

Bulletin

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Structural Change in the Australian Economy

Ellis Connolly and Christine Lewis*

Over time, the structure of the Australian economy has gradually shifted away from agriculture and manufacturing towards services, with the mining industry growing in importance recently. Economic activity has also shifted towards the resource-rich states of Queensland and Western Australia. Changes in the structure of the economy have been driven by a range of factors including rising demand for services, the industrialisation of east Asia, economic reform and technical change. In recent years, the rate of structural change appears to have increased, driven by the rise in resource export prices and mining investment.

Introduction

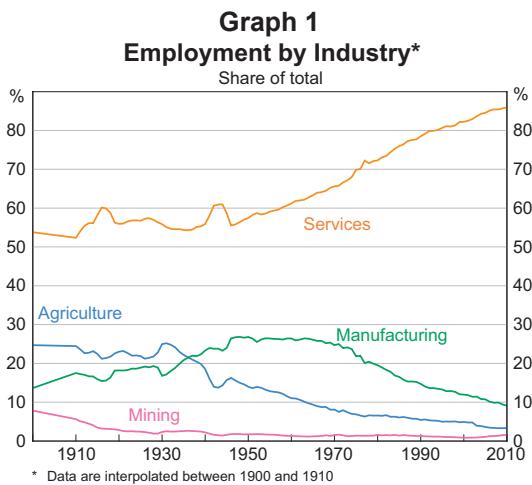
This article discusses the key changes in the structure of the Australian economy, particularly over the past 50 years.¹ The economy has been transformed from one centred on the production of primary products to an urbanised economy mainly producing services. In recent years there has also been a resurgence of the mining industry, lifting the industry's share of investment, output and exports, and contributing to the rising share of the states of Queensland and Western Australia within the economy. Consistent with this, a number of measures suggest that the rate of structural change picked up in the late 2000s. The article also sets out some of the factors that have driven structural change over recent decades.

Trends in Industry Structure

In the 19th century, the Australian economy was oriented towards primary production, with only a small manufacturing industry. Agriculture accounted for around one-third of output, and the share of mining surged dramatically during the booms in the 1850s and late in the century.² Service industries were

nonetheless also important, accounting for around half of all activity, with relatively strong demand for services generated as a result of the long distances between population centres (in the case of transportation and communications) and the relatively high income earned from agriculture and mining.³

The 20th century saw the rise of manufacturing followed by the expansion of service industries. By the 1950s, the manufacturing industry's share of total employment had risen to around 25 per cent, from 15 per cent at the turn of the century (Graph 1).



* The authors are from Economic Analysis Department.

1 The data used in this article are drawn from multiple sources and involve splicing series compiled under different industry classifications and systems of national accounts, which may affect the comparability of series over time.

2 Battellino (2010a) discusses the five major mining booms in Australia's history. See Butlin (1985) for 19th century GDP estimates.

3 See Maddock and McLean (1987).

Table 1: Industry Shares of Activity
Per cent

	Agriculture	Mining	Manufacturing	Services
Output^(a)				
– 1960s	13	2	26	59
– 1980s	6	6	19	70
– 2000s	3	7	12	78
Employment				
– 1960s	10	1	26	63
– 1980s	6	1	17	75
– 2000s	4	1	11	84
Investment^(b)				
– 1960s	11	5	19	64
– 1980s	6	11	13	70
– 2000s	4	13	11	72
Exports				
– 1960s	62	15	9	14
– 1980s	33	38	10	18
– 2000s	18	42	17	23

(a) Nominal value added excluding ownership of dwellings

(b) Investment excludes dwelling investment and cultivated biological resources. When cultivated biological resources are included, the share of agriculture is 30 per cent in the 1960s, 11 per cent in the 1980s and 6 per cent in the 2000s.

Sources: ABS; RBA; Withers *et al* (1985)

Since the 1960s, the share of manufacturing in the overall economy has declined, although in absolute terms manufacturing production has continued to expand.

Service industries have grown strongly over the past 50 years, rising from around 60 per cent of total output in the 1960s to around 80 per cent recently (Table 1). In the 1950s, services were closely linked to manufacturing, with wholesale trade and transport supporting the production and distribution of manufactured goods. Since then, the share of distribution services has steadily fallen, consistent with the declining relative importance of manufacturing and also agriculture. In contrast, the fastest growing service industries in recent years

have been business services, including financial and professional services, and social services such as health and education (Graph 2).⁴ Service industries are generally more labour intensive (and less capital intensive) than manufacturing, mining and agriculture, with services employing around

4 In this article we have aggregated the 19 industries in the ANZSIC 2006 classification into 8 industry groups, excluding ownership of dwellings: agriculture (agriculture, forestry & fishing); mining; manufacturing; construction; distribution services and utilities (electricity, gas, water & waste services, wholesale trade, retail trade, transport, postal & warehousing and information media & telecommunications); business services (financial & insurance, rental, hiring & real estate, professional, scientific & technical and administrative & support); social services (public administration & safety, education & training and health care & social assistance); and personal services (accommodation & food, arts & recreation and other).

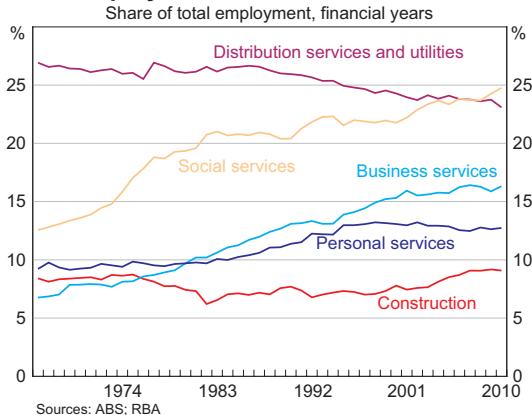
85 per cent of the workforce, but representing only around 70 per cent of investment.⁵

Over the past 50 years, the mining industry's share of nominal output has fluctuated considerably, but has trended higher to be around 8 per cent in 2009/10, up from 2 per cent in the 1960s (Graph 3). Investment in the mining industry has also risen from 5 per cent of total investment in the 1960s to around 19 per cent in 2009/10, well above the peaks in the previous mining booms in the early 1970s and the early 1980s. Notwithstanding this rise, the mining industry's share of employment has remained relatively small, reflecting its high capital intensity. The mining boom over recent years has also had effects on other industries. In particular, output and employment in the construction industry have grown solidly, reflecting strong demand for mining-related construction (Graph 2). There has also been a shift in the composition of the manufacturing industry towards mining-related manufacturing, and away from import-competing manufactures.

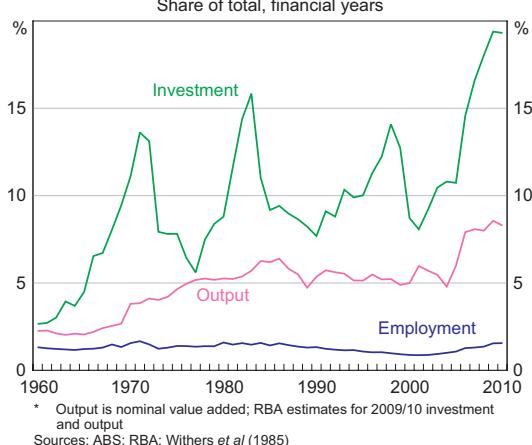
In contrast to output and employment, Australia's exports are still dominated by commodities (Graph 4). In 2009/10, mining exports accounted for around half of export income, while agricultural goods accounted for around 10 per cent of export income. Throughout the past two centuries, commodity exports have accounted for at least half of Australia's export income, reflecting a comparative advantage in the production of these goods. For most of the 19th century, the single biggest export was wool, and until the 1950s, less than 10 per cent of export income was from manufactures. The shares of manufacturing and services exports each rose through the 1990s. These shares have declined in recent years, mainly due to the strength of commodity prices.

⁵ In this article, investment by industry includes business and public investment and excludes dwelling investment and cultivated biological resources. Investment by state includes business, public and dwelling investment and excludes cultivated biological resources.

Graph 2
Employment in Service Industries



Graph 3
Mining Activity*



Graph 4
Exports by Industry*

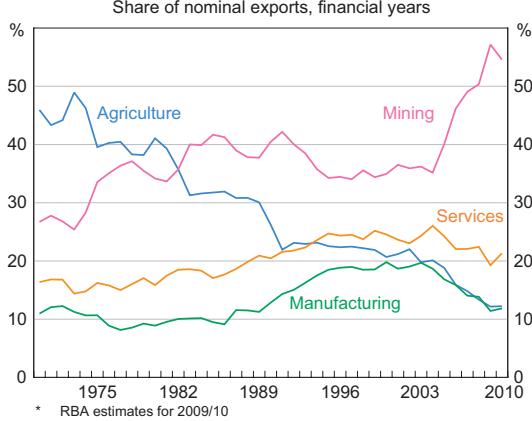


Table 2: State Shares of Activity
Per cent

	NSW and ACT	Queensland	SA and NT	Tasmania	Victoria	WA
Output^(a)						
– 1960s	38	13	9	3	32	6
– 1980s	35	15	9	3	30	9
– 2000s	35	18	8	2	25	12
Employment						
– 1960s ^(b)	38	14	10	3	28	8
– 1980s	36	16	10	3	27	9
– 2000s	35	20	8	2	25	10
Investment						
– 1960s	39	13	9	4	28	7
– 1980s	36	18	9	2	24	10
– 2000s	32	21	8	2	24	14

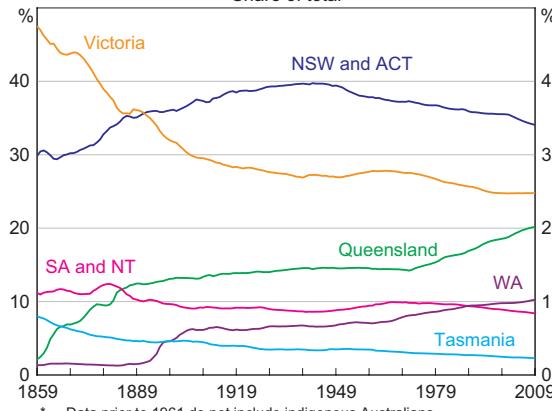
(a) Nominal gross state product

(b) 1966–1969

Sources: ABS; Donovan (1981); RBA

Graph 5
Population by State*

Share of total



Trends in Activity by State

During the past 150 years, the Australian population and economic activity have spread from the south-eastern states towards Queensland and Western Australia in two broad waves – in the second half of the 19th century and in the past

50 years (Graph 5). Victoria's population share peaked with the gold rush in the 1850s, which attracted immigrants from other Australian colonies and overseas, and declined over the remainder of the 19th century as Queensland and New South Wales grew strongly. The 1890s depression hit Victoria particularly hard, encouraging further outflows of labour, with many migrating to Western Australia where another mining boom was under way.⁶

Over the past 50 years or so, Western Australia and Queensland have grown relatively strongly, with their share of output and employment rising steadily from around 20 per cent in the 1960s to more than 30 per cent recently (Graph 6, Table 2). The population has also grown strongly in these states, driven by immigrants and, in the case of Queensland, interstate migration from the south-eastern states. Strong population growth has contributed to faster output growth across nearly all industries in these states relative to the national average over the past

⁶ See Blainey (1963, p 195).

two decades; growth in output *per capita* has been more evenly distributed across the country.⁷ The mining booms in the late 1960s and the late 2000s also contributed to the rising share of the resource-rich states in the national economy, particularly in terms of investment. However, compared with the 19th century, the changes in regional population shares in recent decades have occurred fairly smoothly, with modern mining booms being much less labour intensive than their forerunners.

The Rate of Structural Change

There is no universally accepted measure of the rate of structural change, but a commonly used approach, and the one adopted in this article, is to calculate structural change indices. In terms of industry structure, these indices measure the change over a specified period – in this case five years – in the share of the different industries in total nominal output, real output, employment or investment (Graph 7).⁸ Similar indices are calculated to measure the change in economic activity over time across states. If there has been no change in the relative importance of different industries (or states) over the period, these indices will have a value of zero. If, for example, the share of one industry (or state) has increased by 2 percentage points (with a corresponding decrease in the other shares), then the index has a value of 2.

Using the various indices we can identify periods with high rates of structural change and periods of relative stability over the past 50 years. The indices

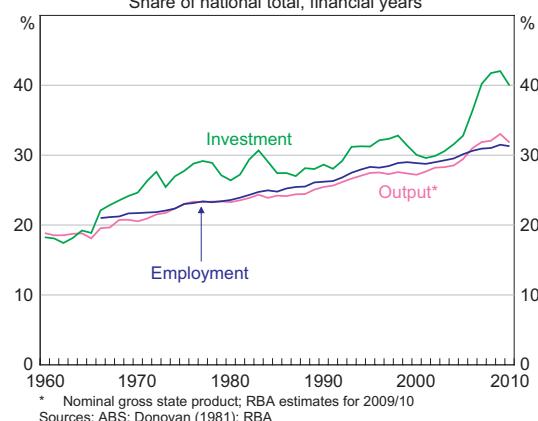
7 For more details, see Battellino (2010b).

8 The structural change index (SCI) takes the form:

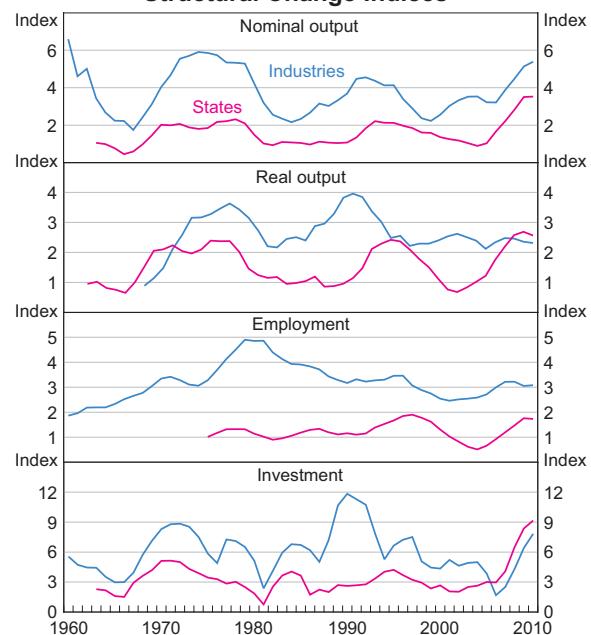
$$SCI = \frac{1}{2} \sum_{i=1}^n |X_{it} - X_{i,t-5}|,$$

where x_{it} is the average share of industry (or state) i in the economy in the five years to year t ; we use five-year averages to abstract from short-term variation in the composition of the economy. For a more detailed description, see Productivity Commission (1998). The eight industry groups used are: agriculture; mining; manufacturing; construction; distribution services and utilities; business services; social services; and personal services. In the state measure, the Australian Capital Territory is included with New South Wales and the Northern Territory is included with South Australia. Note that real output shares are sensitive to the choice of base year.

Graph 6
Queensland and Western Australia



Graph 7
Structural Change Indices*



* Half the sum of the absolute five-year change in five-year average industry or state shares, with the final year indicated. Output refers to value added by industry and gross state product. RBA estimates for 2009/10 output and investment

Sources: ABS; Donovan (1981); RBA; Withers *et al* (1985)

suggest that structural change was high from the late 1960s through to the late 1970s, from the late 1980s through to the mid 1990s and also more recently. The earlier episodes commenced with investment booms – in mining in the late 1960s and in business services in the late 1980s – which flowed through to rising output shares in these industries over following years. At the same time, the shares of manufacturing and agriculture fell as resources were attracted to the booming industries. Another factor was a large increase in the share of social services in the 1970s. In the early 1990s, elevated rates of structural change by industry and state were associated with the recession, when there was a sharp contraction in manufacturing output and employment. This had a disproportionate effect on Victoria and South Australia, given their relatively large manufacturing industries. Compared with the periods of rapid structural change, the structure of the economy was relatively stable in the mid 1960s and the early 2000s, which were both periods of solid economic growth and price stability.

Across a range of measures, the rate of structural change appears to have increased in recent years, partly driven by the mining boom in Western Australia and Queensland. This is particularly noticeable in the measures using nominal output, reflecting the sharp rise in commodity prices over recent years. It is also evident in investment across the states, although by industry this measure remains well below the peak associated with the commercial property boom in the late 1980s. Structural change in real output and employment has not picked up to the same extent as for investment, reflecting the inevitable lags between investment and real output and the fact that the mining industry directly employs a relatively small share of the workforce. The rate of structural change across the states has been the highest since at least the mid 1960s on most measures, partly reflecting that the current mining boom is larger and more geographically concentrated than the previous booms in the late

1960s and the early 1980s. Nevertheless, the strong growth in Queensland and Western Australia has been quite broad based across industries.

Some Factors Driving Structural Change

A range of factors have driven structural changes in the Australian economy, including rising consumer demand for services, the industrialisation of east Asia, economic reform and technical change.

Rising demand for services

The increase in the share of services in the Australian economy largely reflects rising consumer demand for services as real incomes have increased. The share of consumption spent on services has risen from 40 per cent in 1960 to over 60 per cent currently, reflecting rising spending on health, education, recreational services and financial services. A similar trend in the share of services in output is evident in many other economies (Graph 8).⁹

The rising share of services in the economy has coincided with increasing labour force participation, and these trends are likely to be related for several reasons. The increase in the proportion of families where both parents work has generated more demand for services previously provided within the household (and therefore not measured in production), such as childcare, pre-school education, home maintenance and aged care. The demand for health services has also grown with increased longevity. At the same time, service industries have been the source of almost all of the growth in employment over the past two decades, and have facilitated the increase in labour force participation by providing jobs with more flexible working hours than in the traditional goods-producing industries.

⁹ This trend was highlighted as one of the key characteristics of modern economic growth in Kuznets (1973).

Industrialisation of east Asia

The emergence of the economies of east Asia as major producers of manufactured goods over the past 50 years has also had a significant effect on the structure of the world economy. East Asia's share of global manufacturing more than doubled from 1970 to 2008, reflecting the region's comparative advantage owing to relatively low labour costs. This process was led by Japan from the 1960s, followed by the newly industrialising economies of east Asia, and most recently China (Graph 9). The rising share of manufacturing in east Asia has been mirrored by a decline in the share of the United States and Europe, as well as in Australia's share.

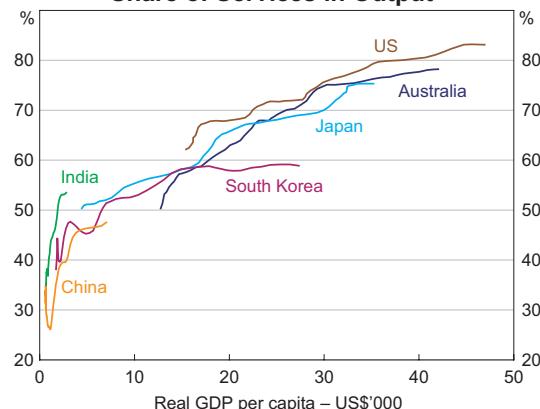
The strong growth in Asia's demand for commodities to supply an expanding manufacturing sector has significantly boosted the share of resources in Australian export income and the economy more generally, reflecting Australia's resource endowment and proximity to Asian markets. Other factors, including government policy and technology, have also played a role in the rise of the Australian mining industry. For instance, the development of the iron ore export industry in the 1960s followed the lifting of an embargo on iron ore exports and lower transportation costs flowing from the introduction of bulk carriers.

Economic reform

The economic reforms undertaken by Australian governments over recent decades to improve the efficiency of the economy have also driven structural change. These reforms include the restructuring and deregulation of a range of service industries and the reduction in the level of trade protection provided to goods-producing industries.

Policies designed to promote greater competition in a range of service industries have contributed to the increasing share of services in the economy.¹⁰ In particular, the deregulation of the finance industry in the 1980s and the introduction of compulsory

Graph 8
Share of Services in Output*

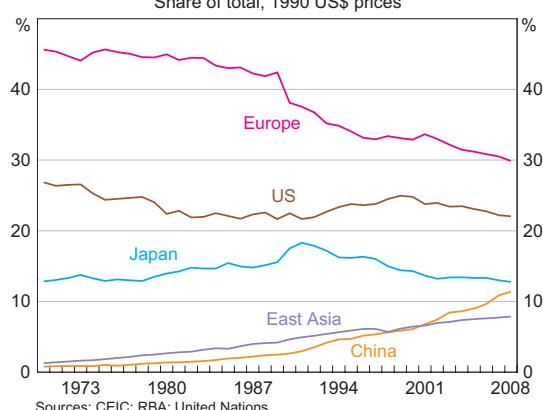


* Five-year moving averages; real GDP per capita in 2009 US\$ prices converted at PPP exchange rates; Australia, India and US from 1950; China, Japan and South Korea from 1953

Sources: ABS; CEIC; Conference Board 'Total Economy Database'

(January 2010); RBA; Timmer and de Vries (2007); United Nations

Graph 9
Global Manufacturing
Share of total, 1990 US\$ prices



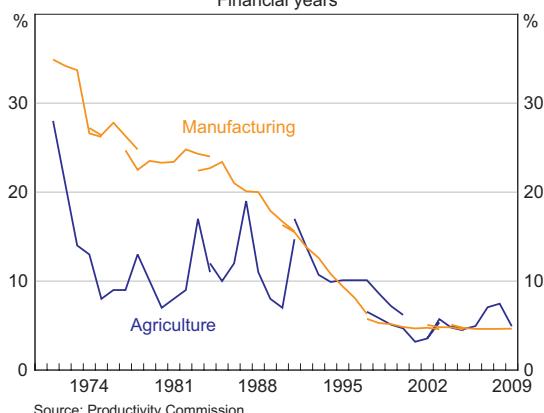
Sources: CEIC; RBA; United Nations

superannuation supported the growth of banking and funds management. The restructuring of a range of services previously provided by government monopolies also led to more competition in the utilities, communications and transport industries.

The reforms also include reductions in the protection provided to the manufacturing industry, which grew in the first half of the 20th century under the protection of trade barriers. From the early 1970s, these trade barriers were progressively wound back – Productivity Commission estimates indicate that the effective rate of assistance to manufacturing

10 For more details on these reforms, see Forsyth (2000).

Graph 10
Effective Rates of Assistance
 Financial years



has fallen from around 35 per cent of output in the early 1970s to around 5 per cent in the 2000s (Graph 10). Agriculture historically received some support in the form of tax concessions and subsidies, particularly during periods of drought or low world rural commodity prices, and this support has also decreased over time. Lower trade barriers have given households and businesses access to imported goods for investment and consumption at reduced cost, allowing them to benefit from the comparative advantage of east Asia in the production of manufactures. In response to the increase in international competition, the manufacturing industry has become more productive and export-oriented.¹¹

Technical change

The development and application of new technologies has also driven structural change over recent decades, particularly in service industries. Since 1970, investment in computers and software has increased exponentially in real terms, reflecting the rapid improvement in the quality of computers over time and their range of uses. In the finance industry, the adoption of technologies such as automatic teller machines and electronic payment methods in

the 1980s and 1990s resulted in significant structural change. Improved transportation technologies and new business practices (such as just-in-time production) are also likely to have resulted in better inventory management and contributed to the reduction in the relative size of distribution services such as wholesale trade and transport.

Over recent decades, firms in goods-producing industries such as manufacturing have progressively outsourced a range of business services to take advantage of the economies of scale generated when these services are pooled together and provided by specialised firms. The outsourcing of services such as accounting, marketing and IT support is also likely to have been hastened by improvements in communications technology, together with increasing trade in services, which exposed service industries to greater competition. As such, the resulting rise in service industries' share of the economy may be overstated since it partly represents the measurement of activities previously undertaken by the goods-producing industries.¹²

Conclusion

The structure of the Australian economy has shifted over time away from agriculture and manufacturing towards services. Structural change has tended to occur in waves, driven by a range of factors including rising demand for services, the industrialisation of east Asia, economic reform and technical change. In recent years, the mining sector has also grown in importance, contributing to the expansion of the resource-rich states of Queensland and Western Australia relative to the south-eastern states. The mining boom has also led to an increase in the rate of structural change, particularly when measured in terms of nominal output and investment. ↗

11 See Dwyer and Fabo (2001) and Productivity Commission (2003).

12 See Productivity Commission (2003) for a discussion of inventory management and outsourcing by manufacturing firms.

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Durable Goods and the Business Cycle

Susan Black and Tom Cusbert*

Spending on durable goods tends to be more cyclical than spending on non-durable goods and services as it can be more readily postponed in times of economic weakness. During the recent global economic slowdown, the decline in durable goods spending was a key transmission mechanism of the uncertainty associated with the global financial crisis to the broader economy, as households and businesses delayed purchases of durable goods.

Introduction

A notable feature of the recent global downturn was a significant fall in demand for consumer durables and capital goods. In part, this reflected a sharp rise in uncertainty associated with the financial crisis, which discouraged households and businesses from making purchases of durable goods until conditions were more certain. These developments highlight the dynamics of demand for durables as drivers of the business cycle.

Cycles in spending on durable goods, both consumer and business, have long been identified as an important feature of the business cycle. The academic literature has found that durable goods consumption spending in both Australia and the United States is highly correlated with total output and is significantly more volatile over the cycle than either total output or the consumption of non-durable goods and services.¹

This article examines cycles in spending on durable goods in Australia over the past 50 years and during the recent economic slowdown, and provides a comparison with the United States and other economies. In addition, it discusses the relative importance of durable goods cycles for economies that are importers (net consumers) or exporters (net producers) of durables.

What are Durables?

Durable goods provide a stream of services or utility over time. In contrast, non-durable goods and services tend to be consumed immediately. In the case of consumers, examples of durable goods are motor vehicles and household furnishings; examples of non-durable goods and services include food and transport services.² As the services received from existing holdings of durable goods tend to be maintained even in the absence of any new purchases, spending on durables can be more easily deferred. For example, a household experiencing a fall in income may decide not to purchase a new car since it can continue to use its current car. As well as being able to be postponed, many durable goods can be considered discretionary compared with more essential spending like food. As a result of these two properties, consumer spending on durable goods is more volatile than spending on non-durable goods and services, and tends to be more closely related to the economic cycle.

Business investment is another example of deferrable durables spending which is also correlated with the business cycle. In the case of construction, firms are likely to delay any new projects going into a

* The authors are from Economic Analysis Department.

1 See Fisher, Otto and Voss (1996), Luengo-Prado (2006) and Stock and Watson (1999).

2 Around 15 per cent of household spending in Australia tends to be on durable goods. Table A1 shows the details of the household final consumption expenditure series used to construct the durable goods, non-durable goods and services series used in this article.

slowdown, but to complete projects that are already underway. In the case of machinery & equipment investment (such as motor vehicles and computers), firms are more likely to be able to change their investment plans rapidly in response to changes in economic conditions. Accordingly, in addition to consumer durables, this article focuses on the machinery & equipment component of business investment.

Cycles in Durable Goods Spending

A common method of looking at the cyclical properties of an economic variable is to calculate its correlation with GDP over the cycle. It is also common to examine the relative volatility of an economic variable by taking the ratio of its standard deviation to that of GDP growth.

Spending on consumer durable goods and machinery & equipment investment has been highly correlated with GDP growth in both Australia and the United States over the past 50 years. The variables are pro-cyclical, meaning they are positively correlated with output growth, with falls (increases) in spending on durables associated with periods of economic weakness (strength) (Table 1).³ Household

spending on non-durable goods and services is also positively correlated with GDP growth. In Australia, the correlation with the economic cycle is higher for household spending on durable items than for non-durable goods and services. This distinction is also apparent for the United States, albeit to a lesser extent.

The high correlations for durables spending and GDP growth appear to be mostly a result of episodes of weak economic activity.⁴ This suggests that there is a greater association between falls in household spending on durables and falls in income than for increases in these variables. Similarly, the relationship between business investment and GDP growth is stronger during downturns. During deep recessions, spending on consumer durables and capital goods in Australia has fallen sharply (Table 2). In contrast, growth in household spending on non-durables and services slowed on average, but remained positive. The experience in the United States has been similar.

Consistent with earlier findings, updated data show that the volatility of durable goods spending and machinery & equipment investment is much higher than the volatility of spending on non-durable goods and services (Table 1). While durable

Table 1: Cyclical Properties of Consumption and Investment
Chain volumes; quarterly percentage changes in trend measures; 1960 to 2010

	Durable goods consumption	Non-durable goods consumption	Services consumption	Machinery & equipment investment
Correlation with GDP^(a)				
Australia	0.63	0.20	0.34	0.50
US	0.79	0.75	0.67	0.82
Volatility relative to GDP^(b)				
Australia	1.9	0.9	0.7	4.6
US	2.7	0.8	0.6	3.4

(a) The correlation coefficient shows how much two variables co-vary compared to their standard deviations. It ranges between -1 and 1 (where 1 indicates the series have proportional changes in the same direction)

(b) This is expressed as the ratio of the standard deviation of the series to the standard deviation of GDP growth

Sources: ABS; Bureau of Economic Analysis

3. The correlations are slightly lower when we exclude each component from GDP (i.e. durable spending and GDP excluding durable spending), but the conclusions regarding relative cyclicity are unchanged.

4. The correlations fall significantly when the bottom decile of GDP growth outcomes are excluded, whereas excluding the top decile of GDP growth outturns has a much smaller effect on the correlation coefficients.

Table 2: Average Growth during Deep Recessions^(a)
Chain volumes; percentage changes; 1960 to 2010

	GDP	Durable goods consumption	Non-durable goods consumption	Services consumption	Machinery & equipment investment
Australia	-2.6	-5.7	0.6	3.6	-14.1
US	-3.2	-6.7	-1.2	0.6	-10.7

(a) Growth rates for each series calculated from GDP peak to trough in 1960–1961, 1981–1983 and 1990–1991 for Australia and in 1974–1975, 1981–1982 and 2008–2009 for the United States

Sources: ABS; Bureau of Economic Analysis

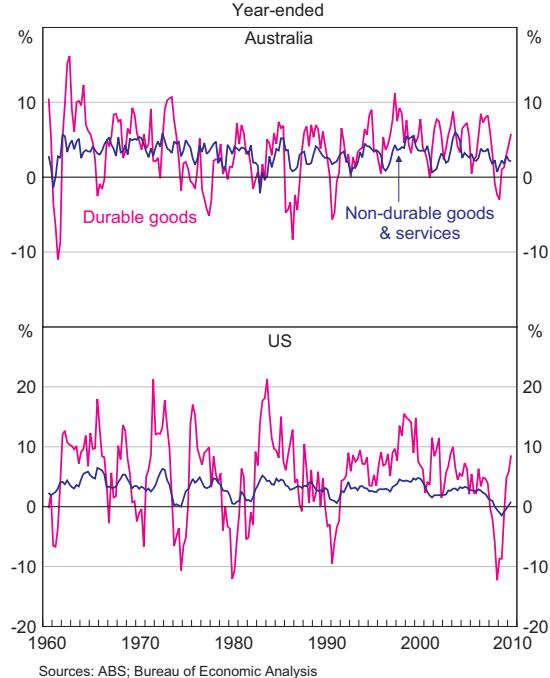
goods consumption and machinery & equipment investment have declined (in year-ended terms) during periods of economic weakness in Australia and the United States since 1960, falls in spending on non-durables have been rare (Graph 1).

Durables Spending during the Recent Downturn

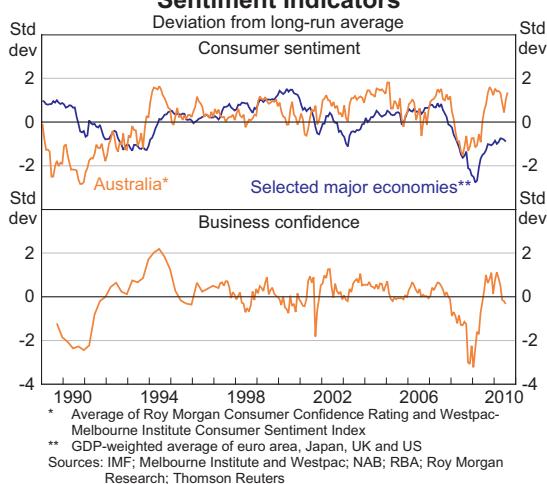
Historically, the cyclical pattern of durables spending often reflected households delaying purchases of durable goods in response to falls in income and firms deferring capital good purchases due to softening demand. However, the business cycle dynamics of durables during the recent period of economic weakness in 2008/09 appear to have been somewhat different. In this case, falls in consumer durables and capital goods spending in part provided a transmission mechanism of the uncertainty created by the financial crisis to the broader economy: uncertain financial conditions and concerns over the economic outlook caused consumers and businesses to become more cautious and postpone or scale back deferrable spending, which in turn had flow-on effects on the rest of the economy. Firms responded to the fall in demand for consumer durables and capital goods by sharply cutting production of such goods and this flowed through into international trade.

Globally, measures of consumer and business confidence fell in late 2007 and 2008 in an environment of increased uncertainty and higher risk aversion (Graph 2). Consistent with the pattern

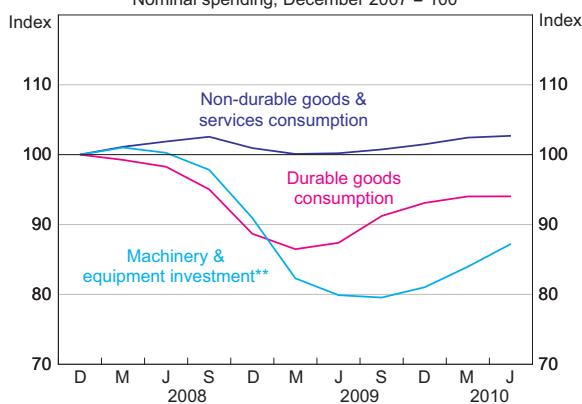
Graph 1
Consumption Volumes Growth



Sources: ABS; Bureau of Economic Analysis

Graph 2**Sentiment Indicators****Graph 3**
Spending in Selected Economies*

Nominal spending, December 2007 = 100



in the long-run data, spending on consumer durables fell more sharply than spending on non-durable goods and services (Graph 3). The decline in machinery & equipment investment was also a global phenomenon, partly reflecting the rise in uncertainty and firms responding to softer consumer demand. In some major economies such as Japan and the United States, machinery & equipment investment declined by 20 per cent or more from peak to trough.

The falls in confidence also contributed to the decline in global industrial production that took place (Graph 4). In line with softer global demand for consumer durables and capital equipment, the largest declines in production were for these goods and there was a large contraction in world trade. Economies that are large producers and exporters of durable goods tended to be significantly affected by the sharp fall in durables spending. For example, exports from east Asia (excluding Japan and China) declined by around 20 per cent during 2008. In addition to uncertainty, tighter access to various forms of credit also seems to have been a factor in the declines in production and international trade.

