaction data and citizenship data. The penalties for not seeking prior approval can be substantive.[2]

FIRB publishes data annually on the total number and value of the approvals it grants to foreign investors and temporary residents for the purchase of a specifically identified property or piece of land (the latest annual data available cover 2012/13, although data covering the first three quarters of 2013/14 were published recently). Setting aside any potential under-reporting to FIRB, these data are likely to represent an upper limit on the actual level of foreign investment in Australia, since not every approval granted by FIRB results in a property sale to a foreign investor or temporary resident. In particular, there is no adjustment made to the published approvals data as to whether the proposed purchases were subsequently completed (i.e. whether a bidder was successful at an auction, a contract to purchase a specified home was completed, or a proposed residential development project was built). In addition, foreign or domestic developers of some proposed new residential projects can receive pre-approval from FIRB to sell up to 100 per cent of the resultant dwellings to non-residents, after which no further approval from the individual buyers is required. As a consequence, the published FIRB data do not reflect the share of new residential dwellings in these projects that was actually sold to foreign citizens or temporary residents or the timing as to when the sales took place. Perhaps, more importantly, the FIRB data published reflect only gross approvals by foreign buyers; the subsequent sale of their properties to Australian citizens or permanent residents (required for instance when temporary residents vacate the property) is not included in the FIRB data. Other limitations of the FIRB data include the lag in their availability as well as series breaks (such as the changes to reporting requirements in 2009 and 2010 for dwelling purchases by temporary residents).

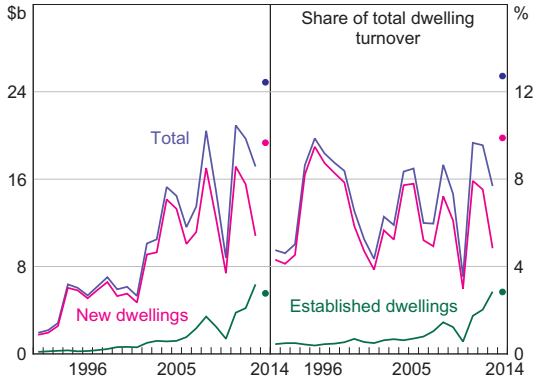
Despite these limitations, the FIRB approvals are the main source of data on the level of foreign residential investment in Australia. While there are published surveys of real estate agents' views on the share of foreign investment, it is not clear how the agents distinguish between sales to foreign investors, Australian expatriates, permanent residents or Australian citizens when completing these surveys. In addition to the FIRB data, this article draws on information gathered through the Bank's liaison with housing market contacts; it does not discuss residential purchases made by permanent residents and citizens of Australia.

Recent Trends in Foreign Residential Investment

While volatile from year to year, the FIRB data indicate that the *value* of approved foreign investment in residential property in Australia has increased, rising from around $6 billion annually in the 1990s to more than $17 billion in 2012/13 (Graph 1). This increase has been driven mainly by approvals for new dwelling purchases and construction – which account for the bulk of the approvals granted – though approvals to purchase established dwellings have also increased over time off a very low base. However, with national dwelling prices and turnover having increased significantly over the past 20 years,

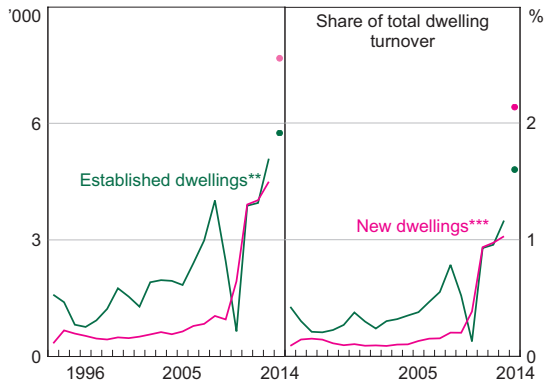
2 People who do not seek approval for foreign investment in Australia can face a fine of up to $85 000 and two years jail, and the Treasurer has the right to order the sale of an acquisition that was not in the national interest. There have been some reports in the media of foreign citizens purchasing established properties through family and friends who already have Australian residency, in which case the FIRB approvals data for this category would understate the level of 'effective' foreign investment; it is difficult to determine the extent of any such purchases.

Graph 1
FIRB Residential Approvals*
Value, financial year



* Data for 2013/14 are for the nine months to March 2014
Sources: FIRB; RBA; RP Data-Rismark

Graph 2
FIRB Residential Approvals*
Number, financial year



* Data for 2013/14 are for the nine months to March 2014
** Excludes approvals for 'annual programs'
*** Only includes approvals for individual purchases
Sources: FIRB; RBA; RP Data-Rismark

the value of foreign residential approvals as a share of total dwelling turnover in Australia has not increased over time, fluctuating around 5–10 per cent, and in 2012/13 it was in the middle of that range.[3] Recently published data indicate that there has been a marked rise in approvals for new dwelling purchases during the first three quarters of 2013/14, with the value of total foreign approvals as a share of dwelling turnover in Australia increasing to over 12 per cent. Over the past decade, there has been an increase in approvals to purchase established dwellings, although these approvals remain only 3 per cent of the value of total dwelling turnover.

FIRB also publishes the number of foreign approvals each year. Focusing first on the approvals granted to foreign individuals and temporary residents to purchase a particular dwelling, the data indicate that while the number of both new and established dwelling approvals have increased over time – especially recently – they are still each around 2 per cent or less of the number of total dwellings turned over in Australia (Graph 2). There is some additional turnover associated with the approvals granted to residential developers, although their number is difficult to estimate from the available data and depends very much on the assumptions used. FIRB grants just a single approval to a developer to cover the purchase of land that can be subsequently subdivided for the development of multiple dwellings, and also grants a single approval for developers who apply to sell some or all dwellings in a new residential project to non-residents, such as for a new higher-density building. Using recent information on the historical average number of dwellings built in these types of approved projects (around 170 dwellings per building; see Australian Treasury (2014)), and assuming as an upper limit that approval was sought for 100 per cent of the dwellings completed in these projects to be available for sale to foreign or temporary residents, then the approvals associated with these residential projects may have added a further 2–3 per cent or so to the foreign share of dwellings turned over in Australia.

However, for the reasons noted earlier, FIRB's approvals-based data overstate the actual share of dwellings purchased by foreign citizens and temporary residents in Australia. For instance, while approval can be sought to sell up to 100 per cent of completed dwellings in a new residential project, a recent FIRB report noted that typically only around 35 per cent of the dwellings in such projects are actually sold to foreign citizens and temporary

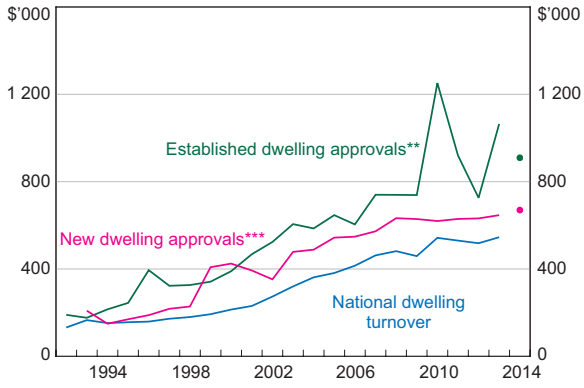
3 These estimates effectively assume that the year in which a residential construction project is approved by FIRB aligns with the year that the consequent dwellings are sold.

residents (Australian Treasury 2014). The share of sales to foreign and temporary citizens would be lowered further if an adjustment were made for the approvals granted by FIRB for foreign individuals to purchase a dwelling but which did not subsequently lead to an actual sale, though this share cannot be determined from the available data.

Overall, the available data suggest that while foreign residential purchases change a bit from year to year, they have been relatively steady and fairly low as a share of turnover in the housing market in Australia and hence are unlikely to have been the main driving factor behind the recent increase in prices, notwithstanding the pick-up in approvals more recently. Nonetheless, there is evidence that foreign purchases play a more prominent role in some parts of the housing market than in others. Focusing on approved purchases by individuals of new and established dwellings, the FIRB data indicate that the average purchase price in 2012/13 was around $650 000 for a new dwelling and around $1 million for an established home. For both new and established dwellings, the average prices for approved purchases have consistently been much higher than the average sales price nationally (Graph 3). Taken at face value, this suggests that purchases by foreign and temporary residents tend to be concentrated in the higher-priced parts of the housing market, although it is possible that this average is elevated somewhat by a few approvals to purchase very high-priced homes.

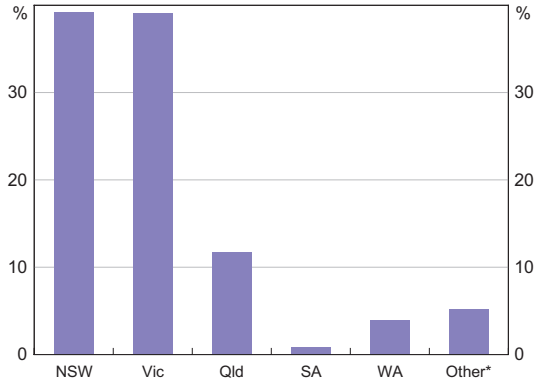
Moreover, the FIRB approvals data suggest that foreign investment in new dwellings is concentrated in New South Wales and Victoria. In 2012/13, investment in new dwellings in these two states accounted for almost four-fifths of the total value of foreign residential investment approvals, much larger than the three-fifths share that these states have in the overall stock of housing in Australia (Graph 4). Bank liaison with industry participants suggests that much of this investment has been for the purchase of higher-density dwellings located in inner-city areas of Sydney and Melbourne, as foreign buyers and temporary residents typically prefer dwellings close to the central business districts, major universities and public transport infrastructure. Nonetheless, there is some evidence from the Bank's liaison with residential builders that foreign investment has started to broaden out into other areas of Sydney and Melbourne and, to a lesser extent, to other state capitals. The data for approvals to purchase established dwellings are more evenly distributed among the states.

Graph 3
FIRB Residential Approvals and Dwelling Turnover*
Average value, financial year



* Data for 2013/14 are for the nine months to March 2014
** Excludes approvals for 'annual programs'
*** Only includes approvals for individual purchases
Sources: FIRB; RBA; RP Data-Rismark

Graph 4
Value of FIRB Approvals for New Dwellings
Share of total approvals for new dwellings, 2012/13



* Includes FIRB approvals where the proposed investment is to be undertaken in more than one state or territory
Sources: FIRB; RBA

Bank liaison with housing market contacts suggests that, rather than being for short-term speculative purposes, foreign purchases of dwellings in Australia generally reflect a decision to invest for the longer term. In particular, these purchases appear to be motivated to meet housing needs for business persons located temporarily in Australia, for children studying in Australia, to acquire a second residence (possibly for eventual migration) and/or to diversify holdings of wealth geographically. There is little indication from the Bank's liaison with industry contacts that the level of foreign demand for Australian housing is significantly affected by fluctuations in the exchange rate, except perhaps for a few high-priced homes.

Economic Effects of Foreign Residential Investment

An increase in the level of demand for new or established Australian dwellings is likely to lead eventually to an increase in housing supply, although the increase in supply may ultimately not be in the same location because of constraints on land availability. In this respect, the key issue is the flexibility of housing supply in terms of its quantum and timeliness. Previous Bank research has suggested that supply impediments in the housing construction market have been significant in some states – reflecting the lack of suitable brownfield and greenfield land for development, difficulties in planning coordination, and resistance by local residents to new housing projects – which have added to the time taken to build and to the cost of new housing (Hsieh, Norman and Orsmond 2012). More recent Bank liaison with housing participants suggests that the coordination of planning processes in some greenfield land areas has improved, though other rigidities remain.[4] In this regard, the recent interest in converting older office buildings in the CBDs to higher-density residential buildings may help to offset the shortage of land available in well-located areas of the capital cities. Nonetheless, to the extent that the housing supply response is inherently sluggish, an increase in housing demand – be it from foreign or domestic sources – will increase dwelling prices, at least temporarily until higher prices induce an increase in housing supply.

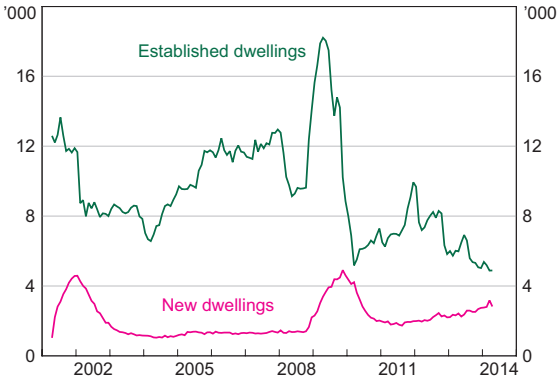
Whether the purchase of a property by a foreign citizen represents an increase in overall demand for housing in Australia depends on a number of factors. For example, if the dwelling is purchased to house a child studying in Australia who would otherwise have had to rent a home, or if the property bought by a foreign citizen is subsequently rented out, then the purchase itself does not represent an addition to demand for housing. Conversely, if a new dwelling is kept vacant after being purchased by a foreign citizen then there will be a net increase in demand for housing. The overall impact on the housing market of ownership by foreign citizens also depends not only on their purchases, but on their subsequent sales. If the flow of purchases and sales by foreign citizens roughly balance, then there is likely to be little effect on overall demand and house prices from foreign participation in the housing market. Furthermore, it is important to note that purchases of dwellings by foreign citizens and temporary residents who subsequently become permanent residents have simply shifted forward their demand for a home. While there are no comprehensive data on how foreign residential investment is divided between all these various categories, it seems likely that there has been some net increase in demand for housing by foreign citizens and temporary residents given the increase in wealth over recent decades of countries relatively close to Australia. It is also worth noting that some Australian citizens purchase property in other countries, which may reduce their demand for property in Australia.

Some commentators have noted the potential for foreign residential demand to push up the price of housing for first home buyers. However, the data available – while incomplete – suggest that first

4 More broadly, a range of structural factors related to Australia's urban environment impede the flexibility of housing supply; for a detailed discussion, see RBA (2014).

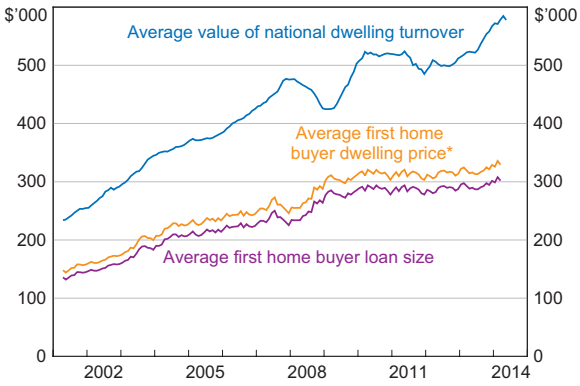
home buyers have generally purchased established rather than new dwellings, and purchased dwellings that are cheaper than the national average (Graph 5 and Graph 6). As noted earlier, both of these are parts of the overall housing market where foreign residential purchasers do not appear to have a major presence.[5] While state incentives for first home buyers have recently shifted toward the purchase of new rather than established dwellings – and hence to the area of the housing market where foreign buyers generally have a greater presence – the degree of competition with foreign buyers is still likely to be fairly small.

Graph 5
First Home Buyer Activity*
Monthly



* Estimated using first home buyer loan approval and first home owner grant data
Sources: ABS; NSW Office of State Revenue; RBA

Graph 6
First Home Buyer Activity
Monthly



* Estimated using first home buyer loan approval data and average first home buyer loan-to-valuation ratio at origination over the past decade
Sources: ABS; HILDA Release 12.0; RBA; RP Data-Rismark

In addition, some of the foreign residential investment has been associated with the large increase in the number of temporary students in Australia during the 2000s, and more broadly with the increased integration of Australia with economies in emerging Asia, which is boosting income and activity throughout the economy. This effect seems likely to continue for an extended period as the number of people in the middle class in Asia increases.

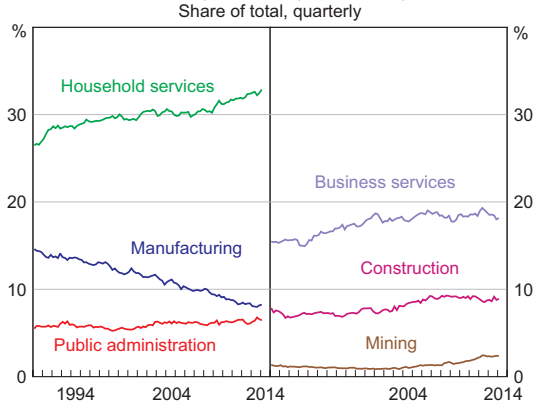
As a consequence of these various effects, foreign demand for Australian dwellings can – and has – provided a stimulus to the local residential construction industry, which accounts for around 9 per cent of total employment in the Australian economy and is more labour intensive than most other industries (Graph 7 and Graph 8). In addition, to the extent that materials used in the construction industry are sourced domestically, an increase in residential building supports local suppliers of building materials and can boost demand for household durable goods. The Bank's liaison contacts report that foreign residential demand has been especially helpful in boosting construction activity in the current stage of the economic cycle. In recent years, developers have reported little difficulty sourcing the skilled labour required for the construction of new dwellings, especially given the decline in investment in the mining industry that is freeing up some construction labour.

The impact of foreign residential developers in adding to the overall supply of new dwellings in Australia is more difficult to determine, although on balance it is probably positive. In principle, the residency of a developer should make little difference to the magnitude of the supply response following an increase in demand for new housing. In practice, foreign developers may introduce new

5 Bank liaison suggests that some foreign purchases of inner-city apartments close to universities are to house foreign students studying in Australia; anecdotal reports suggest that these properties are not a large part of the first home buyer market for Australian citizens.

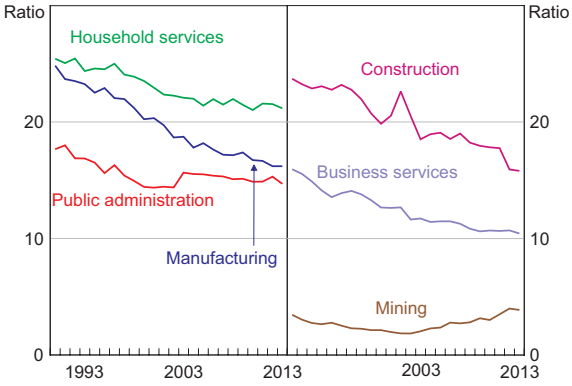
technology and skills to the Australian market and increase competition. In addition, foreign developers often fund projects using offshore financing, which diversifies the source of funding and at times may increase the overall level of funds available for dwelling investment in Australia. Finally, foreign developers often market their projects to potential buyers located in their own home country, which may at the margin increase the level of foreign demand for Australian dwellings and hence construction activity over what it would otherwise have been.

Graph 7
Employment by Industry
Share of total, quarterly



Sources: ABS; RBA

Graph 8
Number of Hours Worked by Industry
Ratio to real industry gross value added ($'000), financial year



Sources: ABS; RBA

Nonetheless, dwelling purchases and development by foreign residents can increase the exposure of the Australian housing market to business cycles offshore. This may amplify Australia's business cycle to the extent that economic cycles are synchronised globally, but may act to dampen the effect on local activity to the extent that business cycles are idiosyncratic across countries. Further, unlike domestic developers, foreign developers often try to pre-sell a large share of new dwellings to non-residents and may therefore have to substantially increase the number of dwellings for sale in Australia should these foreign purchase intentions not be followed through.[6] In addition, as for any net capital inflow, foreign-financed residential investment may increase the value of the Australian dollar, although these inflows appear to have been relatively small to date.

International Comparisons

Foreign participation in the housing market has not been limited to Australia. For many decades, non-residents have purchased homes in global cities such as London and New York. According to industry reports, in most English-speaking countries – including Canada, New Zealand, the United Kingdom and the United States – there are very few restrictions on foreign purchases of residential property. Unlike Australia, these countries appear to make little-to-no differentiation between foreign purchases of new or established dwellings and there are very few reporting requirements. More recently, partly in recognition of the current weak activity in their housing markets, European governments have been looking at ways to increase foreign residential investment from outside the European Union. The situation in Asia varies across economies: for instance, Hong Kong and Malaysia have comparatively minimal restrictions on foreign investment in their new and established housing markets – though

6 Local developers usually cap the share of foreign buyers at around 20–40 per cent of total sales, partly reflecting limits placed by Australian banks; the cap is reportedly much higher for some foreign-developed projects.

some economies have increased property taxes in an effort to slow the pace of house price growth – while in China, India and Indonesia, non-residents are generally not permitted to purchase residential property.

Conclusions

Foreign investment has been a longstanding feature of Australia's housing market, with the available data suggesting that while foreign purchases change a bit from year to year, they have generally remained low as a share of the total value and number of houses turning over. Nonetheless, the data on foreign purchases are limited, and a case could be made to publish more granular – and more timely – statistics, especially data that are already being collected by FIRB. The benefits of any additional reporting requirements would need to be carefully balanced against the added administrative burden. The data and liaison suggest that foreign residential investment is concentrated in some parts of the housing market, though not generally in the parts where first home buyers have a major presence. While it is difficult to know the counterfactual, purchases by foreign residents and construction by foreign developers have probably resulted in a somewhat higher stock of housing in Australia than would otherwise have been the case, although by a magnitude that is difficult to determine.

References

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Why Has the Net Income Deficit Narrowed?

Sara Ma*

Between late 2010 and early 2013, Australia's net income deficit narrowed to its lowest point since the early 1990s. This article examines the reasons for this narrowing and finds that it was mainly due to declines in the average yields paid by Australian entities on their foreign debt and equity liabilities. The lower average yield paid on foreign debt liabilities reflects a combination of declines in Australian interest rates and an increase in the share of Australia's foreign debt attributable to the Australian Government, which pays a lower rate of interest than private sector borrowers. The decline in the average yield paid on foreign equity liabilities was largely due to declining profits for Australian resource sector firms over the period in question, as these firms have a relatively high degree of foreign ownership.

Background

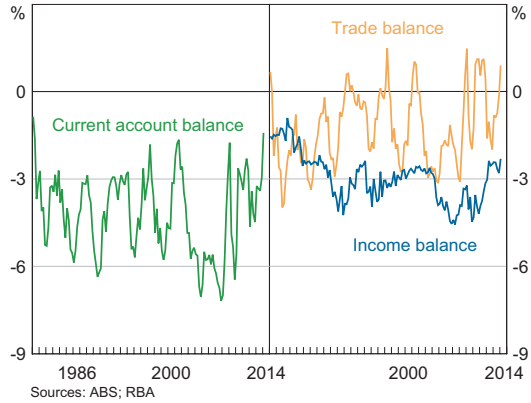
Australia's current account balance has historically been in deficit, as domestic investment has typically exceeded domestic saving. The current account deficit (CAD) has been mirrored by sustained net capital inflows from the rest of the world (a financial account surplus), which has led to a net foreign liability position for the Australian economy.

Although the current account balance has been in persistent deficit throughout most of Australia's history, it has fluctuated over time. For example, in the years leading up to the global financial crisis, Australia's CAD widened from around 2 per cent of GDP in 2001 to around 7 per cent of GDP in 2007, but it has since narrowed to less than 1½ per cent of GDP in early 2014 (Graph 1).

To understand the factors that influence the CAD, it is useful to decompose it into its two components: the trade balance and the income balance.

The trade balance is the difference between the revenue received by Australian entities for their exports of goods and services and the payments made by Australian entities for their imports of goods and services. This trade balance has fluctuated significantly between deficits and (small) surpluses over time, and has tended to drive most of the shorter-term fluctuations in the overall CAD. Since the peak in the CAD in 2007, the trade balance moved from a deficit of around 2½ per cent of GDP to a surplus of around 1 per cent of GDP in 2011. After moving back to a deficit of around 1½ per cent of GDP in 2012, the trade balance returned to a surplus by early 2014.

Graph 1
Current Account Balance
Per cent of nominal GDP

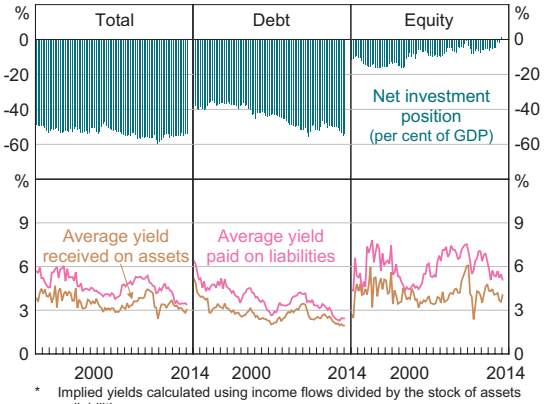


Sources: ABS; RBA

* The author is from International Department.

The income balance, on the other hand, has remained in persistent deficit. This net income deficit (NID) primarily reflects the fact that the income paid by Australian entities to non-resident investors (such as interest paid by Australian banks on their foreign borrowings) has consistently exceeded the income received by Australian entities on their overseas investments (such as dividend income earned by Australian superannuation funds on their holdings of foreign equities).[1] These ongoing net income outflows are the result of two main factors. First, the stock of Australia's foreign liabilities (on which a return is paid) has consistently exceeded the stock of foreign assets (which generates a return) (Graph 2, top panels). Second, the average yield paid on Australian entities' foreign liabilities has been consistently higher than the average yield received by Australian entities on their foreign assets (i.e. there has been a negative yield differential) (Graph 2, bottom panels).

Graph 2
Net Foreign Liabilities and Average Yields*



* Implied yields calculated using income flows divided by the stock of assets or liabilities
Sources: ABS; RBA

This combination of a net foreign liability position and a negative yield differential has been evident for both debt and equity investments, although the net equity liability position has declined over recent years.[2] While the negative yield differential on Australia's net foreign *debt* liability position has typically been narrower than that on Australia's net foreign *equity* liability position – and has narrowed further over recent years – net debt income outflows have historically accounted for an average of around two-thirds of the overall NID, reflecting the fact that Australia's stock of outstanding liabilities are primarily in the form of debt.

Historically, the NID has tended to make a larger contribution to the overall size of the current account deficit than the trade balance, but has had a smaller influence on the CAD's shorter-term fluctuations as the NID has typically been less volatile than the trade balance (Graph 1). The NID widened from around 2 per cent of GDP at the time of the float of the Australian dollar in 1983 to around 4 per cent of GDP in 1990, and has generally remained in a range of 2½ to 4½ per cent of GDP since then. However, since late 2010, the NID has narrowed significantly and has averaged around 2½ per cent of GDP since the first quarter of 2013 – around its lowest level since the early 1990s.

This article explores the factors that have underpinned the recent narrowing in the NID in further detail. It starts by decomposing changes in the NID into changes in gross income flows, and finds that the narrowing can be explained primarily by a decline in income payments on Australia's foreign *liabilities*. It then explores the drivers of this decline in income payments, including changes in the stock of Australia's gross foreign liabilities and declines in the average yield paid on these liabilities.

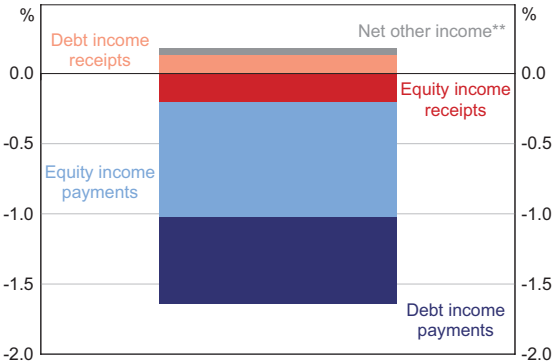
1 Net income flows to and from Australia also include cross-border labour income receipts and payments and a secondary income component, which consists of other transfers such as foreign aid payments. These components are relatively small and are therefore excluded from this discussion.

2 Australia recorded small net equity asset positions in the December quarter of 2013 and March quarter of 2014, partly reflecting positive valuation effects associated with the depreciation of the Australian dollar over the latter half of 2013. However, there were still net equity income outflows in both quarters, as the asset positions were not large enough to offset the ongoing negative yield differential.

Gross Income Flows and the NID

A decomposition of Australia's gross income receipts and payments shows that the narrowing in the NID between late 2010 and early 2013 was driven primarily by a reduction in income payments on Australia's foreign liabilities (Graph 3). This reduction in income payments was evident for both debt and equity liabilities over this period, with the sizeable decline in equity income payments particularly notable given that equity liabilities account for only one-third of the stock of Australia's total foreign liabilities. Changes in income receipts on Australia's foreign assets had little effect on the NID between late 2010 and early 2013, with an increase in Australian entities' foreign equity income receipts roughly offset by a decline in debt and other income receipts.

Graph 3
Contributions to Change in Net Income Deficit
Per cent of GDP, December quarter 2010 to March quarter 2013*

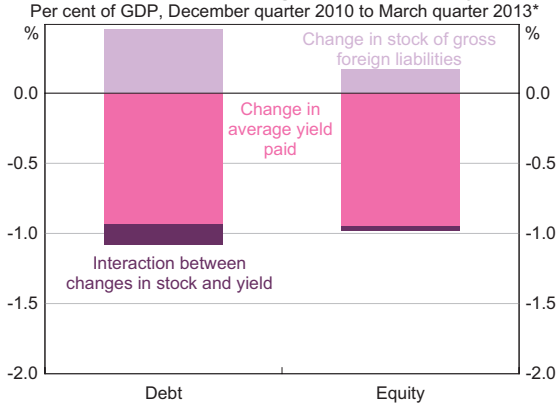


* Share of average quarterly nominal GDP over period
** Compensation of employees and secondary income flows
Sources: ABS; RBA

Explaining the Decline in Income Payments on Australia's Foreign Liabilities

Income payments made by Australian entities to foreign investors depend on two key things: the stock of gross foreign liabilities and the average yield paid on these liabilities. Between late 2010 and early 2013, the decline in income payments was entirely due to declines in the average yields paid on foreign debt and equity liabilities, which more than offset modest increases in the stocks of gross debt and equity liabilities (Graph 4). These increases in the stocks of gross debt and equity liabilities primarily reflected continued inflows of debt and equity investment to Australia, although the stock of debt liabilities was also affected by valuation effects due to asset price changes between late 2010 and early 2013. By comparison, valuation effects associated with the appreciation of the Australian dollar over this period had a relatively small influence on the value of debt liabilities.[3]

Graph 4
Contributions to Change in Income Payments
Per cent of GDP, December quarter 2010 to March quarter 2013*



* Share of average quarterly nominal GDP over period
Sources: ABS; RBA

Given that changes in the average yield paid on Australia's foreign debt and equity liabilities have been the most significant driver of the narrowing in the NID, the remainder of this article examines the influences on these yields in more detail. It does so by considering the influences of two key factors: (i) changes in the yields paid on specific types of foreign debt and equity liabilities; and (ii) changes in the composition of foreign debt and equity liabilities.

3 While Australia has an overall net foreign liability position, around two-thirds of Australian entities' foreign liabilities are denominated in Australian dollars, whereas most foreign assets are denominated in foreign currencies. As a result, Australia has consistently had a net foreign currency asset position. Hence, an appreciation of the Australian dollar increases the size of Australian entities' overall net foreign liability position by decreasing the Australian dollar value of foreign currency assets relative to foreign currency liabilities. See Rush, Sadeghian and Wright (2013) for more information.

Explaining the declining average yield on Australia's debt liabilities

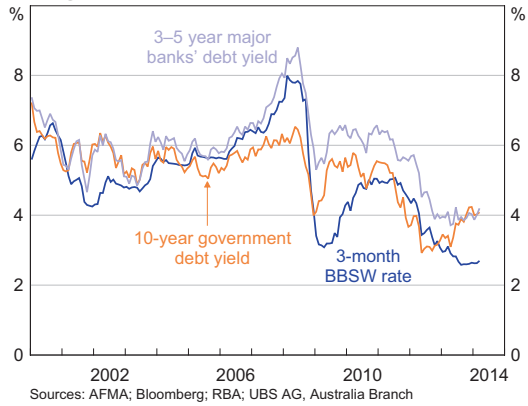
The average yield paid by Australian entities on their foreign debt liabilities declined from around 3½ per cent in late 2010 to around 2½ per cent in early 2013, continuing a trend that had been evident since 2008 (Graph 5). It should be noted that this average yield – as implied from debt income flows in the balance of payments – does not necessarily represent the overall cost of Australian entities' borrowing from non-residents, as it only accounts for income paid *directly* on Australia's foreign debt liabilities, such as interest payments. In particular, the average yield does not include the cost of hedging the foreign exchange risk that would otherwise be associated with foreign currency borrowing: foreign currency borrowing accounts for around half of Australia's foreign debt liabilities and around 60 per cent of this is hedged back into Australian dollars (Rush *et al* 2013). Although hedging costs are accounted for elsewhere within the balance of payments (in the financial accounts), excluding them from the implied average yield means that this yield will understate the overall cost of servicing these liabilities.

Graph 5
Average Yield Paid on Foreign Debt Liabilities*

* Implied yields calculated using income flows divided by the stock of liabilities
Sources: ABS; RBA

A key factor contributing to the decline in the average yield paid on Australia's foreign debt liabilities over recent years has been a decrease in the marginal yields paid on specific types of debt liabilities; that is, declines in interest rates on debt issued by particular sectors and for particular maturities. While declines in marginal interest rates will immediately affect the average yields paid on new foreign debt issuance and on the stock of outstanding floating-rate foreign debt liabilities, in time it will also affect the average yield paid on outstanding fixed-rate foreign debt as this debt is rolled over when it matures. Marginal interest rates on a range of Australian debt instruments declined between late 2010 and early 2013; for example, interest rates on long-term Australian government debt, medium-term bank debt and short-term bank bill swap (BBSW) rates declined by 180 to 220 basis points over this period (Graph 6).[4]

Graph 6
Marginal Interest Rates on Australian Debt



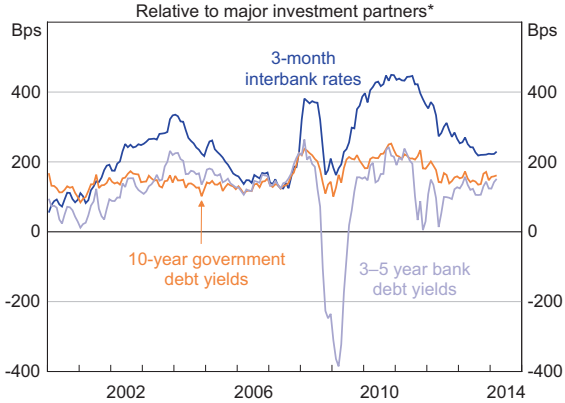
Sources: AFMA; Bloomberg; RBA; UBS AG, Australia Branch

The decline in Australian interest rates over the late 2010 to 2013 period coincided with a reduction in global interest rates, and was therefore also accompanied by a decline in the average yield received on Australia's foreign debt assets. However, the declines in Australian interest rates were more pronounced than the declines in global interest rates, with interest rate spreads on a range of Australian and overseas debt instruments narrowing over this period (Graph 7). This can be partly attributed to the reductions in the cash rate in Australia in 2011 and

4 Marginal interest rates on Australia's foreign currency denominated debt liabilities also declined over this period.

2012, which totalled 175 basis points and occurred as policy rates in several large developed economies remained constrained by the zero lower bound.[5] The compression in interest rate spreads meant that the average yield paid on Australia's foreign debt liabilities fell by relatively more than the average yield received on foreign debt assets, thereby contributing to the narrowing of the NID.

Graph 7
Australian Interest Rate Spreads
Relative to major investment partners*



* Includes Canada, Germany, Japan, United Kingdom and United States, weighted by their shares of Australia's debt investment abroad
Sources: ABS; AFMA; Bank of America Merrill Lynch; Bloomberg; RBA; UBS AG, Australia Branch

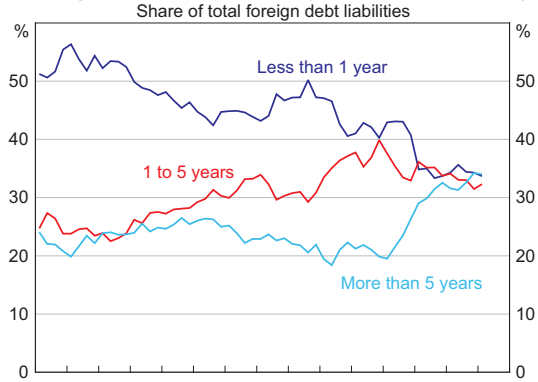
In addition to the decline in interest rates on specific types of debt liabilities, compositional changes in Australia's foreign liabilities have also affected the average yield paid, both through changes in the average maturity of debt and changes in the share of debt owed by different sectors of the economy.[6] These compositional changes appear to have worked in offsetting ways in terms of their influence on the average yield paid on Australia's foreign debt liabilities between 2010 and 2013.

Since the onset of the financial crisis, the share of longer-term debt liabilities has increased significantly. In particular, the share of Australia's debt liabilities with a residual maturity of more than five years increased from around 20 per cent in late 2010 to more than 30 per cent in 2013 (Graph 8).

5 Reductions in the RBA's target cash rate typically result in declines in Australian interest rates for debt with longer maturities, albeit often to varying magnitudes.

6 For a recent discussion of some of these compositional changes, see Debelle (2014a).

Graph 8
Foreign Debt Liabilities by Residual Maturity
Share of total foreign debt liabilities

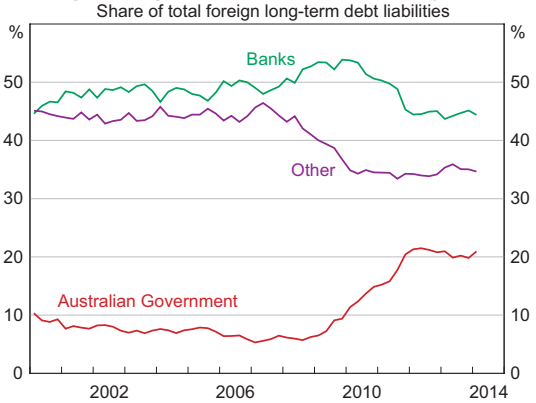


Sources: ABS; RBA

Ordinarily, longer-term debt attracts a higher interest rate than shorter-term debt obligations. Consistent with this, yield curves on both Australian government and bank debt have been upward sloping in recent years. Given this, the lengthening in the maturity of Australia's debt liabilities might, by itself, be expected to have increased – rather than decreased – the average yield paid on debt liabilities, resulting in a widening of the NID (all else equal).

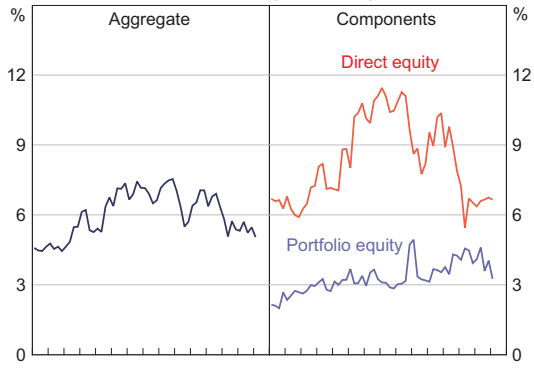
However, the lengthening in the maturity of Australia's debt liabilities has been related to some notable changes in the sectoral composition of these liabilities. In particular, there has been an increase in the share of foreign liabilities owed by the government sector, which tends to issue debt with a longer average maturity than other sectors but also pays a lower rate of interest than the private sector on given maturities. Between 2009 and 2012, the Australian Government's share of long-term debt liabilities – that is, debt liabilities with a residual maturity of greater than one year – increased from less than 10 per cent to around 20 per cent, consistent with increased foreign demand for Australian government debt (Debelle 2014b) (Graph 9). Over the same period, the banking sector's share of long-term debt declined from around 55 per cent to around 45 per cent. This decline largely reflected a shift in Australian bank funding from foreign to domestic (i.e. deposit)

Graph 9
Foreign Long-term Debt Liabilities by Sector*
Share of total foreign long-term debt liabilities



* Debt with residual maturity of more than one year; excludes direct investment and reserve assets
Sources: ABS; RBA

Graph 10
Yields Paid on Foreign Equity Liabilities*



* Implied yields calculated using income flows divided by the stock of liabilities
Sources: ABS; RBA

sources in the post-crisis period, as the average maturity of bank debt liabilities increased over this period (Berkelmans and Duong 2014; RBA 2014). This compositional shift in Australia's long-term debt liabilities towards the government sector would, by itself, be expected to decrease the average yield paid on Australia's debt liabilities.

The net result of these changes was a compositional shift within Australia's foreign debt liabilities from shorter-term bank debt to longer-term government debt. While no breakdowns by sector or maturity are available for income payments on Australia's foreign debt liabilities, interest rates on longer-term Australian government debt have typically been lower than those on shorter-term Australian bank debt. As a result, it appears that the compositional shift towards longer-term government debt has contributed to the recent decline in the average yield paid on Australia's debt liabilities.

Explaining the declining average yield on Australia's equity liabilities

The average yield paid by Australian entities on their foreign equity liabilities decreased from around 7 per cent in late 2010 to around 5 per cent in early 2013 (Graph 10, left panel). This can be further decomposed into the yield paid on direct equity liabilities (i.e. foreign direct investment (FDI) in Australian equity, which includes reinvested earnings) and portfolio equity liabilities (e.g. shares in Australian companies owned by foreign residents).[7] This decomposition indicates that the decline in the average yield paid on Australia's equity liabilities between late 2010 and early 2013 primarily reflected a decline in the average yield paid on direct equity liabilities, with the average yield paid on portfolio equity liabilities little changed over the same period (Graph 10, right panel).

Income payments on Australia's direct equity liabilities include both retained earnings and dividend payments.[8] The average yield paid on these direct equity liabilities should therefore be closely aligned with the profits earned by firms in industries that attract sizeable direct equity investment from non-residents. As at the end of 2013, the top three destinations for FDI into Australia were the mining, manufacturing and finance industries (Table 1). In particular, more than one-quarter of foreign direct equity investment in Australia was in the mining

7 More specifically, the ABS defines direct equity investment as investment where the investor has an equity interest of 10 per cent or more in an enterprise, while portfolio equity investment is defined as investment where the investor has an equity interest of less than 10 per cent. For more information, see ABS (1998).