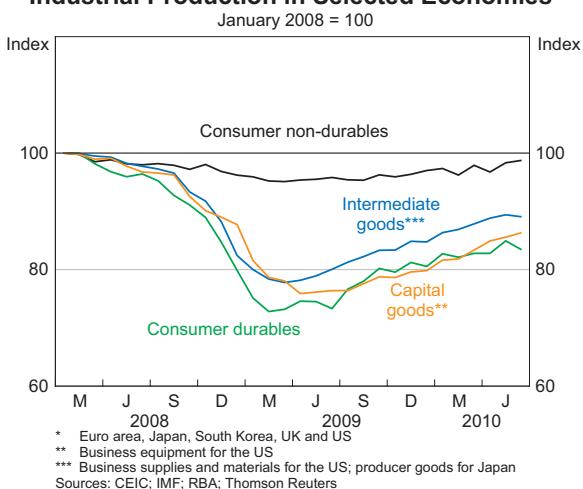
There has subsequently been some recovery in global durables demand, though spending on consumer durables and capital goods remains below the recent peak in many economies. Given the weakness in demand during the slowdown, governments in several countries introduced temporary subsidies targeted at spending on consumer durables. The effect of this was two-fold: it lowered the price of durables relative to non-durables; and it lowered the current price of durables relative to their future price. The second effect encouraged intertemporal substitution, with consumers choosing to buy goods immediately rather than wait; in many cases this resulted in spending that would otherwise have taken place in the future being brought forward. These types of subsidies were particularly evident in economies that are large producers of durables. Motor vehicle subsidies for consumers were introduced in a number of countries, including

China, Japan, the United States and some European nations, with higher car sales and production reported in many cases.⁵ In addition to government subsidies, firms in many countries offered discounts on durable goods, further lowering their relative price. In Japan, the government introduced subsidies for motor vehicles and energy efficient appliances and firms reduced prices significantly. Reflecting these factors, the recovery in durables spending has been especially rapid in Japan, with spending rising almost 20 per cent in nominal terms over the year following the trough recorded in the March quarter 2009.

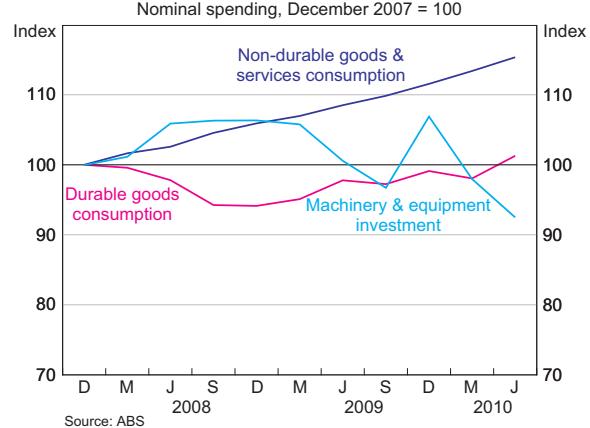
International trade has also recovered somewhat, with this turnaround being most pronounced in east Asia where exports have retraced the previous sharp fall. Electronic components and consumer durables appear to have played a prominent role in driving the rebound. In Korea, for example, exports of motor vehicles and semi-conductors recovered strongly following sharp falls over the second half of 2008. Korean exports of motor vehicles benefited from car scrappage schemes in the United States and several European countries, although the increase in auto exports has been broad-based across destinations.

In Australia the declines in confidence during the financial crisis were sharp, but nevertheless shallower and less protracted than in many other advanced economies. In line with the less severe drop in consumer sentiment, the fall in Australian household spending on durable goods was smaller than in many other advanced economies (6 per cent versus an average of 15 per cent for Japan, the United Kingdom and the United States; Graph 5). As was the case globally, many Australian firms experienced difficult trading conditions and tight credit conditions, becoming more cautious with their spending and delaying or reducing investment plans. While machinery & equipment investment in

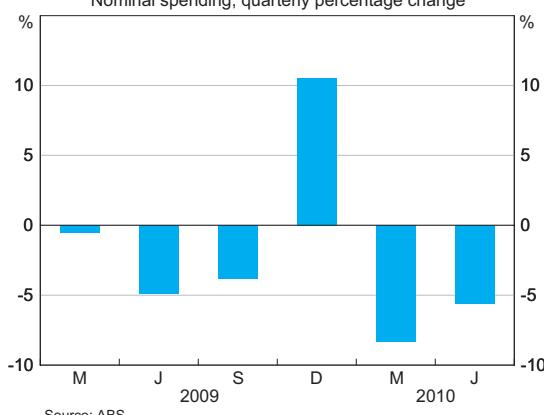
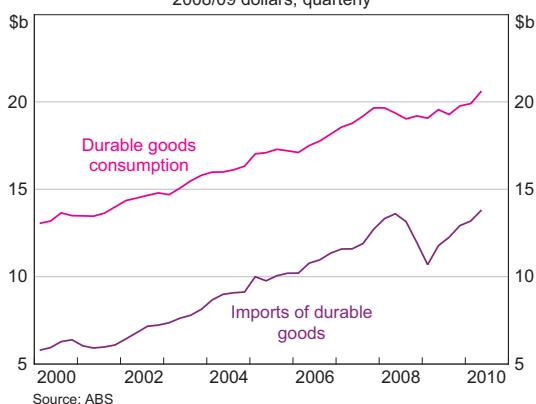
Graph 4
Industrial Production in Selected Economies*



Graph 5
Spending in Australia



⁵ In the United States, the government also introduced temporary incentives to encourage housing activity through home-buyer tax credits.

Graph 6**Machinery & Equipment Investment Growth**
Nominal spending, quarterly percentage change**Graph 7****Durable Goods and Imports**
2008/09 dollars, quarterly

Australia did not fall as sharply as in other advanced economies, it remains subdued.

After falling over the first half of 2008, spending on consumer durables in Australia has experienced a rebound. As was the case in many economies, the Australian Government introduced measures to boost household spending. However, in contrast to the temporary subsidies for durable goods introduced overseas, the Australian measures were more general, providing a boost to household incomes through the cash payment component

of the stimulus package. This may have reflected the fact that Australia produces few durable goods and is a large importer of these. The income boost did not change the price of durables relative to non-durables or relative to durables in the future. As a result, the effects were widespread; while many households increased spending on durables, others purchased non-durables or saved their cash bonus.

The Australian Government also introduced measures to support investment, with firms receiving temporary tax credits for investing in new tangible depreciating assets between 13 December 2008 and 31 December 2009. Machinery & equipment investment rose sharply in the December quarter 2009, ahead of the expiry of the tax deductions (Graph 6). Private-sector surveys suggest that the temporary reduction in the cost of investment goods induced about one third of small businesses to increase business spending. It appears that the temporary subsidy brought forward some investment, with a decline in machinery & equipment investment over the first half of 2010.

As Australia is a net importer of durables and capital goods, falls in spending on consumer durables and capital goods tend to be partly offset by falls in net imports of these types of goods (Graph 7).⁶ Spending on consumer durables less imports is much less correlated with GDP growth compared to durables spending alone.⁷ Nonetheless, Australia is affected by the global durables cycle through other channels, such as international demand for commodities that are used in the process of manufacturing durables, and the wholesaling and retailing industries. ↗

6 See Downes, Louis and Lay (1994).

7 The depreciation of the Australian dollar in 2008, which increased the price of imports, and its subsequent appreciation also contributed to the sharp fall and subsequent rise in the volume of imports of durable goods.

Appendix A Consumer Spending Categories

Table A1: Classification of Consumer Spending Categories

Consumption component	Type
Clothing & footwear	Durable good
Furnishings & household equipment	Durable good
Purchases of vehicles	Durable good
Food	Non-durable good
Cigarettes & tobacco	Non-durable good
Alcoholic beverages	Non-durable good
Electricity, gas & other fuels	Service
Rent & other dwelling services	Service
Health	Service
Operation of vehicles	Service
Transport services	Service
Communications	Service
Recreation & culture	Service
Education services	Service
Hotels, cafés & restaurants	Service
Insurance & other financial services	Service
Other goods & services	Service

Source: RBA

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Economic Change in India

Adam Cagliarini and Mark Baker*

India has become an increasingly important part of the global economic landscape over the past decade. Its economy has become more open to international trade, its workforce is growing strongly and the rate of investment has picked up following economic reforms. The strong growth of the Indian economy has also seen a significant deepening of the trade relationship between Australia and India, with India now the third largest destination for Australia's exports.

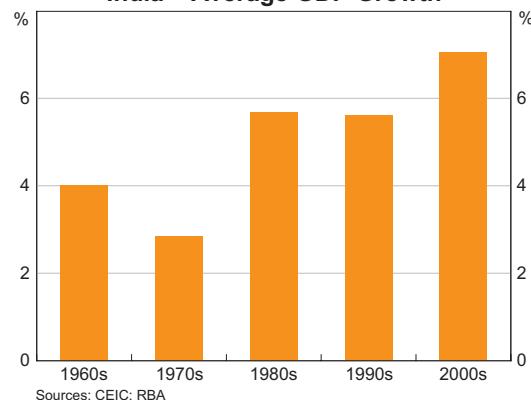
Introduction

This article discusses developments in the Indian economy over the past decade and the increasing importance of India as a trading partner for Australia. It pays particular attention to the evolving industrial structure of the Indian economy as well as recent trends in investment and international trade. The article also examines the nature of India's trade, with a particular focus on its trade with Australia.

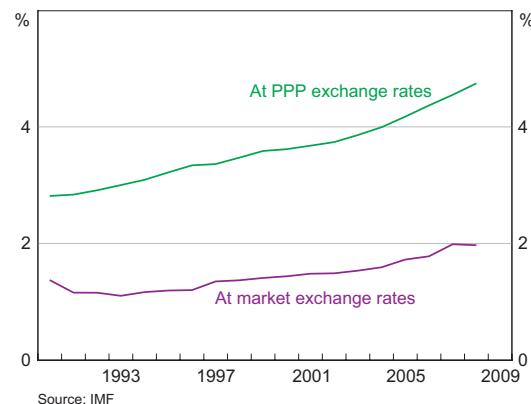
Economic Developments in India

Over the past decade, growth in India increased after a number of decades in which growth was lower than typical of an economy at its stage of development. Since 2000, growth has averaged around 7 per cent per year, up from an annual average of 4½ per cent over the previous four decades (Graph 1). In part, this improvement reflects a series of economic reforms that have significantly opened up the economy and encouraged investment. As a result, on a purchasing power parity (PPP) basis, India's economy is now the fourth largest in the world, accounting for nearly 5 per cent of global GDP (Graph 2).

Graph 1
India – Average GDP Growth



Graph 2
India – Share of World GDP



* The authors are from Economic Group.

The structure of the Indian economy differs in some important respects from that of most other developing economies. In particular, the services sector of the economy is larger than in other countries with similar levels of per capita income. India's industrialisation has occurred more gradually, with much of the decline in agriculture's share of GDP being absorbed by the services sector (Graph 3). As discussed below, this is mainly due to the fact that manufacturing investment historically has been closely regulated. In contrast, the services sector has been subject to less regulation.

India's demographic outlook is also somewhat different from some other Asian countries. India's population is expected to grow over the coming decades, while the size of the population of most of its east Asian neighbours is expected to begin to fall at some point. Projections from the United Nations suggest that India will become the most populous country in the world in the next 20 years. Furthermore, India's long-term economic growth is likely to benefit from a working-age population that is expected to grow until at least the middle of this century, unlike countries such as Japan, South Korea and China (for details see RBA (2010) and Hall and Stone (2010)).

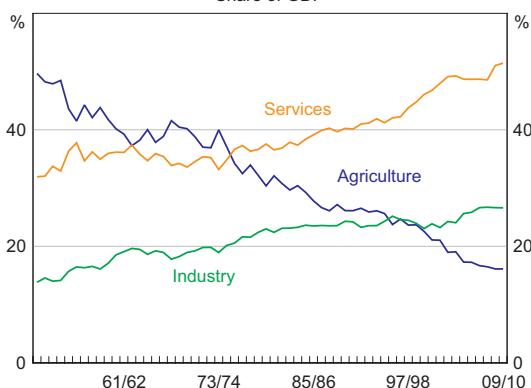
Investment in India

The investment share of GDP in India has historically been low but has increased significantly over the past 10 years. The earlier slow rate of capital accumulation contributed to the low rates of growth in per capita income in India between the 1960s and the 1980s. However, the rate of growth in investment has increased over the past decade and the investment share in India is now at a level that is consistent with those that prevailed in South Korea and China when these countries were at a similar stage of development (Graph 4).

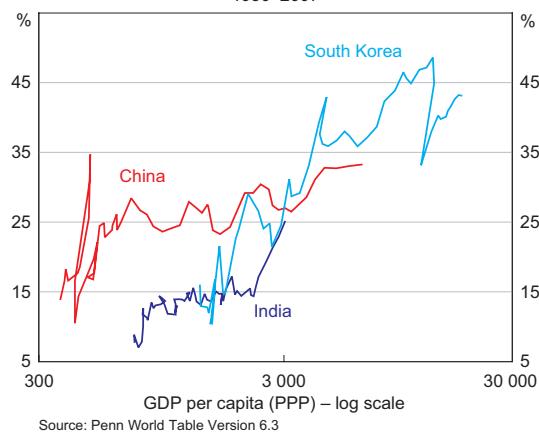
The historically low investment share and India's earlier lacklustre economic performance partly reflected the highly regulated nature of the Indian economy. Throughout the 1960s and 1970s, there were strict controls on investment, the public sector had a very large presence in most industries, and private industries were tightly restricted under a licensing regime that limited product differentiation and decisions on investment, output and employment.

These restrictions were particularly stringent in the manufacturing sector. In 1967, India introduced its small-scale industries (SSI) reservation policy whereby large-scale investment projects were

Graph 3
India – Composition of Output*
Share of GDP



Graph 4
Investment Share of GDP
1950–2007



heavily restricted. Under the reservation policy, only those companies below a certain size were given permission to produce items that were on the SSI list. Large-scale manufacturers of labour-intensive goods were significantly restricted in their investment activities under this regime. By the end of the 1970s, as many as 1000 items were included on the SSI reservation list.¹ These policies acted to create a more fragmented manufacturing sector and reduced its competitiveness by restricting the ability of firms to take advantage of increasing returns to scale.

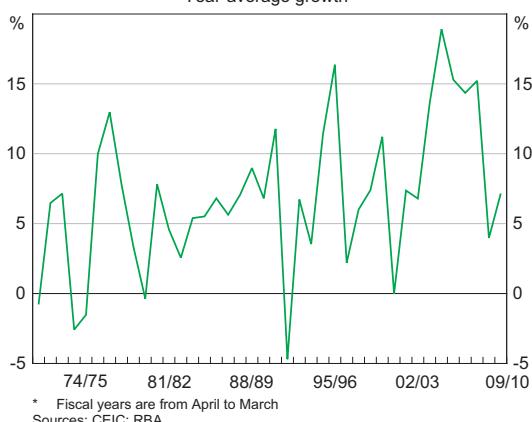
Throughout the 1980s, various market-based reforms were gradually introduced and applied to a narrow set of industries. The limits on investments requiring industrial licenses were raised, as was the asset level at which firms were allowed to produce items on the SSI list. Import controls were also lifted on various products, including raw materials and other intermediate inputs, and various export incentives were introduced. However, significant restrictions and government control of industry and trade remained in place.

In 1991, a balance of payments crisis resulted in a sharp slowing of the Indian economy, prompting a more comprehensive set of market-based reforms under a new industrial policy.² The reform plan virtually abolished the industrial licensing regime and some government-owned firms were privatised. Anti-competitive restrictions on firm-entry in various industries were also abolished gradually throughout the 1990s.

De-reservation of products on the SSI list, which began at a very gradual pace between 1997 and 2001, accelerated rapidly in the 2000s.³ The smaller set of restrictions faced by the producers of newly

de-reserved products and increased flows of foreign investment led to a sharp rise in investment by the manufacturing sector. Investment in machinery and equipment and construction contributed significantly to the pick-up in investment growth (Graph 5).

Graph 5
India – Gross Fixed Capital Formation
Year-average growth*



India's International Openness

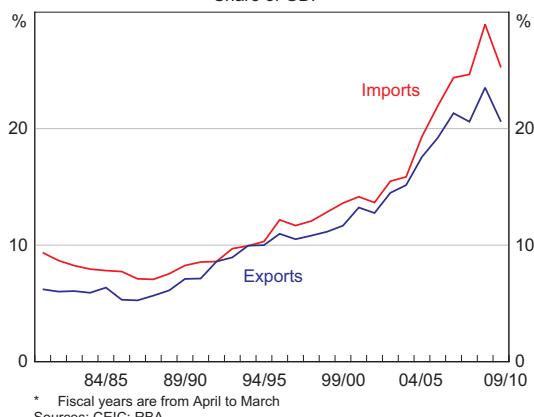
The Indian economy has also become more open over the past 20 years. Through the 1980s, both the import and export shares of GDP were below 10 per cent, reflecting many restrictions that limited the capacity of firms to engage in international trade (Graph 6). The reforms of the 1990s lifted many of these restrictions; some exchange rate controls were abolished, tariffs were reduced and restrictive import licensing on most capital and intermediate goods was eliminated. As a result, by the mid 2000s, both the import and export shares had increased to around 15 per cent of GDP. Additional reforms between 2004 and 2008, including cuts to tariffs, resulted in a rapid further expansion of international trade with the import and export shares of GDP increasing by 2009 to levels similar to those for Australia.

1 For a further explanation of the SSI reservation policy, and various reforms in this area, see Balasubrahmanyam (1995), Panagariya (2008) and National Productivity Council (2009).

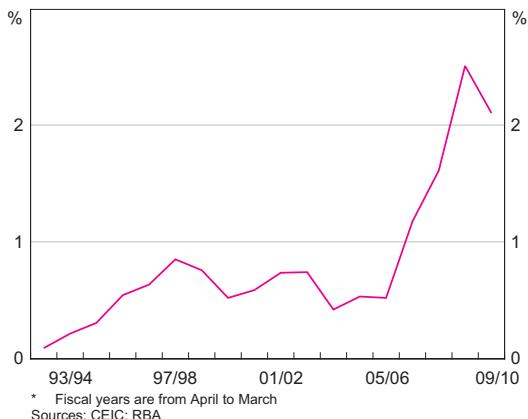
2 For an analysis of the 1990s reforms, see Ahluwalia (2002), Srinivasan (2003), Panagariya (2004, 2008) and Mohan (2006).

3 See National Productivity Council (2009).

Graph 6
India – Trade
Share of GDP*



Graph 7
India – FDI Inflows
Share of GDP*



The growth in investment during the 2000s discussed above was partly due to the increase in foreign direct investment (FDI) inflows from around ½ per cent of GDP to above 2 per cent of GDP in a very short period of time (Graph 7). Government processes to approve foreign investment were simplified and restrictions on foreign investment relaxed.

The Composition of Indian Trade

As its economy has become more open, India has become an important trading partner for many countries, with its share of world trade tripling over the past 20 years to 1½ per cent.

India's largest merchandise export is processed petroleum products (e.g. lubricants, kerosene and propane; Table 1). India has the world's fifth largest oil refining capacity and is a large importer of crude oil. This helps to explain its significant trading relationship with the United Arab Emirates, India's largest trading partner, which is also a major importer of India's processed petroleum products. Despite its vast iron ore deposits, India's iron ore exports are a small share of its total exports, partly reflecting export duties applied to iron ore and designed to promote growth in its steel sector. The high value of India's imports of gold also reflects India's status as the world's largest consumer of gold, while India is also a significant importer and exporter of precious and semi-precious stones, some of which are typically processed and re-exported to countries

Table 1: India – Merchandise Trade
2009, US\$b

Exports		Imports	
Processed petroleum products	23.2	Petroleum oil (crude)	64.9
Pearls and precious or semi-precious stones	17.0	Non-monetary gold	23.4
Gold, silverware, jewellery	13.6	Pearls and precious or semi-precious stones	15.4
Iron ore	5.3	Telecommunications and sound equipment	11.6
Total	176.8	Total	266.4

Source: UN Comtrade

Table 2: Australia – Trade With India
2009, A\$m

Exports to India		Imports from India	
Non-monetary gold	6 715	Personal travel	392
Coal	5 006	Rotating electrical plant & parts	341
Education related travel	3 187	Information technology	139
Copper ores and concentrates	826	Pearls and gems	124
Total	18 185	Total	2 697

Source: ABS

such as the United States, the United Arab Emirates, and Australia.

India's trade in services is also significant. Services account for around 30 per cent of India's total exports, but only 10 per cent of its imports. Software services, which only accounted for 20 per cent of India's services exports in the late 1990s, are now more than half of India's services exports.

While much attention has been paid to the fact that China has become Australia's largest trading partner, less attention has been paid to the fact that India has also become an important destination for Australia's exports. In 2009, India ranked as Australia's third largest export destination from being fifteenth in 1999, surpassing Australia's more traditional destinations such as the United Kingdom and the United States. Australia recorded a trade surplus with India of A\$15.5 billion in 2009, second only to the trade surplus recorded with Japan.

Australia's top three exports to India account for over 80 per cent of exports to India (Table 2). One-third of the value of Australia's exports to India is accounted for by trade in gold. Coal (mainly metallurgical) and education-related travel are also major exports to India. Australians travelling to India and imports of electrical parts are Australia's largest imports from India. Despite general perceptions, imports of information technology services account for less than 10 per cent of Australia's imports from India.

Conclusion

The Indian economy has grown strongly over the past 10 years. It has been opened up to foreign trade and inflows of foreign direct investment have increased significantly, its labour force is growing relatively quickly and is expected to continue growing over the coming decades, and the rate of investment has increased considerably. Partly as a result of these developments, prospects for growth over coming years have improved noticeably, although significant challenges lie ahead, particularly in providing the necessary infrastructure to support the expansion of the private sector and increasing urbanisation. Strong growth in India is also likely to see a deepening of the bilateral trade relationship between Australia and India. ↗

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Ownership of Australian Equities and Corporate Bonds

Susan Black and Joshua Kirkwood*

Australian financial and non-financial companies tap capital markets – particularly equity and bond markets – to source funds from households, foreign investors and domestic institutional investors. Foreign investors supply around half of these funds, with institutional investors providing most of the remainder; households' direct holdings are comparatively modest. During the financial crisis, foreign investors' appetite for Australian assets remained strong, underpinned by the strength of the Australian financial system and economy.

Introduction

Capital markets are a major source of funds for many Australian financial and non-financial companies. Correspondingly, this financing activity provides investment opportunities for Australian and non-resident investors. This article looks at the types of investors who provide the funds raised by Australian entities in bond and equity markets – the main avenues of capital market funding – by examining the composition of the investor base.¹ It also details the notable changes in the ownership of Australian entities and bonds since the early stages of the financial turmoil in mid 2007 when there were signs of dislocation in some capital markets.

In this article, investors are grouped into three broad categories:

- Australian households – this category covers households' direct holdings only and does not include investments in managed funds or superannuation;
- Australian institutional investors – this group is mostly made up of households' indirect holdings of assets in superannuation and

other managed funds, as well as holdings by authorised deposit-taking institutions (ADIs) and insurance companies; and

- foreign investors.

Foreign investors make up around half of the investor base for the combined value of Australian equities and bonds. This is consistent with portfolio diversification by global investors, who, by virtue of their size can account for a large share of the investor base of Australian assets whereas Australian investors only make up a small share of investors internationally. Institutional investors own the bulk of the remainder; as a large share of household wealth is invested indirectly through superannuation and managed funds, households' direct holdings are relatively small.

Overall, investor demand was resilient during the financial crisis, enabling Australian entities to raise a substantial volume of funds. Foreign investor demand for Australian financial assets – with the exception of securitised products – remained strong.² Despite considerable uncertainty and volatility globally, foreign investor appetite for Australian assets was underpinned by the relative strength of the Australian financial system and

* The authors completed this work in Domestic Markets Department.

¹ Companies also issue short-term debt, though this source of funds is comparatively small. The Australian Bureau of Statistics Financial Accounts data used in this article classify convertible hybrids as bonds until converted to shares.

² For a broader discussion on capital flows during this period, see D'Arcy and Ossolinski (2009).

economy compared to most advanced economies. The depreciation of the exchange rate may have also contributed to foreign demand, by making Australian dollar denominated assets cheaper. During the crisis period, domestic demand for financial assets softened a little in an environment of increased risk aversion, but investors continued to participate in new equity and bond issuance.

Equity Ownership

Australian companies predominantly raise public equity domestically by listing on the Australian Stock Exchange (ASX); only a handful of companies have secondary listings overseas. The ASX has a current market capitalisation of around \$1 300 billion, equivalent to 100 per cent of GDP.

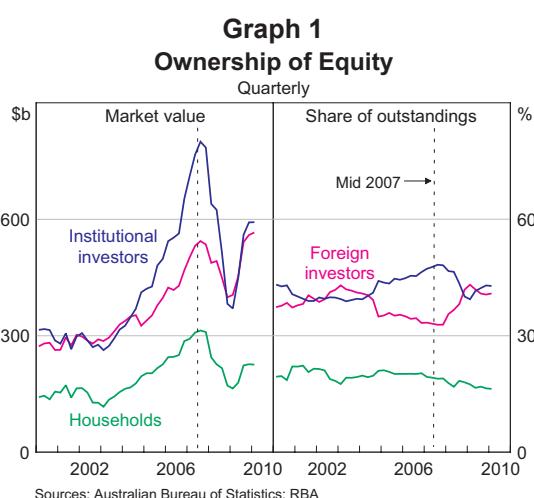
Prior to the financial crisis, institutional investors were the largest single class of investor, owning almost half of listed Australian equities (Graph 1). Institutional ownership had increased significantly over the years leading up to the financial crisis due to the growing pool of funds under management from compulsory superannuation contributions and an increasing portfolio allocation to Australian equities. Contributing to this broader trend, superannuation taxation reforms introduced in May 2007 gave households an incentive to increase

their superannuation investments before July 2007.³ This contributed to a small decline in the proportion of the market owned directly by households to around 20 per cent just prior to the financial crisis, as some households funded extra superannuation by reducing their direct holdings.

Institutional investors, and to some extent households, also diversified their portfolios by investing in global equities. Correspondingly, foreign investors invest in the Australian share market, and accounted for around one-third of the investor base in mid 2007. The performance of the domestic economy in the lead up to the financial crisis underpinned the stock market's strong returns, and contributed to Australia being an attractive destination for foreign investment.

Falls in equity prices since the start of the financial crisis saw the market capitalisation of the Australian stock market decline by 14 per cent between mid 2007 and March 2010 – the latest date for which ownership data are available (although the fall was larger from the peak in November 2007 to the trough in March 2009). As a result, the three classes of investors all experienced a decline in the value of their holdings of equities, with share price falls more than offsetting any purchases of newly issued equity or transfers between investors.

There has also been a change in the distribution of ownership across the different classes of investors. Considering only net flows and abstracting from valuation changes, it is clear that foreign and household demand for Australian equities softened at the onset of the financial crisis, with institutional investors buying virtually all of the (relatively modest) equity issued by listed companies in the second half of 2007 (Graph 2). However, institutions scaled back their purchases significantly over 2008, in part reflecting fund managers increasing cash holdings as a precaution against possible



Sources: Australian Bureau of Statistics; RBA

³ Under a transitional arrangement, households could make up to \$1 million in undeducted (after-tax) contributions to superannuation between 10 May 2006 and 30 June 2007, before new caps on super contributions (of \$150 000 per annum) commenced from 1 July 2007.

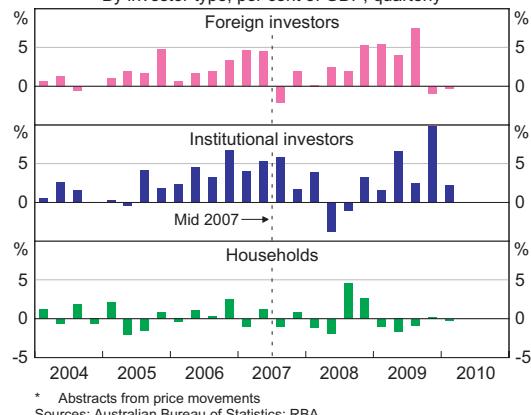
redemptions by investors and also more general portfolio reallocation.

Foreign investor demand increased through 2008, underpinning the large volume of equity raisings undertaken by Australian companies during the financial crisis. Banks mostly raised funds in late 2008 and the middle of 2009, to boost already-sound capital ratios, while non-financial corporates reduced gearing by raising a record amount of equity to pay down debt in 2009. Overall, investor demand for the new shares was strong, with many issues oversubscribed, partly because investors could usually purchase the new shares at a modest (and in a few cases, large) discount to prevailing market prices.

Foreign participation in both the financials' and corporates' equity raisings was high throughout this period, with market reports suggesting that some foreign investors increased their portfolio allocation of Australian assets. While households – whose portfolios are heavily skewed toward shares of financial institutions, as discussed below – purchased a significant volume of the new shares issued by banks in the second half of 2008, in other periods they sold equities to increase their cash deposits in response to the uncertain environment. Institutional investors' demand for equities increased over 2009 as risk aversion eased, purchasing large volumes of corporates' equity raisings.

As a result of these developments, the share of the market owned by foreign investors has increased sharply over recent years to be around the same level as institutional investors (whose share declined),

Graph 2
Purchases of Australian Equities*
By investor type, per cent of GDP, quarterly



* Abstracts from price movements
Sources: Australian Bureau of Statistics; RBA

at around 40 per cent. Households' share fell a little to 16 per cent. Despite this fall in households' direct ownership of equities, the proportion of individuals that own shares remains relatively high by international standards, with the ASX estimating that around 40 per cent of the adult population holds shares, either directly or through managed funds (excluding in superannuation).

The sectoral portfolio allocations of households, institutional and foreign investors differ significantly. Institutional investors' portfolio allocation is broadly consistent with the composition of the share market, holding around 30 per cent in financial stocks and 70 per cent in non-financials (Table 1). This partly reflects the tendency for their performance to be benchmarked against share market indices. In contrast, Australian households have a greater portfolio allocation to financials (making up around

Table 1: Equity Portfolio Weights
March 2010; per cent

	Total	Investors		Foreign investors
		Households	Institutional investors	
Financials (excl real estate)	30	65	30	20
Non-financials	70	35	70	80
Total	100	100	100	100

Sources: Australian Bureau of Statistics; ASX; RBA

two-thirds of their holdings), whereas foreign investors hold more non-financial corporates (which make up 80 per cent of their holdings). Households' high holdings of financial stocks, in part, reflect a preference for high-dividend yielding stocks from which they typically receive a steady cash flow. Privatisations and demutualisations in the 1990s also boosted households' overall direct share ownership, with a large share of these being financials (such as AMP, CBA and NRMA).

Taxation treatment of dividends also influences investor behaviour; non-resident investors cannot utilise dividend imputation franking credits, providing a relative incentive for foreign investors to hold non-financial stocks that tend to have lower dividend payout ratios. Foreign investors also invest in Australian non-financial stocks to gain exposure to resource companies, as the Australian share market has a disproportionately large share of resource companies (available data do not break down non-financial holdings into categories such as resources). These trends in portfolio allocations across investors did not vary greatly during the financial crisis.

Overall, households and institutional investors own the bulk of financial stocks (33 and 41 per cent respectively), with foreign investors owning the remainder (26 per cent). In contrast, foreign investors are the largest holders of non-financial stocks (48 per cent), with institutional investors also owning a large share (44 per cent) and households a small share (8 per cent).

Bond Ownership

Bonds issued by Australian non-government entities can be broadly grouped into three categories:

- financials;
- non-financials; and
- asset-backed securities (ABS).

At around \$800 billion, the market value of Australian non-government bonds outstanding is a little over half the value of the market capitalisation of ASX-listed equities, and equivalent to around 60 per cent of GDP. While companies predominantly raise equity funding on the domestic market (i.e. the ASX), it is common for them to access foreign debt markets by issuing bonds offshore, with around

Table 2: Ownership of Australian Bonds
Issued by Australian non-government entities, onshore and offshore; March 2010

	Total	Financials	ABS	Non-financial corporates
	\$ billion	Per cent	Per cent	Per cent
Foreign investors	530	69	71	52
Institutional investors	235	31	29	47
<i>Of which:</i>				
ADIs	81	11	12	19
Insurance companies	30	4	3	3
Super and managed funds	77	10	7	18
Government and other ^(a)	47	6	7	2
Households	2	0	0	1
Total	767	100	100	100

(a) Includes bonds held under repurchase agreement (repo) by the Reserve Bank for open market operations, other government holdings (such as those of the Future Fund and the Australian Office of Financial Management) and private non-financial corporations' bond holdings.

Sources: Australian Bureau of Statistics; RBA

60 per cent of the stock of bonds outstanding having been issued offshore. While Australian entities tap offshore markets to source funds from foreign investors, non-resident investors also own around one-third of bonds issued into the domestic market, such that they make up over two-thirds of the investor base of total Australian bonds (Table 2).

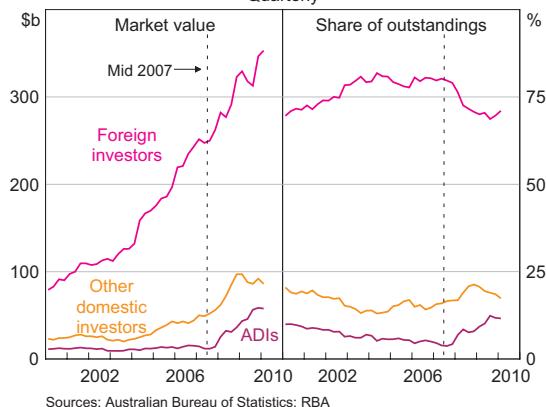
In contrast to the share market, households' direct participation in the bond market is very limited, at less than 1 per cent of all Australian bonds on issue. This low participation reflects two main factors. First, Australia's compulsory superannuation scheme produces a pool of household savings that is invested via the funds management industry rather than directly by households. Second, the disclosure requirements for issuers that raise funds from retail investors mean that it has usually been more cost effective to raise debt funding from institutional investors, although the Australian Securities and Investments Commission (ASIC) has recently announced initiatives to make it easier to issue to households. These factors have contributed to institutional investors' large holdings of bonds, at around three-quarters of bonds on issue domestically and one-third of all Australian bonds.

There was little change in the ownership of the Australian bond market at the aggregate level during the financial crisis, though there have been marked changes in the composition of ownership at the sectoral level which are discussed further below.