8 Retained earnings that are reinvested are recorded as a notional income outflow in the current account with an offsetting notional investment inflow in the financial account, although there is no actual flow of funds in these instances.

Table 1: Foreign Direct Equity Liabilities by Sector
Per cent of total foreign direct equity liabilities; 2013

Sector	Share
Mining	26
Manufacturing	15
Finance and insurance	14
Wholesale and retail trade	10
Property and business services	7
Transport and communication	6
Other	22

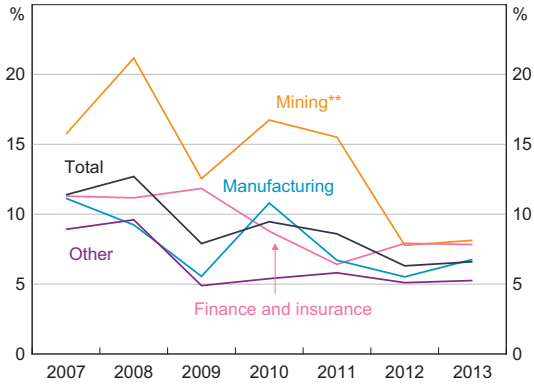
Sources: ABS; RBA

sector, consistent with the relatively high share of foreign ownership in this sector.[9]

Consistent with this, the decline in the average yield paid on Australia's direct equity liabilities between 2010 and 2012 primarily reflected a fall in the yield paid on direct equity liabilities by the Australian mining sector (and, to a lesser extent, the manufacturing sector) (Graph 11). This is consistent with the decline in the return on equity of ASX 200 resource sector companies between 2010 and 2012 (though returns remained relatively high throughout this period compared with historical returns observed before the mining boom) (Graph 12). This in turn reflects sizeable capital expenditures in the resources sector over this period, as well as lower underlying profits due to declining commodity prices. More recently, as a number of mining companies have scaled back their capital expenditure in 2013, both the return on equity in the resources sector and the yield paid on direct equity liabilities by the mining sector have stabilised. This appears to have contributed to the observed stabilisation in the average yield paid on Australia's direct equity liabilities over 2013.

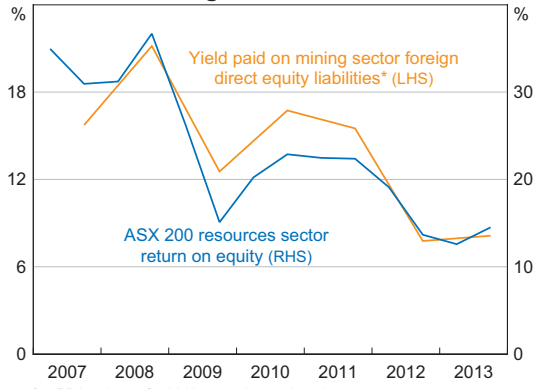
Theoretically, changes in the sectoral composition of Australia's foreign direct equity liabilities may also have affected the average yield paid on these liabilities in recent years. However, apart from a slight increase in the mining sector's share of total FDI liabilities, the sectoral composition of Australia's direct equity liabilities appears to have been little changed between late 2010 and early 2013. This suggests that changes in the composition of Australia's FDI liabilities are unlikely to have had a significant impact on the average yield paid on these liabilities over the 2010 to 2013 period.

Graph 11
Yields Paid on Foreign Direct Equity Liabilities*



* Implied yields calculated using income flows divided by the stock of liabilities
** RBA estimate for 2010 due to incomplete data
Sources: ABS; RBA

Graph 12
Mining Sector Returns



* RBA estimate for 2010 due to incomplete data
Sources: ABS; Morningstar; RBA

9 Arsov, Shanahan and Williams (2013) estimate that around three-quarters of the Australian resources sector is foreign owned.

Conclusion

Between late 2010 and early 2013, Australia's net income deficit declined to its lowest level since the early 1990s. This is due in large part to a reduction in the income paid on Australia's foreign liabilities, rather than an increase in the income received on Australia's foreign assets. The reduction in income payments on Australia's foreign liabilities has been evident for both debt and equity liabilities and, in both cases, these reductions reflect declines in the average yields paid on these liabilities, rather than declines in the stock of liabilities outstanding. The decrease in the average yield paid on Australia's debt liabilities reflects a combination of declines in Australian interest rates and a compositional shift towards lower-yielding government debt. The decline in the average yield paid on Australia's equity liabilities appears to be linked to the decline in the profitability of the Australian resources sector over this period.

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Infrastructure Investment in China

Kelsey Wilkins and Andrew Zurawski*

Infrastructure investment in China has increased significantly in recent decades and has been a significant driver of economic growth and improved standards of living. Nonetheless, the level of infrastructure in China remains below that in developed countries, suggesting that the growth of infrastructure investment is likely to remain strong for some time. This outlook has implications for Australian commodity exports, as infrastructure investment is intensive in its use of steel, which in turn relies on iron ore and coking coal as inputs. While infrastructure investment in China is not without its risks, these may be mitigated to some extent by reforms proposed by the authorities, such as increasing the private sector's participation in the allocation, execution and financing of this investment.

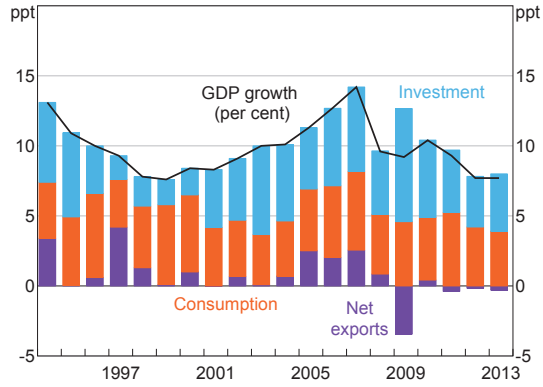
Introduction

Investment has been a significant driver of economic growth in China over the past two decades (Graph 1). Chinese gross fixed capital formation, the measure of investment reported in the national accounts, grew at an average annual rate of 11 per cent in real terms since 2000, although this has declined to 8 per cent per annum over the past two years. This rapid growth has enabled investment in China to remain a large share of GDP, accounting for almost half of GDP in 2013 (by comparison, investment accounts for a little more than a quarter of GDP in a developed economy such as Australia and just over a third in a developing economy like Indonesia).

A significant proportion of investment in China since the early 1990s has been directed towards increasing the amount and improving the quality of infrastructure. Much of this has been driven by urbanisation in China, as cities require substantial infrastructure development to support a growing population.

The rapid development of infrastructure in China over the past few decades is reflected in the improvement in a range of social and economic indicators. However, these indicators also suggest

Graph 1
China – Contributions to GDP Growth



Sources: CEIC Data; RBA

that China still has some way to go to converge with the levels of development and standards of living in developed economies. For example, urban rail transit infrastructure is relatively underdeveloped in many large Chinese cities compared with that in large international cities in most developed economies. More generally, the Chinese authorities plan to facilitate more urbanisation in coming years (although at a slower pace than recent times), which will create further demand for infrastructure. These factors suggest that infrastructure investment in China will remain strong for some time.

* The authors completed this work in Economic Group.

The outlook for Chinese investment in infrastructure also affects significantly the outlook for Australian exports. Infrastructure investment is intensive in the use of steel, which in turn relies on coking coal and iron ore inputs. Together these two commodities accounted for a third of Australia's exports in 2013. Hence, further infrastructure development in China should help to support Australian exports in coming years.

Trends in Infrastructure Investment

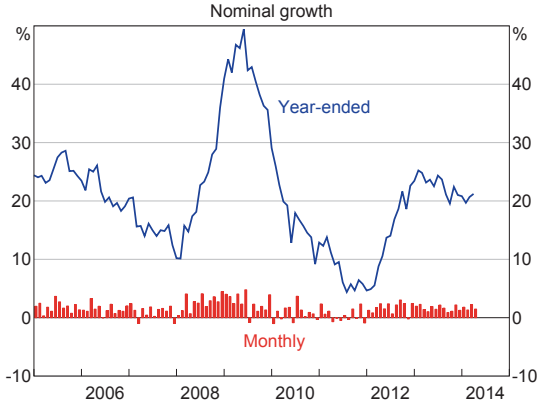
Infrastructure can be classified in various ways, but a standard grouping is:

- municipal infrastructure, such as street lighting, urban roads, bridges and subterranean infrastructure
- utilities, such as gas, water and electricity
- transportation, such as highways and rail
- social infrastructure, such as schools and hospitals.

The Chinese National Bureau of Statistics provides a breakdown of infrastructure investment by type through data on fixed asset investment (FAI).[1] It is important to note, however, that FAI overstates investment growth as measured in the national accounts (which unfortunately does not provide a breakdown by industry). This is because FAI data include second-hand asset sales and land sales. Since 2004, investment in infrastructure has accounted for between 25 and 35 per cent of total FAI in China, and has grown in nominal terms by an average annual rate of 20 per cent (Graph 2).

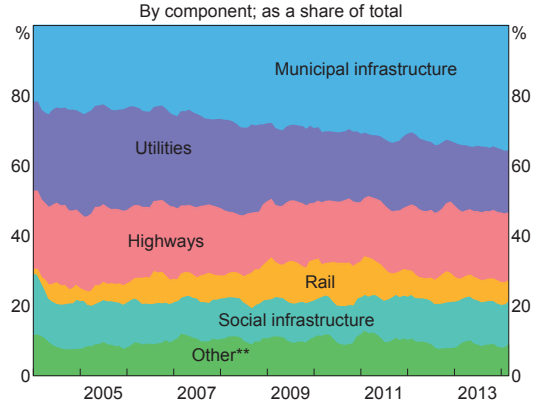
Municipal infrastructure can be thought of as urban infrastructure – and includes water conservation, waste management and urban road maintenance. Over the past decade, this has comprised the largest share of infrastructure investment, accounting for almost 30 per cent of the total (Graph 3). The rapid growth of municipal investment is not surprising given China's ongoing urbanisation process. Over this period, almost 190 million people have migrated from rural areas to cities.[2] As well as building more cities, China has expanded the coverage and quality of municipal infrastructure within cities. For example, 65 per cent of China's population now have access

Graph 2
China – FAI Infrastructure*
Nominal growth



* RBA estimates
Sources: CEIC Data; RBA

Graph 3
China – FAI Infrastructure*
By component; as a share of total



* RBA estimates; seasonally adjusted; three-month moving average
** Other includes waterway, air and pipeline transport and services, storage and other postal services
Sources: CEIC Data; RBA

1 FAI data are compiled via a sample of investment projects larger than CNY 5 million. For more details, see Roberts and Rush (2010).

2 The number of cities and towns (defined as areas with populations of at least 2 500, of which at least 70 per cent are non-agricultural population) in China has also increased substantially over a longer period of time, numbering just over 2 000 in 1978 and rising to around 20 000 in 2010 (State Council 2014a).

to reliable sanitation facilities, compared with just under 24 per cent in 1990 (World Bank 2014).[3]

Utilities have been the second largest component of infrastructure investment over the past decade, comprising around one-quarter of infrastructure investment. This share has been on a declining trend, as the majority of households have attained access to reliable utilities over time and the need for further investment has been reduced. Utilities infrastructure increases households' living standards through better and more reliable access to clean water and power. This infrastructure is also a vital input to industrial production, which requires a reliable energy supply. During the past decade, electricity infrastructure has accounted for almost two-thirds of utilities investment; this investment has resulted in more than 99 per cent of the population now having access to electricity (World Bank 2014). Access to reliable water sources has also reached 98 per cent of the population in urban areas. The share of investment in water production and supply has continued to grow steadily, probably as a reflection of deficiencies in rural water access (with only 85 per cent of the rural population having access to basic safe water facilities).

Transportation infrastructure has comprised roughly a quarter of total infrastructure investment. Investment in roads has been the largest component of this expenditure, accounting for around 20 per cent of overall infrastructure investment. This investment has seen China's highways expand from 1 million kilometres in 1990 to 4.3 million kilometres in 2013. Investment in rail networks occupies a smaller portion of China's investment in infrastructure and tends to be more volatile than that of many other major infrastructure sectors. Nevertheless, rail investment has resulted in a 77 per cent increase in the length of track since 1990, and an even larger increase in passenger travel in the past 10 years (see 'Box A: Railway Infrastructure in China').

Social infrastructure has accounted for about 12 per cent of infrastructure investment over the past decade. This category includes cultural infrastructure as well as health care and education facilities. Since 2004, investment in education infrastructure (such as schools, universities and vocational training facilities) has declined from about 70 per cent to 40 per cent of social infrastructure investment (although the level of investment in education infrastructure has continued to grow). An increased share of spending has been directed towards cultural infrastructure (which includes libraries, museums and sporting facilities). Overall, the share of investment directed towards health care and other social infrastructure has steadily increased since 2004.

In addition to being employed to advance the longer-term development of the Chinese economy, infrastructure investment has also been used as a countercyclical policy tool to stimulate economic activity. This was most evident during 2008–09, when the government rapidly implemented a stimulus program targeted at infrastructure in response to the global financial crisis.[4] Reflecting the government's stimulus measures, year-ended growth in nominal infrastructure investment (as measured by FAI data) peaked in 2009 at almost 50 per cent. While the increase in investment was broad based across all components of infrastructure, rail investment increased at a particularly rapid pace and was an example of how the construction of long-term infrastructure projects in China have been quickly mobilised to provide a short-term stimulus. The stimulus was gradually unwound over 2010 and 2011 as economic conditions in the rest of the world improved.

Although it is common for governments to be involved in the provision of infrastructure, the level of government involvement in China is high by world standards. Chinese government investment

3 Reliable facilities refer to standard facilities, as defined by the World Bank, such as flush/pour flush (to piped sewer system, septic tank, pit latrine), ventilated improved pit latrine, pit latrine with slab and composting toilet.

4 For more details on China's stimulus during the global financial crisis, see McKissack and Xu (2011) and Sadeghian, White and D'Arcy (2013).

accounted for approximately 85 per cent of all infrastructure investment in 2012, compared with less than half in Australia and between 50 and 60 per cent for a large emerging economy like Brazil. Infrastructure planning and development in China is carried out by multiple government institutions. The State Council and the National Development and Reform Commission (NDRC) are both responsible for the direction of infrastructure investment.[5] The NDRC is responsible for the approval of large infrastructure projects, with the approval of smaller projects the responsibility of provincial development and reform commissions. However, the role of the NDRC could change in coming years. Recent reforms announced by the State Council and NDRC aim to decentralise the project approval process and facilitate a greater contribution to infrastructure from private investment, as well as increase the transparency and efficiency of the approval system (NDRC 2013).[6]

Outlook for Infrastructure Investment

Although the improvement in the scale and quality of infrastructure over the past two decades is evident across a variety of social and economic indicators, there is still some way to go before China achieves convergence with the provision of infrastructure seen in advanced economies, including Asian economies that are further along the path of economic development. For example, the share of paved roads in China remains well below that seen in Japan and South Korea, as does the level of access to reliable sanitation and water facilities (Table 1). And even though China is more economically developed than India, it has a similar share of paved roads and slightly less access to standard water facilities.

In addition to converging with the standards of developed economies, the ongoing process of rural-urban migration in China will add to the demand for improvements in national infrastructure. The government's recent urbanisation plan targets an increase in the urbanisation rate to 60 per cent by 2020, a 6 percentage point increase from the current level (Graph 4). This implies an additional 100 million people migrating from agricultural and rural areas to the cities, and an estimated CNY 42 trillion of investment (74 per cent of one year's worth of GDP) spread over the next six years (Wang B 2014). When compared with other developing economies like Brazil and Argentina, it is evident that China still has a large potential to urbanise further.

Table 1: Selected Development Indicators by Country

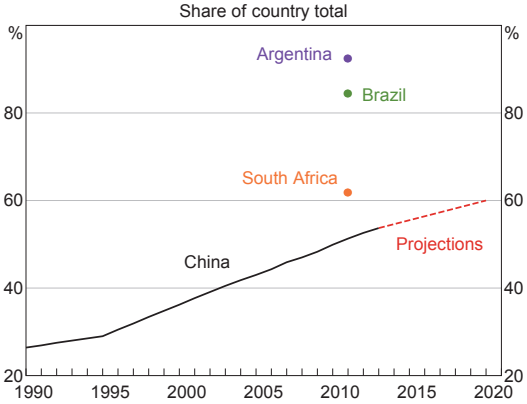
	China	US	Japan	South Korea	India
Gross national income per capita[(a)]	5 720	52 340	47 880	22 670	1 580
Paved roads (per cent of total)[(b)]	54	98	78	79	50
Reliable access to water[(c)]	85	94	100	88	90
Reliable access to sanitation	65	100	100	100	35

(a) 2012, current US dollars
(b) Most recent observation
(c) 2011, per cent of rural population
Sources: RBA; World Bank

5 The State Council, sometimes referred to as China's cabinet, is China's chief administrative and planning body on economic, political and social matters.

6 The NDRC is expected to undertake a transition from an emphasis on micro-level control of projects to a broader regulatory and institutional design focus (Zheng 2014).

Graph 4
Emerging Market Urban Populations
Share of country total

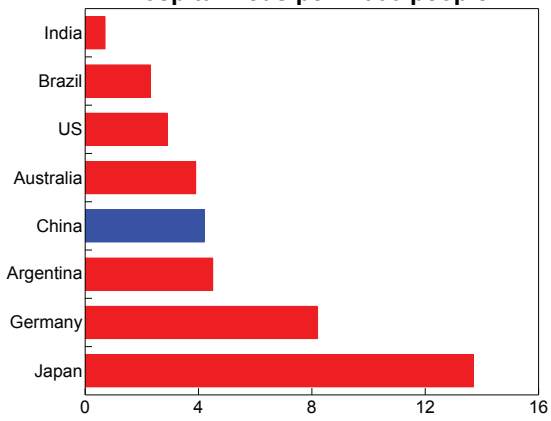


Sources: CEIC Data; China's State Council; RBA; World Bank

For a larger urban population to be accommodated, substantial investment in municipal infrastructure and transport infrastructure will be required. The government has emphasised the need for greater investment in municipal infrastructure, particularly subterranean infrastructure (pipes, sewage works, flood management systems, etc) (State Council 2013, 2014a). Significant improvements are also expected to be made to urban roads, bridges, pedestrian and bicycle paths, and to urban ecological developments. Specifically, China is aiming to improve sewage treatment and garbage disposal rates in urban areas by around 10 percentage points, to cover 95 per cent of the urban population by 2020 (State Council 2014a).

Investment in the social sector (e.g. aged care) is likely to receive increasing attention from policymakers. China is currently facing demographic challenges as a result of its population control policies and the nature of its economic development process. While the care of parents and elderly relatives has traditionally fallen to their children, China's one-child policy and growing geographic dispersion of families (due in part to the migration of young people to urban centres) mean that the task of aged care is becoming increasingly difficult to manage. To respond to these challenges, Chinese authorities are working to ensure that 98 per cent of the urban population has medical insurance and more than 90 per cent are covered by the old age pension by 2020, compared with 95 per cent and 67 per cent currently (State Council 2014a). While, on some metrics, China's medical infrastructure compares favourably to some developed economies, it remains low compared with some developed east Asian and emerging economies (Graph 5). However, the quality of healthcare provision obviously depends on several other factors besides just infrastructure, and China significantly lags most developed countries on these terms, such as the number of doctors per person and the quality of health services. Aged care homes and medical facilities are likely to require further investment to accommodate urbanisation and an ageing population.

Graph 5
Hospital Beds per 1 000 people*



* Data are for 2011 except for the US, Australia and China, which are from 2009, 2010 and 2013, respectively; hospital beds include inpatient beds available in public, private, general, and specialised hospitals and rehabilitation centres

Sources: CEIC Data; RBA; World Bank

Box A
Railway Infrastructure in China

Railway infrastructure is important for the Chinese economy because China's vast geographic size, difficult terrain and weather conditions make rail one of the most reliable forms of transport. Passenger and freight rail transport is also one of the most steel-intensive forms of infrastructure investment.[1] Railway track is routinely subjected to high levels of physical stress (particularly high-speed rail lines) and therefore requires high-quality steel as inputs. Railway infrastructure in China largely comprises national rail lines and urban subway systems.

China's ongoing need for the development of rail infrastructure is apparent in demographic, track length and usage metrics. OECD data illustrate that city rail transport in China is underdeveloped relative to that of large cities of similar sizes in other countries. A comparison of Beijing's rail infrastructure (which is well developed by Chinese standards) with that of London or Tokyo highlights the scope for expansion. For example, Beijing's population of approximately 18 million is serviced by 458 kilometres of rail lines, representing 26 kilometres of rail per million people, compared with 192 kilometres per million in London and 69 kilometres per million in Tokyo (Table A1).

Outside of urban centres in China, plans are underway to build a more connected rail network. These plans, detailed in China's 12th Five Year Plan and recently re-emphasised (State Council 2014b),

Table A1: Rail Transport Systems in Metropolitan Centres[(a)]

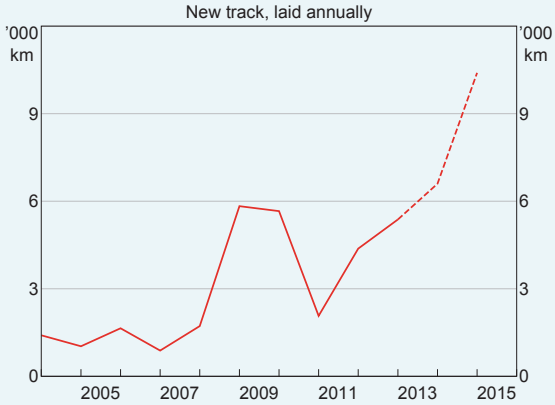
	Length of system	Demographic indicators		Availability
	Kilometres	Population (millions)	Density (people/km^2)	Km per million people
International cities				
London	2 348	12	2 951	192
Tokyo/Yokohama	2 139	31	5 934	69
New York	1 435	20	1 823	71
Seoul/Incheon	950	23	10 402	42
Large Chinese cities				
Beijing	458	18	4 808	26
Shanghai	368	22	5 776	17
Guangzhou	232	10	5 263	22
Shenzhen	178	10	6 579	19
Chongqing (City)	87	8	7 979	12

(a) As of 2012; population is of state/municipality administrative area
Source: OECD

1 A case study of a high-speed rail project in France (World Steel Association 2010) found that each kilometre of rail required 215 tonnes of steel, with steel-reinforced concrete, steel rail and steel structures accounting for 43 per cent, 36 per cent and 21 per cent, respectively.

entail extending rail lines to reach China's lesser developed central and western regions and connecting 'satellite cities'. The underdeveloped western and central regions are where most of China's planned 120 000 kilometres of operational rail lines are set to be constructed by 2015, implying a substantial pick-up in construction if this target is to be met (Graph A1) (NPC & CPPCC 2011). This also includes ongoing efforts to extend high speed rail to cover all cities with a minimum population of 500 000 by 2020. China's plans to extend subway lines in urban centres could see over 6 000 kilometres of additional rail networks constructed within just 35 cities by 2030 (OECD 2013).

Graph A1
China – National Railway Infrastructure*



* Dashed line indicates projection for 2014 and 2015 based on State Council (2014a) and NPC & CPPCC (2011)
Sources: CEIC Data; RBA

Risks to the Infrastructure Investment Outlook

Although the outlook for infrastructure investment in China generally appears strong, there are nevertheless some significant risks. These risks mainly relate to the dominant role of the government in allocating and financing infrastructure investment. Around 85 per cent of infrastructure investment in China is undertaken by the state – a much higher percentage than is typical in other countries. In the absence of a strong framework of project prioritisation and transparent cost-benefit analysis, the reliance on government-directed investment creates the potential for misallocation of resources through inefficient investment. Despite making progress towards broader economic reform, the lack of market price mechanisms in many types of infrastructure industries increases the risk of poor investment decisions. Over-investment also contributes to the crowding out of private investment at a time when contributions from the private sector are being encouraged.

A related risk involves the current method of financing infrastructure investment in China. Typically, large nationwide infrastructure projects in China are financed by the central government, while the financing responsibilities of smaller projects fall to local governments. This is similar to most economies, but the configuration of China's fiscal arrangements means that local governments do not always have the capacity to finance investment out of revenues or by issuing debt. As a result, alternative sources of financing have been used, such as specially designed local government financing vehicles (LGFVs). According to the 2013 Audit of Chinese central and local government debt, 39 per cent of local government debt was sourced from LGFVs. These LGFVs have come under scrutiny recently as the sources of their funds are not always clear and may originate through non-bank financing channels. This has led to concerns about the sustainability of China's increasingly large local government debt, particularly as infrastructure may not generate sufficient financial returns over the period in which funds are borrowed to service this debt.

Chinese authorities have proposed reforms to address these risks. The government has proposed the use of municipal bonds in order to broaden the sources of funding for local governments and to increase transparency.[7] In addition, Chinese authorities have highlighted the need to reform revenue collection and sharing arrangements between the central and local governments (Ministry of Finance 2014).

More broadly, Chinese reform proposals have highlighted the need for private sector involvement in infrastructure investment and to allow market forces to play a more important role in allocating resources. Proposed reforms include supportive measures for public-private partnerships (PPPs) in order to attract more private capital for infrastructure investment. Alongside these reforms and following pilot programs launched in Harbin and Luoyang, the State Council recently announced plans to launch 80 PPPs in infrastructure industries (State Council 2014c), including a new subway line in Beijing and several new ports.[8] Efforts to simplify and decentralise the investment approval process should help to attract more PPPs. But, as experience in many other countries has shown, there are a lot of preconditions required in order for these partnerships to be successful, and PPPs tend to make up only a small share of infrastructure financing even in advanced economies. In addition to broader institutional settings that mitigate private investors' concerns over political risk, PPPs require particularly careful risk assessment and appropriate risk sharing. To this end, China has invited the World Bank to collaborate on PPP projects and related social capital planning (State Council 2014d).

The challenges of financing infrastructure investment are not unique to China. The sustainable financing of infrastructure investment has been on the agenda of the G20 for the past two years. The G20 has reaffirmed the critical importance that these investments play in supporting economic growth and is discussing ways to facilitate the efficient allocation of global savings to long-term infrastructure financing. Actions that can improve project preparation, planning and funding are a key priority, along with broader improvements to institutional settings in G20 countries (Chong and Poole 2013).

Conclusion

Infrastructure investment in China has proceeded rapidly over the past few decades, contributing significantly to economic growth and improved standards of living. The expansion and upgrading of China's infrastructure has had a significant impact on the Australian economy as iron ore and coking coal are key inputs into the production of steel, which is in turn used intensively in infrastructure-related construction. If the Chinese economy continues to converge – on a range of development indicators – with advanced economies and the share of the population dwelling in urban areas grows further over time, Chinese investment in infrastructure should continue to support the global demand for raw materials. While infrastructure investment on the scale being undertaken in China today is not without its risks, these may be mitigated to some extent by reforms proposed by authorities, including those that target greater private sector participation in the allocation, execution and financing of this investment.

7 Currently, local governments are prohibited from borrowing or issuing bonds directly, with the central government issuing bonds on behalf of local governments to finance their budget deficits. A new trial program has been launched to allow 10 local governments to issue municipal bonds in 2014 (Shanghai, Zhejiang, Guangdong, Shenzhen, Jiangsu, Shandong, Beijing, Jiangxi, Ningxia and Qingdao). Local governments will receive no support from the central government or Ministry of Commerce and Finance for the principal or interest of these bonds (as was previously the case). See Wang W (2014) for more information.

8 For more information on the PPPs, including a list of the approved projects, see NDRC (2014) and accompanying attachment.

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Banking Fees in Australia

Ashley Craig*

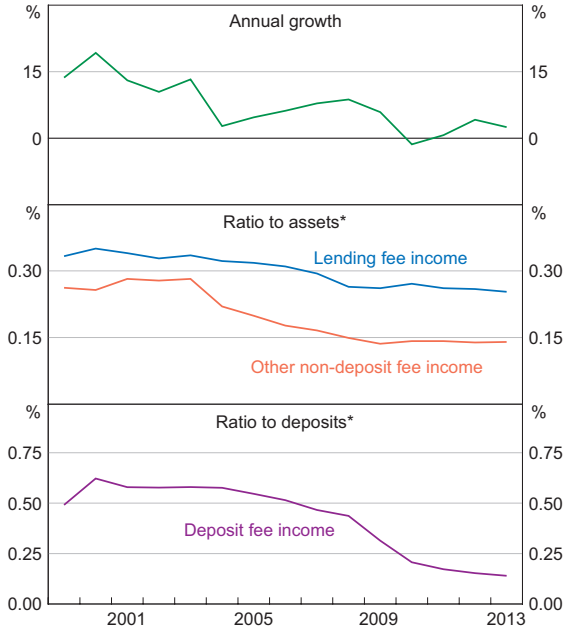
The Reserve Bank has conducted a survey on bank fees each year since 1997. The results of the most recent survey suggest that banks' fee income from both households and businesses rose moderately in 2013. However, deposit and loan fees have declined as a ratio to the outstanding values of deposits and assets, respectively.

Overview

The Reserve Bank's annual bank fee survey provides information on the fees that banks earn from their Australian operations.[1] It focuses on fee income generated by banks in the process of taking deposits, making loans and providing payment services. The 2013 survey included 16 institutions, which together account for around 90 per cent of the total assets of the Australian banking sector. Other forms of non-interest income, such as income earned from funds management and insurance operations, are excluded from the survey. This article provides a summary of the results from the latest survey covering the banks' financial years ending in 2013.[2]

Total domestic fee income grew by around 2½ per cent in 2013 to $11.6 billion, reflecting moderate growth in income from fees charged to both businesses and households (Table 1). The growth was driven by an expansion in banks' balance sheets, with deposit and loan fees declining as a ratio to the outstanding values of deposits and assets, respectively (Graph 1).

Graph 1
Banks' Fee Income



* Adjusted for breaks in series in 2002 due to a change in banks' reporting; financial-year average assets and deposits have been used

Sources: APRA; RBA

* The author is from Domestic Markets Department.

1 The data from the survey are published in the Reserve Bank's Statistical Table C9, 'Domestic Banking Fee Income'.

2 Apart from data in Table 3, all data in this article are based on individual banks' financial years, which differ between banks.

Table 1: Banks' Fee Income

	Households		Businesses		Total	
	Level	Growth	Level	Growth	Level	Growth
	$ million	Per cent	$ million	Per cent	$ million	Per cent
2010	4 311	16.6	6 514	2.1	10 825	–1.4
2011	4 069	–5.6	6 830	4.8	10 899	0.7
2012	4 043	–0.6	7 292	6.8	11 335	4.0
2013	4 136	2.3	7 499	2.8	11 635	2.6

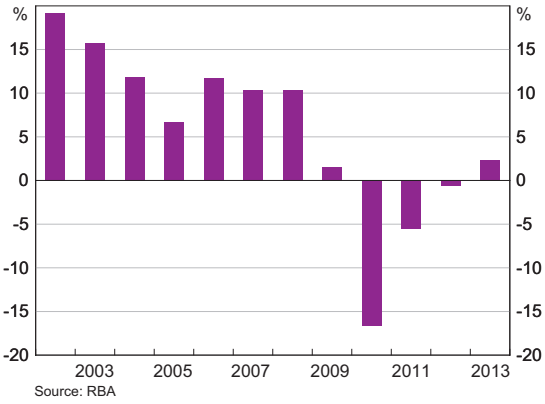
Source: RBA

Households

Banks' fee income from households grew by 2.3 per cent in 2013 (Graph 2, Table 2), following declines in each of the previous three years. This primarily reflected growth in fee income from credit cards and personal loans. However, there were also increases in income from other fees, including deposit fee income, which had fallen noticeably in recent years.

Fee income from household credit cards increased in 2013, reflecting growth in the value of credit card transactions and a small rise in the number of credit cards on issue, which drove an increase in income from account-servicing and other fees (especially foreign currency conversion fees). Annual fees on credit cards were little changed over the year (Table 3), while income from exception fees on credit cards – which are charged when customers exceed their credit card limit or make a late payment on their credit card – declined in 2013 (Table 4). This decline was partly due to a reduction in the average fee charged to customers for exceeding their credit limits (Table 3).

Graph 2
Growth in Household Fee Income



Source: RBA

Table 2: Banks' Fee Income from Households

	2011	2012	2013	Growth 2013	Contribution to growth 2013	Average growth 2007–12
	$ million	$ million	$ million	Per cent	Percentage points	Per cent
Loans	2 838	2 848	2 930	2.9	2.0	2.1
– Credit cards	1 293	1 309	1 363	4.1	1.3	2.1
– Housing	1 228	1 221	1 226	0.4	0.1	2.5
– Personal	317	317	341	7.5	0.6	0.2
Deposits	1 140	1 096	1 102	0.5	0.1	–10.9
Other fees	91	99	104	4.8	0.1	2.5
Total	**4 069**	**4 043**	**4 136**	**2.3**	**2.3**	**–2.6**

Source: RBA

Table 3: Unit Fees on Credit Cards[a]

	2011	2012	2013	Change 2013	Average change 2007–12
				Per cent	Per cent
Annual fees ($)[b]					
Low-rate cards	54	55	55	–0.1	2.8
Standard cards	29	29	29	0.0	0.0
Standard rewards-based cards	80	80	80	0.0	0.0
Platinum rewards-based cards	283	246	236	–4.1	1.4
Cash advance fees (per cent of value)[c]					
Own bank's ATM	1.8	1.8	1.9	3.4	10.0
Other institution's ATM	1.8	1.8	1.9	3.4	4.7
Overseas ATM	1.8	1.8	1.9	3.4	4.7
Other fees					
Foreign currency conversion fee (per cent of value)	2.9	2.9	2.9	0.4	3.2
Late payment fee ($)	14	14	14	0.0	–15.5
Over-limit fee ($)	10	10	8	–23.1	–20.1

(a) Simple average fees for cards with interest-free periods issued by major banks, except for the annual fee on low-rate cards, which is based on a wider sample of banks; note that changes in the sample affect the average fee; as at June
(b) Includes fees for membership in rewards program where charged separately
(c) For low-value transactions, the banks charge a minimum cash advance fee, which represents a higher percentage of the transaction value
Sources: RBA; credit card issuers' websites

Fee income earned from personal loans also increased, although this represents only a small part of household fee income. This increase was reportedly driven by increased income from account-servicing fees as a result of higher customer volumes, as well as a small contribution from an increase in some unit fees charged on unsecured lending.

Deposit fee income from households rose slightly in 2013, which followed four consecutive years of declining revenue from this source. The rise in fee income from household deposits was driven by an increase in income received from exception fees (which include overdrawn account and cheque dishonour fees); these fees grew strongly for the second year in a row after declining from 2009 to 2011 (Table 4). The growth in exception fee income was accounted for by a rise in the number of times that fees were charged, rather than the level of fees. In contrast, income from account-servicing and transaction fees on deposits declined despite around 10 per cent growth in the average value of household deposits over the year. In part, this was driven by a reallocation by customers toward accounts with no fees. For the household sector, the ratio of deposit fee income to the value of deposits has declined from 0.6 per cent in 2008 to 0.2 per cent in 2013.

Fee income from housing loans increased slightly in 2013. Account-servicing fee income from housing loans increased but this was offset by a fall in other fee income (including exception fees, fees for breaking fixed-rate loans and service fees from securitised loans). Much of the growth in account-servicing fee income in the year can be explained by growth in housing loan approvals. Growth in

Table 4: Exception Fee Income from Households

	2011 $ million	2012 $ million	2013 $ million	Growth 2013 Per cent
Loans	315	312	287	–8.1
– Credit cards	255	252	232	–8.1
– Housing	36	35	30	–16.2
– Personal	24	25	26	3.5
Deposits	235	260	292	12.4
Total	**550**	**572**	**579**	**1.2**

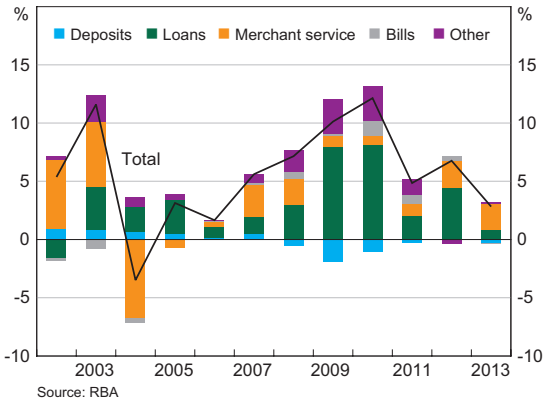
Source: RBA

housing loan approvals is usually associated with higher establishment fee income, although a number of banks have been waiving these fees for some customers. Despite growth in the number of housing loans, exception fee income (which includes, for example, late payment fees) continued to fall and has now declined by more than 50 per cent since 2009.

Businesses

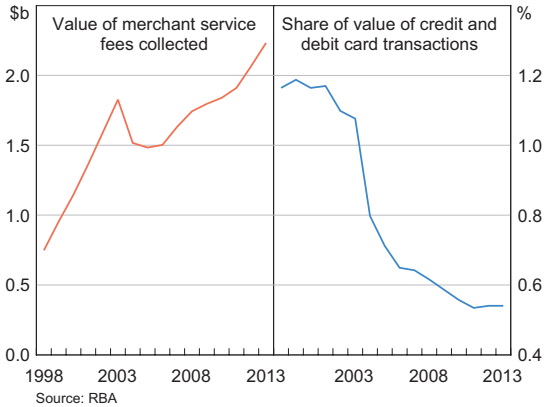
Total fee income from businesses increased by 2.8 per cent in 2013 (Graph 3, Table 5). A rise in the number of credit card transactions drove growth in income from merchant service fees (which cover the provision of credit and debit card transaction services). However, data from the bank fee survey suggest that merchant service fees have, on average, remained stable as a share of transaction values (Graph 4). Merchant service fees collected from both small and large businesses contributed to growth in business fee income, but the increase in these fees paid by small businesses was mostly offset by broad-based declines in other types of fee income derived from small businesses. As a result, growth in aggregate business fee income was largely driven by growth in fees collected from large businesses.

Graph 3
Growth in Business Fee Income
Contribution by product



Source: RBA

Graph 4
Merchant Service Fee Income



Source: RBA

Table 5: Banks' Fee Income from Businesses

	2011 $ million	2012 $ million	2013 $ million	Growth 2013 Per cent	Average growth 2007–12 Per cent
Deposit accounts	624	623	603	–3.2	–5.7
– of which: exception fees	*50*	*46*	*42*	*–8.0*	*na*
Loans	2 837	3 142	3 204	2.0	13.5
– of which: exception fees	*38*	*36*	*31*	*–12.4*	*na*
Merchant service fees	1 910	2 067	2 232	8.0	4.8
Bank bills	236	262	254	–2.9	29.2
Other	1 222	1 198	1 205	0.6	10.9
Total	**6 830**	**7 292**	**7 499**	**2.8**	**8.2**
– of which: exception fees	*88*	*81*	*73*	*–10.0*	*na*

Source: RBA

Loan fee income from large businesses also contributed to the rise in banks' fee income from businesses, which mostly resulted from an increase in the value of account-servicing fees and was broadly in line with growth in the value of new loans.[3] A rise in some fees for packaged loans also made a small contribution to growth in large business loan fees. Exception fee income from businesses continued to decline in 2013, as did fee income from bank bills (which includes charges for arranging bank bill facilities and accepting or endorsing bills).

Despite growth in the value of business deposits, deposit fee income from businesses declined slightly in the year due to falls in income from account-servicing and transaction fees. This mirrored developments in household deposit fees.

3 Part of the increase in account-servicing fee income in 2013 arose from a reclassification of some fees that had previously been included in 'other' large business fees.

Cash Use in Australia

Jessica Meredith, Rose Kenney and Eden Hatzvi*

This article uses results from the 2013 Survey of Consumers' Use of Payment Methods and regression analysis to examine trends in cash use in Australia. The results show that cash remained the most common form of payment, though its use relative to other payment methods has declined over recent years. Older participants were more likely to use cash than younger participants and all participants were more likely to use cash for low-value transactions relative to other payment methods. In addition, participants were asked about their holdings of banknotes in their 'wallet' (i.e. on their person) and elsewhere, with the results suggesting that cash – particularly high-value denominations – was being used as a store of value and not just for transactional purposes.

Introduction

The Reserve Bank of Australia is responsible, under the *Reserve Bank Act 1959*, for the production, issue, reissue and cancellation of Australia's banknotes. Banknotes are used by the public as a payment method and as a store of value. While there is information on the number and value of banknotes in circulation and on withdrawals from automated teller machines (ATMs), data on the use of banknotes by the public are limited. With this partly in mind, the Reserve Bank conducted the third Survey of Consumers' Use of Payment Methods (the survey) in November 2013, following previous surveys in 2007 and 2010.[1]

The survey primarily comprised two components: a diary that participants filled in over seven days; and an end-of-survey questionnaire. In the diary, participants reported details of all transactions made, including the transaction value, the payment method, the payment channel (e.g. point of sale or internet) and the merchant category. Participants were also asked about the cash they obtained (cash 'top-ups'), including the value, the method of obtaining it, and the value of banknotes held following the top-up. In the 2013 survey, 1 167 participants recorded around 15 500 payments totalling over $1.1 million, and around 1 700 cash top-ups.[2] In the end-of-survey questionnaire, participants answered questions relating to their payment preferences, banknote holdings, substitution with new payment methods and use of direct debits.

Drawing on data from the survey, this article explores cash use from three perspectives. First, it looks at cash as a payment mechanism and evaluates who uses cash to make payments and the type of payments they make. Second, banknote holdings for transaction purposes (i.e. banknotes in wallets) and the denominations participants held for conducting transactions are examined. Finally, the article presents some information on cash holdings that potentially reflect the use of cash as a store of value.

* The authors are from Note Issue Department.