Financials

There was strong investor demand for bonds issued by financial institutions – the bulk of which were issued by the major banks – over the decade prior to the crisis, with the value of the stock of bonds outstanding increasing at an annual rate of around 15 per cent. Foreign investors owned around 80 per cent of all financials' bonds on issue in the years leading up to the crisis (Graph 3). As well as buying almost all bonds issued offshore, foreign investors' participation in the domestic market increased to around one-quarter of the investor

Graph 3
Ownership of Financials' Bonds
Quarterly

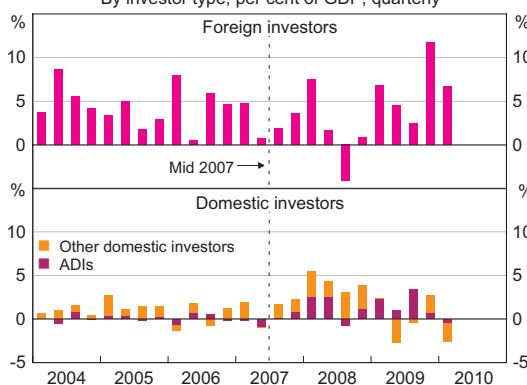


Sources: Australian Bureau of Statistics; RBA

base over this period. Foreign ownership was supported by the introduction of withholding tax exemptions and the liquid swap market that allows non-resident investors to cost-effectively hedge their Australian-dollar investments into their local currency (and conversely Australian entities to hedge their foreign currency exposures into Australian dollars).

During the financial crisis, the rate of growth of financials' bonds outstanding increased to around 20 per cent per annum as banks substituted toward more stable, longer-term sources of wholesale funding. Investor demand for Australian banks' bonds remained strong, underpinned at the peak of the crisis by the introduction of a guarantee by the Australian Government and strong investor appetite for highly rated debt. In contrast to the previous decade, when bonds outstanding offshore increased more rapidly, the stock of bonds on issue domestically increased at a faster rate during the crisis, in part reflecting the greater strains in markets offshore.

A relatively large share of the banks' bonds issued domestically during the financial crisis was purchased by other banks, with this share increasing from less than 5 per cent prior to mid 2007 to peak at almost 15 per cent in late 2009. Banks bought other banks' bonds to increase their holdings of liquid

Graph 4**Flows of Financials' Bonds***
By investor type, per cent of GDP, quarterly

* Abstracts from price movements

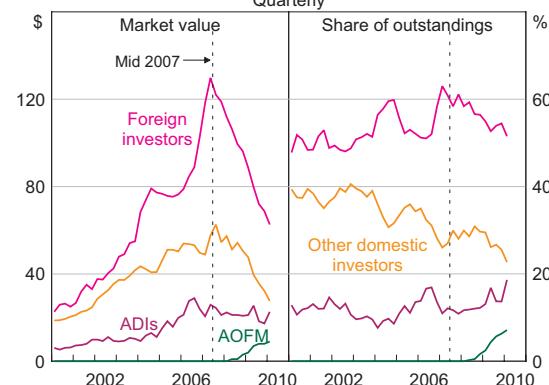
Sources: Australian Bureau of Statistics; RBA

assets that could be used as collateral in the Reserve Bank's open market operations.

Foreign investors' share of financial bonds outstanding decreased a little during the financial crisis, though foreign investors continued to purchase a large volume of bonds and account for the bulk of the investor base. At the peak of the crisis, following the collapse of Lehman Brothers, investor appetite for banks' bonds globally evaporated and foreign investors sold bonds in the September quarter 2008 (Graph 4). Demand resumed in 2009, initially for guaranteed debt, though increasingly for unguaranteed bonds as conditions in financial markets improved and investors became more willing to hold bank credit risk. Prior to the Australian Government Guarantee Scheme ceasing for new issuance in March 2010, around \$165 billion of guaranteed bonds had been issued by banks, over two-thirds of which were sold to foreign investors – in line with the share prior to the financial crisis.

Asset-backed securities

The ABS market – which largely consists of residential mortgage-backed securities (RMBS) – experienced rapid growth in the lead up to the financial crisis with strong demand from institutional investors and foreign investors reflected in a steady decline in RMBS spreads. Foreign investors made up around

Graph 5**Ownership of ABS**
Quarterly

Sources: Australian Bureau of Statistics; RBA

60 per cent of the ABS investor base prior to mid 2007, purchasing both ABS issued offshore as well as increasingly buying ABS issued into the domestic market (Graph 5).

Securitisation markets globally were greatly affected by investors' reappraisal of risk following the collapse of the US sub-prime market in 2007. Although the Australian securitisation market did not have the problems of poor transparency, overly complex structures and low credit quality that were a feature of the US market, investor appetite for Australian structured credit also dried up.⁴ Distressed leveraged foreign investors including structured investment vehicles (SIVs) – which used to account for around one-third of the investor base – not only stopped purchasing new RMBS issues, but were forced to sell their holdings of Australian ABS, alongside the sales of other assets, when they could not roll over the asset-backed commercial paper used to fund their operations.

In total, the value of foreign investors' holdings of ABS has more than halved since its peak in mid 2007, and now amount to around half of Australian ABS, down from 60 per cent at the onset of the crisis. The decline in holdings reflects maturities and ongoing amortisation (i.e. mortgage repayments),

⁴ See Debelle (2008) for a comparison of the Australian and US securitisation markets.

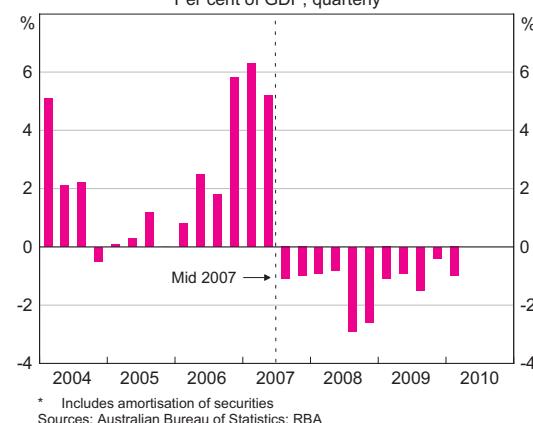
sales to domestic investors as well as lower valuations (Graph 6 shows the flows in foreign holdings, abstracting from valuation effects). While there are signs that foreign investors are starting to return to the market, with some participating in recent RMBS transactions, a significant portion of the investor base has disappeared with the demise of the SIVs.

The appetite for structured credit by resident superannuation and managed funds also diminished; these institutions' holdings of ABS declined by around 45 per cent, to \$30 billion, to be a smaller share of their total asset holdings. The rate of decline is broadly consistent with amortisation over this period – on average, RMBS pay down in 3 to 4 years – which suggests that these funds mostly held their investments but, in net terms, did not undertake many new purchases, consistent with the limited issuance that took place during this time. In contrast, ADI's holdings were broadly flat, suggesting that purchases of RMBS offset amortisation.⁵ In part, this likely reflected ADI demand for liquid assets, as the Reserve Bank extended the range of collateral eligible for its open market operations to include RMBS.

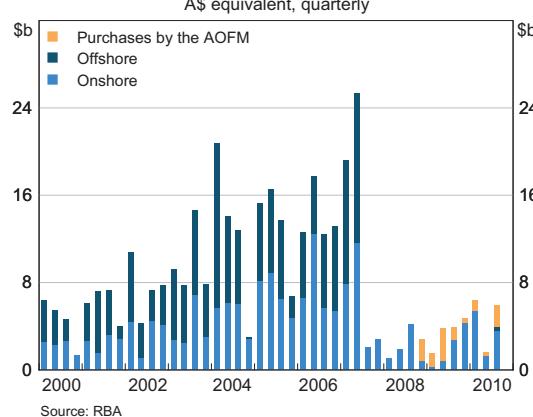
Significant support for new issues of RMBS during the financial crisis was provided by the Australian Office of Financial Management (AOFM). In October 2008, the Australian Government announced an \$8 billion program to support competition in the mortgage market whereby the AOFM would be the cornerstone investor in new RMBS issues. This program was extended in November 2009, with a potential additional \$8 billion of purchases announced. The AOFM now holds around 8 per cent of all Australian ABS on issue. There has been an improvement in conditions in the Australian securitisation market since the peak of the financial crisis, with the AOFM's participation in deals declining and a number of new deals without AOFM support (Graph 7).

⁵ This excludes so-called 'self securitisations', which were held on balance sheet.

Graph 6
Foreign Investors' Net Purchases of ABS*
Per cent of GDP, quarterly



Graph 7
Australian RMBS Issuance
A\$ equivalent, quarterly



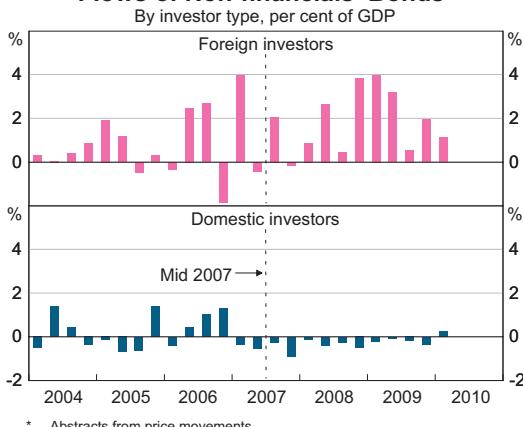
Non-financials

The large non-financial corporates that tap bond markets have historically sourced around two-thirds of these funds from foreign investors. In part this reflects differing domestic and foreign investor appetite for credit risk. While almost all Australian corporates that access bond markets are rated investment grade, most are rated BBB and domestic investors, particularly managed funds with investor mandates, tend to have a preference for higher-rated bonds. Indeed many corporates that did issue domestically often boosted the rating of the bonds

by having them 'credit-wrapped'.⁶ In contrast, it was easier for lower-rated corporates to tap the large heterogeneous foreign investor base that underpins the larger offshore markets, such as the US private placement market.

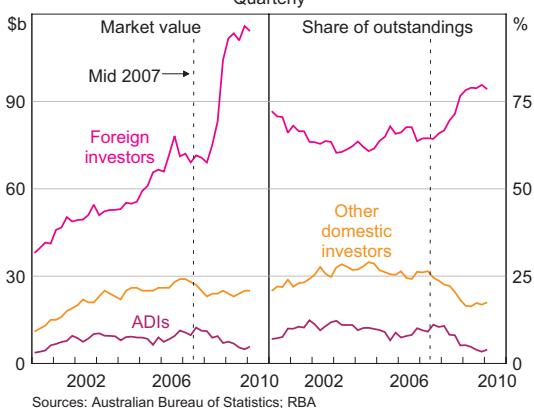
During the financial crisis, most new issuance took place offshore to foreign investors (Graph 8). Most of the large bond issues were undertaken by resource companies that had an established presence in the US market. In contrast, there were limited bonds issued into the domestic market; domestic investors' holdings have declined since

Graph 8
Flows of Non-financials' Bonds*



* Abstracts from price movements
Sources: Australian Bureau of Statistics; RBA

Graph 9
Ownership of Non-financials' Bonds
Quarterly



⁶ This is a type of credit enhancement whereby a bond insurer guarantees to meet interest and principal payments if the issuer defaults.

mid 2007 (by 20 per cent) due to bond maturities more than offsetting purchases. Recently there have been signs that domestic investors are returning to the market, with investors making net purchases in early 2010.

The value of foreign investors' holdings has risen sharply since mid 2007 (by around 65 per cent), such that foreign investors now hold a little over three-quarters of the stock of corporates' bonds outstanding (Graph 9). The increase in foreign investors' holdings over this period mostly reflects some large bond purchases. The value of bond holdings (in Australian dollar terms) was also affected by significant movements in the exchange rate during the period – as foreign investors' holdings of corporate bonds are mostly denominated in US dollars – though the overall effect of exchange rate movements on holdings was small. While the significant depreciation of the Australian dollar in late 2008 sharply boosted the Australian dollar value of US dollar denominated bonds, the broadly equivalent appreciation over 2009 largely unwound this effect. Foreign investors' holdings were largely flat over 2009, with the valuation effect offset by large bond purchases. The willingness of foreign investors to purchase these bonds suggests they were comfortable taking on credit risk associated with the Australian economy, albeit at higher spreads, and continued appetite for exposure to resource companies.

Conclusion

Foreign investors provide around half of the total funds that Australian companies source in equity and bond markets. Institutional investors make up the bulk of the remainder, with households owning a relatively small share. During the financial crisis, the share of the equity market owned by foreign investors increased a little, with foreign demand remaining resilient. There was little change in the ownership of the Australian bond market at the aggregate level during the financial crisis, though there have been marked changes in the composition

of ownership at the sectoral level. Notably, many distressed leveraged foreign investors sold their holdings of Australian ABS, thereby reducing the share of the securitisation market funded by foreign investors. The share of financials' bonds held by foreign investors also decreased a little – despite a large volume of purchases throughout the period – as Australian banks purchased other banks' bonds to boost the liquidity of their balance sheets. At the same time, foreign investors purchased a higher share of non-financial corporate bond issuance. ▶

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Interpreting Market Responses to Economic Data

Patrick D'Arcy and Emily Poole*

This article discusses how bond, equity and foreign exchange markets have responded to the surprise component of Australian and US macroeconomic data announcements over the past decade. The bond and equity market responses are used to infer changes in market expectations for interest rates and dividend growth rates. Both interest rates and expected dividend growth rates are shown to increase by a similar magnitude in response to upside inflation and employment surprises. The estimated changes in the interest rate and expected dividend growth rate differentials between Australia and the US are also compared with the exchange rate response to data surprises. This allows an assessment of the relationship between expected economic fundamentals and the exchange rate.

Introduction

This article examines the response of financial market prices to the surprise component of macroeconomic data announcements in Australia and the United States. In particular, it uses data on bond yields and equity prices to examine the effect of data surprises on expectations for interest rates and dividend growth.¹ The results suggest that announcements that cause interest rates to increase (decrease) also tend to cause a similarly sized increase (decrease) in the expected rate of growth in dividends. In addition, they suggest that US data announcements have a significant effect on Australian financial markets.

The article first presents estimates of the response of the US and Australian bond, equity and foreign exchange markets to macroeconomic data surprises. It then uses the relationship between bond yields,

equity prices and future dividends to examine how announcements affect expectations regarding dividend growth. It concludes by examining the extent to which the implied changes in expectations of dividends and interest rates in response to data announcements in the United States and Australia are consistent with the response of the AUD/USD exchange rate.

Asset Price Responses to Data Surprises

Estimating the average response of asset prices to data announcements requires a measure of the 'surprise' component of the announcements as expected data outcomes will already be incorporated in market pricing. Here the surprise component of each data announcement is calculated as the difference between the actual outcome and the median market forecast published on Bloomberg, plus any revision to the previous period's outcome. In order to allow comparisons across data releases, this surprise component ($S_{k,t}$) is standardised using the historical standard deviation of surprises

* The authors completed this work in International Department.

¹ Campbell and Lewis (1998) show that Australian bond yields react significantly to US data surprises, and Kim and In (2002) show that Australian equity markets react significantly to US data surprises. There are many studies for the United States, including Anderson *et al* (2007) and Boyd, Hu and Jagannathan (2005) that apply similar approaches to measuring the response of financial prices to news, but these papers do not typically interpret the results within a single framework that includes both expected interest rates and dividend growth rates.

for each release ($\sigma(S_{k,t})$). The surprise index for data series k is given as:

$$Z_{k,t} = \frac{S_{k,t}}{\sigma(S_{k,t})} \quad \text{where}$$

$$S_{k,t} = (\text{Actual}_{k,t} - \text{Forecast}_{k,t}) + (\text{revisions to prior period}) \quad (1)$$

This article examines the response of Australian and US markets to employment and CPI inflation announcements for both countries. The results are representative of those for a larger set of data announcements including: GDP, retail sales, housing and producer price data.

The asset price response to the data surprise ($R_{n,t}$) is calculated as the percentage change in price between the trade immediately prior to the announcement and the first trade five minutes after the announcement. Using a narrow five-minute window around the data announcement minimises the possibility that news other than the data surprise is contaminating the asset price response. Prices for bonds and equities are measured using futures rather than the underlying asset or index because futures markets are typically open even when the underlying physical markets are closed, allowing cross-country responses to be estimated.² For bond yields, the futures prices for the 10-year US Treasury bond (UST) and the 10-year Commonwealth Government Security (CGS) are used, while futures for the US S&P 500 equity index and the Australian ASX 200 equity index are used for equity markets.

The calculated data surprise and price response series are used to estimate the following relationship for each asset class:

$$R_{n,t} = a_n + \beta_{n,k} Z_{k,t} + \gamma_n R_{n,t-1} + \gamma_m R_{m,t-1} + \varepsilon_{n,t} \quad (2)$$

² High-frequency price data are sourced from the Reuters RDTH database provided by the Securities Industry Research Centre of Asia-Pacific (SIRCA). Returns are calculated using the closest-to-maturity contract to minimise the difference between changes in the spot and futures prices. A comparison of the reactions of ASX spot prices for equities and futures prices to Australian data surprises indicated that the coefficient estimates are not sensitive to the choice of price data.

In this regression, the estimated $\beta_{n,k}$ is the average percentage change in the price of asset n in response to a one-standard deviation surprise in data series k . (The coefficient on the autoregressive term, γ_n , captures the background momentum in returns of the asset n , and the γ_m coefficients ($m \neq n$) capture any cross-market effects from the other two asset markets). The regression is estimated using ordinary least squares (OLS).³ A positive estimate of $\beta_{n,k}$ indicates a positive asset price response to data surprises on average over the sample.

Table 1 presents the estimated average responses to inflation and employment surprises for the bond, equity and foreign exchange markets in Australia and the United States.⁴ Although there are differences in the magnitude of the responses across the two countries, the results indicate that bond yields typically rise in response to positive inflation and employment surprises, with the responses a little stronger for the latter. Equity market returns are typically negative (that is, equity prices fall) in response to positive inflation surprises, but rise in response to positive employment surprises. Positive inflation and employment surprises cause the local currency to appreciate relative to the other country's currency.

The magnitudes of these estimates are broadly in line with those found in the literature. The absolute sizes of the responses are in the order of 25 to 65 per cent of the average daily movement in prices for each market. Relative to typical daily volatility, the bond markets are more sensitive to data surprises than are the equity and foreign exchange markets.

There are considerable differences between the responsiveness of markets to different types of releases in the two countries. For the United States,

³ Robust standard errors are calculated to deal with any residual heteroscedasticity in the error term ($\varepsilon_{n,t}$). As is often the case for financial market returns, the coefficients on the autoregressive terms are generally found to be significant. However, the coefficients on the lagged returns for the other asset classes (when $m \neq n$) are generally not significant.

⁴ The bond yield responses are calculated from the bond price responses by making an adjustment for the average duration of the underlying bond.

Table 1: Estimated Effect of Inflation and Employment Surprises
January 2001–February 2010

Data release	Asset market response			
	Exchange rate per cent	Equity prices per cent	Bond prices per cent	Bond yields percentage points
	AUD/USD	S&P 500	10-year UST	10-year UST
US CPI	-0.05**	-0.13**	-0.08**	0.01**
Australian CPI	0.08*	0.00	-0.01**	0.00**
		ASX 200	10-year CGS	10-year CGS
US CPI		-0.08**	-0.09**	0.01**
Australian CPI		-0.12**	-0.18**	0.02**
	AUD/USD	S&P 500	10-year UST	10-year UST
US employment	-0.12**	0.26**	-0.26**	0.04**
Australian employment	0.22**	0.01**	-0.01**	0.00*
	ASX 200	10-year CGS	10-year CGS	
US employment		0.13**	-0.28**	0.04**
Australian employment		0.02	-0.17**	0.02**

Note: **, * indicate significance at the 1 and 5 per cent levels respectively

Sources: Bloomberg, RBA, SIRCA

the largest responses across all markets are for employment surprises, but Australian markets (with the exception of the foreign exchange market) tend to react more to inflation news. This may partly reflect the fact that CPI data in Australia are quarterly rather than monthly, and so surprises are viewed by market participants as containing more significant information than US inflation announcements.

Although the direction of the cross-country price responses are consistent with the own-country responses, as expected the largest cross-country effects are for Australian markets responding to US announcements. In particular, US data surprises induce Australian bond yields to adjust by around the same magnitude as US bond yields, while the response in Australian equity prices is about half the US market's response. In contrast, Australian data

surprises generate only very small responses in US markets – that they are statistically significant likely reflects the timing of Australian announcements, which occur at a time of day when there is generally very little other news affecting US markets. Although these cross-country responses are broadly as expected, it is interesting that the Australian equity market is more responsive to US inflation and employment news than to Australian employment news. This suggests that in smaller markets like Australia, the 'lead' from the major market is at least as significant for pricing assets as is news about local economic fundamentals.

Table 2: Estimated Responses of Interest Rates and Dividend Growth Expectations
January 2001–February 2010; percentage points

	US markets		Australian markets
US data release			
	Δi^{US}	Δg^{US}	Δi^{AU}
CPI	0.01	0.01	0.01
Employment	0.04	0.05	0.04
Australian data release			
	Δi^{US}	Δg^{US}	Δi^{AU}
CPI	0.00	0.00	0.02
Employment	0.00	0.00	0.02

Sources: Bloomberg, RBA, SIRCA

Inferred the Response of Dividend Growth Rate Expectations

The standard dividend growth model of equity prices can be used together with the bond and equity market responses discussed above to calculate the average change in the expected dividend growth rate in response to data surprises. Intuitively, if equity prices are related to dividend growth expectations and expected interest rates (the discount factor), then it should be possible to use the observed change in equity prices and interest rates to calculate the implied change in the market's dividend growth rate expectations.

The equity price model can be used to relate changes in equity prices to changes in expected dividend growth, the discount factor and excess return (or equity risk premium) as outlined in Appendix A. Assuming that the risk premium is fixed in the narrow window around the data releases, the model allows an estimate of the change in the market's expected dividend growth rate (Δg) to be 'backed-out' from the observed changes in bond yields (Δi) and the proportional change in equity prices ($\Delta E/E$):

$$\Delta g \approx \Delta i + (\text{dividend yield}) \times (\Delta E/E) \quad (3)$$

For the Australian and US data announcements, the inferred changes in the expected dividend growth rates are invariably of the same sign, and of a similar

magnitude, to the interest rate responses (Table 2). An examination of Equation (3) indicates that this is not a surprising result. The final term in the equation is proportional to the average dividend yield, which is typically a small fraction. Unless the response of equity prices is very large, the change in the expected dividend growth rate will be similar to the change in the interest rate.⁵

One implication of these results is that although equity prices tend to respond negatively to positive inflation surprises and positively to employment surprises, this does not imply negative revisions to dividend growth expectations in response to inflation surprises. Rather, the small fall in equity prices in response to positive inflation surprises is due to the interest rate increase, which is almost, but not entirely, offset by the increase in the expected dividend growth rate. In the case of US employment surprises, the positive equity price response on average is just large enough to imply an expected dividend growth rate response (Δg) slightly larger than the increase in the interest rate (Δi).

One matter that needs to be addressed in interpreting these results is the extent to which the change in *nominal* interest rates reflects a change in *real* interest rates. The nominal interest rate responses

⁵ The estimated average dividend yield is 1.9 per cent for the US and 4.1 per cent for Australia over the sample period.

could be driven by a change in real interest rates and/or inflation expectations – this latter possibility is perhaps most important for inflation surprises, which could influence the inflation premium in nominal yields. However, a comparison of the response of nominal and inflation-linked bond yields to data announcements suggests that the changes in nominal yields are largely, though not entirely, due to changes in real yields, with only a small variation in the inflation component of nominal yields.⁶ The fact that equity prices fall in response to positive inflation surprises is also an indication that there is an increase in real interest rates and that the results cannot be due entirely to higher inflation expectations. Higher inflation would see nominal equity prices increase not decrease. Therefore, while the time series of high-frequency price data on index-linked bonds is not long enough to definitively separate the shift in nominal yields into real and inflation compensation components for the whole sample, it appears that the estimates of Δi and Δg provide an approximate (although slightly upwardly biased) estimate of the change in the market's expectations of real interest rates and the expected real rate of dividend growth.

Another caveat relates to the validity of the assumption that the equity risk premium is fixed around data announcements. It is possible that the estimated changes in the expected dividend growth rates are actually due to shifts in the equity risk premium in response to the data announcement news (according to the equity price model a fall in the risk premium, for example, would have a positive effect on equity prices). There is some evidence in the literature, from Bernanke and Kuttner's (2005) structural model estimates, that the risk premium changes in response to monetary policy surprises; however, that study does not specifically investigate the effect that macroeconomic data announcements

(as opposed to policy announcements) have on the risk premium. In theory, the equity risk premium will reflect investors' preferences for risk and the expected volatility of equity prices. It is difficult to assess empirically the impact of data announcements on investor preferences for risk, but it is possible to examine the impact of announcements on expected volatility of equity prices using implied volatilities from options markets.⁷ Estimated coefficients from regressions of the VIX measure of implied volatility for the S&P500 on the data surprise indices are not significant, suggesting that the assumption of a fixed risk premium is valid.⁸

Cross-country Differentials and the Exchange Rate Response

The above discussion presented estimates of how interest rates and expected dividend growth rates – two key drivers of expected returns on financial assets – change in response to data announcements. These key drivers of expected returns should also influence the relative attractiveness of Australian and US dollar assets, and therefore the exchange rate. This section compares the exchange rate response around data announcements with the change in the interest rate and dividend growth rate differentials between the two countries. The comparison can be viewed as a check on whether the foreign exchange market's response to data announcements is consistent with the implied change in interest rates and expected dividend growth rates observed in the bond and equity markets. Underlying this exercise is a simple framework in which the spot AUD/USD exchange rate ($S^{AUD/USD}$) is a positive function of the interest rate and expected dividend growth rate differentials between Australia and the United States:

$$S^{AUD/USD} = S(i^{AU} - i^{US}, g^{AU} - g^{US}) \quad (4)$$

⁶ The correlation between the change in nominal yields and real yields is 0.8 for a sample of US data surprises between April 2009 and February 2010. Using a larger sample, Beechey and Wright (2009) also find that most of the sensitivity in nominal yields can be attributed to changes in real yields in response to real data releases, but that expected inflation compensation is sensitive to nominal data surprises.

⁷ Arguably it is reasonable to assume that investors' risk preferences should not change in response to small surprises in economic data announcements.

⁸ The VIX measure of implied volatility is calculated in real time by the Chicago Board Options Exchange and measures the implied volatility from options prices on the S&P 500 index.

Table 3: Estimated Change in the Australian Dollar and Expected Interest and Dividend Growth Rate Differentials
January 2001–February 2010; percentage points

	$\Delta \text{AUD/USD}$	$\Delta(i^{\text{AU}} - i^{\text{US}})$	$\Delta(g^{\text{AU}} - g^{\text{US}})$
US data release			
CPI	-0.05	0.00	0.00
Employment	-0.12	-0.01	0.00
Australian data release			
CPI	0.08	0.03	0.02
Employment	0.22	0.02	0.02

Sources: Bloomberg, RBA, SIRCA

The estimated changes in the interest rate and expected growth rate differentials in response to US data surprises are close to zero, which is a consequence of the Australian markets following the lead of US markets when US data are released (Table 3). Despite this, there is still on average a significant depreciation of the AUD/USD exchange rate in response to positive US data surprises. In contrast, Australian data surprises do induce positive changes in the interest rate and growth rate differentials as well as an appreciation of the AUD/USD exchange rate. This positive relationship between the interest rate differential and the exchange rate is consistent with other time series modelling of the exchange rate. However, the relative sizes of the responses are not consistent with a simple positive relationship between the interest rate differential and the exchange rate. For example, despite the change in the interest rate differential being larger for inflation surprises, the appreciation of the Australian dollar is significantly larger in response to Australian employment surprises. Overall, these results suggest that changes in interest rate and growth rate differentials are insufficient to explain the responsiveness of the foreign exchange market to data announcements. This finding resonates with the vast literature on exchange rate modelling, which generally concludes that economic fundamentals do not fully explain short-run movements in nominal exchange rates.

Summary and Assessment

The results in this article show that nominal interest rate and dividend growth rate expectations react in a similar manner to a given data surprise. Data announcements that cause bond yields to increase also cause the expected dividend growth rate to increase. Therefore, the negative response of equity prices to positive inflation data surprises is best interpreted as reflecting a slightly larger impact from the increase in interest rate expectations compared with the increase in dividend growth expectations, rather than the being due to a fall in the expected growth rate of dividends.

Looking at the cross-country responses to data surprises, US data surprises have a significant effect on Australian interest rate and dividend growth expectations, in some cases larger than the impact from the equivalent Australian release. As a result, the changes in expected interest rate and dividend growth rate differentials following a US data surprise are typically very small. Nevertheless, the average response of the AUD/USD exchange rate is found to be significant. This result, along with the irregular relationship between the exchange rate and the interest and dividend differentials in response to Australian data, is consistent with other research. It suggests there is little evidence that short-term movements in nominal exchange rates are well explained by changes in expected economic fundamentals. ▶

Appendix A Equity Price Decomposition

The classic Gordon (1962) dividend growth model of equity prices states that equity prices, are the sum of risk-adjusted discounted future dividends:

$$E = \frac{D(1+g)}{i-g+\rho} \quad (\text{A1})$$

where i is the nominal interest rate, g is the expected growth rate of dividends (D) and ρ is the expected excess return for holding risky equities (equity risk premium).⁹

Using standard calculus, Equation (A1) can be used to decompose changes in equity prices into component changes in future the dividend growth rate, the interest rate and the equity risk premium:

$$\frac{dE}{E} = \frac{(D+E)}{D(1+g)} dg - \frac{E}{D(1+g)} [di + d\rho] \quad (\text{A2})$$

⁹ In the original model the variables are constant, but Jagannathan, McGratten and Scherbina (2000) show that the model still holds when the variables change over time. In that case, parameters in the pricing equation are interpreted as the weighted averages of their expected future values.

where the left-hand side represents the percentage change in equity prices in response to a data surprise. In line with standard intuition, equity prices are positively related to expected dividend growth and negatively related to expected interest rates and the equity risk premium.

As in Boyd *et al* (2005), the risk premium is assumed to be fixed around the time of the data announcements. Thus, rearranging Equation (A2) and allowing for discrete changes in g and i gives an approximate expression for the change in dividend growth expectations (Δg) in terms of the equity price response and the change in the interest rate (Δi)¹⁰:

$$\Delta g \approx \frac{D}{E} \frac{\Delta E}{E} + \Delta i \quad (\text{A3})$$

¹⁰ Equation (A3) is an approximation based on the fact that $(D+E)/E \approx 1$, $D/(D+E) \approx D/E$ and $1+g \approx 1$.

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Australian Bank Capital and the Regulatory Framework

Adam Gorajek and Grant Turner*

The amount and quality of the Australian banking sector's capital has increased considerably over the past couple of years. As in a number of other countries, this is because the recent global financial crisis has prompted both markets and regulators to reappraise their views on acceptable levels and forms of capital. National and international regulatory bodies have proposed a number of major changes to existing capital regulations, details of which will be finalised later this year.

Introduction

A bank's capital, in its simplest form, represents its ability to withstand losses without becoming insolvent. As demonstrated in a number of North Atlantic countries during the recent financial crisis, bank failures – and fears of bank failure – can be highly disruptive to the macroeconomy. National regulators therefore promote resilience in the banking sector by specifying a minimum amount of capital that banks must hold and the form that capital should take. The financial crisis has prompted a rethink of how strict these requirements should be.

This article explains how the minimum capital requirement currently operates in Australia, discusses the Australian banking system's capital position and how it has evolved over the recent crisis period, and briefly outlines some of the main regulatory changes that are being considered.¹

Capital Regulation in Australia

The Australian Prudential Regulation Authority (APRA) makes and enforces the rules which govern the capital adequacy of Australian banks. The current set of rules are a conservative application of the latest set of international capital standards issued by the Basel Committee on Banking Supervision (BCBS), which

are collectively termed 'Basel II'.² APRA introduced these standards to Australia in 2008 as an update to the first set of Basel standards – 'Basel I' – that were implemented in 1988. Central to the design of the Basel capital standards is the idea that a bank should hold capital in relation to its likelihood of incurring losses. The standards focus heavily on the definition of capital and the measurement of risk.

Measuring capital

An Australian bank's regulatory capital is the sum of its 'Tier 1' and 'Tier 2' capital, net of all specified 'deductions'.

Tier 1 capital consists of the funding sources to which a bank can most freely allocate losses without triggering bankruptcy. This includes, for example, ordinary shares and retained earnings, which make up most of the Tier 1 capital held by Australian banks (Table 1). It can also include specific types of preference shares and convertible securities but, since it is more difficult for banks to allocate losses to these instruments, APRA currently specifies that no more than 25 per cent of Tier 1 capital can be in this form. Total net Tier 1 capital of Australian banks as at March 2010 was \$131 billion.

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1 While the same capital requirements also apply to other Authorised Deposit-taking Institutions in Australia, such as credit unions and building societies, this article focuses on Australian banks only.

2 The BCBS' governing body comprises central bank governors and (non-central bank) heads of supervision from its 27 member countries, which include Australia and the rest of the G-20.

Table 1: Australian Banks' Regulatory Capital^(a)
As at end March 2010

	\$billion	Per cent of total
Net Tier 1	131.0	79.9
of which:		
Ordinary shares	115.0	70.1
Retained earnings	52.9	32.2
Reserves and minority interests	−2.4	−1.5
Tier 1 preference shares	12.8	7.8
Tier 1 convertible securities	13.0	8.0
Deductions	−60.4	−36.8
Net Tier 2	33.0	20.1
of which:		
Term subordinated debt	35.8	21.8
Other Tier 2 instruments	7.0	4.3
Deductions	−9.8	−5.9
Total capital	164.0	100.0

(a) Locally incorporated banks, consolidated global banking group; all instruments are measured at book value
Source: APRA

Tier 2 capital is made up of funding sources that rank below a bank's depositors and other senior creditors, but in many cases are only effective at absorbing losses when a bank is being wound up. In this way, Tier 2 capital provides depositors with an additional layer of loss protection after a bank's Tier 1 capital is exhausted. Tier 2 capital of the Australian banking system primarily consists of subordinated debt, though it also comes in other varieties, such as preference shares. Total net Tier 2 capital of the Australian banking system as at March 2010 was \$33 billion.

Both Tier 1 and Tier 2 capital are measured net of deductions, which are adjustments for factors that lessen the loss absorption capabilities of capital. For example, banks often have equity balancing their holdings of intangible assets, like goodwill, which can automatically lose value as a result of the threat of bankruptcy. That part of a bank's gross capital is therefore unavailable to absorb other incurred losses. As at March 2010, there were \$70 billion

of regulatory capital deductions on the books of Australian banks. Around \$45 billion were generated by holdings of intangible assets, most of which were in the form of goodwill.