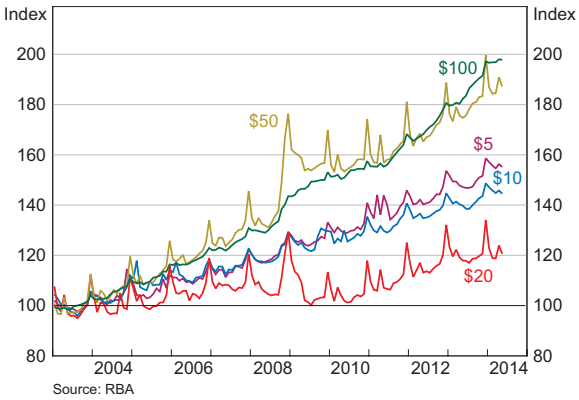
1 For more information about these surveys, see Emery, West and Massey (2008), Bagnall, Chong and Smith (2011), Bagnall and Flood (2011) and Ossolinski, Lam and Emery (2014). The fieldwork for the 2013 survey was undertaken by research firm Colmar Brunton (fieldwork for the 2007 and 2010 surveys was undertaken by Roy Morgan Research).

2 Payments included all transactions between a consumer and a merchant and did not include transfers between a participant's own accounts, such as the repayment of debt, or transfers to friends or family members.

Background

The main source of contemporaneous data on cash is the stock of banknotes in circulation. These data show that the number of banknotes in circulation has been rising, on average, by around 5 per cent per annum over the past decade. This has occurred despite the significant increase in the use of electronic payments. However, not all banknotes on issue have increased at the same rate (Graph 1). The number of high-value denominations in circulation – $50 and $100 banknotes – has increased much faster than the number of low-value denominations – $5, $10 and $20 banknotes. Indeed, between them, the $50 and $100 banknotes now account for around two-thirds of the number of banknotes in circulation.

Graph 1
Number of Banknotes in Circulation
2003 = 100



Source: RBA

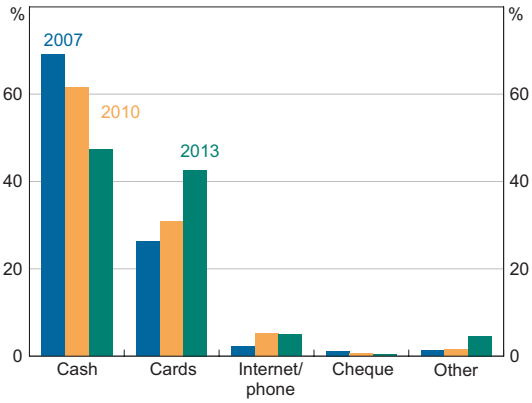
Notwithstanding the continued rise in the number of banknotes in circulation, there is some evidence that the use of cash in transactions has declined relative to other payment methods. The main indicator of this is the growth in the value of cash withdrawals relative to the growth in nominal household consumption. While nominal household consumption has grown at an average annual rate of 6 per cent over the past decade, cash withdrawals (including ATM withdrawals, eftpos cash out and over-the-counter cash withdrawals at bank branches) have grown at an average annual rate of just 2 per cent.[3]

While these data suggest that the importance of cash as a payment method is declining, they do not provide any insights into the use of cash by consumers and the factors that might affect it. The surveys conducted by the Reserve Bank in 2007, 2010 and 2013 provide some insights. The following sections set out the key findings from these survey data.

Cash Payments

As in the 2007 and 2010 surveys, cash was the most frequently used payment instrument in the 2013 survey but its use declined compared with earlier surveys. Cash accounted for 47 per cent of the number of transactions in the 2013 survey, compared with 69 per cent of transactions in the 2007 survey (Graph 2). While cash was the most frequently used method of payment in the 2013 survey, cards (including all debit and credit cards) were used nearly as often.

Graph 2
Use of Payment Methods
Share of number of payments

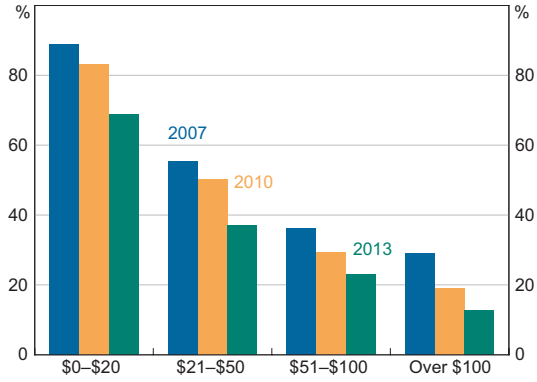


Sources: Colmar Brunton; Roy Morgan Research

3 Cash withdrawals do not increase banknotes in circulation, because banknotes are considered to be in circulation when they leave the Reserve Bank.

Consistent with the previous surveys, cash was the preferred payment method for low-value transactions.[4] Participants used cash to make 69 per cent of payments worth $20 or less, but only 13 per cent of payments exceeding $100 (Graph 3). The median value of a cash transaction in the 2013 survey was around $12, which was little changed from 2007. Although participants indicated in the end-of-survey questionnaire that they were generally comfortable making a cash payment worth up to $200, they clearly preferred other methods for payments of this size. The share of payments undertaken using cash declined across all payment values since 2007, suggesting a broad-based shift in payment preferences away from cash to alternative payment methods.

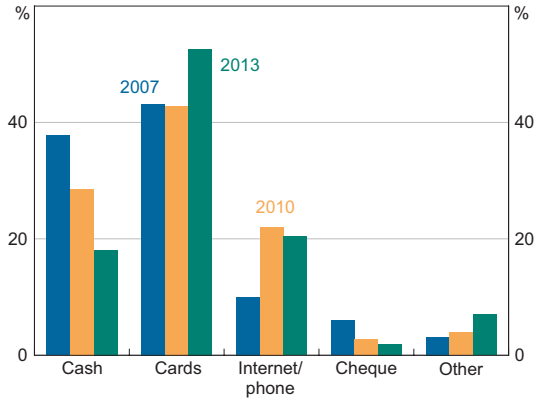
Graph 3
Use of Cash by Payment Value
Share of number of payments made in cash



Sources: Colmar Brunton; Roy Morgan Research

As cash was used more frequently for lower-value than for higher-value transactions, it accounted for a smaller share of the value of payments compared with the number of payments. Cash accounted for 18 per cent of the value of the surveyed transactions in 2013, while cards accounted for 53 per cent of the value of transactions (Graph 4).

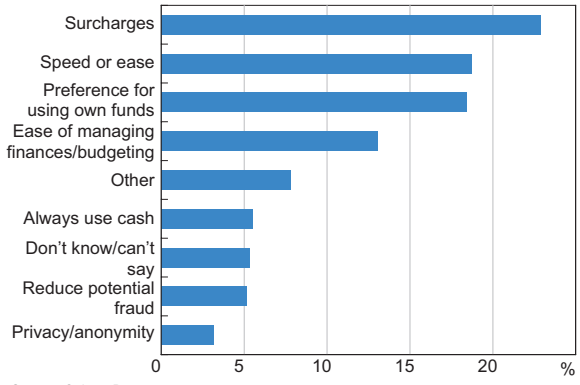
Graph 4
Use of Payment Methods
Share of value of payments



Sources: Colmar Brunton; Roy Morgan Research

In order to understand why some consumers continue to use cash despite the prevalence of alternative payment mechanisms, survey participants were asked why they used cash at the point of sale. Around one-quarter of participants identified avoiding credit card surcharges as the most important factor, around one-fifth of participants stated speed or ease of transaction, and a similar proportion indicated a preference for using their own funds (Graph 5). Only 3 per cent of participants indicated privacy as the most important reason for using cash.

Graph 5
Why Choose Cash?
Most important factor, 2013



Source: Colmar Brunton

4 The finding that cash was preferred for low-value transactions is consistent with international studies, such as Deutsche Bundesbank (2009), ECB (2011) and Wang and Wolman (2014).

Factors Affecting Cash Use

Previous studies, both international and domestic, have found that cash use varies with demographic factors, such as age and income.[5] These studies have generally found that other factors, such as the size of the payment and merchant type are also important in determining whether cash is used in transactions. The 2013 survey provides very similar results to these previous studies.

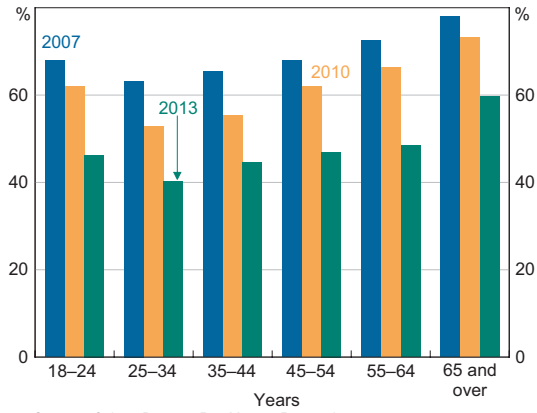
A result consistent across each of the Australian surveys was that those who are older had a stronger preference for cash than younger age groups. Cash payments accounted for around 60 per cent of all payments made by participants aged 65 years and over in the 2013 survey, much higher than the share of payments made using cash by participants in all other age groups (Graph 6). This difference did not occur because participants aged 65 years and over conducted a higher proportion of low-value transactions (for which cash was typically preferred) compared with participants aged between 25 and 64 years (Table 1). This suggests that those aged 65 years and over preferred to use cash over other payment methods. In contrast, 18–24 year olds' cash use as a share of the number of transactions was higher than the next age cohort (25–34 years), which was consistent with the tendency for 18–24 year olds to have a higher share of low-value payments.

While the relative use of cash between age groups was little changed across all three surveys, the decline in cash use as a share of transactions over time was evident across all age groups. Specifically, cash use as a share of total transactions has declined for all age groups by around 20–25 percentage points since the 2007 survey.

The survey results also showed that the share of the value of cash payments was lower for participants in households with higher incomes than it was in households with lower incomes (Graph 7). While individuals in households with incomes greater

5 See Emery *et al* (2008), Deutsche Bundesbank (2009), Bagnall and Flood (2011), Arango, Hogg and Lee (2012), Jonker, Kosse and Hernández (2012), Kosse and Jansen (2013) and Bennett *et al* (2014).

Graph 6
Cash Payments by Age
Share of payments made in cash within an age group



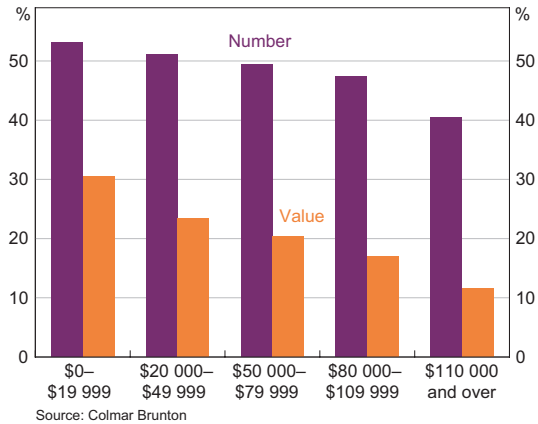
Sources: Colmar Brunton; Roy Morgan Research

Table 1: Low-value Payments by Age (Years)
Number of payments up to and including $20, as a share of all payments

	2007	2010	2013
18–24	56	60	62
25–34	51	51	46
35–44	53	49	47
45–54	54	50	47
55–64	58	54	44
65 and over	58	53	47
Overall	55	52	48

Sources: Colmar Brunton; Roy Morgan Research

Graph 7
Cash Payments by Household Income
Share of payments made in cash within an income group, 2013

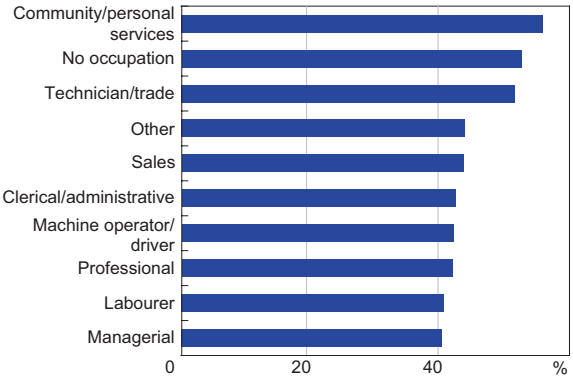


Source: Colmar Brunton

than $110 000 used cash for about 10 per cent of the value of their purchases, cash accounted for around 30 per cent of the value of transactions for individuals in the lowest income bracket (less than $20 000) and around 20 per cent for individuals in households in the next income bracket ($20 000–$49 999). This could reflect limited access of low-income households to credit relative to high-income households (Arango *et al* 2012). It is also possible, however, that cash was used for similar purchases regardless of income, but these purchases accounted for a larger proportion of low-income earners' overall consumption. The results from the survey showed that the average cash payment at merchant categories where more non-discretionary spending occurs (e.g. supermarkets) was broadly similar across income groups.

Survey participants in some occupations made a relatively large share of their payments using cash, with little variation evident across other groups (Graph 8). These included community or personal services workers (such as hairdressers and cleaners), technicians or trade workers, or who did not have an occupation (including retirees, students, the unemployed and others not looking for work). The results reflect the possibility that employees in some occupations may tend to receive more payments in cash, be on lower incomes, work part time or be older.

Graph 8
Cash Payments by Occupation
Share of number of payments, 2013



Source: Colmar Brunton

While the results presented above provide some insight into the impact of demographic characteristics on the use of cash and potential reasons for the changes observed in cash use, the correlation between demographic factors makes it difficult to disentangle their relative importance. A regression model was therefore estimated, using data from all three surveys to estimate how the probability of using cash at the point of sale varied by factors such as age, household income, transaction size and merchant type.[6] Importantly, a regression makes it possible to isolate the effect of each factor by controlling for all other variables in the regression (see Appendix A for the full regression results).

The results confirmed that, with other demographic and transaction-based variables held constant, the probability of using cash at the point of sale increased with age. For example, over the three surveys, participants aged 65 years and over were between 13 and 17 percentage points more likely to use cash at the point of sale relative to individuals aged between 18 and 24 years.

Interestingly, household income was generally not a significant factor in predicting the likelihood of paying with cash. The likelihood of using cash was not statistically different for different levels of household income, with the exception of the highest household income bracket ($110 000 and over), which was statistically less likely to use cash. Similarly, owning a credit card exhibited no explanatory power in the regression, which by itself suggests that a lack of access to credit does not explain why the share of payments made with cash was higher for low-income groups. The results suggest, however, that people who paid the full balance of their credit card account before the due date were less likely to use cash to make purchases than individuals who did not.

The regression results also indicated that occupation was not a statistically significant predictor of cash use, with only trade workers and technicians

6 The regression was a probit model.

significantly more likely to use cash. It may be that other factors were generating the survey result that participants in some industries seemed more likely to use cash. For example, the initial effect observed for people without an occupation and for community or personal services workers could be largely driven by age.

Many transaction-based factors were significant in predicting whether cash was used at the point of sale. Other things equal, individuals were 49 percentage points more likely to make a payment in cash for values of $20 or less relative to values exceeding $100. In addition, the merchant type was highly significant in predicting whether cash was used, with cash most likely to be used at a pub or bar and for household bills, and least likely to be used for medical costs and holiday spending.

The regression results can also be used to estimate whether, after controlling for all other demographic and transaction-based factors, there was a difference in the likelihood that a payment was made in cash across the three surveys. The results were significant with a payment 15 percentage points less likely to be made in cash in 2013 than in 2007. One factor behind this result could be the adoption of new payment technologies, such as contactless card payments, which could not be controlled for specifically in the regression. New payment technologies are faster at the point of sale than traditional credit and debit card payments, potentially counteracting the relative speed of making cash transactions. However, this may not explain the shift away from cash use entirely, since the end-of-survey questionnaire showed that younger participants were more willing to use newer payment technologies relative to older participants, and the decline in cash use was broad based across all age groups.

Other factors (that were not controlled for in the regression) could also explain the result that a payment made in 2013 was less likely to be made in cash. These include an increase in remote payments (such as over the internet) for which cash would not be an option, the increased availability of card acceptance terminals at the point of sale and the removal of limits on the number of fee-free debit card transactions over recent years.[7]

Banknotes in Wallets

In addition to recording transactions, participants in the survey were asked to record the number and value of banknotes held in their wallet. Participants held a median of three banknotes in their wallet with a value of $55 in 2013, up slightly from around $50 in 2010 (Table 2). The value of banknotes held in wallets increased with age. Participants aged 65 years and over typically held $80 more than individuals aged between 18 and 24 years and $60 more than individuals aged between 35 and 44 years. The mean value of banknotes held in wallets was close to double the median value, as there was a small number of participants holding a large value of banknotes.

In order to disentangle the importance of potentially correlated determinants of the value of banknotes held in wallets, an additional regression was estimated using similar variables as the regression above (see Appendix B for the full regression results).[8] The results showed that age was significant in determining the value of banknotes held in a participant's wallet, with each additional year in age associated with an increase of $2.18 in the expected value of cash held, holding all else constant. Another notable result was that labourers were estimated to have held an extra $96 in banknotes in their wallets.

Unlike cash transactions, the results suggested that banknote wallet holdings were significantly influenced by income. Participants earning under $20 000 and between $20 000 and $49 999 were

7 The 2013 survey included more demographic information than the previous surveys. To take advantage of this, a second regression was estimated using only 2013 data (in which the base person also lived in a house with her partner and children and owned a debit card). Results from this regression suggest that: not owning a debit card increased the probability of making a cash payment by 12 percentage points; and individuals living by themselves were more likely to use cash.

8 The regression was a tobit model, which used only the 2013 survey and did not include the transaction value or merchant category variables.

Table 2: Banknotes in Wallets by Age (Years)

	Value ($)		Number	
	Median	Mean	Median	Mean
18–24	30	60	2	3
25–34	40	73	3	3
35–44	50	92	3	4
45–54	65	125	3	5
55–64	70	118	4	5
65 and over	110	191	5	7
Overall	55	112	3	5

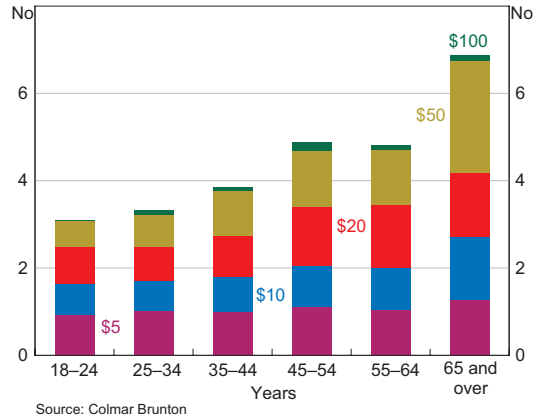
Source: Colmar Brunton

estimated to carry $49 and $41 less, respectively, than individuals earning between $50 000 and $79 999 per year. Those on incomes between $50 000 and $79 999 did not carry statistically different values of cash in their wallet compared with individuals who earned $80 000 and above, suggesting that preferences for holding cash did not change once a middle-income threshold was met. Further, wallet holdings were estimated to be $37 higher for individuals who paid their credit card balance in full compared with individuals who did not.

Participants were also asked to record the composition of banknote denominations held in their wallet, with $50 banknotes being the most commonly held denomination. The proportion of different denominations held varied by age with older participants holding more $50 banknotes in their wallet (Graph 9).

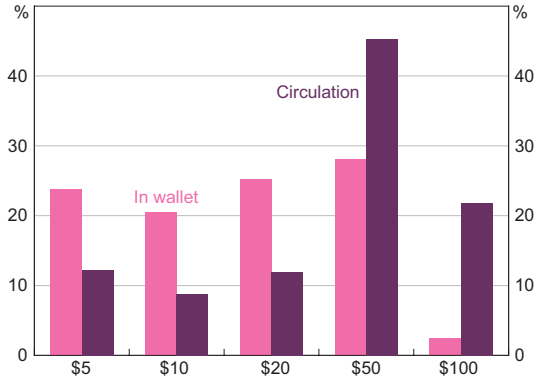
Comparing the number of banknotes of each denomination held in participants' wallets with the proportions implied by the number of banknotes in circulation provides an indication of whether some denominations are being used as a store of value. Of the banknotes in participants' wallets, the share of the number of low-value banknotes was considerably higher than the proportion implied by the share of these banknotes in circulation (Graph 10). In contrast, the share of high-denomination banknotes in wallets was considerably lower than the share in circulation. This is consistent with the premise that high-denomination banknotes are being used as a

Graph 9
Banknotes in Wallets by Age
Mean number of banknotes in wallet at start of survey, 2013



Source: Colmar Brunton

Graph 10
Circulation
Share of number of banknotes, 2013



Sources: Colmar Brunton; RBA

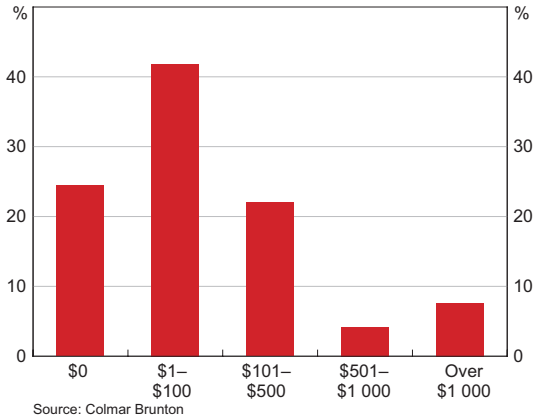
store of value rather than as a medium of exchange, and may explain why the number and value of banknotes in circulation have continued to grow at around 5 and 6 per cent per annum, respectively, despite an apparent decline in the importance of cash for transactions.