Measuring risk

For capital adequacy purposes, Australian banks are required to quantify their credit, market and operational risks. The most significant risk of these is typically credit risk, reflecting Australian banks' focus on traditional lending activities.

Credit risk is measured as the risk-weighted sum of a bank's individual credit exposures, which gives rise to a metric called 'risk-weighted assets'. Under the Standardised approach employed by most of the smaller banks, the risk weights are prescribed by APRA and are generally based on directly observable characteristics of each exposure. For example, if a residential mortgage has a loan-to-valuation ratio of 70 per cent, full documentation and no mortgage insurance, APRA specifies a risk

weight of 35 per cent. If the outstanding balance of that mortgage is \$100, its corresponding risk-weighted asset is \$35. Corporate exposure risk weights are based on external credit ratings and are generally higher than for residential mortgages because the exposures are usually riskier.³

Some banks, including the four largest, use an alternative Internal Ratings-based approach whereby risk weights are derived from their own estimates of each exposure's probability of default and loss given default.⁴ APRA grants approval to use this approach only after a bank has met strict governance and risk modelling criteria.

Table 2: Australian Banks' Risk-weighted Assets^(a)
As at end March 2010

	Exposure \$billion	Average risk-weight Per cent	Risk-weighted assets \$billion	Per cent of total
Credit risk	2 739	43	1 181	85
of which:				
Corporate	472	78	370	27
Residential mortgage	1 157	26	302	22
Other retail ^(b)	171	80	137	10
Bank	103	18	18	1
Sovereign	99	7	7	½
Off-balance sheet ^(c)	560	36	200	14
Other ^(d)	177	83	147	11
Market risk			63	5
of which:				
Traded			22	2
Non-traded (IRRBB)			41	3
Operational risk			102	7
Securitisation ^(e)			24	2
Other ^(f)			20	1
Total			1 390	100

(a) Locally incorporated banks, consolidated global banking group

(b) Includes exposures to individuals for small business purposes, credit card exposures, and other personal exposures

(c) Excludes risks associated with selling securitised assets; exposure amount is on an on-balance sheet equivalent basis

(d) Includes, for instance, fixed asset investments and margin lending exposures

(e) Charges for risks associated with the buying or selling of asset-backed securities

(f) Charges that are applied to banks using the Internal Ratings-based approach to credit risk to ensure that there are no unintended falls in banking system capital during the transition to Basel II

Source: APRA

3 Corporate exposures that are unrated are assigned a risk weight of 100 per cent.

4 One bank operates under a different Internal Ratings-based approach, whereby internal models are used to estimate default probabilities but supervisory rules are used to determine each exposure's loss given default.

These methodologies together give rise to \$1 200 billion in credit risk-weighted assets at Australian banks (Table 2). This compares with (unweighted) assets of around \$2 700 billion. Within the risk-weighted total, corporate exposures account for \$370 billion, while residential mortgage exposures are lower at around \$300 billion, reflecting their relatively lower risk weights. There are also \$200 billion in credit risk-weighted assets that are generated from off-balance sheet exposures. These are predominantly in the form of corporate credit commitments, interest rate derivatives, and foreign exchange derivatives.

The market and operational risks are also measured in terms of risk-weighted assets, though this is more of a naming convention than being indicative of the underlying measurement process. For instance, as part of market risk, APRA requires some banks to consider interest rate risk in the banking book (IRRBB), which refers to the potential for loss arising from timing and size mismatches in the repricing of a bank's funding and lending instruments. Measuring this risk requires a holistic approach to the bank's balance sheet rather than the granular use of risk weights for each exposure.⁵ As at March 2010, total market and operational risks accounted for 5 per cent and 7 per cent of the Australian banking system's total risk-weighted assets.

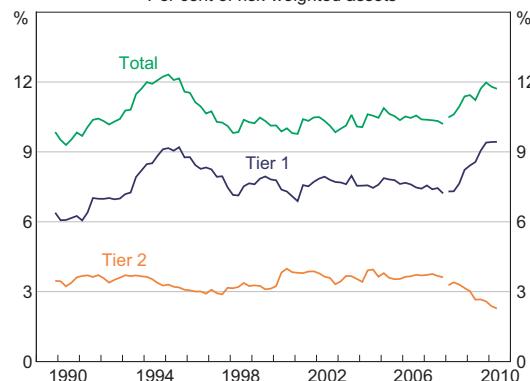
Minimum capital requirements

APRA requires all locally incorporated banks to hold total capital of at least 8 per cent of their risk-weighted assets. At least half of their total capital must be the better-quality Tier 1, implying a minimum Tier 1 ratio of 4 per cent.⁶ APRA can and does also increase these minima for individual banks where considered necessary on account of their risk profile.

⁵ It is also worth noting that Australia is the only country in which IRRBB is explicitly included in banks' risk-weighted assets. That said, IRRBB is a relatively small risk in Australia because most lending is made at variable rates and interest rate mismatches are usually relatively minor.

⁶ Foreign banks operating in Australia as branches are not required to hold capital in Australia. They are capitalised through their head office, offshore.

Graph 1
Australian Banks' Capital*
Per cent of risk-weighted assets



* Locally incorporated banks, consolidated global banking group; break in March 2008 due to the introduction of Basel II for most banks
Source: APRA

As at March 2010 the Australian banking system had an aggregate total capital ratio of 11.8 per cent and an aggregate Tier 1 capital ratio of 9.4 per cent, with both ratios having increased significantly over the past couple of years (Graph 1).

Recent Developments in Australian Banks' Capital

The recent global financial crisis has prompted much greater focus on banking system capital. Notably, large and sudden losses incurred by some of the world's largest banks prompted investors, regulators and rating agencies to reappraise the prospect of bank losses and appropriate levels of capital. In addition, some of the lower-quality forms of capital were not as available to absorb losses as anticipated, and were subsequently looked upon less favourably as a source of financial strength. Convertible securities, for example, were included in the Basel II definition of Tier 1 capital on the premise that banks would exercise their option to convert them into common equity whenever additional capital was needed. These securities have not been as widely used in Australia as in a number of other countries, but some domestic and international banks have recently opted to raise capital in other ways rather than convert, fearing the negative signal that conversion might send to markets.

Australian banks have responded to the change in global attitudes by significantly increasing the level and quality of their capital. Changes to the growth and composition of their loan portfolios have also limited increases in their risk-weighted assets. As a result, the Australian banking system's total capital ratio rose by 0.9 percentage points from September 2008 to March 2010 (it rose by 1.3 percentage points from March 2008 to March 2010, though this figure is clouded by data issues associated with some banks' delayed transition to Basel II and the introduction of the IRRBB charge in September 2008). Moreover, the system's Tier 1 capital ratio rose by 1.8 percentage points during this time, to its highest level since at least the 1980s (when comparable data first became available). The sizes of these capital ratio increases are similar to the experience of the early 1990s, during which Australia had a recession and the banking sector also faced strong market pressures to improve its capital position.

Holdings of capital

The amount of capital held by the Australian banking system rose by \$13.7 billion from September 2008 to March 2010. Within this total, there was a rise in Tier 1 capital of \$26 billion and a decline in Tier 2 capital of \$12.4 billion (Table 3).

The rise in the banking system's Tier 1 capital mostly reflects a large amount of new equity that was issued in late 2008 and the middle of 2009 (Graph 2). The major banks issued \$30 billion during this time, largely through a combination of new share issuance and dividend reinvestment plans. The regional banks issued a further \$2.1 billion. In contrast to some of their international peers, these issues were at only modest discounts to the market price, and were entirely to the private sector; there was no injection of public money into Australian bank capital. New equity raisings were

Graph 2
Major Banks' Equity Raisings*

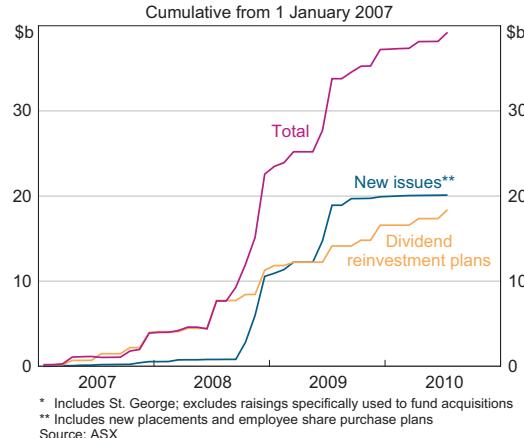


Table 3: Change in Australian Banks' Capital and Risk-weighted Assets^(a)
September 2008 to March 2010

	\$billion	Per cent
Total capital	13.7	9.1
of which:		
Net Tier 1	26.0	24.8
Net Tier 2	-12.4	-27.3
Risk-weighted assets	16.3	1.2
of which:		
Credit risk	-6.6	-0.6
Market risk	11.3	21.9
Operational risk and other	11.7	8.6

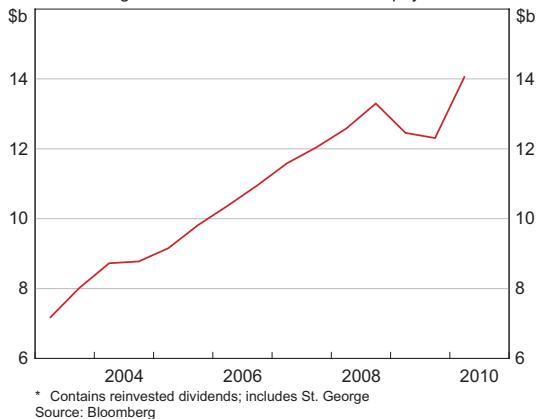
(a) Locally incorporated banks, consolidated global banking group
Source: APRA

the key driver of increases to the Australian banking sector's Tier 1 capital in the early 1990s as well.

Having reported solid profits throughout the turmoil, the Australian banking sector was also able to generate Tier 1 capital organically, through increases in retained earnings. Some banks supported this process by making cuts to the overall value of dividend payments, which contributed to higher retained earnings than would have otherwise been the case (Graph 3).

Graph 3
Major Banks' Dividend Payments*

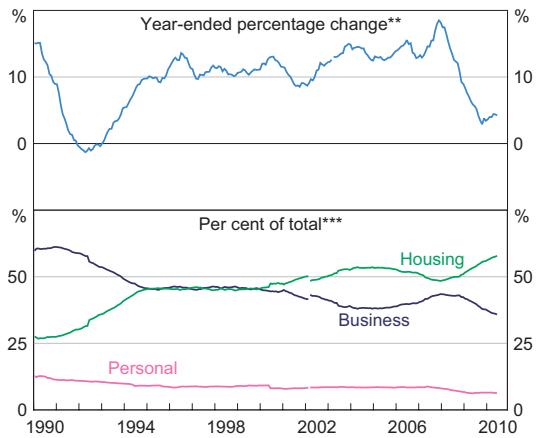
Rolling sum of interim and final dividend payments



* Contains reinvested dividends; includes St. George

Source: Bloomberg

Graph 4
Domestic Bank Credit*



* Includes securitisation

** Adjusted for series breaks; prior to 2002 includes all domestic credit extended by Australian financial institutions

*** Series break in 2002 is due to change in reporting requirements

Sources: APRA; RBA

The effect of these initiatives in increasing Tier 1 capital was somewhat offset by a rise in deductions, partly because a number of acquisitions generated new goodwill through the purchase price exceeding the book value of assets. There was also a \$1 billion fall in the outstanding amount of Tier 1 convertible securities. The financial crisis has highlighted that there can be strong disincentives for banks to use them as loss absorption tools, so they have become less highly regarded as sources of bankruptcy protection by markets and regulators. The BCBS has signalled that the status of these securities is being reviewed in forthcoming revisions to international capital standards.

With a number of governments overseas having recently demonstrated their willingness to shore-up banks' balance sheets before their Tier 2 capital takes losses, markets are also placing less emphasis on this form of capital. Most notably, the outstanding balance of Australian banks' term subordinated debt has fallen by around \$10 billion since September 2008, after strong issuance in the earlier part of the decade.

Exposures to risk

The Australian banking sector's total risk-weighted assets rose by \$16.3 billion, or 1.2 per cent, from September 2008 to March 2010. There was a \$11.3 billion rise in the charge for market risk, with the IRRBB charge increasing as a result of rises in long-term interest rates from early in 2009 and the amortisation of past IRRBB gains. The operational risk charge rose by \$11.7 billion.

Partly counteracting these rises was a \$6.6 billion fall in credit risk-weighted assets. One reason for this decline is the relatively slow growth in Australian banking sector lending over this period, as banks tightened their lending standards and businesses worked to reduce their leverage.⁷ The sector's total domestic credit has grown at an annualised rate of 4.5 per cent since September 2008, compared with an average of around 14 per cent over the previous five years (Graph 4). There has also been

⁷ See, for example, Black, Kirkwood and Shah Idil (2009).

a shift in the composition of banks' loan portfolios, towards housing lending, which typically attracts much lower risk weights than business and personal lending. The amount of banks' off-balance sheet credit commitments has been falling recently as well. The slower growth in credit and the change in its composition are similar to the patterns of the early 1990s recession, when credit growth of the Australian banking sector fell significantly and the share of credit devoted to housing increased strongly. Credit risk-weighted assets, though measured differently at the time, fell by 6.4 per cent from December 1990 to December 1993.

These recent size and compositional changes to bank lending have been partly offset by an increase in the average risk weight of banks' business exposures. For the major banks, whose credit risk weights are derived using internal models, estimates of the average probability of default for large corporate counterparties increased by around $\frac{1}{2}$ of one percentage point to $1\frac{1}{2}$ per cent (Graph 5). Their average probability of default estimates for residential mortgages have increased only very slightly and remain at a little over 1 per cent. There were also some rises in loss given default estimates across these categories.

Forthcoming Regulatory Developments

With the financial crisis revealing a number of inadequacies in the capital held by banks globally, there has been a strong push by national regulators to tighten global capital regulations, particularly in those countries most affected by the crisis. The BCBS has been the main driver of international reforms in this area over the past year or so and has released a number of consultative documents suggesting major changes to its Basel II capital standards.⁸ There are several proposed key reforms (some of which are now closed to consultation and have aspects on which broad agreement seems to have been reached).

- Increase the quality, international consistency and transparency of the capital base. This

Graph 5
Counterparty Default Probabilities*
Simple average of major banks' estimates



* Consolidated global banking group; on-balance sheet portfolios assessed under the Internal Ratings-based approach only

** Loans to households and small businesses that are secured by residential mortgages

Source: APRA

includes enhancing a bank's capacity to absorb losses on a going concern basis, such that more of its Tier 1 capital is in the form of common shares and retained earnings.

- Strengthen the risk coverage of the capital framework, with more capital being required for counterparty credit risk exposures arising from derivatives and repurchase agreements. This would strengthen the resilience of individual banks and reduce the risk that shocks might be transmitted from one institution to another through the derivatives and financing channels.
- Introduce a non-risk-weighted simple leverage ratio requirement as a supplement to the Basel II risk-weighted capital adequacy rules. The stated advantages of this methodology are that it would help contain the build-up of excessive leverage in the banking system and introduce additional safeguards against attempts to 'game' the risk-based requirements.
- Reduce procyclicality by promoting the build-up of capital buffers in good times that can be drawn down in periods of stress. Based on one of the current proposals, this would work in the form of a system-wide capital surcharge that national authorities would put into effect when they judge that there is a build-up of system wide risk.

⁸ See, in particular, BCBS (2009, 2010a).

- Ensure that even if a failed or failing bank is rescued through a public-sector capital injection, all of its capital instruments are capable of absorbing losses. This includes a requirement that the contractual terms of capital instruments allow them to be written off or converted into common equity if a bank is unable to support itself in the private market.

Most of these reforms will inevitably raise the cost of intermediation above pre-crisis levels, and it will be important to ensure an appropriate balance between this cost and the benefit of financial systems being subject to stronger standards. In order to help policymakers assess this balance, the BCBS undertook a detailed quantitative impact study of some of these proposed changes during the first half of 2010. APRA led Australia's contribution to this work and consulted with Australian banks involved in the study. APRA and the Reserve Bank also participated in international working groups that took a 'top-down' look at the capital proposals by determining benchmarks against which they will be judged, and assessed their likely macroeconomic effects.⁹

APRA will consider the agreed international timetable when implementing the new standards, which on the basis of the latest proposals would see the first of the new requirements in place from the start of 2013, with some longer phase-in periods for certain elements of the package. The BCBS has committed to issue details of finalised capital reforms and transition arrangements later this year. APRA will provide further guidance on Australian transition arrangements around that time, but currently does not expect that banks in Australia will need an extensive transition period to meet the new capital requirements. Australian banks appear to be better placed to meet the new capital criteria than banks in a number of other countries, partly because APRA's existing capital rules are based on a relatively more conservative application of the Basel II standards.

Conclusion

The Australian banking system has significantly increased its capital buffer against potential losses in recent years. To a large extent this has been driven by the financial crisis, which prompted markets, regulators and rating agencies to reappraise appropriate levels and forms of capital. Australian banks responded by issuing considerable amounts of new equity – the highest quality form of capital – while changes to the growth and composition of their loan portfolios limited increases in their risk-weighted assets. Unlike banks in a number of other countries, at no point was there any injection of public money into Australian bank capital.

National and international regulatory bodies have proposed major changes to capital regulations, which include: increasing the quality, consistency and transparency of the capital base; strengthening the risk coverage of the capital framework; implementing a leverage ratio; and introducing countercyclical capital requirements. The details of the new global capital standards will be finalised, along with other reforms, later in the year. ↗

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⁹ See BCBS (2010b) and Macroeconomic Assessment Group (2010).

A Guide to the Card Payments System Reforms

Michele Bullock*

Studies by the Reserve Bank undertaken from 2000 to 2002 concluded that the structure of pricing in the Australian card payments system was encouraging inefficient use of credit cards relative to EFTPOS. From 2003, therefore, the Bank progressively introduced reforms to address this issue: ‘interchange fees’ were reduced; merchants were permitted to reflect the cost of different payment instruments in their prices to consumers; and merchants were provided with more freedom to choose the payment instruments they accept. The effect of these changes was to increase the price to cardholders of using a credit card relative to EFTPOS, thereby reducing the incentive to use the more costly payment instrument (credit card) over the less costly one (EFTPOS) and reducing the overall cost of the payments system. The reforms also strengthened the ability of merchants to put downward pressure on the fees they pay when they accept cards.

Introduction

When most cardholders swipe a card at a retailer to purchase goods and services, they are probably unaware of what happens behind the scenes between the time the card is swiped and when the merchant is finally paid. There is, however, a detailed set of arrangements between financial institutions that ensure that the merchant is paid and the cardholder’s account debited. Historically, these arrangements have been very opaque. But since 2000, the Bank has undertaken a detailed analysis of these arrangements and their implications for the efficiency of the Australian payments system. As a result of this work, the Bank has progressively introduced a number of reforms to card payment systems which have had an impact on both cardholders and merchants accepting payment cards. Among other things, these reforms have altered the prices that cardholders face when using debit and credit cards, reducing the incentive to use a higher-cost payment method (credit cards) instead of a lower-cost payment method (EFTPOS).

This article provides a non-technical summary of the reasons for the reforms, the reform process and their impact.

Essential Concepts

There are a number of essential concepts that underpin any explanation of the card payments system reforms. These are payment systems, interchange fees, and no-surcharge and honour-all-cards rules.

Payment systems

Payment systems are arrangements between financial institutions that allow their customers to make payments to, and receive payments from, other people without using cash. The person making the payment has his/her account at a financial institution debited and the person receiving the payment has his/her account at a financial institution credited. In order to achieve this, financial institutions must be able to communicate with, and make payments to,

* The author completed this work in Payments Policy Department.

one another on behalf of their customers. Typically, therefore, payment systems involve four different parties:

- the person making the payment (payer);
- the person receiving the payment (recipient);
- the payer's financial institution; and
- the recipient's financial institution.

Examples of payment systems in Australia include cheques, debit and credit cards, BPAY and direct credits and debits. These systems are used to make non-cash payments between individuals, from individuals to businesses and government, between businesses, and from businesses and government to individuals.

Interchange fees

Financial institutions typically charge fees to their customers for payment services. Customers *making* payments (such as cardholders) are charged by their financial institution in a variety of ways. In the case of payments from a deposit account (such as cheques, debit cards and BPAY), financial institutions typically charge a monthly account-keeping fee and, sometimes, a fee per transaction (or for transactions above a certain number). In the case of payments using a credit card, financial institutions usually charge an annual fee rather than a per transaction fee, and interest is charged on borrowings that are not repaid by a specified due date.

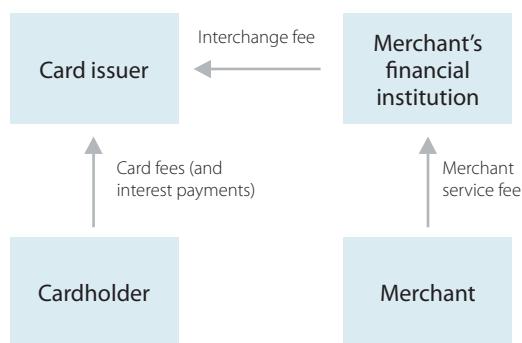
Customers *receiving* payments (such as merchants providing goods and services) are also typically charged by their financial institutions. The fees paid by merchants usually depend on the payment method. But for credit and debit cards (the focus of the Bank's reforms) merchants are usually charged a 'merchant service fee' for every card payment they accept. Some merchants are also charged a fee by their financial institution to rent a terminal to accept the cards.

There is, however, an important feature of the way credit and debit card payments are priced.

In addition to customers paying fees to financial institutions, financial institutions also pay fees to one another. These fees are known as 'interchange fees'. Interchange fees are often not obvious – cardholders and merchants do not typically see them. But they have an impact on the fees that cardholders and merchants pay.

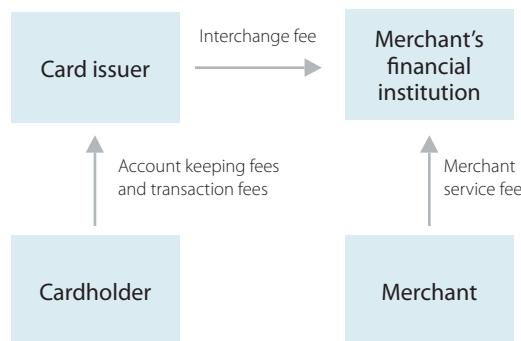
Furthermore, in Australia, interchange fees work differently in the international (MasterCard and Visa) card schemes and the local debit card system (EFTPOS). In the MasterCard and Visa card schemes, interchange fees are paid by the merchant's financial institution to the cardholder's financial institution every time a payment is made using a MasterCard or Visa card (Figure 1). This has two effects. First, the merchant's financial institution will charge the merchant for the cost of providing it with the acceptance service *plus* the fee that it must pay to the card issuer (the interchange fee). The higher the interchange fee, the more the merchant pays to accept a card payment. Second, since the card issuer is receiving a fee from the merchant's financial institution every time its card is used, it does not need to charge its customer – the cardholder – as much. The higher the interchange fee, therefore, the less the cardholder has to pay. In effect, the merchant is meeting some of the card issuer's costs which can then be used to subsidise the cardholder.

Figure 1
Fee Flows in a Credit Card Transaction



Source: RBA

Figure 2
Fee Flows in an EFTPOS Transaction



Source: RBA

In contrast to the fees charged in the international card schemes, in the Australian EFTPOS system, the cardholder's financial institution pays the merchant's financial institution every time there is an EFTPOS transaction (Figure 2). This also has two effects. First, it increases the cost to the cardholder's financial institution and, potentially, the fee paid by the cardholder to use EFTPOS. The higher the interchange fee, the more the customer is likely to be charged to use EFTPOS. Second, since the merchant's financial institution is receiving a fee from the card issuer, it does not need to charge the merchant as much. The higher the interchange fee, the less the financial institution has to recover from its merchant customer and, if the fee is high enough, the merchant could even receive a fee from its financial institution. In effect, in this case, the cardholder is meeting some of the costs of the merchant's financial institution.

No-surcharge rule

The international card schemes, including MasterCard and Visa but also others such as American Express and Diners Club, have historically imposed rules on merchants that accept their cards. One of these is often known as a *no-surcharge rule*. This rule prohibited merchants from charging more for accepting the card of a particular scheme than for other payment instruments. While in Australia

this rule did not prohibit merchants from providing a discount to customers who paid with cash, it prohibited them from charging more for cards that were more costly to accept. This meant that when using a card, customers did not know that some payment methods were more expensive for merchants to accept than others because customers using more expensive payment methods were paying the same price as customers using less expensive payment methods.

Honour-all-cards rule

A second rule imposed by card schemes on merchants was a requirement that if a merchant takes one type of card issued with a particular scheme's brand, it must take all cards associated with that brand. For example, if a merchant accepted MasterCard credit cards, it was also required to accept MasterCard debit cards, MasterCard pre-paid cards, and any other type of card with a MasterCard brand. This is known as the *honour-all-cards rule*. Since the schemes already had a large number of merchants accepting their credit cards, this rule ensured that any new products would automatically have a large acceptance base. This provided the schemes with an advantage over other schemes that might have to build up the number of merchants accepting their cards from scratch. And since acceptance was mandatory, it also meant that the schemes could charge a relatively high price to merchants accepting the new product.

The Policy Issues

When the Reserve Bank started to focus on practices in card payment systems in 2000, two main issues arose: prices of using the different types of cards did not appear to reflect their costs; and restrictions on merchants appeared to be inhibiting merchants' bargaining power over the fees they paid.

Prices and costs

In 2000, cardholders were typically paying transaction fees to use EFTPOS but there were no

transaction fees for credit cards. That is, it often cost cardholders more to use their EFTPOS card than it did to use their credit card. Most financial institutions charged cardholders for EFTPOS transactions above a certain number a month. A fairly typical account offered 8 fee-free transactions a month and then every EFTPOS transaction above that number cost the cardholder 50 cents. On the other hand, for cardholders who paid off their credit card balance by the due date, there were no fees on transactions. Furthermore, if they received an interest-free period and loyalty points, cardholders were receiving benefits from undertaking credit card transactions. In these circumstances, cardholders were effectively *being paid* to use a credit card.

This difference in effective prices was not necessarily a concern if it was more costly to financial institutions to provide EFTPOS transactions than credit card transactions. Normally, goods or services that cost more to produce have higher prices and consumers then need to decide whether they receive enough benefit from the higher cost product to justify paying the higher price. But data collected by the Bank suggested that the cost to financial institutions of an EFTPOS transaction was *less* than the cost of a credit card transaction. This meant that cardholders were paying more to use the lower cost payment method – EFTPOS – than to use the higher cost payment method – credit cards. It was therefore possible that consumers were using credit cards more frequently, and EFTPOS less frequently, than they would if prices more closely reflected costs. Consequently, the cost of making payments was higher than it might otherwise be.

The main reason for this apparent inconsistency was interchange fees. As noted above, in credit card systems, the merchant's bank pays the cardholder's bank a fee every time a credit card is used. In 2000, this fee was around 1 per cent of the value of the transaction. So for a \$100 transaction, a card issuer would receive a payment of \$1 from the merchant's bank. This was \$1 of revenue that the card issuer could use to offset costs and it could therefore lower

the price it charged to cardholders or offer such benefits as loyalty points. In the EFTPOS system, on the other hand, the cardholder's bank paid the merchant's bank around 20 cents every time a cardholder made an EFTPOS transaction. Card issuers therefore typically sought to charge cardholders when they used EFTPOS.

So why were interchange fees set in such a way that they generated these outcomes? In the case of EFTPOS interchange fees, the explanation was relatively simple. The fees had been set by negotiation when the system was established in the 1980s to provide an incentive to merchants to install EFTPOS terminals. To change the arrangements required around 8 financial institutions and merchants to renegotiate their bilateral agreements with one another, a task that had proved impossible.

In the case of credit card interchange fees, the explanation was more complicated. In these systems, interchange fees are typically set to encourage financial institutions to issue cards. The higher the fee, the more attractive it is to issue cards and the more benefits the card issuer can offer cardholders to use the cards. At the same time, merchants typically find it difficult to decline acceptance of cards, even if fees are rising. The reason a merchant accepts cards is to sell goods and services so it usually seeks to provide customers with as many payment methods as possible. There has therefore been a tendency for interchange fees to be set at relatively high levels, adding to merchants' costs while providing benefits to card issuers and cardholders.

Merchant restrictions

The restrictions imposed on merchants by the card schemes had three effects. First, since merchants were not permitted to charge customers extra if they used more costly cards, the pricing inconsistency noted earlier was entrenched and cardholders were making payment choices that did not reflect costs. While discounts for cash were possible (and some merchants took advantage of this), this only allowed merchants to have two prices – a cash price and a

card price. It did not allow merchants to distinguish between different types of payment cards on the basis of their cost of acceptance. Cardholders were therefore charged the same by the merchant regardless of which type of card they used so they tended to use the card that cost them the least – usually the credit card. They did not need to take into account the fact that credit cards typically cost merchants more to accept than debit cards.

Second, the restrictions limited the ability of merchants to compete down the fees they were charged for accepting cards. There were two ways in which this occurred.

- The no-surcharge rule meant that merchants could not use the threat of surcharging to negotiate lower fees. If a scheme raised its fees, a merchant had only two choices. It could either refuse to accept the card at the new (higher) price or it could pay the new price and build the higher cost of acceptance into the prices of its goods and services. As noted earlier, it often is difficult for merchants to stop taking cards if fees rise. The schemes could therefore increase fees knowing that acceptance of their cards would probably not be affected.
- The honour-all-cards rule meant that merchants were unable to decline acceptance of a new type of card product even if they thought the cost of acceptance was too high. For example, prior to the Bank's reforms, it cost merchants the same to accept MasterCard or Visa debit cards as it did to accept credit cards with the same brand. It was much cheaper, however, for a merchant to accept an EFTPOS card than a MasterCard/Visa debit card even though the payment was made from the same account. But a merchant could not decline to take MasterCard/Visa debit cards unless it was prepared to decline acceptance of credit cards – an unlikely decision as discussed above. MasterCard and Visa could therefore charge merchants a higher price for their debit cards without being concerned that merchants might stop taking these cards.

Third, the restrictions ensured that the high costs of accepting particular instruments were passed on to all consumers, including those that used low-cost payment methods. The no-surcharge rule ensured that those using high-cost cards were not charged an additional fee so the extra cost of accepting these cards was passed by merchants into the prices of goods and services to *all* customers. And since the honour-all-cards rule allowed the schemes to charge merchants more to accept a new product than they might otherwise pay, it too resulted in higher costs for merchants which were in turn passed on to all customers in the form of higher prices for goods and services.

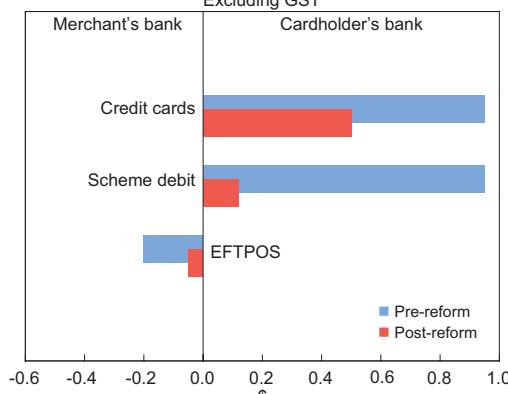
The Reserve Bank's Reforms

The Bank assessed card payments system issues a number of times between 2000 and 2006. As a result of these assessments, from 2003 the Bank progressively introduced a number of reforms to the debit and credit card systems in Australia. The two main sets of reforms were to reduce interchange fees in both credit and debit card systems to move them closer together and to remove restrictions on merchants. The Bank also increased transparency in card payment systems and allowed new firms into the card systems, increasing competition with the established banks.

Interchange fees

The interchange fees existing in the debit and credit card systems in Australia were affecting the prices paid by cardholders and merchants so that cardholders were being encouraged to use a higher-cost payment method (credit cards) instead of a lower cost method (EFTPOS). But while the Bank brought these issues to the attention of the industry, little was done to address them. From 2003, therefore, the Bank progressively imposed standards on MasterCard, Visa and Australian financial institutions. The effect of the standards was to reduce the size of interchange fees being paid to card issuing banks

Graph 1
Interchange Fees on a \$100 Payment*
 Excluding GST



* The post-reform data show the benchmark for each system
 Source: RBA

in the MasterCard and Visa systems and of EFTPOS interchange fees being paid by card issuers to the merchant's financial institution (Graph 1).

The standard for credit card interchange fees, introduced in 2003, sets a cap on the average interchange fee in the MasterCard and Visa credit card systems. MasterCard and Visa can set a number of different interchange fees for different types of transactions but the average can be no more than a cap based on a number of costs that card issuers incur. Initially, MasterCard and Visa had slightly different caps since they had slightly different costs, but in 2005 the Bank set a common cap for both schemes of 0.5 per cent. This means that, on average, credit card interchange fees paid to card issuers are around 0.5 per cent of the value of the transaction, around half the fee prior to the reforms.

The standards for EFTPOS and Visa debit interchange fees were introduced in 2006. The two debit card systems had very different interchange fees, despite the fact that they were both undertaking an equivalent transaction – transferring money from a deposit account to a merchant. The standards therefore reduced fees in both systems. Interchange fees for MasterCard/Visa debit can average no more than 12 cents per transaction (paid to the card issuer) and EFTPOS interchange fees are to be between 4 and 5 cents (paid to the merchant's financial

institution).¹ Given how far apart the fees were to begin with, the Bank decided that it was likely to be very disruptive to make the fees in the two systems the same. The standards did ensure, however, that they were much closer together than they had been.

Removal of merchant restrictions

Since restrictions imposed by the card schemes limited competition in the payments system, the Bank set standards requiring the removal of no-surcharge rules and honour-all-cards rules in Australia. In 2003, MasterCard and Visa were required to remove their no-surcharge rules. In addition, American Express and Diners Club voluntarily removed equivalent rules in their systems; there was no such rule in the EFTPOS system. Removal of the no-surcharge rule provides merchants with another option if schemes choose to increase fees – they can surcharge. A merchant can, for example, indicate to a scheme that if fees are increased (or not lowered), customers using those cards will be charged extra. Indeed, the threat of surcharges might be enough to ensure that schemes do not increase their fees too much. In this way, there might be some competitive pressure on the fees charged to merchants.