Cash Holdings

To explore how people may be using cash as a store of value, survey participants were asked to state the value of cash that they held in places other than their wallet. Around three-quarters of participants indicated that they held cash in other places, with 12 per cent of people stating that they held over $500 (Graph 11). In addition to making a higher share of cash payments and holding more banknotes in their wallet, older participants also tended to store cash in places other than their wallet. In particular, around 16 per cent of participants aged 65 years and over held more than $500 in places other than their wallet, while only 9 per cent of 18–24 year olds and 5 per cent of 25–29 years olds stored the same amount.

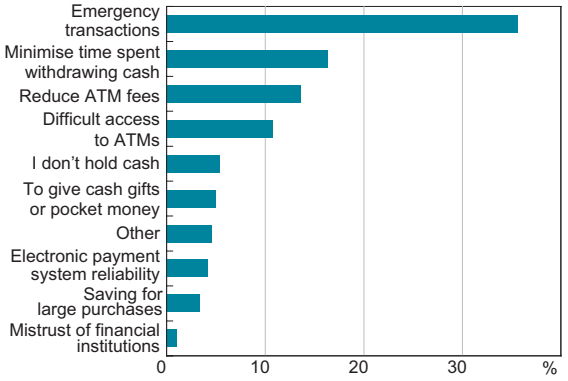
As expected, the main reason that participants gave for holding banknotes in their wallet or elsewhere was to fund day-to-day transactions. Looking at options other than day-to-day transactions, participants indicated that the most important reason for holding cash was for emergency transaction needs (36 per cent; Graph 12). Considerations relating to obtaining cash were also an important reason for people storing cash. In particular, minimising time spent withdrawing cash, reducing ATM fees and limited access to ATMs accounted for a further 41 per cent of responses.

Graph 11
Cash Holdings in Places Other Than Wallet
Share of participants, 2013



Source: Colmar Brunton

Graph 12
Why Hold Cash?
Most important factor other than day-to-day transactions, 2013



Source: Colmar Brunton

Conclusion

Results from the 2013 Survey of Consumers' Use of Payment Methods indicated that cash remained the most frequently used payment method for day-to-day transactions, though its use relative to other payment methods has declined over recent years. Age was an important factor in determining preferences for the use of cash, with older participants more likely to use cash than younger participants. Consistent with previous surveys, participants were more likely to use cash for low-value transactions relative to other payment methods. Given the continued preference for cash of older participants in the survey, and the dominance of cash for low-value transactions, these results suggest that cash is likely to remain an important part of the payments system for the foreseeable future.

The survey responses and regression results also indicated that older participants and those on higher incomes held more banknotes in their wallets than younger participants and lower-income

earners. More broadly, the results suggested that high-denomination banknotes were used as a store of value, with around three-quarters of participants indicating that they held banknotes in places other than their wallet. This is likely to continue to underpin the demand for higher-denomination banknotes.

Appendix A: Probit Regression Results

Table A1: Probit Regression Results[a],[b],[c]

(*continued next page*)

Independent variables		Coefficient[d]	Change in probability
Year of survey	2010	–0.24*	–0.08
	2013	–0.47***	–0.15
Age (years)	18–24	–0.12	–0.04
	25–29	–0.11	–0.04
	30–34	–0.10	–0.04
	40–44	0.05	0.02
	45–49	0.10	0.04
	50–54	0.04	0.02
	55–59	0.23**	0.09
	60–64	0.16	0.06
	65 and over	0.33**	0.13
Household income	Less than $20 000	–0.09	–0.03
	$20 000–$49 999	–0.11	–0.04
	$80 000–$109 999	–0.04	–0.01
	$110 000 and over	–0.21***	–0.07
Gender	Male	–0.04	–0.01
Location	Non-capital city	0.04	0.01
Employment status	Part time	–0.04	–0.01
	Self employed	–0.15	–0.05
	Not employed/unemployed	0.41	0.16
	Student	–0.03	–0.01
	Retired	0.26	0.10
	Look after house	0.17	0.06
Occupation	No occupation	–0.03	–0.01
	Managerial	–0.02	–0.01
	Technician/trade/machine operator or driver	0.22*	0.08
	Community/personal services	0.27	0.10
	Clerical/administrative	0.01	0.00
	Sales	0.01	0.00
	Labourer	0.02	0.01
	Other occupation	–0.10	–0.04

Table A1: Probit Regression Results[a],[b],[c]
(*continued*)

Independent variables		Coefficient[d]	Change in probability
Maximum education	Year 10 or below	0.01	0.00
	Years 11 or 12	–0.09	–0.03
	Trade certificate	–0.01	–0.00
	Diploma	–0.03	–0.01
	Other education	–0.33	–0.11
Card ownership	Does not own a credit card	0.12	0.04
Card behaviour	Transactor[e]	–0.14**	–0.05
Merchant category	Food store	0.75***	0.29
	Electrical store	0.02	0.01
	Other retailer	0.21***	0.08
	Takeaway store	0.70***	0.27
	Café	0.77***	0.30
	Pub	1.15***	0.43
	Petrol store	–0.03	–0.01
	Transport	0.46***	0.18
	Leisure	0.84***	0.33
	Holiday	–0.05	–0.02
	Household bills	0.92***	0.36
	Medical	–0.11	–0.04
	Services	0.89***	0.34
	Other merchants	0.90***	0.35
Payment amount	$0–$20	1.09***	0.41
	$21–$50	0.34***	0.13
	Over $100	–0.21***	–0.07
Constant		–0.42***	na
Observations		37 820[f]	na

***, ** and * represent statistical significance at the 1, 5 and 10 per cent level, respectively

(a) Calculated relative to a base of a female in the 2007 survey aged 35–39 years, with a household income of $50 000–$79 999, who was employed full time as a professional, had a university degree, lived in a capital city, owned a credit card, did not pay her credit card in full every month and the base payment was made at a supermarket, worth $51–$100

(b) Separate regressions were run for each wave to consider the potential impact of factors such as inflation and the results were broadly similar

(c) Estimated using clustered standard errors

(d) Probit coefficients cannot be interpreted as the marginal effect on the dependent variable; for the marginal effect on the dependent variable, see the 'Change in probability' column

(e) A credit card transactor is someone who pays the full balance of their credit card each month

(f) The regression was estimated using transaction-level data

Sources: Colmar Brunton; RBA; Roy Morgan Research

Appendix B: Tobit Regression Results

Table B1: Tobit Regression Results[a],[b]
2013 data only

Independent variables		Coefficient
Age		2.18***
Household income	Less than $20 000	–49.39**
	$20 000–$49 999	–40.93***
	$80 000–$109 999	–16.81
	$110 000 and over	–8.96
Gender	Male	15.51
Location	Non-capital city	–3.97
Employment status	Part time	–30.52**
	Self employed	–0.80
	Not employed/unemployed	58.03
	Student	42.76
	Retired	82.04*
	Welfare	74.03
	Look after house	57.45
Occupation	No occupation	–56.45
	Managerial	51.29
	Technician/trade/machine operator or driver	10.46
	Community/personal services	22.94
	Clerical/administrative	–0.76
	Sales	–15.83
	Labourer	96.49**
	Other occupation	–8.32
Maximum education	Year 10 or below	–18.63
	Years 11 or 12	7.21
	Trade certificate	26.84
	Diploma	–9.19
	Other education	123.48
Household size		3.71
Household structure	Couple with no children	–6.47
	Single with no children	22.88
	Single with children	30.30
	Live with a group	6.54
	Other household structure	–0.09
Debit card	Does not own a debit card	21.67
Credit card	Does not own a credit card	4.72
Card behaviour	Transactor[c]	37.41***
Constant		–23.85
Observations		1 122[d]

***, ** and * represent statistical significance at the 1, 5 and 10 per cent levels, respectively
(a) Calculated relative to a base of a female with a household income of $50 000–$79 999, who was employed full time as a professional, had a university degree, lived in a capital city as a couple with children, owned a debit card and a credit card and did not pay her credit card in full every month
(b) Estimated using clustered standard errors
(c) A credit card transactor is someone who pays the full balance of their credit card each month
(d) The regression was estimated using respondent-level data
Sources: Colmar Brunton; RBA

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The Introduction of Same-day Settlement of Direct Entry Obligations in Australia

Sascha Fraser and Adriarne Gatty*

In November 2013, the Reserve Bank introduced changes to its Reserve Bank Information and Transfer System (RITS) to allow the same-day settlement of non-government direct entry obligations. This outcome met one of the objectives set by the Payments System Board in its June 2012 Strategic Review of Innovation in the Payments System. The changes provide a platform for greater efficiency and innovation in Australia's payments system, potentially allowing faster access to funds, and reducing the key risks associated with deferred settlement. The support of the Australian Payments Clearing Association (APCA) and the banking industry was critical in the successful development and implementation of the new settlement arrangements. The transition to the new arrangements has progressed smoothly, with the vast bulk of customers' direct entry transactions, around $16.5 billion, now settled on a same-day basis each business day.

Introduction

The direct entry system is a means of making electronic payments, and is commonly used by businesses to make and receive regular payments such as salaries and recurring bills. It is also used extensively by consumers and businesses to initiate 'pay anyone' transactions using internet banking applications. Although customer accounts at financial institutions are credited and debited with the date of the transaction, settlement between the sponsoring financial institutions has historically occurred at 9.00 am on the following business day. Since 25 November 2013, the obligations arising from direct entry payments are able to be settled between financial institutions on the day of their exchange. These settlements now occur as part of multilaterally netted batches at 10.45 am, 1.45 pm, 4.45 pm, 7.15 pm and 9.15 pm each day. This represents one of the most significant changes to settlement arrangements in Australia since the introduction of real-time gross settlement (RTGS) in 1998. This article outlines the motivation for the introduction of same-day settlement, the necessary changes to the operational and liquidity arrangements for RITS, and provides some observations on the early outcomes of the new arrangements.

* Sascha Fraser completed this work in Payments Settlements Department and Adriarne Gatty is from Payments Settlements Department.

Background

In Australia, payment obligations between banks and other approved institutions are settled electronically in RITS, primarily on an RTGS basis. On an average business day, RITS settles over 40 000 Australian dollar-denominated interbank payments and the cash leg of securities transactions, worth around $180 billion – equivalent to around 11 per cent of annual Australian GDP.

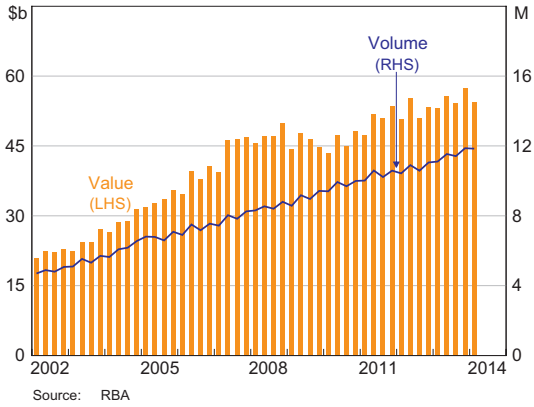
Final and irrevocable settlement of payment obligations is achieved by the simultaneous crediting and debiting of Exchange Settlement Accounts (ESAs) held at the Reserve Bank. The paying ESA holder must have sufficient funds in its ESA to settle each transaction. RITS is classed as a hybrid RTGS system since it settles certain payments

individually on an RTGS basis and others periodically on a multilaterally netted basis.[1]

Payments that settle in RITS on an RTGS basis are delivered via 'high-value' feeder systems, and comprise: wholesale debt securities and money market transactions; foreign exchange, correspondent banking and customer transactions; and interbank borrowing and lending transactions. These payments have been settled on an RTGS basis in Australia since 1998, resulting in significantly reduced settlement risk in Australia's financial system, with close to 90 per cent of the value of RITS interbank settlement now settled in this way. Prior to the introduction of RTGS in Australia, all interbank transactions were settled on a deferred basis in RITS.

The remaining 10 per cent of the value of RITS interbank settlement is settled on a multilaterally netted basis. These obligations arise from clearing activity that takes place through 'low-value' (or 'retail') clearing systems and from share market activity. Low-value clearing systems include debit and credit card transactions, cheques and direct entry transactions.[2] Direct entry payments can be made by households, businesses and governments.[3] Many direct entry payments are part of 'bulk' distributions, such as salary, welfare and dividend payments and are typically provided by direct entry users to their sponsoring financial institution within electronic files. These payments, along with individual internet ('pay anyone') banking transfers and direct debits for bill payments, are aggregated in clearing files that are regularly exchanged, or cleared, between sponsoring financial institutions. The average daily value of direct entry payments, in both dollar terms and as a per cent of nominal GDP, has grown over the past decade; in 2013 direct entry payments averaged around $55 billion per business day (Graph 1).[4]

Graph 1
Direct Entry Payments
Average daily



Source: RBA

Following the exchange of payment details between direct participants in a clearing system, the obligations owed between participants as a result of those exchanges are collated and sent to RITS for settlement as part of a multilaterally netted batch. In the event that one or more of the participants in a multilateral settlement were unable to settle their obligations in RITS due to insufficient funds, the entire settlement would be delayed. This has the potential to disrupt the payments system significantly and might cause other banks that are waiting for payment to source liquidity elsewhere. Such a scenario increases in severity with the size of outstanding payment obligations owed by the affected ESA holder.

The deferred settlement of payments on a multilaterally netted basis in RITS allows for the accumulation of potentially quite large obligations between participants. The longer the period between settlements, the larger these credit exposures can

1 For more detail on RTGS settlement operations, see Gallagher, Gauntlett and Sunner (2010), and see 'Box A: Netting' for a detailed explanation of multilateral netting.

2 These payments are termed 'low-value' based on the payment system through which they are cleared, not because all reflect transactions of low value; some payments which are high in value are also settled via the low-value payments system.

3 References to direct entry in this article exclude payments made using the government direct entry system (GDES), which are settled separately in RITS.

4 This includes government direct entry transactions and direct entry transactions that do not require settlement at the interbank level, for instance because the payer and beneficiary hold accounts at the same institution. In addition, some financial institutions appoint another institution as an agent to clear and settle on their behalf such that obligations between an 'indirect' participant and its direct participating institution, or between two 'indirect' participants who use the same direct participant, would not settle at the interbank level.

become, and the greater the opportunity for an institution to default on these obligations. Over time, the value of direct entry obligations has grown to reach around 9 per cent of the total value of RITS interbank settlements. Hence, the move to settling direct entry payments on a same-day basis rather than on the following day provides a significant reduction in settlement risk. It has the additional benefit of allowing funds to be made available to recipients on a more timely basis without the receiving institution taking on credit risk.

The introduction of same-day settlement of direct entry obligations was a strategic objective of the Payments System Board, identified in its Strategic Review of Innovation in the Payments System.[5] The Review was announced in May 2010, with the aim of identifying potential gaps in Australian retail payments systems that might benefit from innovation through more effective cooperation between stakeholders and regulators. The Review concluded that there was a need to provide a system of near real-time retail payments in the next few years, which the industry is currently developing as the New Payments Platform.[6] The Review also saw scope to enhance the services that can be offered by the existing direct entry system, including by settling direct entry payments in a more timely fashion in RITS. One important consideration was the increasingly common practice of banks providing access to incoming direct entry funds to their customers on a more timely basis in order to be competitive.

Operational Arrangements for Same-day Settlement

Direct entry participants submit electronic settlement instructions directly to RITS after each official clearing exchange using the RITS Low Value Settlement Service (LVSS). These obligations were settled on a deferred, multilaterally netted basis at 9.00 am with the other low-value payment obligations from the previous day until same-day settlement was introduced for direct entry obligations on 25 November 2013. Direct entry payments, which comprise around 75 per cent of the value of low-value debit and credit transactions cleared between institutions, have since been able to be settled for same-day value.

Direct entry payments are settled as part of a netted multilateral settlement on the same day they are cleared, and shortly after the official industry clearing exchange times, at 10.45 am, 1.45 pm, 4.45 pm, 7.15 pm and 9.15 pm (Figure 1).[7] The introduction of five intraday settlements has significantly reduced the delay between payment clearing and settlement for the vast bulk of the value of direct entry obligations settled. Direct entry obligations that do not settle on the day of clearing may be resubmitted with all other low-value clearings for settlement on a net deferred basis at 9.00 am the next business day.[8]

Under the new arrangements, eligible settlement instructions are aggregated at the scheduled start time of each multilateral settlement, creating one net settlement position (to pay or receive) per participant (Table 1). These positions are then tested against available funds in each participant's ESA, and when all net-paying participants have sufficient funds in their ESA, all positions are settled simultaneously.

A key consideration in moving to same-day settlement was the need to extend RITS settlement hours to accommodate the same-day settlement of obligations arising from evening direct entry

5 For conclusions of the Review, see RBA (2012).

6 Further information on the New Payments Platform is available on the APCA website at <http://www.apca.com.au/about-payments/future-of-payments/new-payments-platform>.

7 There is a sixth official clearing exchange at 10.30 pm; however, payments cleared in this exchange are settled on the following RITS day in the low-value payments deferred 9.00 am settlement – these direct entry payments are also value dated the following business day.

8 Functionality exists in RITS for any low-value settlement obligations to settle individually on the RITS queue (without being multilaterally netted), similar to other interbank payments in RITS. This is predominantly used for the settlement of government direct entry obligations, but the functionality can also be used in contingency scenarios.

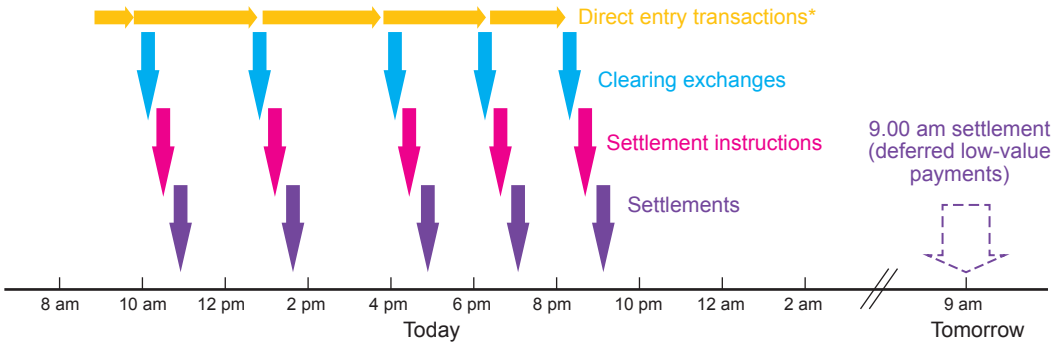
exchanges. Previously, the RITS 'Evening Settlement Session' closed at 6.30 pm Australian Eastern Standard Time (AEST) (8.30 pm Australian Eastern Daylight Time (AEDT)) following settlement of foreign exchange transactions using CLS, which operates in the European morning.[9] As there is an official clearing exchange for direct entry at 8.45 pm and a subsequent multilateral direct entry settlement in RITS at 9.15 pm, RITS operating hours have been extended until 10.00 pm Monday to Friday all year (Figure 2). For those direct entry participants that did not previously participate in the Evening Settlement Session (the majority of direct entry participants), managing direct entry settlement activity in the Evening Settlement Session was a significant change.

Table 1: Direct Entry Same-day Settlement Schedule

Official clearing exchange time	Multilateral settlement testing	
	Start	End
10:00	10:45	11:15
13:00	13:45	14:15
16:00	16:45	17:14
18:30	19:15	19:45
20:45	21:15	21:30

Source: RBA

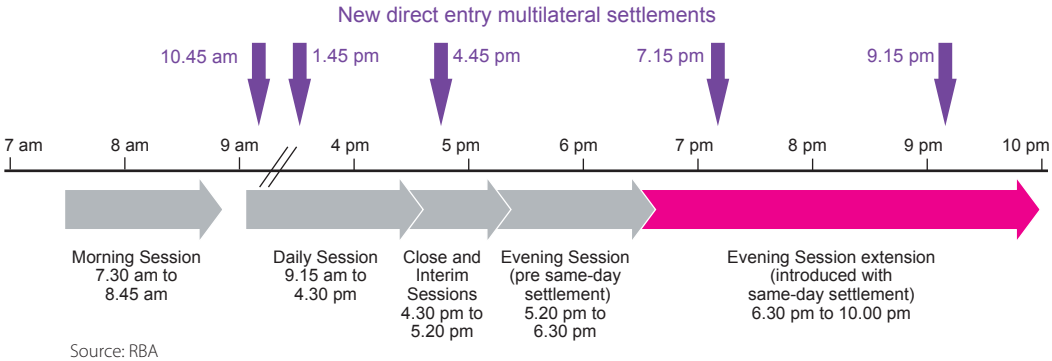
Figure 1: Same-day Settlement Direct Entry Payment Cycle



* At the customer level, direct entry transactions can be performed 24 hours a day. However, at the interbank level, not all direct entry transactions are settled on a same-day basis; this diagram shows only those direct entry transactions settled on a same-day basis.