There are no restrictions on the size of surcharges, so merchants are free to choose whether to surcharge or not, and the level of any surcharge. But if a merchant chooses to surcharge, it cannot mislead or deceive customers or make misleading statements. For example, merchants are required to inform the customer of any surcharge *before* the customer enters into the transaction. Furthermore, customers should not be led to believe that the business is required to impose a surcharge, or that it is only recovering acceptance costs if the surcharge is in fact higher than acceptance costs.²

In 2006, MasterCard and Visa were required to remove their honour-all-cards rules as they applied

1 MasterCard undertook to voluntarily meet the same cap as specified in the Visa Debit interchange standard.

2 See [http://www.fido.gov.au/asic/pdflib.nsf/LookupByFileName/news_for_business.pdf/\\$file/news_for_business.pdf](http://www.fido.gov.au/asic/pdflib.nsf/LookupByFileName/news_for_business.pdf/$file/news_for_business.pdf).

to credit and debit cards. This means that merchants can choose to accept, say, a Visa credit card but not a Visa debit card and *vice versa*. Furthermore, MasterCard and Visa are required to make the cards visually different so that merchants can look at a card and determine whether it is a credit or debit card. Removal of this rule gives merchants another tool to negotiate down the price of acceptance. A merchant can, for example, indicate to MasterCard and Visa that it will not accept their debit cards unless the price of acceptance is reduced. And it can do this while continuing to accept MasterCard/Visa credit cards.

Other reforms

In addition to directly addressing interchange fees and merchant restrictions, the Bank also introduced a number of other reforms to further increase competition. First, it required MasterCard and Visa to publish their interchange fees on their websites, or otherwise make them generally available to the public. Until 2003, these fees had been hidden. While merchants paid interchange fees as part of their merchant service fee, they had no knowledge of the size of these fees. Publication of interchange fees provides merchants with more information to assist in negotiation and increase competitive pressure on these fees.

Second, the Bank required MasterCard and Visa to widen the types of firms that can join their systems. Prior to the reforms, only authorised deposit-taking institutions (ADIs) were permitted to apply to join MasterCard and Visa. In order to increase competition in the credit card market, particularly in providing card services to merchants, the Bank introduced regulations to allow institutions other than ADIs to become members of MasterCard and Visa, and potentially issue credit cards to cardholders or provide card acceptance services to merchants. These institutions are now supervised by the Australian Prudential Regulation Authority (APRA) but need not be deposit-taking institutions.

Effect of the Reforms

The main effect of the reforms has been to change the prices facing users of credit and debit cards. The combination of decreases in interchange fees and surcharging on credit card transactions has resulted in most cardholders paying more to use credit cards and less to use EFTPOS. Furthermore, cardholders are likely to have found that the benefits of using credit cards (in the form of loyalty points earned) have declined. At the same time, merchants have seen the cost of accepting credit cards decline and the cost of accepting EFTPOS cards increase somewhat.

The change in prices to cardholders has been the result of two effects. First, the reduction in interchange fees has resulted in financial institutions changing the prices they charge to their cardholders. With a reduction in the fees received from the merchant's bank, credit card issuers have responded to the loss of revenue by increasing fees and reducing benefits. Annual fees have risen and the benefits from loyalty schemes have been either reduced or capped, sometimes both. This has increased the effective price of using credit cards.

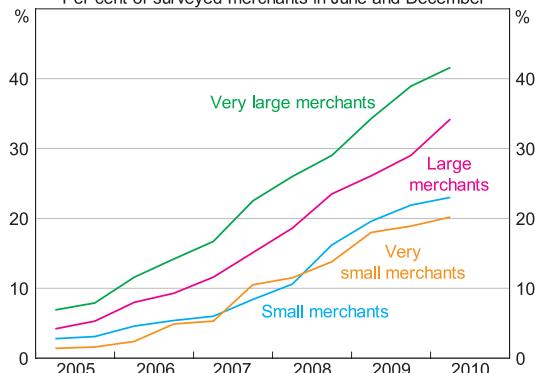
The price to cardholders of using EFTPOS, on the other hand, has declined. Many card issuers have introduced transaction accounts that offer cardholders unlimited electronic transactions (including EFTPOS) for a fixed monthly fee. This change reflects a number of factors, but the reduction in EFTPOS interchange fees as a result of the reforms has made it more viable for institutions to offer accounts that do not have EFTPOS transaction fees.

While the reduction in interchange fees has resulted in some increase in the price of using credit cards, the ongoing presence of loyalty schemes and interest-free periods means that many cardholders are still being encouraged by issuers to use credit cards. This is where the second effect comes into play – surcharging. Since the beginning of 2003, when the no-surcharge rule was removed, the number of merchants surcharging has risen substantially (Graph 2). Survey data indicate that

Graph 2

Merchants Surcharging Credit Cards

Per cent of surveyed merchants in June and December

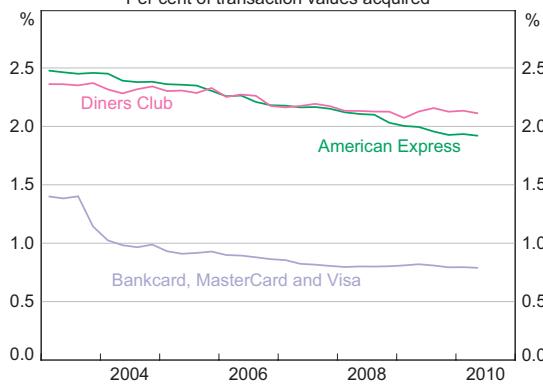


Source: East & Partners' Merchant Acquiring & Cards Market program

Graph 3

Merchant Service Fees

Per cent of transaction values acquired

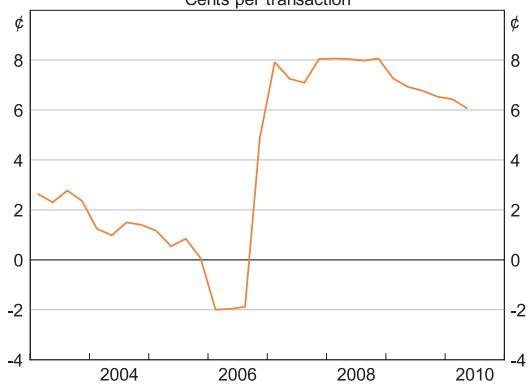


Source: RBA

Graph 4

EFTPOS Merchant Service Fees

Cents per transaction



Source: RBA

in June 2010, around 40 per cent of very large merchants imposed a surcharge; for small or very small merchants, the percentage was closer to 20 per cent. Although the size of the surcharge varies across merchants, the survey data suggest that the average surcharge imposed is currently around 1.7 per cent for MasterCard and Visa transactions, and around 2.7 per cent for American Express and Diners Club transactions.

Of all the reforms, the disallowance of no-surchARGE rules has probably been the most visible to consumers and therefore has drawn the most reaction. Cardholders had been accustomed to paying the same price for goods and services when using their credit card, while at the same time receiving substantial benefits from loyalty points and interest-free periods. This was an important reason why so many cardholders were choosing to use credit card rather than debit card services that would have been less costly to provide. With surcharging, the prices paid by cardholders to use a credit card are higher. For transactions that are surcharged, the benefits from loyalty points and interest-free credit are likely to be offset, at least to some extent, making the effective net price of using a credit card closer to that for using a debit card. And for consumers who do not pay the balance by the due date, and therefore pay interest, the price of a credit card transaction where a surcharge applies will be even higher. These changes to pricing were not unexpected. Indeed, an explicit aim of the reforms was to alter the incentives to use credit cards as opposed to debit cards.

The effect on merchants has mirrored the effect on cardholders. Financial institutions servicing merchants are now paying lower fees to card issuers for credit card transactions, and this has been passed on to merchants as lower fees for credit card transactions (Graph 3). On the other hand, financial institutions are now receiving a lower fee from card issuers when an EFTPOS transaction is made, so they have responded to this loss of revenue by charging merchants more for EFTPOS transactions (Graph 4). While these effects have been partly offsetting on

merchant costs, the net effect of the reforms was a reduction in merchant costs of around \$1 billion in 2009/10 relative to what merchants would have paid in the absence of the reforms.

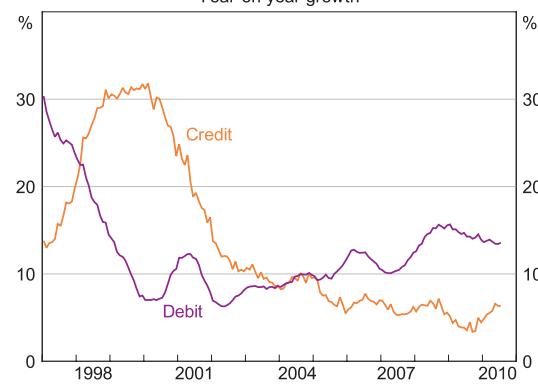
There is evidence that cardholders do react to prices when choosing which payment instrument to use. Surveys indicate that credit card users who pay off the balance by the due date and receive the benefits of loyalty points and an interest-free period undertake more transactions using a credit card than cardholders that pay interest on their credit card; the latter group tends to use debit cards more frequently. Indeed, many credit cardholders who do not pay interest do not use a debit card for any payments. In other words, the pattern of credit and debit card use appears to be influenced by the relative prices faced by different types of cardholder. While it is difficult to measure the precise impact, the number of debit card transactions has in fact been growing more quickly than credit card transactions over the past few years, consistent with the shift in relative prices resulting from the reforms (Graph 5).

There is some evidence too that the removal of restrictions on merchants has resulted in more competitive pressure on interchange fees and merchant service fees, although this mostly seems to have been confined to larger merchants. Interchange fees paid by larger merchants have been lowered substantially in recent years and merchant service fees charged by American Express and Diners Club have declined, partially reflecting an attempt by these schemes to limit surcharging of their cards.

While the ability to surcharge has been utilised by an increasing number of merchants, only one large merchant has so far utilised the ability to decline acceptance of MasterCard and Visa debit cards. Nevertheless, the removal of the honour-all-cards rule provides choice to merchants and hence provides a source of competitive pressure on the fees charged for debit card products.

Graph 5
Number of Card Payments*

Year-on-year growth



* RBA credit card data prior to March 2008 adjusted to remove BPAY transactions
Sources: BPAY; RBA

Conclusion

The primary objective of the Bank's reforms to the card payments system was to change the relative prices of credit cards and debit cards to cardholders so as to more closely reflect the cost of these payment instruments. Prior to the reforms, cardholders were encouraged to use credit cards by loyalty points, interest-free periods and the absence of fees on transactions, while cardholders were discouraged from using debit cards because they paid transaction fees. The regulated reduction in interchange fees and the removal of restrictions on merchants has altered these relative prices, thereby reducing the substantial incentive to use credit cards over debit cards. In addition, the reforms have strengthened the capacity of merchants to put downward pressure on the fees they are charged for card payment services. ▶

Real-time Gross Settlement in Australia

Peter Gallagher, Jon Gauntlett and David Sunner*

The introduction of real-time gross settlement (RTGS) in Australia in 1998 was a major reform to reduce risk in the Australian payments system. Since its introduction, the value of RTGS payments has grown by nearly 70 per cent and the number of these payments has more than doubled. The infrastructure is critical in facilitating the orderly settlement of payment obligations in Australia and it functioned smoothly during the recent global financial crisis.

Introduction

Under RTGS, payments between banks are made individually in real time out of credit funds in the paying bank's Exchange Settlement Account (ESA) with the Reserve Bank. RTGS payments are final and cannot be revoked by the paying bank or otherwise unwound. In Australia, RTGS commenced on 22 June 1998, using the Reserve Bank Information and Transfer System (RITS), Australia's interbank settlement system. This article looks back over the twelve years of RTGS operations, discussing important characteristics of the system, reviewing its performance, and highlighting key developments.

Background

The move to RTGS was the culmination of several years of effort by the Reserve Bank, financial institutions and industry bodies to significantly reduce domestic interbank settlement risk.

Prior to the introduction of RTGS in June 1998, banks settled most of their transactions and those of their customers at 9.00 am (Sydney time) on the day after these transactions were made. Settlement was

achieved by means of a single net transfer across their ESA at the Reserve Bank. This meant that in the intervening period banks could accumulate very large payment obligations to each other. If these failed to settle for any reason the payment system could have been seriously disrupted due to the large values and numbers of transactions involved. Other banks could have faced liquidity and even solvency pressures as a result. RTGS addressed this systemic risk by requiring the settlement of high-value payments to take place irrevocably, in real time, out of credit funds in banks' ESAs, thereby preventing the build-up in large values of unsettled obligations. The RTGS system is protected by an approval made by the Reserve Bank under the *Payment Systems and Netting Act 1998* which ensures that payments cannot be unwound if a participant were to fail after having made payments earlier in the day. Today, around 90 per cent of interbank payments by value are settled on an RTGS basis. Work is also currently under way to provide for more timely settlement of some payments from low-value systems, such as direct entry, that still settle in RITS on a next-day deferred basis.

* The authors are from Payments Settlements Department.

Types of Payments Settled

RITS settles payment obligations of banks and other institutions (other types of authorised deposit-taking institutions, clearing houses and other special-purpose institutions) authorised by the Reserve Bank to operate an ESA. At present, 55 banks and 14 other institutions (referred to collectively as 'banks' for the purposes of this article) hold ESAs.

There are three main categories of payment obligations settled on an RTGS basis in RITS:

- Wholesale debt securities and money market transactions undertaken in the Austraclear securities settlement system. A link between this system and RITS ensures that for securities settlements, delivery of securities occurs at the same time as the payment for these securities. This eliminates the risk of loss of principal (securities or cash) that can occur if delivery and payment do not occur simultaneously.
- The Australian dollar leg of foreign exchange transactions, correspondent banking flows and other customer payments. These are made using the SWIFT Payment Delivery System (PDS), administered by the Australian Payments Clearing Association.
- Interbank borrowing and lending, and special purpose interbank transactions entered directly into RITS as 'cash transfers'. Prior to February 2002, RITS provided an electronic depository and settlement system for Commonwealth Government Securities (CGS).

In addition to RTGS, RITS still settles batches of net interbank obligations. At 9.00 am each day a batch of multilateral net obligations is settled that includes those arising from the clearing of low-value payments (cheques, debit and credit card transactions, and direct entry) exchanged on the previous business day.

Share market transactions are also settled in RITS after being processed through the ASX Limited's Clearing House Electronic Subregister System (CHESS). The ASX Limited inputs netted settlement obligations

into RITS for simultaneous settlement in the CHESS batch at around midday each day.

In addition, since May 2008, settlement of some property transactions has been able to take place directly in RITS as an alternative to using bank cheques. The settlement obligations arising from real estate transactions processed via an electronic registration system are entered into RITS by Austraclear Limited for settlement in the Electronic Property Settlement batch.

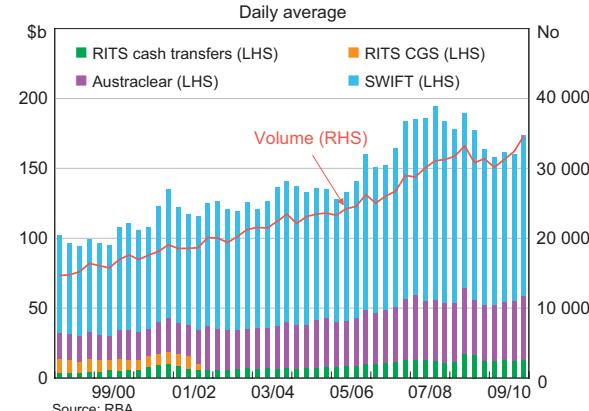
Payment Activity in RITS

Composition

In 2009/10, RITS settled, on average, about 32 000 transactions per day worth around \$168 billion. To place this in context, on an average day in 2009/10, RTGS payment values equated to around 13 per cent of Australia's annual gross domestic product.

Considerable growth in payment activity has occurred since the start of RTGS (Graph 1). Growth in the number of transactions during the first decade of RTGS was relatively constant, averaging about 7 per cent per annum. In contrast, growth in the value of settlements has been more volatile, reflecting fluctuations in general economic and financial activity. During 2008/09 there was a noticeable downturn in both settlement values and volumes in RITS associated with reduced turnover in a range

Graph 1
RTGS Settlement



of financial markets as a result of the global financial problems.¹ Since then, there has been a strong recovery in the number of transactions settled in the system culminating in a record day of 52 120 transactions on 15 June 2010. In contrast, values settled in RTGS have been slower to recover and despite a strong pick up in the June quarter, values settled in 2009/10 were, on average, 14 per cent below those in 2007/08.

The major contribution to both the level and growth of RTGS payments has come from the SWIFT PDS (Table 1). Of these, it is 'interbank' SWIFT payments (i.e. payments between banks, largely associated with foreign exchange settlements and correspondent banking transactions) that have dominated RTGS values and have contributed most to the growth in RTGS values over time. By contrast, customer SWIFT payments (i.e. payments that arise from transactions of banks' customers) have been the largest contributor to the growth in RTGS numbers. These tend to be small-value payments (of less than \$100 000) and have accounted for nearly 70 per cent of the increase in RTGS volumes since the inception of RTGS but only about 10 per cent of the increase in RTGS values.

Settlements of securities transactions in Austraclear account for less than 10 per cent of the total number

of RTGS transactions but make up over 25 per cent of the total value of transactions; the average Austraclear transaction size is \$16 million. The share of Austraclear payments increased significantly as a result of the movement of Commonwealth Government Securities from RITS to Austraclear in February 2002. This consolidation was the result of a consultative process which demonstrated a market preference for a single settlement system for both Commonwealth Government and other debt securities.

Over time there have been notable changes in the size distribution of RTGS payments (Graph 2). Although the number of large payments (of over \$100 million) has changed little as a proportion of the total number of payments, their share of the total value of RTGS payments has risen to about 60 per cent, from about 40 per cent around ten years ago. Over the same period, the proportion of small RTGS payments (those less than \$100 000) has grown to about 65 per cent of the total number of RTGS transactions. The total value of these payments has, however, remained very low as a share of total payments.

The values settled through the 9.00 am batch for low-value clearings have grown steadily since

Table 1: RTGS Settlement by Source
Per cent of total

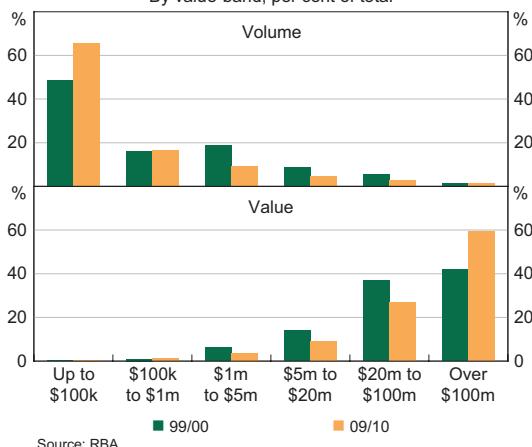
	Value		Volume	
	1999/00	2009/10	1999/00	2009/10
RITS cash transfers	5	8	1	0.5
RITS CGS	8	na	2	na
Austraclear	19	26	13	8
SWIFT	68	66	83	91
<i>of which:</i>				
– Customer	5	7	41	54
– Bank	63	59	42	37
Total RTGS	100	100	100	100

Source: RBA

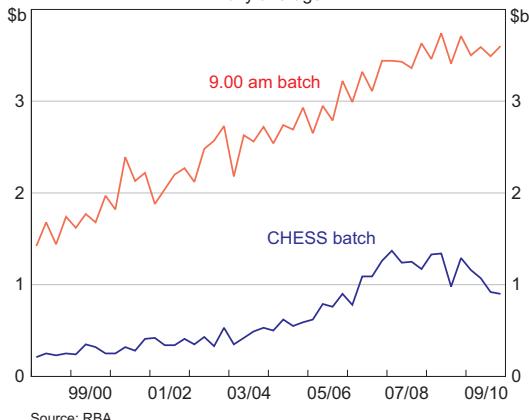
¹ For a fuller discussion of Australian markets during this period, see Black, Brassil and Hack (2010) and Ossolinski and Zurawski (2010).

Graph 2**RTGS Settlement**

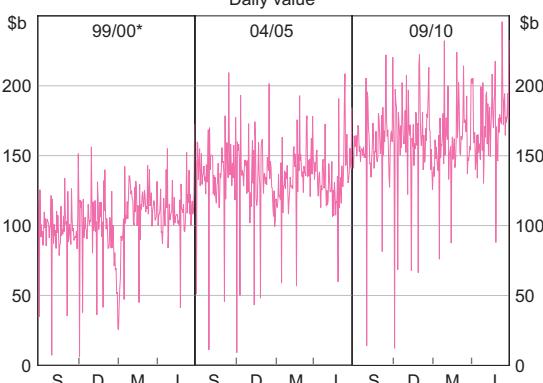
By value-band, per cent of total

**Graph 3**
Batch Settlement

Daily average

**Graph 4**
RTGS Settlement

Daily value



the introduction of RTGS (Graph 3). CHESS batch settlement values also grew quite rapidly for a number of years prior to the onset of the global financial crisis. The recent downturn in CHESS batch value reflects a fall in turnover (by value) on the Australian share market and is also influenced by trends in other equity related transactions such as capital raisings.

Volatility

There is significant volatility in day-to-day RTGS payment activity. On a peak day, values can be 50 per cent higher than on a normal day, while on low-activity days values settled are often 85 per cent below average (Graph 4). Similar patterns are evident for RTGS daily volumes but declines from the yearly average are less pronounced.

Day-to-day volatility is influenced significantly by foreign exchange settlements and correspondent banking flows. Troughs in RTGS activity occur on US holidays and the days when Melbourne is open for business but Sydney is not. Although RITS is open for settlement on all business days in either Sydney or Melbourne or both, by market convention there are no AUD foreign exchange settlements on non-business days in Sydney. On these days, foreign exchange settlement and many settlements of domestic origin do not occur. As a result, peak days normally occur surrounding these days and Australia-wide holidays.

Peaks also occur at the end of the financial year, quarter and month ends and at the expiry of some financial market contracts. The largest peak day on record occurred on the final business day of September 2007 with RTGS payments of \$312 billion.

Liquidity

The settlement of \$168 billion in payments on average each day is facilitated by a pool of about \$15 billion in system liquidity, which is exchanged multiple times between banks during the course of the day. The availability of sufficient liquidity is vital to ensure that settlement of RTGS transactions can continue uninterrupted. In RITS, the level of intraday

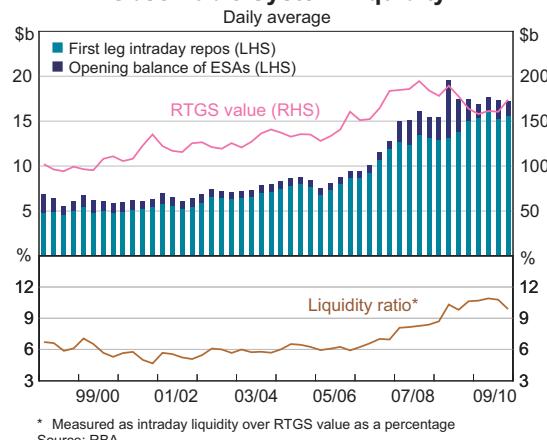
liquidity available for settlement can be measured by the total of ESA balances held overnight plus intraday repurchase transactions undertaken with the Reserve Bank (often referred to as RBA Repos).

The overall level of ESA balances is ultimately determined by the Reserve Bank's open market operations, aimed at maintaining the overnight cash rate at its target. In this task, the Reserve Bank seeks to provide sufficient ESA funds to meet demand by banks, rather than seeking to provide any specific level of funds.

Banks may, at their discretion, enter into intraday repos with the Reserve Bank to obtain intraday liquidity for the settlement of their payment obligations. An intraday repo involves a bank selling eligible securities to the Reserve Bank in exchange for ESA funds and agreeing to reverse this transaction by the end of the day. These repos are the major source of liquidity to facilitate payments. The range of eligible securities for intraday repos, and the Reserve Bank's open market operations, has been broadened considerably since the start of RTGS as the Reserve Bank has sought to ensure there are sufficient volumes of securities available for these purposes.

Demand for intraday liquidity was reasonably constant over the first half of the decade as banks became familiar with the regular pattern of funding and settlements (Graph 5). Changes to the Reserve Bank's dealing arrangements in 2004 made intraday repos in private securities more attractive for use in intraday funding of payments. With supply of these assets plentiful, banks were able to readily accommodate strong growth in settlement values. The onset of the financial market turbulence in mid 2007 saw some banks become less willing to lend their excess funds in the cash market, preferring instead to hold risk-free liquid assets with the Reserve Bank. The resulting higher opening balances of ESAs meant that for a given amount of intraday repos, system liquidity was higher. Overall, the increased use of intraday repos, and to a small extent higher opening ESA balances, saw intraday liquidity

Graph 5
Observable System Liquidity



* Measured as intraday liquidity over RTGS value as a percentage
Source: RBA

double between 2005/06 and 2009/10, while the value of RTGS settlements only increased by around 15 per cent. The increase in observable liquidity, in concert with a reduction in settlement values since 2007/08, has resulted in a marked rise in the liquidity ratio (observable liquidity as a percentage of settlement value).

System Liquidity-saving Features

Given that there is an opportunity cost to banks from holding overnight ESA balances and other highly liquid assets, which could otherwise be invested in higher earning assets, an RTGS payment system aims to use liquidity efficiently. RITS does so by using a liquidity-efficient queue-testing method, and including features such as Targeted Bilateral Offset and Auto-Offset, to assist in the rapid redistribution of liquidity as payments are settled (see 'Box A: The Settlement Process'). The Auto-Offset algorithm can be highly effective in mitigating the effect of low liquidity by reducing the total liquidity needed to settle two offsetting payments to the net difference between the two.

Intraday settlement profiles show how participants manage their payments throughout the day, including the use of priority payments status and Auto-Offset (Graph 6). The use of Auto-Offset has become an increasingly important means of settling

Box A

The Settlement Process

All payment instructions submitted to RITS are placed on the system queue, where they are tested to ensure the paying bank is ready to make the payment and has sufficient funds in its ESA. RITS tests payment instructions in order of receipt and each payment only settles if all queue tests are passed. If a payment fails one of the queue tests, then the queue processor leaves the payment on the queue and attempts to settle the next payment. The process continues until the end of the queue is reached, after which it restarts testing from the start of the queue (Figure A1). This means that while the queue processor tests transactions in the order received, transactions may not settle in that order. RITS is able to test around 25 000 payments per minute and the queue is traversed multiple times per minute depending on the queue size.

RITS tests the value of a payment against the sending bank's available ESA funds. Banks may apply different statuses to payments that affect this testing and may use a sub-limit to reserve ESA funds for critical payments.

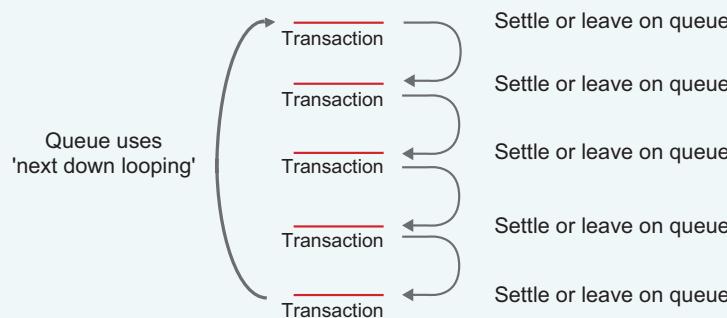
Banks may manage their ESA and queued payments online using the RITS User Interface or by using the Automated Information Facility (AIF) over the

SWIFT network. The AIF allows banks to perform automated credit and liquidity management, as well as make enquiries and receive various automated advices. RITS processes an average of about 15 000 AIF messages per day.

RITS also employs a number of liquidity-saving mechanisms that help avoid gridlock. Auto-Offset is a bilateral offsetting algorithm that automatically runs when a payment remains unsettled on the system queue for longer than one minute. Once a payment has triggered the Auto-Offset algorithm, the queue processor searches for queued payments from the receiving bank that will offset some or all of the value due to be paid by the paying bank of the trigger transaction. Where the simultaneous settlement of all of these transactions would not result in a negative balance on either ESA or breach any ESA sub-limit, then the trigger and offsetting transactions are settled simultaneously.

A new piece of functionality implemented in RITS in July 2009 is the Targeted Bilateral Offset facility. This functionality allows any two ESA holders to offset selected transactions against each other to improve the efficient use of system liquidity and to assist in client credit management.

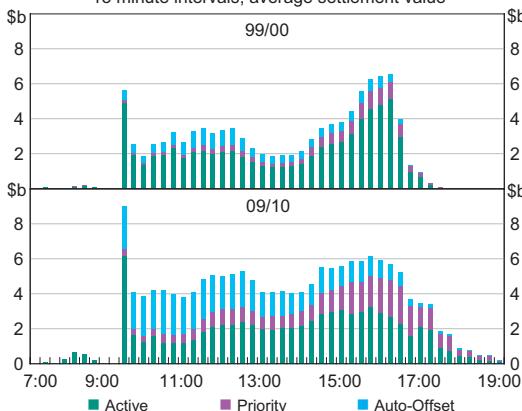
Figure A1: Operation of the System Queue



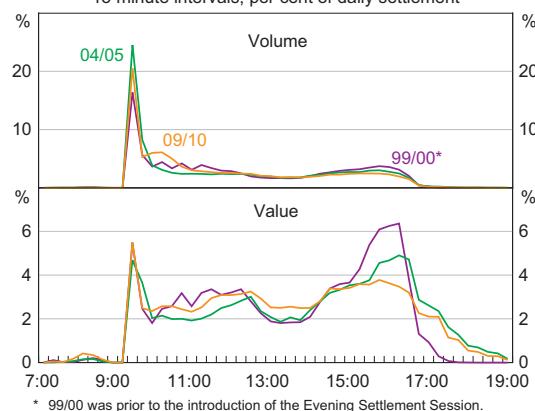
Source: RBA

Graph 6**RTGS Liquidity-saving Features**

15 minute intervals, average settlement value

**Graph 7****RTGS Intraday Settlement Profile**

15 minute intervals, per cent of daily settlement



payments earlier in the day. A larger proportion of small-value payments is submitted to the system queue for settlement testing before midday and this increases the probability that RITS is able to locate eligible offsetting payments. Towards the end of the Daily Settlement Session (discussed in 'Box B: The RTGS Operating Day'), the average size of transactions tends to be significantly larger. As a result, banks tend to manage their queued payments more actively by using sub-limits and priority statuses to prevent settlement delays that might otherwise arise due to liquidity constraints.

Intraday Payment Activity

In general, earlier settlement of payments is desirable as this assists in the redistribution of liquidity between banks and reduces the operational and liquidity risks that can manifest late in the settlement day. One set of funding payments which must, however, take place late in the RTGS day is for foreign exchange related transactions that use Continuous Linked Settlement (CLS), which has its operational timeframe concentrated in the European morning.

Banks queue a large number of payments in advance of, and around the opening of, the Daily Settlement Session at 9.15 am. A large

proportion of these queued payments by number is then settled almost immediately (Graph 7). These payments are predominantly small-value SWIFT customer payments.

In contrast, settled payment values show two distinct peaks. The first occurs immediately after the 9.15 am opening of the Daily Settlement Session when large numbers of smaller payments are settled. The second peak occurs in the late afternoon as banks' treasuries become more active in managing the settlement of their larger payments and engage in interbank borrowing and lending to square their overnight positions. In the early years of RTGS this second peak tended to be the larger of the two. However, the afternoon peak has fallen over time, due in part to some netting efficiencies gained with the migration of foreign exchange related payments to CLS and the introduction of an Evening Settlement Session to settle some of these transactions, and more recently as greater intraday liquidity has facilitated the earlier settlement of large-value payments.

Despite the relatively large proportion of values and volumes settled early in the settlement day, the aggregate value of payments on the queue awaiting settlement testing tends to rise

Box B

The RTGS Operating Day

The RTGS operating day is divided into a number of sessions (Figure B1). During the Morning Settlement Session, only RITS and interbank Austraclear payments can be settled. This enables banks to borrow funds or enter into intraday repurchase agreements with the Reserve Bank to fund debit positions in the 9.00 am batch and fund their subsequent daily RTGS payment obligations. Following this, RTGS settlement ceases temporarily at 8.45 am to allow the 9.00 am batch to be run.

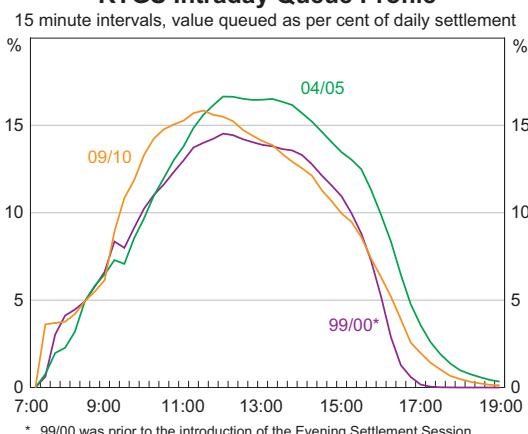
At 9.15 am, RTGS settlement recommences with the start of the Daily Settlement Session. In this session, all RTGS payments are eligible for settlement. This session ends at 4.30 pm, at which point new customer payments are no longer accepted. This allows a brief period for banks to enter funding transactions to balance their ESA positions before 5.15 pm, which, until the commencement of Continuous Linked

Settlement (CLS) in September 2002, marked the close of the settlement day. CLS is an international initiative that extinguishes settlement risk in foreign exchange transactions by providing for payment versus payment settlement in multiple currencies during a common international window of open hours for RTGS systems.

With the operation of CLS, RITS operating hours include an Evening Settlement Session that accommodates an overlap of Australian settlement hours with the European morning, when funding of CLS positions occurs. The length of the Evening Settlement Session varies depending upon the time of year and the consequent difference between European and Australian time. During this session participating banks unwind remaining intraday repos and undertake final funding transactions to square their positions.

Figure B1: The RTGS Operating Day



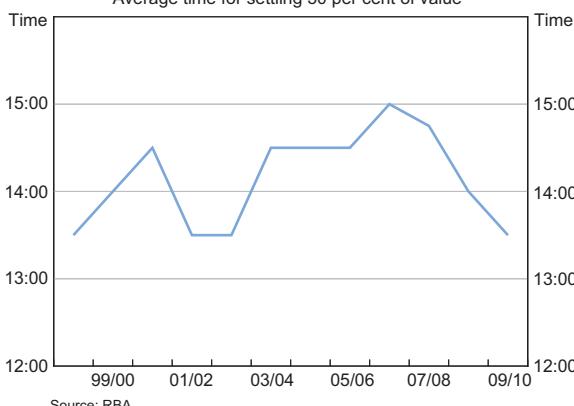
Graph 8**RTGS Intraday Queue Profile**

* 99/00 was prior to the introduction of the Evening Settlement Session.

Source: RBA

Graph 9
RTGS Throughput Time

Average time for settling 50 per cent of value



Source: RBA

throughout the morning as more large-value interbank payments are entered (Graph 8). Until recent years, the value of payments on the queue tended to plateau during the middle of the day. More recently, the peak in aggregate queued values has occurred significantly earlier in the day and the value of payments on the queue has fallen noticeably during the afternoon.

The average time of day when half of the day's total settlement value is complete has fluctuated since the start of RTGS (Graph 9). This is consistent with the changes in intraday settlement peaks over time. In the lead-up to the financial crisis in 2007, it was

taking until as late as 3.00 pm to settle half of the day's payment values. With the increase in liquidity and the earlier settlement of larger payments, the half-way point is now significantly earlier.

Conclusion

The implementation of RTGS in RITS on 22 June 1998 was a milestone in the reduction of settlement risk, and in turn systemic risk, in the Australian financial system. The past twelve years have witnessed strong growth in the value and number of RTGS transactions settled by RITS. The RITS infrastructure functioned reliably and efficiently in providing final interbank settlement during the recent financial crisis, providing a solid foundation for the operation of the Australian financial system.

The Reserve Bank has made a significant public policy investment in RITS to ensure that it is stable and resilient and that it meets the settlement needs of participants, appropriate to its critical role in the financial system. Investments include the total upgrade of the technical architecture, with dual components at two sites, introduction of a modern browser-based user interface, internet access and enhanced security features.

The Reserve Bank is continuing to develop initiatives that will further strengthen the settlement infrastructure in Australia. In particular, work is currently underway to provide enhanced settlement functionality to facilitate a reduction in settlement lags for various payments currently settled on a deferred basis. This functionality will provide a platform for greater efficiency and product innovation in Australia's payment system, through faster access to funds and by reducing the risks associated with deferred settlement. □

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The Impact of the Financial Crisis on IMF Finances

Anthony Brassil*

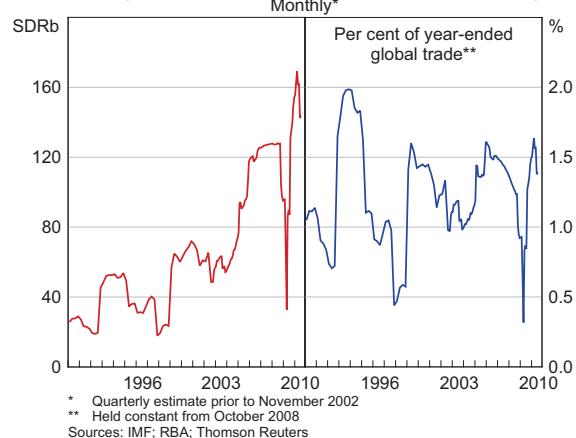
The global financial crisis has led to increased lending by the International Monetary Fund (IMF) to member countries. With IMF resources low by historical standards before the crisis, the IMF has funded this increase in lending partly by borrowing from member countries; this is the first time borrowing has been used since 1998. Further work to enhance the IMF's lending facilities and review the IMF's available resources is underway.

The IMF's Lending Capacity

A primary role of the IMF is to provide temporary financing to member countries with a balance of payments need. Financing is provided from the IMF's own resources, which include its members' capital subscriptions (known as quotas) as well as borrowing. A key indication of the IMF's ability to provide new lending to its members is the One-year Forward Commitment Capacity (FCC), a measure of its resources not already disbursed or committed. Immediately prior to the financial crisis, the FCC stood at SDR125 billion, around double that in the early 2000s (Graph 1).¹ While in absolute terms this was a record high, as a share of global trade it was no higher than a decade earlier.²

Following the intensification of the crisis in late 2008, the use of IMF facilities rose sharply, with the FCC reaching a low of SDR33 billion in May 2009. The decline in the FCC turned attention to the IMF's

Graph 1
One-year Forward Commitment Capacity



capacity to make further commitments and the IMF subsequently supplemented its resources through borrowing from its members. As a result, the IMF's available resources as a share of international trade returned to a relatively high level. The remainder of this article discusses the evolution of IMF finances during the crisis, highlighting changes in the form of financial assistance and the types of resources used.

* The author is from the International Department.

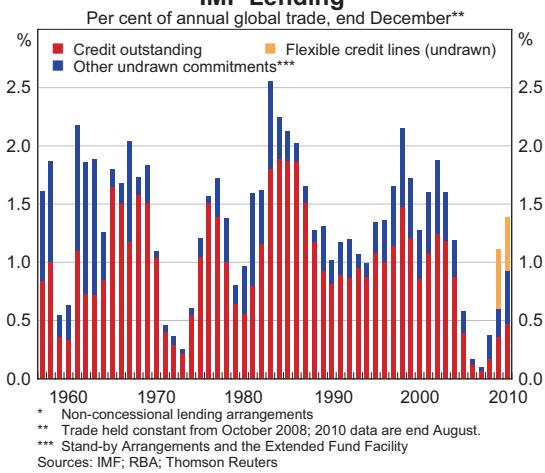
1 The Special Drawing Right (SDR) is a reserve asset, constructed by the IMF. It is currently valued as a weighted average of the US dollar, euro, yen and sterling.

2 Because IMF financial assistance is provided for balance of payments needs, and potential balance of payments needs increase as economies become more open, global trade (as a measure of openness) is used here to standardise IMF lending and resource data through time. Since the fall in trade following the intensification of the crisis in late 2008 did not reflect a reduction in members' potential balance of payments needs, year-ended trade flows are held constant from their peak in October 2008.

IMF Lending

In the years leading up to the financial crisis, most of the IMF's non-concessional lending was conducted through Stand-by Arrangements (SBAs) and the Extended Fund Facility (EFF). SBAs are the IMF's core lending facility; they are available to all member countries with loan tranches disbursed provided financial and other policy conditions are met. EFFs are designed for members undertaking structural reforms; they typically have longer disbursement and repayment periods than SBAs. While members' borrowings under SBAs and EFFs normally have limits based on their quotas, these limits may be waived if deemed necessary and justifiable by the Executive Board. This is known as 'exceptional access'.

Graph 2
IMF Lending*



Sources: IMF; RBA; Thomson Reuters

In March 2009, a new facility – known as the Flexible Credit Line (FCL) – was established as part of a series of reforms designed to enhance the effectiveness of IMF financial assistance.³ The facility is designed to be used predominantly as a precautionary line of credit by countries that are considered to have strong economic fundamentals and a track record of good economic policy (unlike SBAs which are available to all members). Moreover, lending is not conditional and is not subject to the usual access limits.

Prior to the collapse of Lehman Brothers in September 2008, total IMF lending (credit outstanding plus undrawn amounts from already approved arrangements) stood at less than SDR9 billion, its lowest level since 1975. By August 2010, it had reached SDR144 billion, the largest amount ever committed by the IMF (although, as a share of trade, the amount committed was not particularly high by historical standards; Graph 2).

SBAs make up the largest share of outstanding arrangements. The largest SBAs approved during the crisis (all with exceptional access) were for Ukraine with SDR11 billion (802 per cent of quota), Romania with SDR11.4 billion (1 111 per cent of quota) and Greece with SDR26.4 billion (3 212 per cent of quota). Greece's SBA represents the largest arrangement (as a share of quota) in the history of the IMF, with Korea's arrangement in 1997 the previous largest at 1 938 per cent of quota.

The use of FCLs has significantly increased the IMF's commitments. Mexico, Poland and Colombia had FCLs approved in April and May 2009 totalling SDR52 billion. Each FCL was initially active for one year and all three countries have subsequently renewed their FCLs for another year (although Colombia's renewed FCL was smaller than its original facility). Consistent with the precautionary objective of the FCLs, no drawings have been made. As a result, IMF credit outstanding is now just 0.47 per cent of global trade, less than half the historical average of 0.97 per cent.

3 For a discussion of these reforms and IMF initiatives to bolster liquidity, see Doherty (2009).

IMF Resources

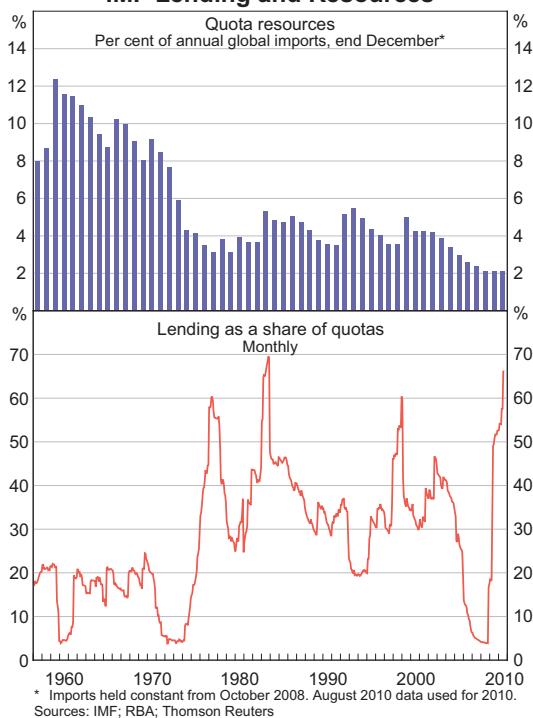
Members' quotas are the IMF's main financial resource; they are paid in members' own currencies and in reserve assets (such as SDRs or any of the four currencies that determine the value of the SDR). The size of quota resources is reviewed on a regular basis (typically every five years) to ensure the IMF's resources keep pace with potential balance of payments needs. At the previous two general quota reviews (2003 and 2008), the Executive Board determined that the IMF's available resources remained adequate. However, with global trade expanding since the last general increase in 1999, quotas have fallen to historic lows as a share of trade (Graph 3). Moreover, despite lending not being particularly large by historical standards (relative to global trade), lending as a share of quotas has risen to its highest level since the early 1980s.

The IMF's quota resources can be supplemented by borrowing arrangements, as occurred in 2009. Previously, the IMF relied on borrowed resources most heavily following the oil price shocks of the 1970s, financing over 60 per cent of IMF credit outstanding at that time (Graph 4). Historically, periods of strong borrowing by the IMF have been followed by general quota increases, thereby ensuring quotas remained the IMF's main source of funding.

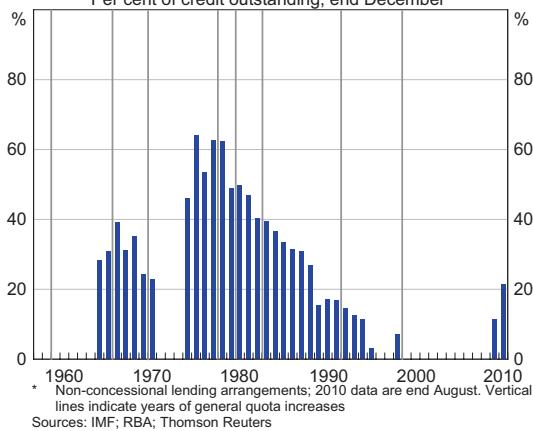
Prior to the recent financial crisis, the IMF last used borrowed resources to fund non-concessional financial assistance in 1998, during the Asian financial crisis, with the borrowings repaid following the general quota increase in 1999. Borrowing in 1998 occurred through activation of two multilateral borrowing arrangements – the General Arrangements to Borrow (GAB) and the New Arrangements to Borrow (NAB).

The GAB has been in place since 1962 (but was significantly reformed in 1983). It allows the IMF to borrow up to SDR17 billion from participating countries following activation. The NAB was established in late 1998 reflecting concerns following

Graph 3
IMF Lending and Resources



Graph 4
Borrowing Utilised by the IMF
Per cent of credit outstanding, end December*



the Mexican financial crisis in 1994 that more resources might be needed to respond to future financial crises. While the NAB potentially gives the IMF access to SDR34 billion in borrowed resources, the GAB is to be used only in limited circumstances and the maximum amount the IMF is allowed to borrow under the GAB and NAB combined is SDR34 billion.

Although the IMF still has the ability to activate SDR34 billion under the GAB and NAB (0.3 per cent of global trade in 2008), the sharp fall in available IMF resources from late 2008 led to a commitment from the G-20 to expand the NAB and increase its flexibility. Following this, the IMF Executive Board adopted a proposal in April 2010 to expand the NAB to SDR367.5 billion, although the expansion is yet to be ratified by a sufficient number of NAB participants to make it effective.⁴ Australia has ratified its expanded NAB commitment of SDR4.37 billion.

Given the time needed for the expanded NAB to become operational, the G-20 also committed to immediately increase the resources available to the IMF, with the intention of later incorporating these resources into the expanded NAB. This increase in IMF resources occurred through bilateral borrowing agreements between the IMF and some of its members; there are currently 19 bilateral agreements activated, worth approximately SDR172 billion (1.7 per cent of global trade). Consistent with the majority of IMF lending commitments remaining undrawn, most of the credit available under these bilateral agreements remains unutilised: only around SDR10 billion (21 per cent of IMF credit outstanding) has been drawn down. With the majority of credit available through these bilateral agreements still available for new IMF lending, the FCC is currently around SDR144 billion, significantly higher than the SDR33 billion available prior to these agreements becoming operational. Neither the GAB nor the NAB was activated during the recent financial crisis.

Going Forward

Although borrowing agreements boosted the IMF's resources during the crisis, the International Monetary and Financial Committee (the IMFC, a committee that advises the IMF on the direction of its work) has emphasised that quotas should remain the IMF's main financial resource and has pledged to complete the next general quota review before January 2011 (two years ahead of schedule). G-20 Leaders have called for full ratification of the expanded NAB by the time of the Finance Ministers' and Central Bank Governors' meeting in October 2010.

The general review of IMF quotas and the NAB ratification process are occurring against a background of ongoing work by the IMF to further enhance its lending facilities and modernise its governance. With respect to lending, the discussions thus far have led to an increase in the flexibility of the IMF's FCL and the creation of a new precautionary facility, which together are part of the IMF's efforts to enhance its crisis prevention 'toolkit'. As a part of ongoing work to enhance the governance of the IMF, the G-20 have committed to increasing the voting power of emerging market and developing countries in the IMF, given their strong growth and increasing weight in the global economy. This is to be achieved by increasing these countries' shares of total quotas. ✎

⁴ The number of NAB participants will increase from 26 to 39 members. While a sufficient number of the new participants have ratified their NAB commitments, this is not true of the existing participants.

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The Role of Finance

Glenn Stevens, Governor*

The Shann Memorial Lecture, University of Western Australia, Perth, 17 August 2010

Thank you for the invitation to deliver the 2010 Shann Lecture. It is an honour.

People are shaped by formative events, and Edward Owen Giblin Shann was no exception. Born in Hobart in 1884, his family moved to Melbourne a few years later. Growing up in the Depression of the 1890s – an episode that hit Melbourne particularly hard – Shann saw first-hand the effect that financial crises could have on peoples' lives. Those memories stayed with him and motivated much of his career's work.¹

In his early adult life Shann exhibited some Fabian tendencies – and a flirtation with the Left would be a not uncommon response by a later generation of intellectuals as a result of the sense that capitalism had failed in the 1930s. But by the time he had become prominent as an economist, his views had shifted in a direction that we would probably today call Libertarian. One of his most noted works was a short pamphlet, published in 1927, that described the lead-up to and crash of the early 1890s. It was prescient in drawing parallels with the financial developments in the 1920s that preceded the 1930s depression.²

The 1880s were characterised by rapid population growth and increased urbanisation which fostered an investment boom dominated by construction. There was a spirit of optimism, which saw international capital flow in and asset prices – particularly land prices – increase. Leverage rose and

lending standards fell. As Shann's monograph noted, financial regulation at the time abetted the excesses, including an 'untimely amendment' of the Victorian Banking Act in 1888, which allowed borrowing against a wider range of collateral.

In the 1920s, when Shann was applying this experience to contemporary issues, the problem was not so much excessive private debt or poor regulation.³ This time the problem Shann saw was too much *public* borrowing. He viewed the extensive public works popular with State governments in the 1920s as not only increasing debt but also lowering productivity. So it would come as no surprise that, after Australia's terms of trade collapsed in the late 1920s and international capital markets made new borrowing much more difficult, Shann was among the group that argued that the standard of living that could feasibly be associated with full employment was noticeably below that to which people had become accustomed in the boom. The Premiers' Plan of 1931, which Shann had a hand in producing, sought to recognise this, and to spread the associated decline in incomes across the different sectors of society.⁴

These two episodes had some important differences, but in a deeper sense both stories were rather similar, and all too familiar. The sequence goes as follows. Some genuine improvement in economic

* I would like to thank Paul Bloxham for his extensive research assistance in preparing this address.

1 Snooks (1993).

2 Shann (1927).

3 In the 1890s more than half the note-issuing banks had suspended payment – one third never re-opened (Cornish 2010; Kent forthcoming). By comparison, only three minor banks failed in the 1930s' Depression.

4 Shann and Copland (1931).

conditions leads to more optimism. It may be a resource discovery (including the opening up of new productive land), or a technological change, or a rise in the terms of trade, or even just greater confidence in economic policy's capacity to solve problems. Human nature being what it is, people (or governments) are inclined to project into the future with undue confidence and insufficient assessment of risk. They often decide to invest more in ventures that are marginal, or even speculative, borrowing to do so. Because their assessment of permanent income is that it has increased, they also decide to consume more now (either privately or in the form of public services). Financial markets and institutions – which are populated by human beings after all – help them do both these by making capital available. Then, at some point, an event causes people suddenly to realise they have been too optimistic. Maybe the 'new paradigm' disappoints in some way or the terms of trade decline again. The cycle then goes into reverse, usually painfully.

This pattern is fresh in our minds after the events of the past several years. But Shann was writing about it 75 years ago, and of course he wasn't the first. Narratives like these are peppered throughout history. The thought that 'This Time is Different' springs eternal in the human psyche, and is a fitting title to the recent work by Reinhart and Rogoff (2009) covering eight centuries of financial delusions. Moreover, financial instruments, markets and institutions are always central to the way these cycles play out.

So it is fitting, given Shann's own work, to ask the question: what is the proper role of finance? In particular, I will take up four questions:

1. What are the desirable functions of the financial system, and how did they evolve?
2. What problems are inherent in finance, and what issues do they raise for policymakers?
3. What questions arise from the growth and change of the financial system over the past couple of decades?

And finally,

4. What are the challenges as we look ahead?

The Functions of the Financial System and its Origins

What is it that we need the financial system to do?

I think we can outline five key functions. We want it to provide:

- i. a reliable way of making payments (that is, exchanging value);
- ii. a means for pricing and pooling certain types of risks;
- iii. a way of transferring resources from savers to borrowers;
- iv. a way of transferring the returns back again, which requires that the savers' money is not lost and which, in turn, requires monitoring of borrowers and managers; and
- v. liquidity.

These are very valuable things for a community to have. The modern economy could not have developed without these capabilities arising in the financial system.

We tend to think of financial activity and innovation as very recent, but in fact the history is a long one. There is not time to do justice to that history here, and there are some fascinating books on the subject which repay the reader generously for the investment of their time.⁵ But it is clear that borrowing and lending is almost as old as civilisation itself. Evidence of such transactions, some of them remarkably codified, go back at least to eighteenth century BC Babylonian records.⁶ Some scholars suggest that the records of the Greek and then Roman ages show considerable evidence of several activities we would

⁵ One of the most accessible recent treatments is Ferguson (2008).

⁶ Banking activities were sufficiently important in Babylonia that there were written standards of practice that were part of the Code of Hammurabi, the earliest known formal laws (Davies 1994). These were carved on tablets of stone, including details of how loans, interest and guarantees would operate according to a set of standardised procedures.

associate with banking, including taking deposits, making loans and facilitating transactions.⁷

Developments seemed to accelerate during the Renaissance, particularly in Italy. Bills of exchange were by then in common use as a means to facilitate trade and also to circumvent usury laws. Traders were able to take a deposit in one city, make a loan to someone transporting goods to another city and then take repayment at the destination (possibly in a different currency) – with a suitable addition to the price in lieu of interest. This activity would appear to be a forerunner – by seven centuries – of an instrument that in our terminology would combine elements of a zero coupon or discount security, trade credit and a sort of foreign currency swap.

The most noted bankers of that era were of course the Medici family of Florence, who went further than their predecessors and contemporaries in the pooling of credit risk, by having a branch network with partners who were remunerated with a profit share.⁸ The development of double-entry bookkeeping, in Genoa in the 1340s, also helped banking assume more modern features: the receipt of deposits, maintenance of current accounts, provision of loans and management of payments.⁹

This form of banking in Italy later became a model for Holland, Sweden and England, to which further innovations were added. In Amsterdam, the *Wisselbank*, which was the first exchange bank in Northern Europe, pioneered a system of cheques and direct debits circumventing problems with different currencies.¹⁰ The Sveriges Riksbank, formed in 1656 and the oldest institution recognised today

⁷ Temin (2004).

⁸ See de Roover (1946). The Medici family may have learned from earlier failures of the Peruzzi and Bardi families' banks in Florence in 1348 owing to defaults on payments when King Edward III failed to repay borrowings taken in the beginning of the Hundred Years' War (Kindleberger 1993).

⁹ As an aside, it is from this era that we receive the term 'bank,' which derives from the merchant's bench, or banco, in the market places of medieval Italy (particularly Lombardy; Lombard Street in the City of London is named after this region of Italy, as King Edward I granted this piece of land to the goldsmiths of Lombardy).

¹⁰ Quinn and Roberds (2005).

as a central bank, is credited by some as having pioneered fractional reserve banking.¹¹

Other key innovations were joint-stock ownership and limited liability. These allowed more capital to find its way into banking and further reduced the costs of intermediation. The Bank of England, established in 1694, was for many years the only bank in England allowed to operate on a joint-stock ownership basis. Walter Bagehot devotes a chapter in *Lombard Street* to the virtues of joint-stock ownership, noting that while these sorts of companies 'had a chequered history', in general the joint-stock banks of Britain were 'a most remarkable success'.¹² The same innovations helped to develop equity markets more generally.

Meanwhile bond markets had also developed. Again the earliest forms were in Renaissance Italy, where wealthy citizens were able to buy bonds and thereby invest their savings in one of the few activities that was seen as providing a significant return: war. Such instruments allowed governments (and later large corporations) to raise funds from a broader set of sources. In time, the formation of secondary markets for these securities meant that risk had a price set by a market. These innovations also spread to Northern Europe and, by the mid-eighteenth century, London had a well-developed bond market.¹³ It was trading in the bond market that made the Rothschild family wealthy and for most of the nineteenth century its bank was the largest in the world.¹⁴

¹¹ Ferguson (2008).

¹² Bagehot (1873).

¹³ The more market-oriented approach of British finance stood in contrast to mainland Europe, which was more bank-oriented (and remains so today). Both approaches provide different ways of achieving the functions listed above.

The contrast between systems has spurred much debate about their effectiveness. Some suggest a key role in the development of German industry in the nineteenth century, for example, was the large size and scope of the universal banks of Germany, which allowed them to develop a close relationship with industry (Gerschenkron 1962). Others suggest that markets provide the discipline required and also led to a superior allocation of capital.

¹⁴ Ferguson (2008).

So by the middle of the nineteenth century a quite sophisticated financial system had arisen in major western economies. It included banks and other financial intermediaries, stock and bond markets and insurance. It allowed transactions to be made, and mobilised pools of savings for investment in enterprise while offering a degree of liquidity to savers. It pooled certain risks, and served in a fashion to monitor borrowers. It allowed payments to be made and funds invested across national borders. In the process, it facilitated the industrial revolution, which resulted in the biggest transformation in living standards seen in the history of western civilisation. This system did just about all the things we would want a financial system to do today, albeit with less technological efficiency. Arguably the biggest change a financier from much earlier times would notice today would not be the new instruments – nor the crises! – but the effects of the silicon chip and fibre optics on the way finance is conducted.

Incidentally, the difficulties that accompanied having only a rudimentary financial system were nowhere better illustrated than in the early Australian colonies, as one of Shann's other works, *An Economic History of Australia*, makes clear. The most commonly used means of exchange for many years was rum. Indeed, he reports that in Sydney 'George Street between Brickfield Hill and Bridge Street cost four hundred gallons' of rum to build.¹⁵ In today's prices for rum, this amounts to about \$80 000. It is doubtful that a road of that length could be constructed for that sum today, such has been the increase in the price of labour in terms of rum (and indeed other commodities). The colonists began to issue 'notes' or 'cards', which were forms of IOUs and which circulated as currency, although this system soon became unworkable partly because the quality of such IOUs varied greatly and tended to decline over time. Governor Macquarie famously sought to end the shortage of metallic currency by punching holes in a consignment of Spanish dollar coins, giving the 'ring' and 'dump' different values, and also rendering

them less useful elsewhere, thereby retaining this currency in the new colony.

However, the need for credit facilities, for pastoral expansion and short-term financing for local and overseas trade, still required the development of a banking system. In 1817, Macquarie granted a charter to a group of leading traders and officials to form the Bank of New South Wales, with responsibility to issue a paper currency. As Shann points out, the stock holders were given limited liability in the operations of the Bank of New South Wales, which at the time in England was still an exclusive privilege of the Bank of England, and was not granted to other British banks until 1858.¹⁶ So despite a somewhat shaky start, Australia's own financial system was able to catch up rapidly on the other developed economies by adopting their technologies.

The Problems of Finance and Development of Regulation

As banking had developed, it had become more leveraged. No longer was it a case of a few wealthy individuals risking their own money in enterprises akin to venture capital funds – accepting the risk and illiquidity that went with it. In their more developed form, banks raised deposits from the public – redeemable at their face value, at notice or at call.

Leverage changes the dynamics of any business. Expected returns are higher but management needs to be on its game – which is an oft-quoted argument for having some debt in a corporation. In the case of banks, it meant that the business of banking became even more focused on monitoring, information gathering and risk management.

Of course the depositors had some protection in that the capital of the proprietors was at risk before deposits. But banks also undertook maturity transformation. They offered depositors liquidity, but held only a fraction of their own assets in liquid form – enough for normal day-to-day operations. The whole thing depended on confidence – if depositors

15 Shann (1930, p 49).

16 Shann (1930) and Newton (2010).

wanted their funds back *en masse*, a bank could not provide them because its assets were not all in cash. If there was a loss of confidence for some reason, the bank would be under pressure: there could be a run. So banks themselves needed access to liquidity in situations of stress; that is, they needed to be able to liquify assets when a shock to confidence occurred.

When such a shock was idiosyncratic, a bank might seek funding in the market. Other institutions, mindful of the possibility of contagion if a run got going, might support one of their competitors provided there was a reasonably held expectation of solvency. But if the confidence shock was more systemic in nature the question was how the whole system could be supported. This came to be seen as the proper role of a central bank and was ultimately encapsulated in Bagehot's famous (if widely misquoted) maxim that the central bank should be prepared to 'lend freely, against good collateral at a high rate of interest'.¹⁷ Of course central banking was at that time embryonic at best: the central banks in existence in Bagehot's day mainly had been established to help sovereigns raise war finance; their stability functions evolved later, over time.¹⁸

But while the provision of liquidity in crises left the system less vulnerable to runs, it was no real solution to simple bad lending. Even if all the good assets can be liquified to meet a run, if not all the assets are good, failure may still occur. Failures of individual institutions could be allowed provided they did not damage confidence in others, but it is always difficult to know just how small or large a failure might cross the threshold. Inevitably, since there could be spillovers from failures, and since banks and others would accept funds from the general public, there would end up being a degree of regulation.

¹⁷ I spoke at length about the role of a central bank as lender of last resort in the Melville Lecture at ANU in 2008, so will not cover it here in further detail (Stevens 2008).

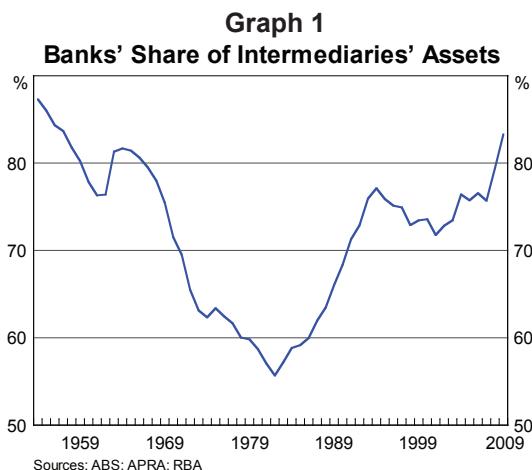
¹⁸ Most central banks in existence today were established in the twentieth century. The price stability mandate typically came later – since until the 1930s countries were typically on some sort of link to gold and the problem of continual inflation was not expected to arise in such a world.

And so the history of banking and finance is not just a history of financial innovation, it is also a history of regulatory response. That regulatory response has had its own quite pronounced cycles. Moreover, regulation prompts further innovation, and so on.

From the 1930s, regulation became much more intrusive. In the United States, fear of the 'money power' saw some large institutions (J.P. Morgan for example) broken up, much as occurred in some other industries at the time. Yet simultaneously, competition between banks was intentionally curtailed in some respects, for fear of irrational behaviour. Regulatory intervention extended to interest rates, requirements for reserves, prohibitions on certain types of business, and even lending guidelines and quotas. In the 1940s this all became part of the war-time apparatus that essentially sought to run economies via direct intervention rather than by relying on the price mechanism. However, it persisted in finance for many years after the war had ended, perhaps in part to keep low the costs of servicing large war debts. It was only really in the 1980s and 1990s that this regulatory approach had finally passed, allowing banks to compete vigorously for all lines of business and allowing pricing to be driven by market forces.

We can trace many of these trends in Australia. The 1937 Royal Commission argued for greater control and regulation of the Australian monetary and banking systems, motivated by the perceived failings of the financial system through the depressions. Legislation on many of the recommendations from the Commission was enacted in 1945 and continued the tight controls placed on banks during the Second World War. The focus immediately after the war was on stability with little regard given to the efficiency of the financial system. This was consistent with extensive government intervention and regulations in other markets.

As a result, in the early post-war period, the Australian banking system was highly constrained. There were tight controls on interest rates for bank lending and borrowing, on terms to maturity of different types of



deposits and loans, and quantitative and qualitative controls on banks' loans in aggregate and to particular types of borrowers. These were introduced to guard against excessive risk-taking by banks with depositors' savings and also were regarded as serving the needs of macroeconomic policy.

Given the pervasive and restrictive nature of these controls, it is perhaps not surprising that the banking system was very stable. In the almost five decades from the early 1930s until the problems of the Bank of Adelaide in 1979 no Australian bank failed or even faced serious financial problems.¹⁹ This was in a very real sense a result of the terrible 1890s depression which had been so influential on the young Shann. As Selwyn Cornish points out, that episode had a significant effect on the nature and form of much of Australian economic policy throughout most of the twentieth century, including financial regulation and central banking.²⁰

But the constrained banking system left a gap into which others stepped.²¹ As early as the 1960s, new, less regulated, financial institutions began to arise. The banks' share of financial intermediation in the Australian economy steadily declined from the mid 1960s, reaching a little over half at its lowest point in the early 1980s (Graph 1).

The increasing size and complexity of the system and the rise of non-bank financial institutions made the regulatory architecture increasingly less effective. By the late 1970s, the philosophical tide was turning against intervention as efficiency costs became more apparent – a trend not confined to finance.

Eventually these inefficiencies led to calls for financial liberalisation and so, around 40 years after the Royal Commission, the Campbell Inquiry laid the foundations for the intellectual and practical shift towards liberalisation and the current system. In addition to freeing up banks, the floating of the currency and the opening up of capital markets, a range of technological advancements – as well as economic development and policy changes affecting other sectors in the economy – also were important drivers of change in the financial system.

Questions Arising from the Growth of Finance

The past 20 years has seen a major increase in the size and breadth of activity of the financial sector in most economies, as well as an acceleration in the globalisation of finance.

Statistics abound to demonstrate this: the turnover in various markets, the real value of assets, the amount of gross derivative positions outstanding; all have grown considerably faster than the size of overall economic activity. Again some of these same trends are seen in Australia. Total assets of financial

19 Macfarlane (2006).

20 Cornish (2010).

21 This 'regulatory arbitrage' has antecedents, in the Medici example I used earlier, and descendants in the form of the recent North Atlantic financial crisis. In the recent case, as we all know, a great deal of financial activity moved outside the regulatory net, via the so-called shadow banking system which enabled the creation of a whole array of off-balance sheet vehicles, for example SPVs and conduits, to circumvent capital requirements.

institutions relative to the size of the economy have increased from the equivalent of around 100 per cent of annual GDP in the early 1980s to almost 350 per cent in recent years (Graph 2).

Noteworthy in some countries has also been a significant increase in the share of financial activity in the economy's value added and the proportion of people employed in the financial sector.

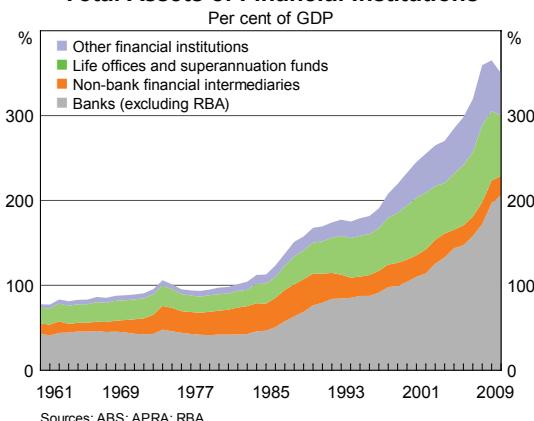
It is widely assumed that financial deregulation played a major role in this increase, and the timing seems to fit. Now, in the aftermath of the crisis, there is a more questioning tone about whether all this growth was actually a good idea: maybe finance had become too big (and too risky). This question is certainly a live one in the United Kingdom, where the City of London was very prominent in the economic success of the country since the mid 1980s.²²

There are at least two potential problems in a world where the finance sector becomes 'too big'. If it is accepted that finance has its own cycle – of risk appetite, leverage, crisis and then de-leveraging – then a bigger financial system compared with the economy, unless accompanied by much more capital (and it wasn't in the case of the big international banks – the reverse was true), risks de-stabilisation of the whole economy. Because crises can be costly, moreover, calls are inevitably placed on the public purse for support. These are very difficult to resist. In the current episode, the direct costs to the public purse of restoring financial stability in some of the North Atlantic countries are non-trivial. But the cost of lost revenue in the lengthy periods of economic weakness that seem invariably to follow financial crises is an order of magnitude larger. It is this factor really that has unleashed the recent round of concerns about public finances in the affected countries.