Source: RBA

Figure 2: The Extended RITS Day (AEST)



Source: RBA

9 CLS is a multi-currency settlement system designed to reduce foreign exchange settlement risk.

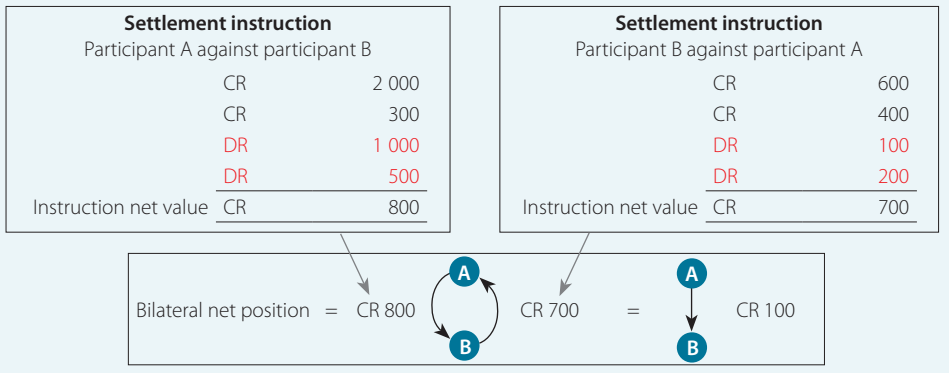
Box A
Netting

Direct participants submit settlement instructions to RITS via the LVSS once direct entry payments have been outwardly cleared through the bilateral exchange of files that contain the underlying transaction details. The obligations arising from each of these exchanged files already contain an element of netting since a file may contain both credit and debit transactions. The settlement instruction is for the net of the credits less the debits contained in the file submitted by, for example, participant A against participant B (Figure A1). Similarly, participant B may send a clearing file to participant A – containing different transactions – in which the underlying credit and debit transactions also may net to either an overall credit or debit. This value is reflected in the settlement instruction sent to RITS. To calculate the *bilateral net* position between participants A and B, the two settlement instructions can be netted off against one another, resulting in a single obligation owed by one participant to the other.

A *multilaterally* netted settlement refers to the case where three or more bilateral positions are netted off against one another. For example, imagine participants A, B, C and D have bilateral obligations with each other as shown in Scenario A of Figure A2. If each of these positions was settled bilaterally (i.e. with no multilateral netting), a total of 410 of liquidity would be needed to settle all of these positions (30+60+70+70+80+100).

In a multilaterally netted settlement, the final obligation owing to or by each participant is the sum of the individual bilateral positions, and all participants' multilaterally netted obligations must sum to zero. If the obligations in Scenario A were settled on a multilaterally netted basis, the resultant multilateral settlement positions would be reduced as shown in Scenario B. The total value of liquidity required to settle these positions would be reduced to 210 under multilateral netting, which implies a reduction of 200, or nearly half the amount of liquidity required.

Figure A1: Settlement Instructions and Bilateral Netting

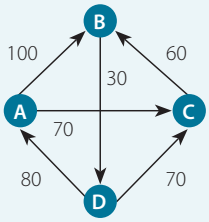


Source: RBA

This concept is applicable to any number of participants greater than three. The number of bilateral settlements grows exponentially as the number of participants does.[1] In Scenario A, the six bilateral settlements are reduced by multilateral netting to three in Scenario B.

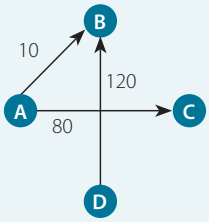
Figure A2: Bilateral and Multilateral Netting

Scenario A: Bilateral settlement



Total system liquidity required = 410

Scenario B: Multilaterally netted settlement



Total system liquidity required = 210

Source: RBA

1 The number of bilateral settlements is $[(N^2 - N) / 2]$, where N is the number of participants.

Changes to Liquidity Arrangements

ESA balances must remain positive at all times. Since the commencement of RTGS in 1998, ESA holders have been able to access intraday liquidity from the Reserve Bank by selling securities under repurchase agreement (repo).[10] Provision of adequate intraday liquidity by the RBA promotes the smooth distribution of settlements over the course of the RITS payment day.

Prior to the introduction of same-day settlement, transactions scheduled for settlement in the RITS Evening Settlement Session were generally known to ESA holders by about 6.05 pm, which meant that ESA holders were sure of their end-of-day positions before the close of the interbank overnight cash market at 6.30 pm AEST (8.30 pm AEDT).

However, because the final direct entry clearing exchange now occurs after the interbank cash market has closed (as does the second last, for part of the year), ESA holders no longer know with certainty what settlement obligations require funding in the Evening Settlement Session. Hence, direct entry participants are unable to 'square up' their daily funding requirements at the time that the cash market closes. Moreover, RITS participants are not able to initiate new liquidity transactions (repos) after the cash market closes because the securities settlement system, Austraclear, also closes at that time. Therefore, in order to ensure direct entry participants have sufficient ESA liquidity to settle their direct entry obligations after the close of the interbank cash market, the Reserve Bank altered arrangements for the provision of liquidity to ESA holders.

Direct entry participants now require significantly higher precautionary ESA balances to meet their (unknown) evening direct entry settlement obligations. This is facilitated by a new liquidity instrument – an open RBA repo (i.e. a repo with no specified end date). The Reserve Bank set a minimum value that each direct entry participant is required to hold for their open repo, and also set a maximum amount able to be contracted by each participant;

10 A repo is the sale or purchase of one or more securities, with an undertaking to reverse the transaction at an agreed date in the future and at an agreed price.

up to this amount, open RBA repos are contracted at the cash rate target. Open RBA repos taken out in excess of this limit are contracted at a higher interest rate (the cash rate target plus 25 basis points).

As an offset to the cost of open RBA repo positions, overnight funds in the respective participants' ESAs, adjusted for the value of evening direct entry settlements (the final two multilaterally netted settlements), are recompensed at the cash rate target. As a result, the open RBA repo is effectively costless to the holder, as long as their end-of-day ESA balance, excluding the evening direct entry settlements, is at least equal to their open RBA repo position. The ESA funds received from these repos provide sufficient liquidity for settlement of evening direct entry obligations. The changes to liquidity arrangements have been implemented so as not to affect the model used to implement monetary policy. The new arrangements preserve the existing 50 basis point 'corridor' around the Reserve Bank's cash rate target.[11] The new liquidity arrangements were also designed to accommodate the New Payments Platform being developed by the industry, which will allow for 24 hours a day, 7 days a week real-time settlement of payments for businesses and consumers.

Impact of Same-day Settlement

Around 75 per cent of the value of payments previously settled on a deferred basis in RITS at 9.00 am is now settled on a same-day basis. There has been a decline in netting efficiency in moving from settling direct entry value in one batch to settlement across five multilateral settlements. The new liquidity facility has resulted in a significant increase in system liquidity and a sharp decline in the use of intraday repos.

Operational efficiency

In May 2012, participants commenced providing their direct entry settlement instructions to RITS at the time of exchange (although from May 2012 to November 2013 settlement of these instructions remained part of the next day's 9.00 am settlement). Since the move to same-day settlement, participants have around 45 minutes following the official clearing time to ensure that all settlement instructions for that multilateral settlement are submitted to RITS (see Table 1); hence, the move to same-day settlement has increased the importance of these instructions arriving at RITS close to their exchange time. If a settlement instruction is not submitted in time for its scheduled multilateral settlement it will be settled in the next settlement; and settlement instructions that miss the final multilateral settlement of the day will generally need to be settled on an 'individual' (i.e. RTGS) basis before the end of the Evening Settlement Session, or they will need to be settled as a part of the next business day's 9.00 am deferred settlement.

Since the introduction of same-day settlement, instructions have generally been submitted in a timely manner and very few have missed the instruction input cut-off time for a settlement.

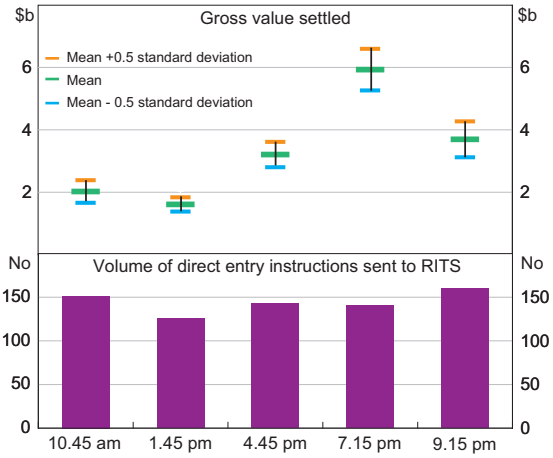
Settlement activity

An average of $16.5 billion of direct entry transactions has settled on a same-day basis in RITS each business day since the introduction of same-day settlement. The standard deviation of the daily value is $3.8 billion.

The average value settled shows a clear pattern across the five daily settlements (Graph 2 and Graph 3). Most of the value of direct entry payments, around 58 per cent, is settled in the 7.15 pm and 9.15 pm settlements. This is likely to reflect participants' customers sending them direct entry transaction files late in the day, and this trend reinforces the importance of having liquidity arrangements that accommodate these new evening settlements. Relative to the value settled in each exchange, the 10.45 am settlement is subject to the most variability. In absolute terms, the greatest variability is in the exchange with the largest value settled, which is the 7.15 pm settlement.

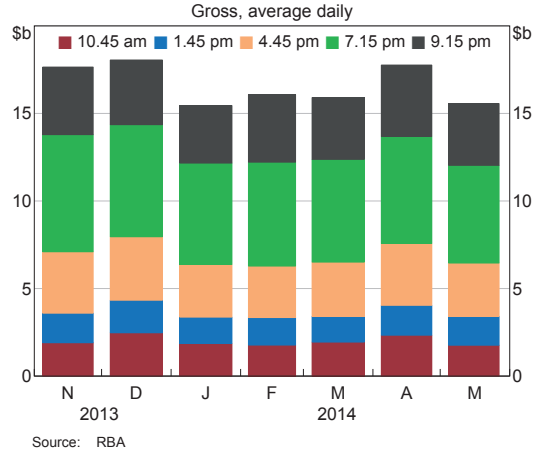
11 More information on the Reserve Bank's monetary policy implementation is available at <http://www.rba.gov.au/mkt-operations/dom-mkt-oper.html>.

Graph 2
Direct Entry Value and Volume
Average daily, November 2013 to May 2014



Source: RBA

Graph 3
Direct Entry Value Settled
Gross, average daily



Source: RBA

The distribution of direct entry settlement value across the five new settlement times is consistent with clearing exchange patterns observed prior to the introduction of same-day settlement. This was a crucial input to the design of the liquidity solution. Settlement patterns of same-day direct entry payments and the adequacy of the size of participants' open RBA repo positions continue to be monitored by the Reserve Bank for any unexpected shifts in payments activity that might have implications for the newly introduced liquidity solution.

Not surprisingly, the distribution of the number of direct entry settlement instructions submitted to RITS for same-day settlement has been more uniform than the distribution by value across the five clearing exchanges. The number of instructions is driven by the number of participants that choose to exchange files at any time, whereas the distribution of values depends on the distribution of customers' transactions (Graph 2). On average, around 720 settlement instructions, from 13 direct participants, are submitted to RITS each business day, representing over five million individual credit and debit transactions. The volume of settlement instructions submitted to RITS peaks in the first and last exchanges of the day.

The volume of settlement instructions submitted to RITS in each clearing exchange is relatively static over time, and has not exhibited any day-of-the-week or seasonal patterns to date, as settlement instruction volumes are primarily driven by operational arrangements rather than settlement activity. Participants generally exchange instructions at the same time each day with the same counterparties; that is, participants exchange files and send instructions to RITS even if they have no payment obligations with a counterparty in an exchange (i.e. the file is for zero value) as an operational signal that their counterparty does not need to wait for a file from them.

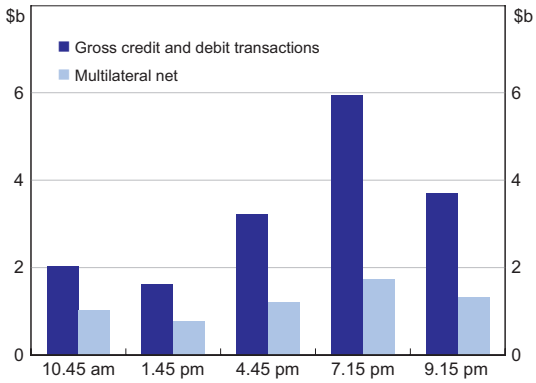
Netting efficiency

Settling transactions on a netted basis has the significant benefit of economising on liquidity requirements. That is, by netting off the obligations between two or more settlement participants, the total value of funds required to achieve settlement can be reduced. Prior to the introduction of same-day settlement for direct entry obligations, an average of $21.4 billion of customers' transactions relating to direct entry, cheques and debit and credit card transactions were settled as a part of the 9.00 am settlement each business day. Before being submitted for settlement testing, these obligations were netted on a multilateral basis between

participants leading to, on average, just $3.9 billion of net settlement positions,[12] representing 91 per cent netting efficiency.[13]

Direct entry settlement arrangements have moved from settling one business day's worth of direct entry payments in one multilateral settlement (with other low-value payments), to settling one business day's worth of direct entry payments in five (direct entry only) multilateral settlements.[14] The dispersion of direct entry across the five new same-day settlements has caused a considerable reduction in netting efficiency. Since November 2013, gross low-value settlement obligations have been little changed at an average of $21.3 billion, and the sum of net settlements representing these obligations (the five new multilateral settlements and the remaining 9.00 am settlement) has grown to $7.2 billion (Graph 4). This now represents 83 per cent netting efficiency for these payments, 8 percentage points lower than prior to the introduction of same-day settlement.

Graph 4
Direct Entry Value per Exchange
Average daily, November 2013 to May 2014



Source: RBA

12 This figure represents the absolute sum of both payments and receipts, since obligations in any multilaterally netted system will sum to zero.

13 Calculated as net direct entry payments and receipts ($3.9 billion) divided by gross direct entry payments and receipts ($21.4 billion x 2).

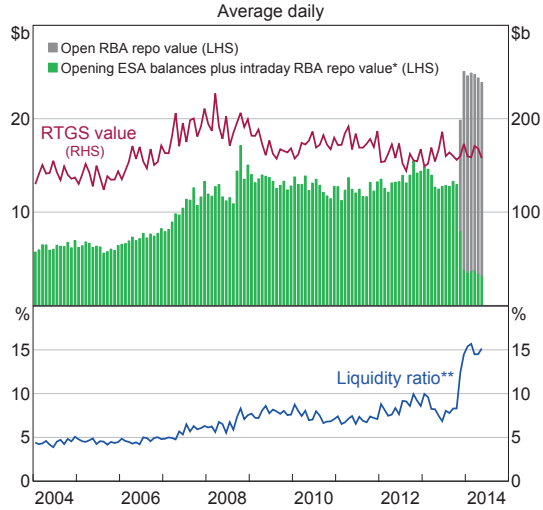
14 Excluding payments cleared as a part of the 10.30 pm direct entry exchange (see footnote 6). Prior to same-day settlement, one business day's worth of transactions was settled each weekday, except for the second business day following weekends and public holidays, when any additional days' transactions were also settled.

System liquidity

The introduction of open repos has significantly diminished the demand for intraday repos used to support settlement activity. Ten participants are required to hold open RBA repo positions as a liquidity buffer for evening direct entry settlements. The open RBA repos contracted by these participants have largely replaced their use of intraday repos. In aggregate, participants have taken out around $21 billion in open RBA repos, while the use of intraday repos each business day has fallen by around $8 billion (Graph 5). With the increased level of system liquidity provided by open RBA repos, the liquidity ratio, which measures average liquidity as a share of the total value of RTGS payments settled, has increased by around 7 percentage points, to a record high of 15 per cent.

The new liquidity facility ensures that direct entry participants with a net-paying position on any given day have sufficient ESA balances to fund their evening direct entry obligations. This can be expressed as the ratio of a participant's evening

Graph 5
System Liquidity
Average daily



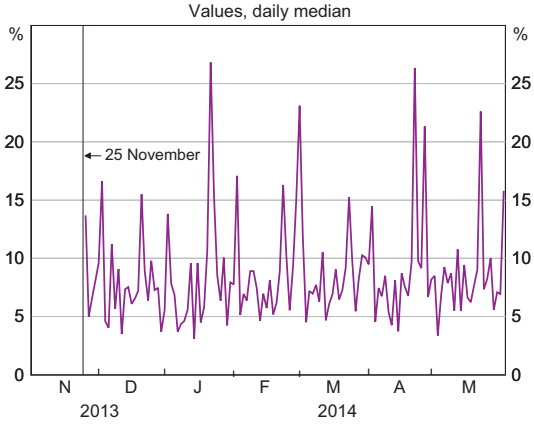
* Excludes open RBA repo value; intraday RBA repo value measured as the average balance of intraday repos during the Daily Settlement Session (not adjusted for overnight repos)

** Total daily average liquidity relative to RTGS value

Source: RBA

net-paying direct entry obligations to their open repo position, which for the median participant is less than 10 per cent, on average. All direct entry participants, including those whose ratio is higher than the average median, hold appropriate ESA balances should larger-than-expected settlement obligations arise in the evening (Graph 6).

Graph 6
Net Evening Direct Entry as a Share of Open RBA Repo



Source: RBA

Conclusions

The introduction of same-day settlement of direct entry obligations is part of the Reserve Bank's ongoing efforts, in collaboration with financial institutions and industry bodies, to further strengthen Australia's settlement infrastructure. The move to same-day settlement of direct entry obligations has proceeded smoothly, with participants meeting the operational and liquidity requirements of the new settlement arrangements without incident.

References

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RBA (Reserve Bank of Australia) (2012), *Strategic Review of Innovation in the Payments System: Conclusions*, June. Available at <http://www.rba.gov.au/payments-system/reforms/strategic-review-innovation/conclusions/pdf/conclusions-062012.pdf>.

Cross-border Capital Flows since the Global Financial Crisis

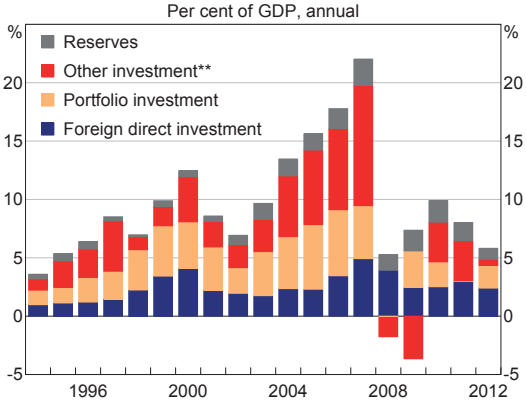
Elliott James, Kate McLoughlin and Ewan Rankin*

Global gross capital flows remain well below their peak before the global financial crisis, which was reached after a period of unusual expansion. Much of the decline can be attributed to a reduced flow of lending by banks – particularly to, from and within the euro area – as banks have unwound many of the cross-border positions they built up before the crisis. Capital inflows to some economies, however, are now larger than they were before the crisis. The international regulatory response to the crisis aims to address some of the risks associated with increased capital flows, while maintaining the benefits of an integrated financial system.

Introduction

Gross capital flows are one indicator of international financial integration or financial globalisation.[1] By this measure, the pace of overall financial integration increased markedly in the decade before the global financial crisis (Graph 1). Since then, there has been a well-documented decline in cross-border flows of capital, particularly from the banking sector, such that total annual flows have fallen to around one-third of their size in 2007 (Borio and Disyatat 2011; Broner *et al* 2013). This article examines recent trends in gross capital flows by their type, origin and destination, and considers some potential consequences for economic growth and financial stability.

Graph 1
Global Capital Flows*
Per cent of GDP, annual



* Gross capital outflows; excluding financial derivatives; 2012 data are latest available
** Includes flows related to international banking transactions
Source: IMF

Recent Trends in Cross-border Capital Flows

Relative to the size of the global economy, all major types of capital flows are now smaller than they were in 2007. The fall in 'other investment' flows, much of which reflects a fall in cross-border lending by banks, has been particularly pronounced, following a large increase in the pre-crisis period (Table 1).[2] Portfolio investment in debt and equity securities has also declined considerably since the period before the

* The authors completed this work in Financial Stability and International Departments.

1 At the global level, gross capital flows can be calculated as the sum of capital inflows or the sum of capital outflows. The size of global inflows and outflows should be roughly the same, though there are frequently small differences because of measurement problems.

2 The International Monetary Fund's (IMF's) Balance of Payment statistics identify five main types of capital flows: foreign direct investment, where an investor takes an equity stake of 10 per cent or more in a company; portfolio investment, which includes smaller equity investments and purchases of debt securities; reserves, which are foreign currency assets held by monetary authorities; transactions in derivatives; and 'other investment', which is a residual category that includes, among other things, lending by banks and international organisations. Transactions in derivatives are excluded from this analysis as the timing and magnitude of these flows are difficult to interpret.