Secondly, as well as making incomes and activity less stable, an overly large financial sector, if characterised by perverse incentives that can drive extraordinary

²² See for example the recent conference on The Future of Finance at <http://www.futureoffinance.org.uk>, and particularly the papers by Turner (2010) and Haldane (2010).

Graph 2
Total Assets of Financial Institutions



remuneration for individuals, may draw in too many resources that could otherwise be employed at a higher social return. To put it in practical language, too many PhD physicists, mathematicians and engineers working on options pricing and designing structured products could lower, rather than increase, the productive capacity of the economy.

For finance is not, for the community, an end in itself. It is a means to an end. Ultimately it is about mobilising and allocating resources and managing risk and so on – providing the five outputs I listed earlier. Yet people have become suspicious of the way much of the activity in the financial system amounts to the production of 'intermediate' financial services, delivered to others within the same sector: the 'slicing and dicing' of risk, re-allocating it around the system to those who are most willing and best able to bear it (or, sometimes perhaps, and much more troublingly, to those who least understand it).

Some commentators – among them the chair of the UK Financial Services Authority – have openly questioned the social usefulness of much of this activity. In essence people are asking whether the rising size and pace of transactions of the finance sector is actually a sign of higher economic prosperity, or of something wrong. They are also questioning implicitly whether the thrust of financial liberalisation in the 1980s and 1990s was correct, or

at least may have gone too far, if it helped to produce these outcomes.

These questions are likely to be debated intensely over the next several years. This will be a growth sector of the conference and consulting industry. It is therefore premature to draw strong conclusions, but a few observations may be useful.

First, a small point of measurement. In most modern economies, the share of GDP accounted for by services generally has long been growing as agriculture and manufacturing get (relatively) smaller. It would not be surprising for the finance sector to be part of that. So it might make more sense to measure the financial sector as a share of the services sector, rather than as a share of total GDP. On this basis it will still have shown a distinct rise, but not quite as much. In Australia's case, by the way, the finance sector's share of services sector employment peaked around 1990, thereafter declined somewhat and has changed little for a decade.

Second, a fair bit of the growth in financial sector activity was surely bound to happen in view of changes in technology. These dramatically lowered costs, so that the provision of news and information became instantaneous and ubiquitous, as did the ability to respond to news. The capacity to monitor and manage a portfolio more actively is likely a 'superior good': people will want more of it as their affluence increases. The increasing development of financial management techniques and new instruments – another kind of technology, if you will – also led to a lot more gross activity. For example the conceptually simple process of keeping to a benchmark drives a good deal of transaction volume. So surely *some* of the growth in the finance sector *has* been genuinely useful, and the technological changes mean that much of it has been accommodated without much in the way of real resources being used. That is not to deny that there is a very important set of questions about the price the general public is paying for some of the services and about whether the capacity to respond to every piece of 'news' is resulting in an excessively

short-term focus in management. The latter is, of course, a question that extends much more widely than just the finance sector.

Third, the increasing integration of the global economy – itself assisted by financial development – brought the savings of literally hundreds of millions of Asians into the global capital market. This meant that differences between countries' policies and saving and investment appetites became more likely to affect financial trends and market prices. These factors were certainly one reason that interest rates, including long-term rates set in markets, not just the ones set by central banks, were so low in the middle of last decade. Surely this had a major bearing on the pace of growth of intermediation and, ultimately, the appetite for risk in the global system.

Fourth, we need to be careful how much blame we ascribe to changes in regulation for everything that went wrong. Of course it cannot be denied that the regulations had shortcomings. But while all significant countries were operating on more or less the same minimum standards for bank supervision, some countries had serious financial crises, but many – in fact most – did not. Moreover, a significant part of the problems arose in the 'shadow banks' – more lightly regulated institutions which were not banks (though some of them became banks subsequently when there was a regulatory advantage to doing so). Many observers have concluded that in the major countries, allowing large regular commercial banks to engage in more 'shadow banking' type activity without more capital was a mistake. But all this says that supervisory practice is as important as the formal regulations. Moreover, if those freedoms were granted in response to the demand by the commercial banks to get in on the action happening elsewhere, that points to the general environment as a big part of the story. As we know from our own history, if there is an incentive for risk-taking activity to occur (like low interest rates, for example), it will eventually occur even if it has to migrate to markets and institutions where fewer regulatory impediments are in place. To put this point at its most extreme, it

could be argued that that the overall environment dictates the appetite for risk-taking financial activity, and that the nature of regulation simply determines the location of the activity. That is, as I say, extreme, but there is some truth to it.

Looking Ahead

Where then does this leave us?

The regulatory cycle has come fully around. After two or three decades of liberalisation and allowing markets and private agents in the financial sector more sway, the international debate has of late been consumed with issues of financial regulation: how to re-design it, and generally increase it.

This is understandable, and it is entirely appropriate that these questions be posed in the light of the events of the past decade. My point is simply that we have been here before. If we think far enough back in history, there are things to learn about regulation and its cycle, just as there would have been – had people been more inclined to look – about the nature of private finance and *its* cycle.

The objective shouldn't be to suppress finance again to the extent it was for so long in the past. There would be a cost to the economy in attempting this, and in any event the financiers will be quicker to figure out the avoidance techniques than they used to be. The objective should, rather, be to foster arrangements that preserve the genuine benefits of an efficient and dynamic financial system, but restrain, or punish, the really reckless behaviour that sows the seeds of serious instability. Such arrangements surely have to include allowing badly run institutions to fail, which must in turn have implications for how large and complex they are allowed to become.

There is a large reform effort under way at the international level. I have spoken about this before on several occasions and so I will not revisit the regulation issue here. I would only say that while no doubt regulations can always be improved – and who would say otherwise? – it is unlikely that regulation *per se*, becoming more and more complex

and widespread as it is, will be the full answer. A big part of the answer must come from practice, not just black-letter law.

The finance industry, certainly at the level of the very large internationally active institutions, needs to seek to be less exciting, less ambitious for growth, less complex, more conscious of risk and more responsible about where those risks end up, than we saw for the past decade or two. And, of course, it does have to be better capitalised.

Equally, surely regulators and supervisors in some jurisdictions need to be more intrusive and assertive, to be prepared to go beyond minimum standards and to be a little less concerned about the competitive position of their own banks, than they have been in the past. It has been not uncommon, for example, for Australian bankers to complain about APRA's relatively strict rules on definition of capital for regulatory purposes, where other jurisdictions were more lenient. But the international supervisory community is at this moment in heated debate about what can and cannot be counted as capital, and it is moving, belatedly, in APRA's direction.

But to be effective, supervisors need support from their legislatures and executive government – in having strong legislation, adequate funding, and a high degree of operational independence from the political process in the conduct of their duties. In several countries legislatures are working now, in the aftermath of the crisis, to strengthen supervisory arrangements. That is good, but the most important time to have this support is in the boom period – when a cashed up private sector, which would much prefer the party to keep heating up, can bid quality staff from regulatory agencies and is not averse to looking for other ways of tilting the playing field in the direction of short-term profits. It is precisely then that capable, well-resourced and well-supported regulators need to be able to say 'no'.

Conclusion

Edward Shann died tragically in 1935. He did not live to see the full recovery from the Great Depression, nor the long post-war prosperity. He could not take part in the subsequent debate about financial regulation in its ebbs and flows. But were he to have been able to observe the past fifteen years in the global economy and financial system, I think he would have recognised many of the features.

Finance matters. Its conduct can make a massive difference to economic development and to ordinary lives – for good or ill. Moreover, finance has its own cycle – of risk appetite, innovation and occasional crisis. That won't change. Shann understood that and so must we.

The sort of financial system we should want is what was once described as 'the hand-maid of industry':²³ reliably facilitating transactions, fostering trade, bringing savers and investors together, pooling risk and so on. We don't actually want too many of the financiers to be 'masters of the universe'. There will always be a risky fringe, but it should stay at the fringe, not be at the core.

But the man we remember tonight would not want the financial system to be simply an arm of the state either, subject entirely to bureaucratic or political direction. We shouldn't be looking to go back to the 1940s and 1950s.

So we have to find the right balance involving regulation, supervision and financial industry practice. That is the task that lies before us. ✎

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²³I first heard this phrase in remarks by Ed Frydl at a conference many years ago – about a previous financial crisis. I have several times tried to find its origins. To my knowledge Withers (1916) was the first to use the phrase.

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Some Longer-run Consequences of the Financial Crisis

Glenn Stevens, Governor*

Address to The Anika Foundation Luncheon Supported by Australian Business Economists and Macquarie Bank, Sydney, 20 July 2010

Thank you for coming along today in support of the Anika Foundation's work supporting research into adolescent depression. This is the fifth such occasion and it is very gratifying indeed to see such a strong response from the financial community. I want also to record my thanks to the Australian Business Economists for their support and to Macquarie Bank for their sponsorship of today's event.

My subject is the consequences of the financial crisis. We are all aware of the immediate and short-term impacts the crisis had on the international financial system and the world economy. I won't repeat them.

The initial phase of the recovery has been underway for over a year now. Global GDP started rising in mid 2009. When all the figures are in we will probably find that it rose by close to 5 per cent over the year to June 2010, though the pace has been uneven between regions and with some of the leading Asian economies seeking to slow down to a more sustainable pace, and European nations tightening fiscal policy, there is a bit more uncertainty just now about prospects for 2011. The bulk of financial institutions most affected by the crisis have returned to profit, while estimates of the total losses to be absorbed from the whole episode have tended to decline somewhat lately (though they are still very large). Financial market dislocation has gradually eased, albeit with sporadic episodes of renewed doubts and instability.

But what of the longer-run consequences of the crisis? I want to offer some remarks under three headings, though with no claim this is an

exhaustive list. These remarks are about the general international situation, not Australia in particular, unless otherwise noted.

Fiscal Issues

The first lasting consequence is the fiscal burden taken on by countries at the centre of, or close to, the crisis. There are three components to this.

First, some governments took on bank ownership in order to ensure the replenishment of capital that had been too thin to start with and that was depleted by the losses on securities and loans. Table 1 shows public capital injections to the financial sector for several key economies. The amounts in mainland Europe could quite possibly grow soon as a result of the forthcoming stress tests. Note that this is not necessarily a permanent burden since, if carried out successfully, the ownership stake can be sold again in due course. In fact about 70 per cent of the funds invested by the United States in banks have been repaid, and the US Government expects to make an overall profit from these capital injections.¹ Nonetheless for a period of time governments are carrying a little more debt than otherwise as a result of the provision of support to the banking system.

* I thank George Gardner for assistance in preparing this address.

1 Of course the United States retains the stake in the insurer AIG. Fannie Mae and Freddie Mac also remain in government ownership though that perhaps might be seen simply as final recognition on the US Government's balance sheet of an obligation everyone always assumed it would meet.

Table 1: Government Support During the Crisis

	Capital injections to financial sector Per cent of 2009 GDP	Discretionary fiscal stimulus Per cent of GDP	
		2009	2010
Australia	0.0	2.8	1.8
Canada	0.0	1.8	1.7
China	0.0	3.1	2.7
France	1.1	1.0	0.5
Germany	1.2	1.5	2.1
Italy	0.3	0.0	0.1
Japan	0.1	2.8	2.2
Netherlands	6.3	2.5 ^(a)	
Switzerland	1.1	0.5 ^(a)	
United Kingdom	6.4	1.6	0.2
United States	2.9	1.8	2.9

(a) Cumulative effect of fiscal stimulus from 2008–2010 as a per cent of 2008 GDP

Sources: Bloomberg; De Nederlandsche Bank; Eurostat; IMF; OECD; Thomson Reuters

Second, the depth of the downturn saw recourse to discretionary fiscal packages. As the table shows, while there was a lot of national variation, for some countries this spending was quite significant relative to the normal pace of annual growth in GDP. To the extent that the packages had measures that increased spending for a finite period but not permanently, the result is a rise in debt of a finite magnitude, but not an ever-escalating path of debt.

But it is the third factor – namely the magnitude of the downturn itself and the initial slowness of recovery – that is having by far the biggest effect on debt ratios. According to the IMF, for the group of advanced economies in the G-20, the ratio of public debt to GDP will rise by almost 40 percentage points from its 2008 level by 2015. Fiscal stimulus and financial support packages will account for about 12 percentage points of this. Close to 20 percentage points are accounted for by the effects of the recessions and sluggish recoveries. Another 7 percentage points comes from the unfavourable dynamics of economic growth rates being so much lower than interest rates for a couple of years.

Now it is somewhat inaccurate to attribute the economic downturn effects entirely to the financial crisis because there would probably have been some sort of slowdown even without a crisis. There will always be a business cycle, after all, and deficits and debt rise when downturns occur. As a comparison, the rise in the debt ratio of the G7 from 2000 to 2005 associated with the previous cyclical downturn – which was not an especially deep one – was around 12 percentage points.

Nonetheless the recent downturn was a bad one in many countries, and that is because it was associated with a financial crisis. For this reason, together with the other factors I have already mentioned, the major countries generally are going to have significantly higher public debt relative to GDP after the crisis than before, and the debt ratios will continue to rise for several more years.

This was largely unavoidable. To a considerable extent, the fiscal legacy can be seen as one manifestation of a broader legacy of lost output (and hence weaker budgetary positions through ‘automatic stabilisers’) over a period of several years.

Generally speaking, the public balance sheet has played the role of a temporary shock absorber as private balance sheets contracted.

But the servicing of the resulting debt is an ongoing cost to the citizens of the countries concerned. At present that additional cost is, in some countries, reduced compared with what it might have been due to the low level of interest rates on government debt that we see. Moreover, had the debt not been taken on it could well be that the economic outcomes would have been much worse, so increasing fiscal and other costs. Nonetheless this lasting debt servicing burden is a real cost.

More importantly, the pace of the rise in public debt has increased focus on the question of fiscal sustainability. This is especially so in those countries where debt burdens were already considerable before the crisis.

The difficulty is that 'sustainability' is so hard to assess. It is more complex than simply the ratio of debt to GDP. In any number of countries, including our own, public debt ratios have on some past occasions been much higher than 100 per cent. Many countries found themselves with such a situation in the aftermath of World War II. Those ratios thereafter came down steadily though it took until the 1960s in our case, or longer in some others, for them to reach levels like 50 or 60 per cent that today is often regarded as a sort of benchmark.² That reduction occurred for a combination of reasons. The big deficits of the war years really were temporary in most cases; economies recorded good average rates of output growth in the long post-war boom with strong growth in both population and productivity; in the same period, business cycle downturns were not especially deep or protracted; interest rates were low – so the comparison of the growth rate of GDP and the interest rate on the debt was favourable; and lastly, significant inflation raised the denominator of

the ratio – in some cases in the late 1940s and early 1950s, and more widely in the 1970s.

So high or even very high debt ratios *per se* have not necessarily been an insurmountable problem in the past. On the other hand, that earlier decline in debt ratios may not be easy to replicate in the future. In some countries demographics are working the wrong way, with population growing more slowly or even declining. Other things equal, future growth of nominal GDP will thus be lower than in the past. A period of rapid catch-up growth in income, which helped Europe and Japan in the couple of decades after 1950, is more likely in the future to occur in the emerging world than in the parts of the developed world where most of the debt is.

In fact it might be argued that the fiscal position of a number of countries has been increasingly vulnerable for quite some years. Perhaps what the crisis has done is to act as a catalyst to bring forward a set of pressures for long-term budgetary reform that were bound to emerge anyway.

This has placed some governments in a very difficult bind, since the heightened focus on sustainability has increased the pressure for fiscal consolidation at a time when aggregate demand remains weak. The 'least-damage path' through the various competing concerns has become harder to tread.

Public Intervention in Finance

The second long-run implication of the crisis is that government intervention in the financial sector has become much more pervasive. I have already mentioned governments taking major stakes in banks in key countries, which was virtually unthinkable, certainly for an American or British government, only three years ago.

But the intervention was broader than just a temporary period of public ownership – as massive an event as that has been. Take guarantees. Once the Irish Government guaranteed its banks, governments all over the world felt bound to follow suit in some form or other – expanding or (as in our case) introducing deposit insurance, and

² A public debt to GDP ratio of 60 per cent was one criterion in assessing eligibility for the European monetary union and was a benchmark in the Stability and Growth Pact (a Pact perhaps more often honoured in the breach).

guaranteeing wholesale obligations (for a fee). The feeling was probably most acute in countries whose citizens could shift funds to a bank guaranteed by a neighbouring country without much effort.

In circumstances of incipient or actual panic, or potential complete market closure, measures along such lines had to be taken. The simple truth is that, given a big enough shock, the public backstop to the financial system has to be used.

But the backstop having *been* used so forcefully on this occasion, it is desirable not to use it again soon. The real question is how, having set the precedent, governments avoid too easy recourse to such measures in the future. They will want to get to a position where in future periods of financial turmoil, they are standing well in the background, not in the foreground.

Meanwhile there is a growing debate, at a very high level, about what the financial sector should do, and what it should not do. The number of inquiries, commissions, conferences, papers and ideas about the desirable shape of the system in the future is growing. This is a growth industry with, I should think, pretty good prospects over the next few years.

Another characteristic of public intervention is the expansion of central bank balance sheets. During a panic, the central bank's job is to be prepared to liquefy quality assets, with a suitable combination of hair-cuts and penalty rates, to the extent necessary to meet the demand for cash.

Once the panic is over, the additional liquidity shouldn't need to remain in place, and indeed some particular facilities established by central banks had design features which saw their usage automatically decline as conditions improved. But overall it has proven difficult, so far, for the major central banks to start the process of winding down the sizes of their balance sheets.

In effect central banks have been replacing markets. They had to. If counterparties feel they cannot trust each other and flows between them are cut off, with everyone preferring to keep large liquid balances with the central bank, the central bank has to replace

the market to ensure that everyone has the cash they need each day (against suitable collateral of course). Central bank purchases have also acted to reduce credit spreads and yields.

I am not arguing that this policy is macro-economically wrong. But consider the implications of persisting with it over a long period. One doesn't have to believe that markets can solve all problems to accept that well-functioning markets have a value. A cost of the zero or near zero interest rate and a greatly expanded role for the central bank's balance sheet is that some markets tend to atrophy – as Japan has found over a decade.

Moreover some central banks have had to accept a degree of risk on their own balance sheets that is considerably larger than historical norms. Of course since the governments are ultimately the owners of the central banks, that is where the risk really resides. From a purely financial point of view, the risk of a rise in yields on bonds held by central banks, but issued by their own governments, is actually no risk at all once the central bank is consolidated with the government. On the other hand, to the extent that central banks are really exposed, or are exposing their governments, to private credit risk or to the risk of other sovereigns, those are genuine risks.

So some central banks, like their governments, have found themselves in very unusual terrain. It is terrain: in which the relationship between the central bank and the government is subtly changed; where the distinction between fiscal and monetary policy is less clear; from which it may be hard to exit in the near term; and a side effect of which may be wastage, over time, in some elements of market capability.

Regulation

Of course I have not yet mentioned the other significant public intervention in finance which is the major regulatory agenda being pursued by the international community. This is being pushed by the G-20 process and by the Financial Stability Board. The 'perimeter' of regulation is being extended to include hedge funds and rating agencies. Governments are

demanding a say in the pay of bankers and talking of specific taxes on banks' activities. The climate is more difficult for bankers these days, it seems, especially in countries where the public purse had to be used to save banks.

But the core work on regulatory reform is being done by the Basel Committee on Banking Supervision. I am not sure who first began to talk of this as 'Basel III' but the label seems to be starting to stick. Basel II came in only about two years ago for many countries, 20 years after Basel I. The gap between Basel II and Basel III looks like being a lot shorter. Warning: that pace of acceleration in devising new standards is unsustainable!

You would all be well aware of the essence of the proposals. In a nutshell, what regulators are pushing toward is a global banking system characterised by more capital and lower leverage, bigger holdings of liquid assets and undertaking less maturity transformation. It is hoped that this system will display greater resilience to adverse developments than the one that grew up during the 1990s and 2000s.

What will be the implications of the various changes? Put simply, the customers of banks around the world, and especially of large internationally active banks, will generally be paying more for intermediation services, in the form of higher spreads between rates paid by banks and rates charged by them. The reason is that capital is not free and it typically costs more than debt. The spread between a bank's own cost of debt, both deposits and bonds etc, and the rate it charges its borrowers has to cover operating costs, expected credit and other losses and the required cost of equity capital. Assuming the costs of equity and debt do not change, the more capital intensive the financial structure is, the higher that spread has to be. A requirement to hold more high quality liquid assets and/or to lengthen the maturity of debt has a similar effect.

Of course the costs of equity and debt may not be, and actually should not be, constant as banking leverage declines. The cost of wholesale debt should

fall over time if the equity buffer, which protects unsecured creditors against losses, is larger. In time, the cost of equity may even fall with lower leverage if the required equity risk premium declines to reflect a less variable flow of returns to equity holders. All of that assumes of course that the perceived riskiness of the underlying assets is unchanged.

Still, such effects would take some time to emerge. Most observers appear to agree that even allowing for some possible pricing changes over time, spreads between banks' borrowing and lending rates will be wider in the new equilibrium after the regulatory changes have been fully implemented.³

What will be the broader economic effects of these higher costs of intermediation?

The conclusion most people are reaching is that economic activity will, to some extent and over some horizon, be lower than otherwise. The question is, by how much and for how long? There are various ways of approaching that question. Researchers are putting it to various macroeconomic models. The answers will vary, depending on the models and particularly according to the degree of detail in models' financial sectors. Overall, these techniques are likely to show moderate but nonetheless non-zero effects on economic activity of the regulatory changes over an adjustment period of several years.

Some other analyses, often by banks themselves, find much larger adverse effects. This is usually because they find that credit to the private sector must be reduced in order to meet the various standards, particularly liquidity standards, because it is assumed there will be quantity limits on the availability of funding in the form necessary. It is further assumed that a mechanical relationship between credit and GDP exists, which in turn results in big adverse impacts on GDP.

To a fair extent these differences come down to a discussion about what economists would call

³ By the way, in those countries that choose to impose 'levies' of some kind or other on banks, we shouldn't assume that the banks' shareholders will ultimately bear such costs: it is fairly likely that the costs of this tax will fall mainly on the customers.

elasticities: for the non-bank private sector to respond to a desire for banks to be funded differently, how big a change in the price is required – a little, or a lot? Some of the industry estimates appear (to me anyway) to assume elasticity pessimism. Official sector estimates are likely to be based on less pessimism.

In truth, it is impossible to know for sure exactly how big these effects will be. That is a reason to proceed carefully, and to allow time for the new rules to be phased in. Clearly, we wish the new rules to be constraining risk taking and leverage as the next boom approaches its peak, but that will probably be some years away, so we have time to implement strong standards and allow an appropriate period of transition.

That said, there are three broad observations that I would like to offer.

First, I think we ought to be wary of the assumption of a mechanical relationship between credit and GDP. Of course a sudden serious impairment in lenders' ability to extend credit almost certainly amounts to a negative shock for growth in the short term. But did the steady rise in leverage over many years actually help growth by all that much? Some would argue that its biggest effects were to help asset values rise, and to increase risk in the banking system, without doing all that much for growth and certainly not much for the sustainability of growth in major countries. Some gradual decline in the ratio of credit to GDP over a number of years, relative to some (unobservable) baseline, without large scale losses in output may be difficult to achieve but I don't think we should assume it is impossible.

Secondly, even accepting that there will probably be some effect of the reforms in lowering growth over some period of time, relative to baseline, we have to remember that there is a potential benefit on offer too: a global financial system that is more stable and therefore less likely to be a source of adverse shocks to the global economy in the future. So we have a cost-benefit calculation to make. Quantifying all this

is very difficult, but then that is often the case when deciding policies.

Thirdly, however, the reforms do need to be carefully calibrated with an eye to potential unintended consequences. One such consequence, obviously, would be unnecessarily to crimp growth if the reforms are not well designed and/or implementation not well handled.

Another could be that very restrictive regulation on one part of the financial sector could easily result in some activities migrating to the unregulated or less regulated parts of the system. Financiers will be very inventive in working out how to do this. If the general market conditions are conducive to risk taking and rising leverage (which, sooner or later, they will be if the cost of short-term money remains at zero), people will ultimately find a way to do it. Of course while ever the unregulated or less-regulated entities could be allowed to fail without endangering the financial system or the economy, *caveat emptor* could apply and we could view this tendency simply as lessening any undue cost to the economy of stronger regulation of banks. But if such behaviour went on long enough, and the exposures in the unregulated sector grew large enough, policymakers could, at some point, once again face difficult choices.

Conclusion

The financial turbulence we have lived through over recent years has had profound effects. The most dramatic ones in the short-term have been all too apparent. But big events echo for many years. My argument today has been that the full ramifications are still in train, insofar as impacts on governments' finances, governments' role in the financial sector and the trend in regulation are concerned. It will be important, as these reverberations continue, for there to be a balanced approach blending strong commitment to sensible long-run principles with pragmatism in implementation.

In Australia we have been spared the worst impacts of serious economic recession in terms of lost jobs,

much as we will be spared the prospect of higher taxes that face so many in the developed world. These are factors that support our native optimism, at least about economic conditions.

Nonetheless depression still ranks as a serious, and underestimated, problem in our community including among our young people. That is why the work of the Anika Foundation, working alongside other bodies seeking to combat depression, is so important, and why I thank you all very much for coming along today. ☺

Recent Developments

Glenn Stevens, Governor

Address to Western Sydney Business Connection, Castle Hill RSL, Sydney, 9 June 2010

Thank you for the invitation to be here today in western Sydney, a region which accounts for about one in every 15 people employed in Australia.

Of course events far from western Sydney can affect all of us here, through various channels. In view of the developments in recent weeks in Europe, it seems sensible to devote some time to what has occurred, and to what it may mean for Europe itself, for the global economy and of course for Australia. I should stress at the outset, though, that any assessment is very much preliminary at this stage.

To begin, let me sketch some background on the global economy.

We estimate that world GDP grew by around 1 per cent, or perhaps a little more, in the March quarter of this year. This was the third consecutive quarter of growth of about that pace after the contraction in the first half of 2009. Note that this occurred with very little contribution from the euro area, a region in which domestic demand contracted over the past two quarters.

Many respectable forecasters have pencilled in a growth rate for 2010 as a whole of 4 per cent or a bit more – that is, they have expected that the sort of the growth already seen for the past nine months or so would continue for the rest of this year. This would be close to, or slightly above, the average pace of growth for the global economy over the ten years up to 2008.

This is not just the Reserve Bank's forecast – though we broadly concur with it at this stage. The IMF, the OECD and various private forecasters have numbers

like this. There are some who are more pessimistic, though there have also been others somewhat more optimistic. It is worth noting, by the way, that this outcome would be noticeably better than what was expected a year ago. For most of the intervening period the bulk of commentators seem to have been worried by 'downside risks' – that is the possibility that things could turn out worse than expected. But it was the 'upside risks' that, in fact, materialised over that period.

One reason for that may be that all countries responded to the events of late 2008 by moving their macroeconomic policies in an expansionary direction. Just as the downturn in October 2008 was highly synchronised, so was the policy reaction. In countries that have not had an impaired banking system, those policy reactions have had a considerable effect. They were amplified by the spill-overs that occurred because the stimulus took place in all countries more or less at the same time.

Yet the upswing is uneven. It has been very strong in Asia and Latin America, moderate so far in the US and weak overall in Europe (which itself has quite a mix of growth performances across countries).

Of importance to Australia is that the strongest growth in demand has been nearby. Apart from Japan, most of the economies in the east Asian region have experienced a 'v-shaped recovery'. While some of this recovery reflects the process of re-stocking of durable goods around the world, it also reflects strong demand within the region.

Commodity prices generally rose somewhat after the very large falls in late 2008. But of significance for Australia, prices for those resources which serve as the raw materials for steel production in particular have been exceptionally strong. Prices for iron ore and coal rebounded very sharply during 2009 and early 2010. Contract prices for iron ore in the current period are double those of a year ago; until recently spot prices were well above even that level though they have retreated somewhat of late.

In short, global growth, while uneven, has been recovering in the places and in the form that was most likely to deliver a boost to Australia's terms of trade. It looks like our terms of trade this year will again reach the 50-year high seen two years ago.

It could, of course, be that some of this recent increase in prices turns out not to be permanent. Some economies in Asia will probably, one way or another, experience a moderation in the pace of expansion over the coming year, because the pace of growth over the past year can't be sustained without problems arising. The Chinese authorities have been seeking for some months to take the steam out of certain sectors of their economy, particularly housing prices. They may be having some success. For this and other reasons, we and other forecasters are assuming that this peak in the terms of trade won't be sustained.

But to reach that 50-year high twice in three years would appear to signal that something pretty important has been going on – something more than just temporary cyclical events. It is increasingly apparent that the Asian region is becoming large enough that it has a tangible independent impact on the global economy and on Australia in particular. China and non-Japan east Asia together accounted for around 9 per cent of the world economy in 1990. By 2000, their share was around 14 per cent. In 2010, it is likely to be about 20 per cent. China is already the world's largest steel producer and the second largest user of oil after the United States. China's

share of global GDP¹ could exceed that of the euro area within another five years.

This confluence of events is likely to see an acceleration in the shift in perceptions about the shape of the global economy and financial system. The prominence of Asian views, and the weight accorded to them, are likely to grow accordingly. What Asian policymakers do and say increasingly matters.

Turning then to the recent events in Europe, it is worth asking at the outset how these countries arrived at their current position. The story has many nuances by country but broadly, the public debt relative to GDP has long tended to be on the high side in Europe. It generally ratcheted up in successive economic downturns over the past three or four decades and efforts to get it down in the good times had only modest success. For some countries that joined the euro area the substantial fall in borrowing costs they enjoyed masked a degree of vulnerability, in that their fiscal sustainability depended partly on being able to continue borrowing cheaply. Demographic trends – pronounced in Europe, with some countries already experiencing declining populations – further highlight the problem. A high debt burden is much more easily managed in countries with higher potential growth prospects, one driver of which is population growth.

This problem was slowly but steadily accumulating over many years. Then the financial crisis occurred. There was a deep recession from which recovery is not yet entrenched. Budget deficits rose sharply as a result – reaching 10 per cent of annual GDP or more in a number of instances. The prospect of adding that much to the debt stock each year for even just a few years can make a difference to assessments of sustainability even for strong countries. For the not-quite-so-strong cases, markets began to signal unease. Borrowing costs rose for those countries, which of course makes the fiscal situation worse. And so on.

¹ Measured on a purchasing power parity basis.

Initially the effect of these developments on financial markets was very much confined to Europe. Wider effects were observed in May as global investors became more cautious. Uncertainty over the nature of the policy response, and fears that it could be un-coordinated across countries, saw a marked increase in volatility in share prices and exchange rates. Our own markets have been affected along with everyone else's.

Qualitatively, some of the market events had a little of the flavour of September and October 2008 about them. *Quantitatively*, however, they have, at this point, been nothing like as pronounced. Indicators of stress in markets have not, to date, signalled anything like the problems of late 2008 when interbank and capital markets seized up. But of course the episode is not yet over, and the issues will continue to need careful handling by all concerned and close monitoring by the rest of us.

European authorities have responded by assembling a large support package, which covers Greece but, if needed, other countries too. It has several elements. It provides European-level financing for individual governments – so relieving them of the need to go to private capital markets – for a period of time, subject to conditions. The European Central Bank is undertaking some operations to stabilise dysfunctional bond markets and is ensuring abundant liquidity in money markets. The IMF has also committed to make funds available and will play a role in ensuring conditionality requirements are met. The final element is that governments are committing to reduce budget deficits and thus control the future rise of debt, though debt will keep increasing for a few years. Of course much detail remains to be set out as to how the mechanics of the package will work.

At this stage any assessment about the impact of these events on the economies of Europe and on those further afield is very preliminary. One might expect some effect on business and household confidence, but it is too early to see much evidence of that yet.

Looking ahead, we would have to expect that the planned fiscal contractions will dampen European demand as they occur, which in some cases will be over a number of years. Now some such effects should already have been embodied in existing projections since fiscal consolidation has been planned all along. But with some euro area countries now intending to do more consolidation in the near term than they had earlier planned, the dampening effects will occur sooner than earlier assumed (though this presumably improves growth prospects in a few years' time compared with the earlier forecast). The alternative path of less fiscal action would carry less risk of near-term weakness in demand. However in the current climate it could also have an attendant risk of loss of fiscal credibility. If the latter occurred, it could be followed in short order by a serious crisis that would push up borrowing costs sharply for both governments and private borrowers, so damaging growth.

So a path involving a credible fiscal consolidation has to be found that steers between these two possible bad outcomes. That task has become more difficult. Over the horizon of a couple of years it is hard to see how euro area demand won't be weakened. All other things equal, that would lessen global growth in 2011 compared with earlier projections (although it must be said that those projections have not relied all that much on growth in the euro area).

Of course, all other things won't be equal. Financial markets and, perhaps, policymakers will respond to these events. The decline in long-term interest rates in the core European countries and many other countries around the world that has occurred may work, if it is sustained, to lessen the adverse impact on growth in those countries. If policymakers in other regions responded to the potential euro area weakness by leaving policies easier than they would otherwise have been, this too would have some offsetting impact, though possibly at the cost of more unbalanced growth.

As to the effects on Australia, the euro area takes only about 5 per cent of Australia's exports. Those exports have been declining over the past few years anyway because the euro area has been weak for a while. So that direct effect doesn't seem likely to be all that large. It is usually the case, however, that the most important impacts on Australia from these sorts of events are not the direct export effects but those that come through the broader global channels – the impact on world and Asian growth, on resource prices and on the cost and availability of global capital.

How big those effects may turn out to be remains to be seen. But one thing we can say is that one of the most important advantages in coping with episodes such as this is a good starting point. There is an old joke about the best way to get somewhere involving 'not starting from here'. We are not starting from the same place as Europe. In particular, Australia's budgetary position is very different from those in Europe and, for that matter, most countries. Public debt is low and budget deficits are under control and already scheduled to decline. The banking system is in good shape with little exposure to the European sovereigns having the biggest problems, and asset quality is generally better than had been expected. The flexibility afforded by our floating currency, coupled with credible monetary and fiscal policies, are all advantages in periods of global uncertainty. This doesn't mean there will be no effects. But these factors put us in the best position to ride through this particular event, even if it does get worse.

Stepping back from the immediate issues, a final question worth posing is: what lessons might we take away from watching the travails in Europe?

One is that vulnerabilities can remain latent for a long time, then materialise very rapidly. Markets can happily tolerate something for an extended period without much reaction, then suddenly react very strongly as some trigger brings the issue into clearer focus. There were certainly significant revelations about the true financial position in Greece that occasioned additional concern, but more generally

in Europe it can't really have been news that the state of public finances was an issue: it had been so for years. But governments didn't come under gradually increasing market pressure to fix the problem – the pressure was minimal for a long time, then it suddenly became intense after a trigger event, in this case an economic downturn.