Table 1: Global Capital Flows[a]
Per cent of GDP, annual

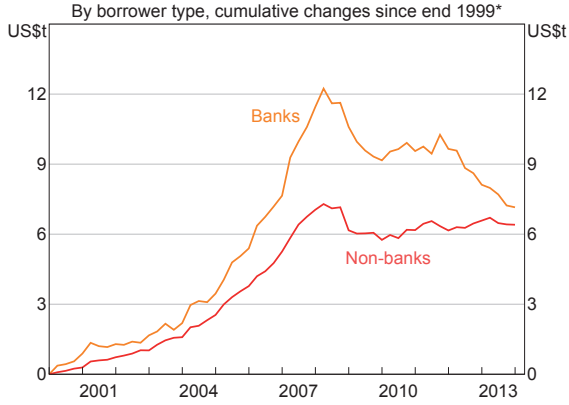
	Yearly average			
	1980–1989	1990–1999	2000–2007	2008–2012
Foreign direct investment	1.0	1.5	2.9	2.9
Portfolio investment	1.2	2.3	4.2	1.4
Other investment[b]	2.7	1.9	5.0	0.4
Reserves[c]	0.8	0.5	1.2	1.5
Total	**5.7**	**6.2**	**13.3**	**6.2**

(a) Gross capital outflows; excluding financial derivatives; RBA estimates used for some capital flows prior to 1994, based on extrapolation of capital outflows from developed economies
(b) Includes flows related to international banking transactions
(c) Estimated as a residual prior to 1994, assuming flows resulting from financial derivatives transactions are minimal during that period
Sources: IMF; RBA

crisis.[3] Direct investment flows, by contrast, have remained relatively stable in recent years, with average flows above those of the 1980s and 1990s.

More detailed and up-to-date data from the Bank for International Settlements (BIS) show that most of the fall in banking flows is likely to have been accounted for by a fall in interbank lending.[4] Following several years of expansion, cross-border interbank lending declined sharply after the crisis. By contrast, cross-border lending to non-banks (including other financial institutions, non-financial firms and governments) has been relatively resilient following the sharp decline in late 2008 (Graph 2).

Graph 2
Cross-border Bank Lending
By borrower type, cumulative changes since end 1999*



* Adjusted for exchange rate movements and series breaks by the BIS
Source: BIS Locational Statistics

Lower capital flows have coincided with weak macroeconomic and financial conditions in many economies. This has affected both the demand for and supply of capital, with households and businesses (including banks) in many countries less willing or able to take on risk. Other factors, including slower growth of world trade since the crisis, are also consistent with less demand for international capital. Alongside the subdued demand for capital, banks in many economies have actively reduced their supply of credit, as they repair their balance sheets and rebuild capital positions. As banks have deleveraged, cross-border lending has been among the types of lending most heavily affected.

3 Only considering portfolio investment from an outflows perspective somewhat amplifies the extent of the post-crisis decline in portfolio flows. From an inflows perspective, portfolio investment as a per cent of GDP is in line with its 1990s average, though still well below pre-crisis activity. Strength in reserves outflows since the crisis has contributed to the higher volume of portfolio inflows, as much of what is recorded as outflows of reserves from one country will appear as inflows of portfolio investment into another country.

4 This article uses the locational data published by the BIS in the International Banking Statistics. Locational data measure the gross claims of banks located in a reporting country on entities in other jurisdictions – that is, the claims of domestically owned banks and foreign-owned branches and subsidiaries. Cross-border claims include loans and advances, deposits and balances with other banks, as well as holdings of debt securities. Because the data are unconsolidated, they include cross-border lending between branches and subsidiaries of the same banking group. The BIS also publishes data on a consolidated basis.

Changes in the Geographical Distribution of Capital Flows

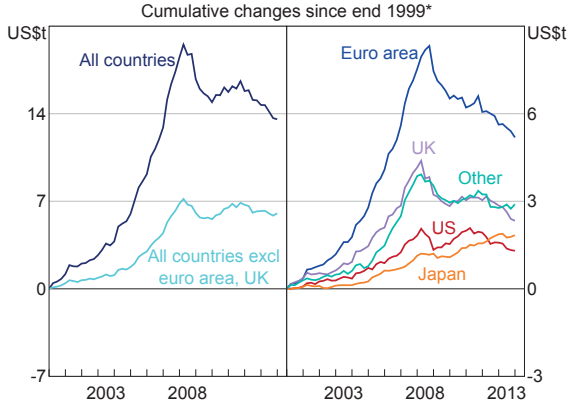
While global flows of bank lending and portfolio investment have both declined since the crisis, there are marked differences across countries. Nearly the entire decline in global capital flows has been accounted for by reduced lending among advanced economies, particularly within Europe, whereas capital flows to emerging economies have generally increased.[5] In some instances, capital flows to emerging economies have been very strong since the crisis, though they have also proved volatile.

Cross-border lending by banks

The increase in banking flows in the years before the crisis – and the sharp overall decline since then – in large part reflected banking flows to, from and within Europe, including flows through the United Kingdom in its role as a major financial centre for Europe (Graph 3 and Graph 4). This is reflected in the change in the cross-border claims of banks in the euro area and the United Kingdom, which respectively account for around one-half and one-third of the fall in the total stock of cross-border banking claims among BIS reporting banks since the crisis.[6] The decline in banking flows over the seven consecutive quarters to December 2013 has also been driven by lenders and borrowers in Europe.

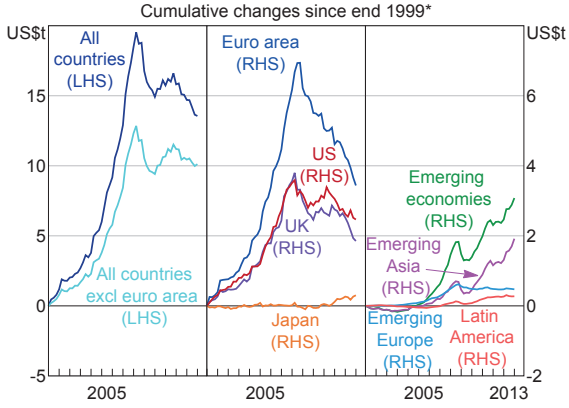
The contraction in European banking flows is consistent with the protracted sovereign debt and banking concerns in the region. Signs of weakness in euro area bank balance sheets, weak macroeconomic conditions and ensuing fiscal strains, as well as concern that countries might exit the currency union, were met by large outflows of capital from those euro area countries on the weakest footing: investors sold down their holdings of foreign sovereign debt; households and businesses repatriated their deposits; and banks reduced their exposures to the euro area. Some of the sovereign debt and deposit outflows have reversed since the second half of 2012 as measures were taken to stabilise conditions in the euro area (ECB 2014). Nevertheless, cross-border lending by banks in the euro area has continued to decline, and the slow process of balance sheet repair by banks, households, businesses and governments has continued to act as a drag on capital flows.

Graph 3
Cross-border Bank Lending by Origin
Cumulative changes since end 1999*



* Adjusted for exchange rate movements and series breaks by the BIS
Source: BIS Locational Statistics

Graph 4
Cross-border Bank Lending by Destination
Cumulative changes since end 1999*



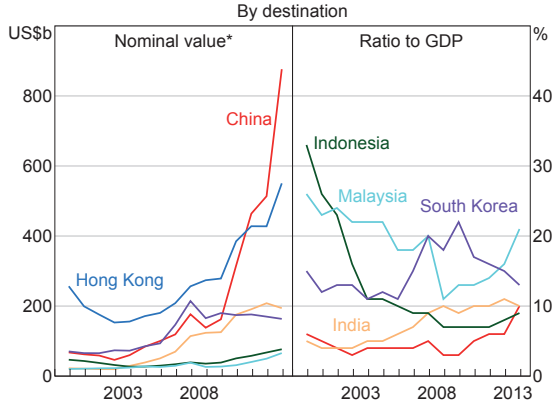
* Adjusted for exchange rate movements and series breaks by the BIS
Source: BIS Locational Statistics

5 Gross capital flows to and from the Australian economy have declined since the crisis, though by somewhat less than in the major advanced economies. A decline in flows to and from the Australian banking sector has occurred alongside an increase in direct investment flows to non-financial corporations, particularly to the resources sector, and an increase in foreign purchases of Australian government debt (Debelle 2014).

6 BIS reporting banks span around 45 countries, encompassing some 85 per cent of the global banking system. Developments in cross-border bank lending are expected to be closely related to the cross-border banking flows captured in the broader 'other investment' category used by the IMF, although some elements of cross-border bank lending will be reflected in the IMF's portfolio and direct investment flow categories.

Outside Europe, the volume of cross-border bank lending to and from some other countries has expanded since the global financial crisis, particularly for economies that have grown relatively quickly. Inflows have been strongest to markets in emerging Asia: lending to China has accounted for the majority of the increase, although lending to India, Indonesia and Malaysia has also risen notably (Graph 5, left panel). In the case of China and Malaysia, this lending has also been rising relative to the size of their economies (Graph 5, right panel). This is true also of Hong Kong, for which cross-border bank lending has increased to about 200 per cent of GDP (from around 100 per cent in 2007). This relatively high level in part reflects its status as an international financial centre and its close relationship with mainland China.[7]

Graph 5
Cross-border Bank Lending to Asia
By destination



* Initial stock extended forward using flows adjusted for exchange rate movements and series breaks by the BIS
Sources: BIS Locational Statistics; IMF; RBA

Japanese banks have intermediated a large proportion of the increase in lending to emerging Asia, reflecting a decision by some of these banks to increase foreign lending as other international banks have retreated. Banks from Hong Kong, Korea and Taiwan have also significantly increased their lending to the region since the crisis. More broadly, local banks in emerging economies have generally increased their presence in domestic and regional financial systems, although emerging economies still make up only a small share of total cross-border lending by banks (CGFS 2014). These developments have been reflected in a number of changes in the overall stock of cross-border bank lending accounted for by countries in advanced and emerging economies (Table 2).

Table 2: Global Cross-border Bank Lending
Per cent of outstanding claims by BIS reporting banks

	Origin		Destination	
	2008	2013	2008	2013
Major advanced economies[(a)]	80	77	74	68
Japan	*8*	*11*	*2*	*3*
Euro area	*40*	*35*	*36*	*30*
Asia excl Japan[(b)]	na	na	5	9
Other emerging economies	na	na	6	7
Other advanced economies	na	na	15	16

(a) Includes the euro area, Japan, Switzerland, the United Kingdom and the United States
(b) Includes China, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand
Source: BIS Locational Statistics

7 Much of the increase in lending to China has been by banks in Hong Kong, which have also increased lending to other countries in the region by a significant amount since 2009. It is likely that much of the increase in cross-border bank lending to Hong Kong reflects lending by Chinese banks, though this cannot be verified using the BIS banking statistics.

Portfolio investment

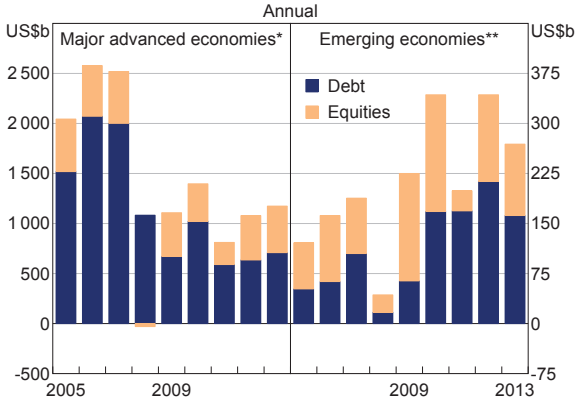
A clear distinction between some advanced and emerging economies is also apparent in the evolution of portfolio flows since the crisis. Portfolio flows to the major advanced economies have declined sharply, especially debt flows, which remain around two-thirds below their pre-crisis peak (Graph 6). As in the case of lending by banks, the fall has been starkest for the euro area and the United Kingdom. In contrast, portfolio flows to many emerging economies have been strong overall, and debt inflows appear to have increased, notwithstanding periods of volatility. This trend has been apparent in Indonesia and Malaysia, where local bond markets are more developed (IMF 2011). Emerging market corporate bond issuance has been resilient in the post-crisis period (Graph 7).

More broadly, the increase in capital flows to emerging economies is likely being driven, in part, by structural factors: as emerging economies expand and trade links with the rest of the world grow, it would be natural that their share of global capital flows would increase. Cyclical conditions will have also played a role, as economic growth has been much stronger in emerging economies relative to advanced economies since the crisis.

Accommodative monetary policies in the major advanced economies have been another factor behind capital inflows into emerging economies. With interest rates in most advanced economies at record lows, investors have been encouraged to seek out higher-yielding assets. As yields on advanced economy assets have fallen, the higher yields on offer in emerging economies have drawn large inflows of capital to emerging market bond and equity funds.

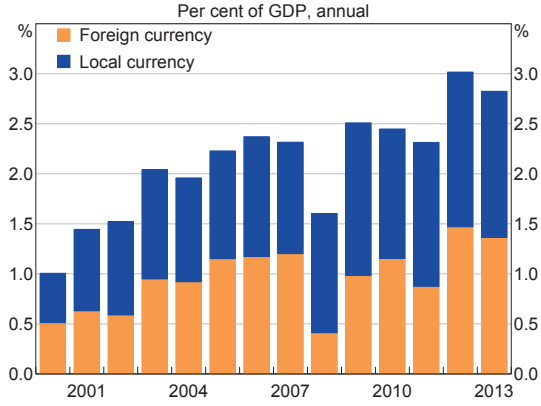
Even so, emerging market economies have remained susceptible to bouts of volatility in capital flows. To some extent this reflects a natural process of markets repricing risks across asset classes, with economies assessed as most vulnerable on metrics of external debt, fiscal sustainability and future economic activity typically experiencing larger capital outflows.

Graph 6
Portfolio Inflows
Annual



* Includes the euro area, Japan, the United Kingdom and the United States
** Sample of 14 emerging economies
Source: Thomson Reuters

Graph 7
Emerging Market Corporate Bond Issuance*
Per cent of GDP, annual



* Gross issuance; excludes China, which has had very strong issuance in recent years
Sources: Dealogic; IMF; RBA

Cross-border Capital Flows and Financial Stability

Economic theory suggests that international capital flows can boost growth and be a source of resilience for individual economies. While capital flows can provide financial stability benefits, including diversification from idiosyncratic risk, they also make financial conditions more correlated across jurisdictions and create channels for contagion. Indeed, the global financial crisis highlighted the fact that increased financial flows cannot always be

assumed to result in a better distribution of risks, at the institution level or the country level, and may in fact amplify them (Obstfeld 2012).

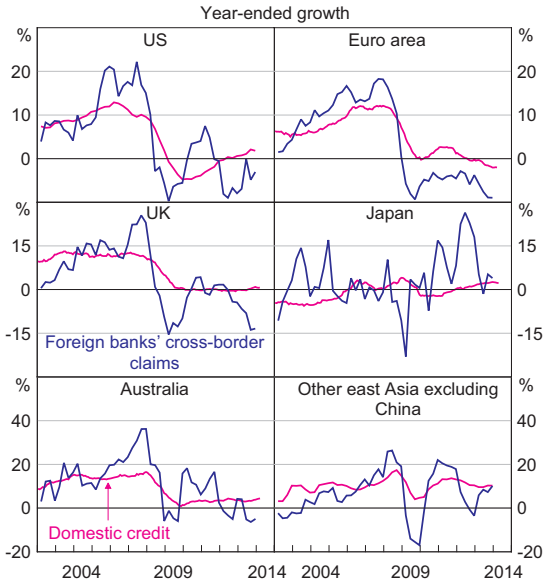
In responding to weaknesses exposed by the financial crisis, global policymakers face a potential trade-off between minimising possible threats to financial stability and seeking to promote the benefits of an integrated financial system. There are difficulties calibrating the system-wide costs and benefits of different types of capital flows and the policies that seek to constrain or promote them.

While some studies have found that international capital flows can boost productive capacity, expand opportunities for diversification and increase liquidity in financial markets, other studies have raised questions about the strength of these relationships. For example, there is only qualified evidence that greater 'financial openness' leads to improved risk sharing (Kose, Prasad and Terrones 2007; Obstfeld 2012). Similarly, it is difficult to establish a causal relationship between capital flows and economic growth, using the available data, once controls are made for other determinants of growth (Kose *et al* 2009). More recent studies have suggested that capital flows may even start to drag on economic growth once they increase beyond a certain size (BIS 2012).

In weighing the advantages and disadvantages of capital flows, it may be important to distinguish between the types of capital. Cross-border lending by banks over the past decade, for instance, was highly procyclical (Graph 8). Indeed, there is a growing literature documenting the volatility of foreign bank lending and the large volume of interbank lending undertaken per dollar of lending to the real economy (Hoggarth, Hooley and Korniyenko 2013; Turner 2014). Flows of direct investment and portfolio equity, by contrast, were more stable over the years around the financial crisis and have stronger empirical links with long-term growth (Kose *et al* 2009).[8]

8 That said, the literature on international capital flows offers mixed conclusions about the preferred composition of capital flows. Becker and Noone (2009), for instance, look at advanced economies and find little evidence that some types of capital flows are more conducive to a stable capital account than others.

Graph 8
Credit Growth and Cross-border Bank Lending



Sources: Bank of England; BIS; CEIC Data; European Central Bank; IMF; RBA; Thomson Reuters

Regulatory responses to the crisis

The international regulatory response to the crisis has led to a range of reforms, including standards on the resilience and resolvability of internationally active banks, as well as policies to reduce risks in the over-the-counter derivatives and shadow banking markets.[9] These reforms generally aim to reduce interconnectedness and opacity in the global financial system and increase its resilience to shocks. In addition, several reforms are targeted at risks arising from banks' cross-border transactions, including mismatches in the maturity and currency of their assets and liabilities. Improving cross-border supervisory and regulatory cooperation has also been an important part of the response to the crisis. Reforms that impose greater control on cross-border activities include:

- Reforms to the Basel Capital Accord (including higher risk weights for certain trading book assets and enhanced requirements for the quantity and quality of capital under Basel III)

9 For more information on the international regulatory response to the financial crisis, see Schwartz (2013).

require banks to price their risk more accurately and deploy capital more prudently across their retail and wholesale businesses. In adjusting to these reforms, some large banks have pared back their international activities to refocus on businesses in their domestic markets, which are often more familiar, less complex and require less capital.

- The Basel III reforms include two new standards for liquidity management: the Liquidity Coverage Ratio and the Net Stable Funding Ratio. The standards require banks to hold more liquid assets and use more stable, long-term sources of funding. In combination with these standards, regulators have supported banks' own efforts to better manage funding mismatches in their balance sheets. Before the crisis, some banks used a network of branches and subsidiaries to raise deposits and wholesale funding in one jurisdiction for lending in another. Maintaining these intragroup flows proved unsustainable when funding markets became stressed – a problem that was exacerbated by mismatches in the maturity, currency and residency of banks' assets and liabilities.
- Reforms for systemically important financial institutions (SIFIs) are aimed at reducing both the probability and impact of their failure. The cross-border funding and lending practices of many banks before the crisis made them quite complex and interconnected, and therefore hard to resolve. In response, regulators have introduced new capital surcharges for SIFIs, enhanced their recovery and resolution planning, and increased the intensity of their supervision. Countries are also working towards reforming their financial systems and legal frameworks to meet the new global standard for resolving financial institutions, as set out in the *Key Attributes of Effective Resolution Regimes for Financial Institutions* (FSB 2011).

International reforms have been complemented in some jurisdictions by national initiatives to enhance the supervision of foreign-owned banks and make it easier to resolve those that might fail. These efforts may also be weighing on cross-border lending (McKinsey Global Institute 2013). This is partly because regulators in several jurisdictions will require that large foreign banks are 'ring-fenced' into entities that are legally and operationally independent. In such cases, a foreign bank would have to hold capital and liquidity locally, rather than relying on their parent for support.

- In the United Kingdom, regulators are considering reforms that could require foreign bank branches to incorporate as a subsidiary if their home country supervision and resolution arrangements are not sufficiently 'equivalent' to those in the United Kingdom.
- In the United States, the Federal Reserve finalised a rule in February that will require large 'foreign banking organisations' to consolidate their bank and non-bank subsidiaries under an 'intermediate holding company', which would be subject to supervisory requirements generally applicable to US bank holding companies.
- The trend towards greater ring-fencing is being reinforced by 'structural banking reforms' in the United States, the United Kingdom and the European Union (the Volcker, Vickers and Liikanen proposals, respectively). These reforms will force banks to transfer some or all of their investment banking and high-risk wholesale banking activities into a separately capitalised subsidiary, and cease certain speculative trading activities entirely (Gambacorta and Van Rixtel 2013).

By seeking to make banks simpler, less interconnected and easier to resolve, these reforms aim to increase the resilience of the financial system and reduce the risk that taxpayers or depositors will incur losses if a bank fails. Some observers have expressed concern, however, that these reforms could come at the cost of making the global financial system more fragmented. Nevertheless, given the costs arising from the global financial crisis, the case for regulatory change to alleviate shortcomings revealed by the crisis remains strong.

Conclusion

While global gross capital flows are now lower than they were in 2007, this reduction has not been broad based across economies and all types of capital flows. Much of the decline reflects a reduction in flows to and from advanced economies, with the fall most pronounced in portfolio flows and cross-border lending by banks. In contrast, capital inflows to some economies have increased since the crisis, particularly those to emerging Asia. These changes in the volume, type and geographical distribution of capital flows have reflected a broad reassessment of risk across jurisdictions and asset classes, as well as other cyclical and structural factors.

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These reviews, issued in March and September, assess the current condition of the financial system and potential risks to financial stability, and survey policy developments designed to improve financial stability.

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- *Payments System Board Annual Report*
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