It follows that potential vulnerabilities need to be addressed in good times, even when markets are not signalling unease, because by the time markets take notice and start responding seriously – which will usually be in bad times – the problem may have become pretty big.

How is this relevant to Australia?

Australia does not have a problem with public debt, as I have already said. Nor do we have a problem with corporate debt. Some highly leveraged entities foundered over the past couple of years but most of the corporate sector had pretty strong balance sheets going into the downturn and they are even stronger now.

The big rise in debt in the past couple of decades has been in the household sector. There have been many reasons for that and, overwhelmingly, households have serviced the higher debt levels very well. The arrears rates on mortgages, for example, remain very low by global standards. As a result the asset quality of financial institutions has remained very good. So, to be clear, my message is *not* that this has been a terrible thing.

But that doesn't mean it would be wise for that build-up in household leverage to continue unabated over the years ahead. One would have to think that, however well households have coped with the events of recent years, *further* big increases in indebtedness could increase their vulnerability to shocks – such as a fall in income – to a greater extent than would be prudent.

It may be that many households have sensed this. We see at present a certain caution in their behaviour: even though unemployment is low, and measures of confidence have been quite high, consumer

spending has seen only modest growth. This may be partly attributable to the fact that the stimulus measures of late 2008 and early 2009 resulted in a bringing forward of spending on durables into that period from the current period (though purchases of motor vehicles by households – a different kind of durable – have increased strongly over recent months). But the long downward trend in the saving rate seems to have turned around and I think we are witnessing, at least just now, more caution in borrowing behaviour. Of course this will have been affected by the recent increase in interest rates but the level of rates is not actually high by the standards of the past decade or two. We can't rule out something more fundamental at work.

We can't know whether this apparent change will turn out to be durable. But if it did persist, and if that meant that we avoided a further significant increase in household leverage in this business cycle, it might be no bad thing. Moreover if a period of modest growth in consumer spending helped to make room for the build-up in investment activity that seems likely, perhaps that would be no bad thing either.

These sorts of trends would surely increase the medium-term resilience of household finances and accommodate the resource boom and the rise in other forms of investment with less pressure on labour markets and prices than otherwise.

The world economy has to date staged a stronger recovery than most thought likely a year ago, albeit one that is uneven across regions. Looking ahead, it has to be expected that the unfolding situation in Europe, which is going to result in earlier fiscal tightening than had been assumed by forecasters until now, will weigh somewhat on global growth in 2011. But the overall outcome will depend on what else happens and judgements about all that at this stage can only be preliminary. It cannot be denied that the potential for further financial turmoil exists, but to date the stresses have not been of the order of magnitude we saw a year and a half ago.

Much still hinges, however, on the way European policymakers craft their ongoing response to a complex problem.

We in Australia must naturally keep a careful watch on all this. It will be just as important, though, to keep a close watch on developments in the Asian region. Asia will be affected by events in Europe, but also by domestic forces. The experience of the past few years is that those domestic factors – good or bad – can loom just as large as ones further afield when it comes to Asia's economic performance and, therefore, our own. In the final analysis, sensible and credible policies at home, the strength of our financial institutions and the resilience and adaptability of the businesses and employees that make up the Australian economy, will continue to be our greatest assets. ✎

Twenty Years of Economic Growth

Ric Battellino, Deputy Governor*

Address to Moreton Bay Regional Council, Redcliffe, Queensland, 20 August 2010

Introduction

The Australian economy has started what will be its twentieth year of economic growth. This has been a remarkable performance – one that is unprecedented both in Australia's economic history and among other developed economies over this period. It raises a number of interesting questions:

- why was Australia able to record such a good performance; were we just lucky, or were there economic policy decisions that contributed to it?
- how has this growth been distributed across the nation? and
- what is the likelihood of it continuing?

I would like to focus on these issues in my talk today, but, before I do, it might be useful if I set out some facts and figures.

Historical and International Comparisons

Following the recession in the early 1990s, the Australian economy began to grow again in the September quarter 1991 (Graph 1). In the period since, the economy has grown in every quarter except three.

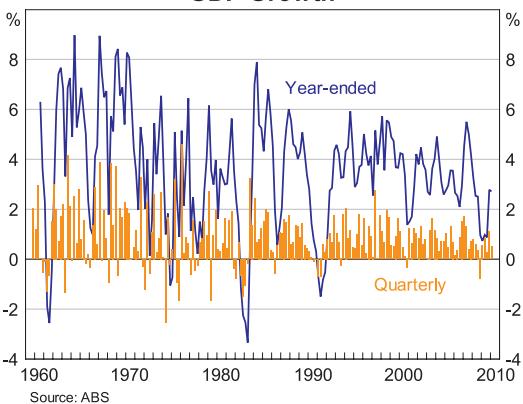
There were a couple of periods when economic growth slowed noticeably, but at no time did year-ended growth turn negative. The lowest rate that year-ended growth fell to was 0.7 per cent. That was in the year to the March quarter 2009. The other slowdown was in 2000–2001, when growth slowed to 1.4 per cent.

I should note that, while growth remained positive, both these slowdowns in economic activity did cause a noticeable rise in unemployment.

The period since 1991 is the longest period of growth that Australia has recorded for at least the past century. The next longest period during which year-ended growth remained positive was the 13 years between 1961 and 1974.¹ In the 1970s and 1980s, growth phases typically lasted only seven or eight years before another recession hit.

As I mentioned, no other developed economy has experienced uninterrupted growth over the past 20 years. In fact, many developed economies have experienced two episodes of negative growth during that period: one in 2001 following the collapse of the dot-com bubble; and one in 2008 following the collapse of the US sub-prime housing bubble. Even among the fast-growing emerging

Graph 1
GDP Growth



* I would like to thank my colleagues in the Bank's Economic Group for their assistance with this talk, particularly Susan Black and Cathie Close.

1 That period, however, was broken by consecutive quarters of negative growth in December 1971 and March 1972.

economies, such an extended period of growth is rare, as most of these countries were affected at some point by the various crises that occurred over that period.

Australia's performance, therefore, is quite unusual and I think it is worth spending some time thinking about how it was achieved.

Factors Contributing to this Performance

Part of the growth came, of course, from the fact that the population grew strongly over the period, particularly in recent years. Some people might also say that Australia was just lucky: that it was well-placed to take advantage of the emergence of China, both in terms of its location and the composition of its exports. I think these factors have played a role, but they are only a small part of the explanation. The China story has been significant only over the past five years; most of its significance still lies ahead. Remember, too, that the country that was our main export market, Japan, has experienced very subdued economic growth over the past 20 years, and that several other of our Asian trading partners experienced a very severe economic crisis in the 1990s. I would therefore conclude that our luck has been somewhat mixed, and we need to look to other factors to explain Australia's good growth performance.

I won't pretend to be able to provide a detailed analysis of these factors in the short time available today, but I do want to highlight a couple of factors I think have been important. These are the increased flexibility of the Australian economy and the pursuit of prudent and disciplined financial policies.

The Australian economy over the past 20 years has shown a greater degree of flexibility than was the case in the 1970s and 1980s. This has made it more resilient to the various external shocks that have been experienced over the period: the Asian crisis; the collapse of the dot-com bubble; and the recent collapse of the US sub-prime credit bubble, to name some of the more severe.

One of the key elements in that flexibility has been the floating exchange rate. The Australian dollar has played an important countercyclical role by rising and falling in response to various external events that otherwise might have had the potential to destabilise the domestic economy. This was evident both during the Asian crisis and the dot-com bubble, when the Australian dollar fell sharply in response to deteriorating economic conditions abroad, helping to insulate the domestic economy.

Evidence of the role played by the exchange rate in stabilising the economy can also be seen in recent years. The Australian dollar rose strongly between 2006 and 2008 as commodity prices rose, which helped to dissipate pressures that would otherwise have caused the economy to overheat. Conversely, the temporary, but sharp, fall in the exchange rate during the recent financial crisis helped cushion the economy on the downside.

Given the consistent way in which the exchange rate has moved to insulate the economy from various external shocks, I would have to conclude that the decision to float the exchange rate in 1983 ranks among the most important economic reforms, if not the most important reform, of the past 30 years.

But other reforms have also clearly played a role:

- a wide range of reforms to competition and industry policy, implemented over many years, have seen the business sector become more outward-looking and competitive;
- labour market reforms, some extending back to the late 1980s, gave the labour market increased flexibility to respond to changing economic conditions without producing large swings in unemployment or unsustainable pressures on wages; and
- various reforms of the financial system gave it greater capacity to meet the financing needs of the economy and made Australia more attractive to foreign investors.

In total, these reforms contributed to a substantial pick-up in productivity in the 1990s. The Bank

estimates that, during that decade, Australia was able to produce an extra 1½ per cent of output per year simply by using capital and labour more efficiently (Table 1).

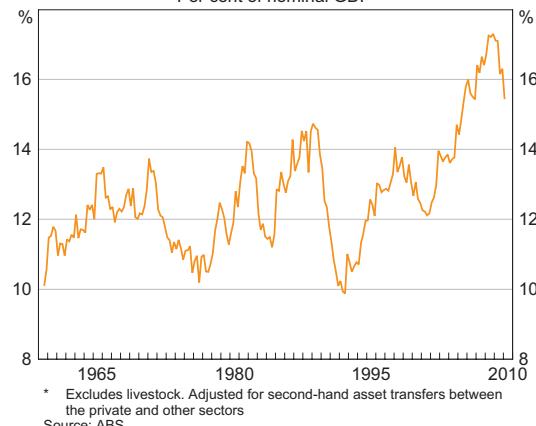
Unfortunately, this growth in productivity appears to have slowed substantially more recently. Perhaps this is partly a measurement problem, since the large shifts we have seen in the composition and pricing of output in recent years may have complicated the measurement task. Some of the slowdown in productivity is also a reflection of the economy being relatively fully employed in recent years. It is also possible, however, that the slowing in productivity growth is due to the fading effects of the earlier economic reforms.

Output growth has not slowed as much as productivity in recent years, because businesses have been applying increased amounts of labour, and particularly capital, to production. Business investment in recent years has risen to a very high level relative to GDP, one of the highest among the developed economies (Graph 2). Employment growth has also been strong. Nonetheless, the slowdown in productivity growth has meant that GDP growth in the latest decade was not as fast as in the previous decade.

Disciplined economic policies also contributed to the good economic performance of the past 20 years. They have prevented the build-up of imbalances that might otherwise have threatened the economy, as occurred frequently in the 1970s and 1980s.

Graph 2 Business Investment*

Per cent of nominal GDP



Government budget finances were greatly improved during the period. Budget surpluses were recorded in 10 of the 19 years since 1991. Government debt was reduced sharply, leaving Australia as one of the best positioned developed economies in terms of government finances.

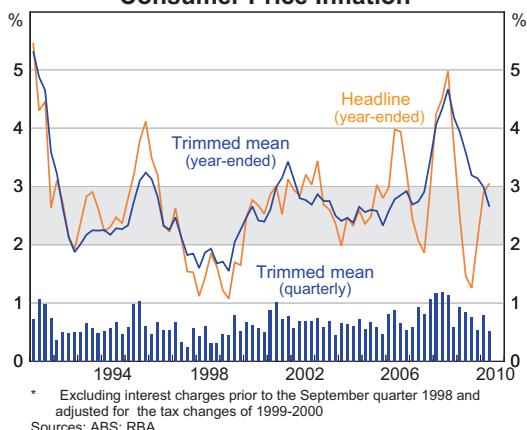
Monetary policy helped keep inflation low, providing a stable environment in which businesses and households could plan and undertake their economic activities. Since inflation targeting began in 1993, inflation has averaged 2.7 per cent, a little above the mid-point of the target range (Graph 3).

Table 1: Output Growth
All Industries

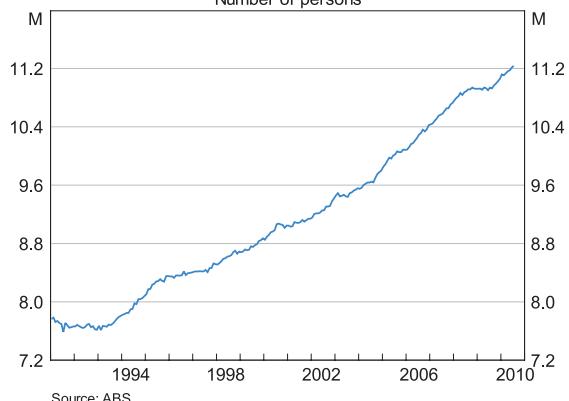
	GDP growth Average annual percentage change	Contributions to GDP growth (percentage points) ^(a)		
		Labour	Capital	Multifactor productivity
1990/91 to 2000/01	3.6	0.8	1.3	1.5
2000/01 to 2008/09	3.2	1.0	1.8	0.4
1990/91 to 2008/09	3.4	0.9	1.5	1.0

(a) Estimates based on a Cobb-Douglas production function
Sources: ABS; RBA

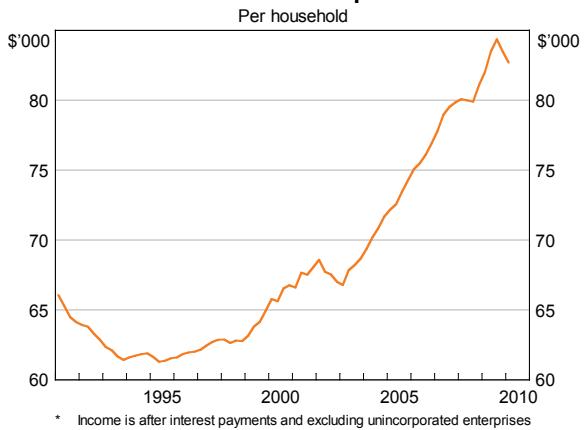
Graph 3
Consumer Price Inflation*



Graph 4
Employment
Number of persons



Graph 5
Real Gross Household Disposable Income
Per household



How has this Growth been Distributed through the Economy?

Economic growth is important because it allows living standards to rise and more people to find work. The benefits that have flowed to Australians in this respect over the past couple of decades have been impressive. Since June 1991, 3.5 million new jobs have been created and income per household has risen by a cumulative 30 per cent in real terms (Graphs 4 and 5).

The increase in jobs, which represented a rise of 2 per cent per year on average, was faster than the growth in the population, and was met partly by an increase in the proportion of the working-age population that is in the workforce, and partly by a decline in unemployment. Over the period, the unemployment rate fell from 9 per cent to a little over 5 per cent.

One question of interest is how the benefits of this growth were distributed through the community. There are various ways to look at this: one is across the states; another is across the income distribution; and a third is across industries.

Let me start with a comparison of the states. The key point that stands out is that all the states shared in the growth over the period, though Queensland and Western Australia grew faster than the others. As can be seen in Table 2, growth in gross state product in Queensland averaged 4.8 per cent per year, and that in Western Australia, 4.5 per cent. The other states averaged between 2.8 per cent and 3.7 per cent. Population shifts explain most of this gap, however, and on a per-capita basis growth in gross state product was more uniform.

All the states also experienced large falls in unemployment over the past couple of decades (Table 3). In fact, the states with the highest unemployment rates in 1991 generally experienced larger falls. At present, the rate of unemployment is fairly uniform across the states, with the exceptions of Western Australia, where it is below average, and Tasmania, where it is above average.

Table 2: State Economic Indicators
1991/92 to 2008/09; annual average growth, per cent

	NSW	VIC	QLD	WA	SA	TAS
Gross state product	2.8	3.7	4.8	4.5	2.9	2.9
Population	1.0	1.2	2.2	1.8	0.6	0.4
Gross state product per capita	1.8	2.5	2.6	2.7	2.3	2.5

Source: ABS

Table 3: Unemployment Rates by State
Seasonally adjusted, per cent

	NSW	VIC	QLD	WA	SA	TAS
September 1991	9.4	10.3	9.4	10.6	10.4	10.6
Current (July 2010)	5.6	5.5	5.6	4.4	5.1	6.5

Source: ABS

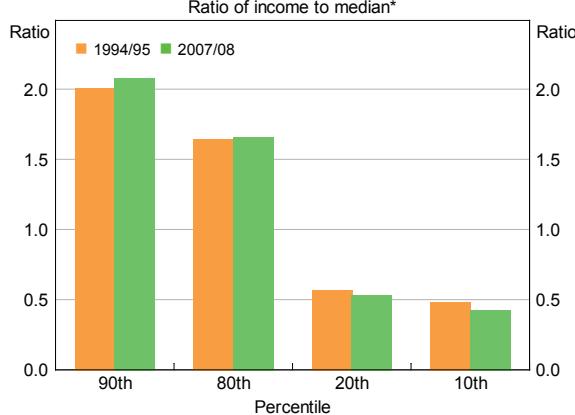
Table 4: GDP by Industry^(a)
Per cent of total

Industry	2008/09	1991/92	Difference
Financial & insurance services	10.8	7.0	3.8
Education, health & social assistance	10.4	10.8	-0.4
Retail & wholesale trade	9.6	10.2	-0.6
Manufacturing	9.4	14.0	-4.6
Ownership of dwellings	8.0	8.9	-0.9
Administrative (including public administration & safety)	8.0	7.9	0.1
Mining	7.7	5.0	2.7
Construction	7.4	6.3	1.1
Professional, scientific & technical services	6.1	4.3	1.8
Transport, postal & warehousing	5.8	5.6	0.2
Utilities, accommodation & food services	5.0	6.4	-1.4
Information media & telecommunications	3.4	4.1	-0.7
Rental, hiring & real estate services	3.0	3.1	-0.1
Arts, recreation and other services	2.8	3.1	-0.3
Agriculture, forestry & fishing	2.6	3.3	-0.7
Total	100.0	100.0	

(a) GDP excludes taxes, subsidies, and the statistical discrepancy

Sources: ABS; RBA

Graph 6
Income Distribution



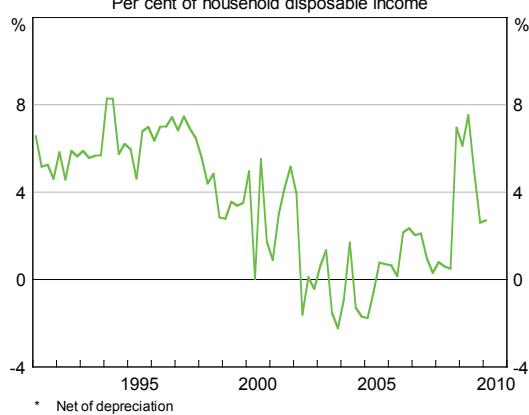
* Equivalised household disposable income
Sources: ABS; RBA

The benefits of growth were also spread fairly widely across households at different points of the income distribution. Income relativities across the bulk of the population did not change much over the period, though the relative position of households in the top 10 per cent of the income distribution improved somewhat, and that of households in the lowest 10 per cent deteriorated (Graph 6).

One area where there have been sizeable differences in growth performance has been across industries. The output of the mining, financial services and professional services industries grew at a much faster rate than average, while the output of the manufacturing sector increased by less than average (Table 4). Around three-quarters of the economy now involves the production of services rather than goods, and the financial sector has replaced manufacturing as the largest single industry in the economy.

While many people lament the small share of manufacturing sector in the Australian economy, the low exposure to manufacturing may have been one reason why the economy has fared relatively well over the past couple of decades. It meant that Australia was less affected than many other countries by the global shift of manufacturing to emerging markets, particularly Asia, that took place over that period.

Graph 7
Household Saving Ratio*



* Net of depreciation
Sources: ABS; RBA

Current Conditions

Let me turn now to the current state of the economy, and the prospects for the next few years.

As you know, the Australian economy recovered relatively quickly from the slowdown that followed the global financial crisis. It is currently growing at around its trend rate, in part due to a large increase in government spending. Consumer spending remains relatively restrained, even though consumer confidence is high. It seems that households have become more cautious in their financial habits, borrowing less and saving more. The household saving rate has risen back to around 4 per cent over the past year, after being close to zero in the early part of the decade (Graph 7). Investment in new housing is also growing at only a modest pace, despite fast growth in the population. This is because of the relatively high cost of housing, rigidities in the housing supply process and difficulties for developers in obtaining finance.

Business investment, however, is at very high levels. It did decline somewhat during the financial crisis, but it is expected to increase strongly again over the period ahead, driven importantly by the mining sector.

Exports are also increasing at a solid pace at present, as earlier increases in mining capacity are coming on

stream. Together with much higher export prices, this has meant that the trade account of the balance of payments has moved strongly back into surplus, an unusual situation for Australia.

Employment has been growing strongly, in fact more strongly than would normally be associated with recent rates of increase in GDP, and the unemployment rate has fallen significantly since mid 2009, to around 5½ per cent (Graph 8).

As I mentioned earlier, over the past couple of decades the typical pattern had been for growth in the resource-rich states of Queensland and Western Australia to be faster than the average of the other states. Currently, however, that is not the case. Queensland is lagging the other states, with relatively weak growth in retail sales and consumption, and particularly business investment (Table 5). Over the past year, Queensland has experienced little growth in final demand, whereas in the rest of Australia demand grew by close to its highs of the past decade (Graph 9). Part of the problem is that Queensland seems to be suffering from an overhang in the property market after a period of exuberance in the lead-up to the financial crisis. Apartment building outside Brisbane is especially weak, as is commercial building. The high exchange rate is, of course, also affecting the tourism industry in Queensland, as Australians are taking advantage of cheaper foreign holidays.

Graph 8 Unemployment Rate



Graph 9 State Final Demand

Year-ended percentage change

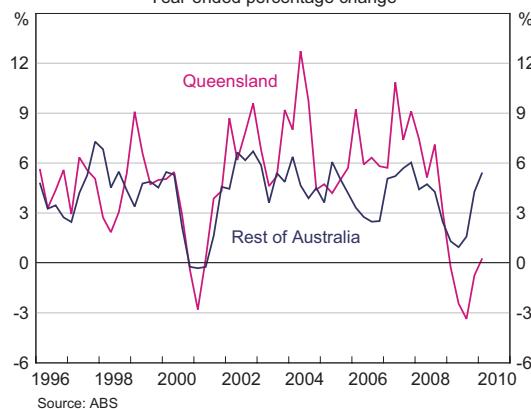


Table 5: State Economic Indicators
Percentage change over past 12 months^(a)

	NSW	VIC	QLD	WA	SA	TAS
State final demand (sa, per cent)	4.7	6.4	0.3	6.1	5.2	3.1
Consumption	2.8	3.3	1.8	5.9	3.3	3.0
Dwelling investment	0.1	0.6	1.3	5.0	-8.1	6.8
Business investment	1.9	10.4	-17.8	0.6	-0.7	-24.3
Government	13.4	12.8	10.6	14.5	17.7	15.8
 Employment (sa)						
Per cent	1.4	3.6	2.9	5.2	2.2	-0.1
Number ('000)	48	98	66	60	18	0

(a) State final demand data are over the year to the March quarter 2010; employment data are over the year to July 2010
Source: ABS

Outlook

Our expectation is that economic growth in Australia will continue for at least the next couple of years, the period for which the Bank typically prepares forecasts. Our latest forecasts, which were published earlier this month, show growth in the Australian economy continuing at a solid pace over this period.

This view is partly based on the expectation that the world economy will continue the expansion that began in 2009. World economic growth is estimated at about 4½ per cent for this year, which is above average – in other words, quite a healthy outcome.

Growth in our major trading partners, a group that is more heavily weighted to the fast-growing economies of Asia, is expected to be even stronger this year.

Despite the good performance of the past year, there has been considerable discussion in recent months about whether the global economy can continue to grow solidly in the face of the financial problems it has been experiencing, particularly the overhang of government debt in many countries. However, while official forecasters around the world all acknowledge that this is a potential risk to growth, they are nonetheless forecasting that the global economy will grow at a reasonable pace over the next couple of years. This is the Reserve Bank's view as well.

The strong growth of the global economy over the past year or so has again pushed up the prices of commodities that Australia produces. They have returned to the high peaks reached before the onset of the global financial crisis in 2008. Relative to prices of our imports, export prices are at their highest level in 60 years (Graph 10). This is generating a large increase in income for the country: we are forecasting that Australia's gross income (in nominal terms) will rise by about 10 per cent this year.

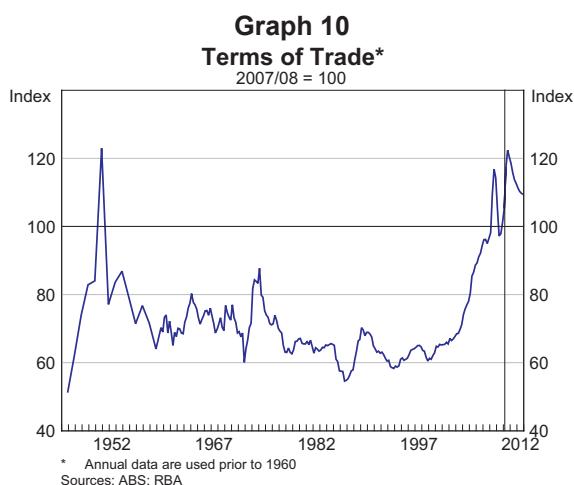
We expect that export prices will ease back somewhat over the next couple of years, as more supply comes on stream and as economic growth in our trading partners slows to a more sustainable rate. Nevertheless, by historical standards, prices will still be very high.

This creates a very favourable environment for the Australian economy. Household income will most likely rise quite solidly, which should underpin consumption even if households maintain their recent higher rate of savings.

Most importantly, however, we think that economic growth will be driven by strong business investment. This will be concentrated in the mining and gas industries, including some large projects that are planned here in Queensland. Mining investment typically runs at about 1¾ per cent of GDP, and in past mining booms it has reached up to 3 per cent of GDP (Graph 11). In the current boom, it has already risen to 4½ per cent and, even on conservative assumptions, is expected to rise significantly in the years ahead. That will provide a major impetus to growth.

Even outside mining, investment is likely to rise, given that capacity constraints exist in many parts of the economy. This expansion in business investment is expected to outweigh the planned scaling back of government spending.

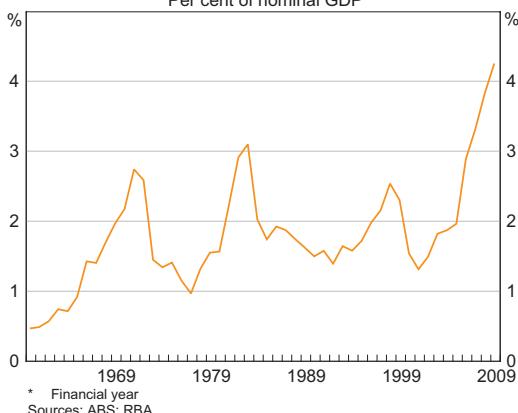
In this environment, we see further growth in employment, probably continuing to run ahead of growth in the labour force, so that unemployment will continue on a downward trend.



Graph 11

Mining Investment*

Per cent of nominal GDP



* Financial year
Sources: ABS; RBA

One issue is whether the strength of the economy will have implications for inflation. At present, underlying inflation has fallen back into the top half of the target range after rising noticeably over the second half of 2007 and 2008. We expect that it will stay around its current rate for the next year or so but, after that, upward pressure on inflation is again likely to emerge with a strongly growing economy. History tells us that inflation can be a problem during resources booms, and while there are grounds for thinking it will be less of a problem this time than in the past, we need to remain alert to the risks.

While Australia will, most likely, continue to do well over the next few years, it would be a mistake to assume that the economic cycle has been eliminated. We also need to recognise that it is difficult to foresee what will happen in the future, and that there are risks regarding the future path of the economy. It is possible, for example, that growth in the world economy will lose momentum, creating a significantly less favourable environment for Australia than is currently assumed. Both the volume and price of our exports would be weaker and external financing might also be more difficult. On the other hand, it could also turn out that inflationary pressures build more quickly than assumed.

Conclusion

Let me conclude.

Australia has delivered a very good growth performance over the past couple of decades. That was the benefit that flowed from a long process of economic reform and the adoption of prudent and disciplined economic policies. Even though there was significant variation in growth across industries, the benefits of growth were spread relatively widely across the states and across the income distribution of the population.

It is reasonable to expect that further growth lies ahead. However, with the economy now operating close to its capacity, it will take further improvement in productivity and disciplined policies for this growth to be sustained. ▶

Aspects of Australia's Finances

Ric Battellino, Deputy Governor

Address to Financial Executives International of Australia, Sydney, 15 June 2010

Given the financial orientation of this group, I thought I would focus my remarks today on some aspects of Australia's finances. In particular, I want to deal with three questions that often come up when I talk to analysts and bankers from overseas.

These are:

- are Australian households over-g geared?
- does Australia have too much foreign debt? and
- do Australian banks rely too much on foreign wholesale funding?

Before I move on to these questions, I should note that, in my experience, foreigners never ask about government debt in Australia, or corporate debt for that matter. It is not hard to understand why, as both government and corporate debt in Australia are low by international standards.

Household Debt

Let me then start with household debt.

The Reserve Bank monitors developments in household debt very closely as they have significant implications for the economy.

Glenn Stevens summarised the Bank's view on this last week when he noted that, while households had coped well with current levels of debt, it would not be wise for there to be further big increases in household indebtedness.

As you know, household debt has risen significantly faster than household income since the early 1990s. At that time, households on average had debt equal to half a year's disposable income; by 2006, debt

Graph 1
Household Debt

Per cent of household disposable income*



* Household sector excludes unincorporated enterprises. Disposable income is after tax and before the deduction of interest payments.

Sources: ABS; RBA

had risen to around one and a half years' income. Since then, however, the ratio of debt to income has stabilised (Graph 1).

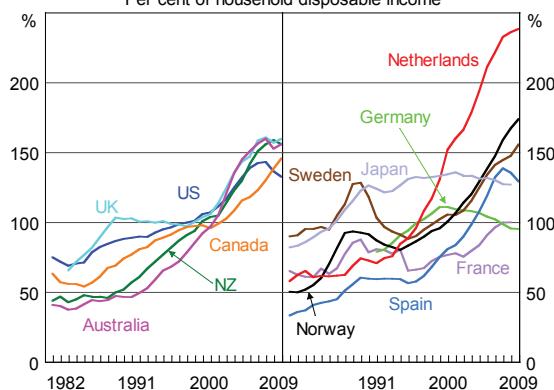
Most of the rise was due to housing debt, including debt used to fund investment properties. Other household debt, which includes credit card debt, car loans, margin loans and so on, has not changed much relative to income over the period.

The current household debt ratio in Australia is similar to that in most developed countries (Graph 2).¹ Significant exceptions are Germany and France, where the ratios are lower, at around one year's income, and the Netherlands, where the ratio is much higher – almost 2½ years' income – due to the tax incentives for households to stay geared up.

1 Note that there is no particular reason why household debt ratios should be the same across countries.

Graph 2
Household Debt

Per cent of household disposable income



Sources: National sources

All countries have experienced rises in household debt ratios over recent decades. Clearly, therefore, the forces that drove the rise in household debt ratios were not unique to Australia. The two biggest contributing factors were financial deregulation and the structural decline in interest rates.

One of the consequences of financial deregulation was that the availability of credit to households greatly increased. Up to the 1980s, the various controls on the financial sector meant that the ability of households to obtain credit was constrained. Even obtaining a housing loan was relatively difficult. However, after financial regulations were eased around the globe, many new financial products were developed specifically for households, and particularly relating to housing finance. Households found it was much easier to get a loan. Most loans products have worked well, though some have caused significant problems; sub-prime loans in the United States are the clearest example.

The level of interest rates in most developed economies in the past decade has been about half that in the decade to 1995. This structural decline in interest rates has facilitated the increase in household debt ratios because it reduced debt-servicing costs (Table 1). Households have therefore found that they can now service more debt than used to be the case.

Table 1: Average Policy Interest Rates
Per cent

	1985–1995	2000–2010
New Zealand	12.7	5.9
Australia	11.4	5.3
United Kingdom	10.1	4.2
Canada	8.7	3.1
Germany	5.9	2.9
United States	6.2	2.9

Sources: Thomson Reuters; central banks

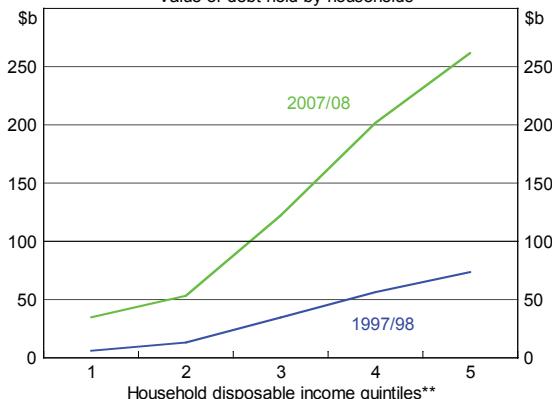
Has the rise in household debt left households over-exposed financially? In trying to judge this, there are a few considerations to take into account.

First, at the same time as the household debt ratio has risen, so too have the assets held by households. Some commentators might dismiss this as simply reflecting the fact that the additional debt has been used to inflate asset values. There is some basis for this in relation to housing assets but, even if we exclude housing and focus only on households' financial assets, the statement is still true. Financial assets held by households have risen to the equivalent of 2.75 years of household income, up from 1.75 years' income in the early 1990s.

Second, the available data suggest that the increased debt has mostly been taken on by households which are in the strongest position to service it. For example, if we look at the distribution of debt by income, we can see that the big increases in household debt over the past decade have been at the high end of the income distribution (Graph 3). Households in the top two income quintiles account for 75 per cent of all outstanding household debt (Graph 4). In contrast, households in the bottom two income quintiles account for only 10 per cent of household debt.

If we look at the distribution of debt by age of household, we see that the increased debt has mainly

Graph 3
Owner-Occupier Debt*
Value of debt held by households



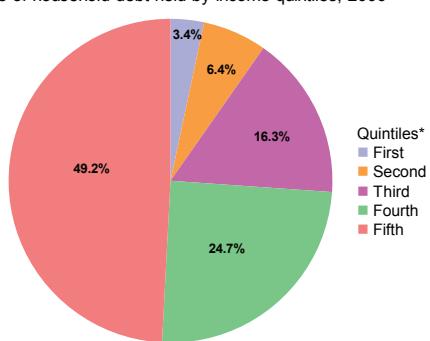
* Average debt over the year
** Quintiles include all households

Sources: ABS; RBA

Graph 4

Indebted Households

Share of household debt held by income quintiles, 2006



* Income quintiles include all households
Sources: HILDA Release 6.0; RBA

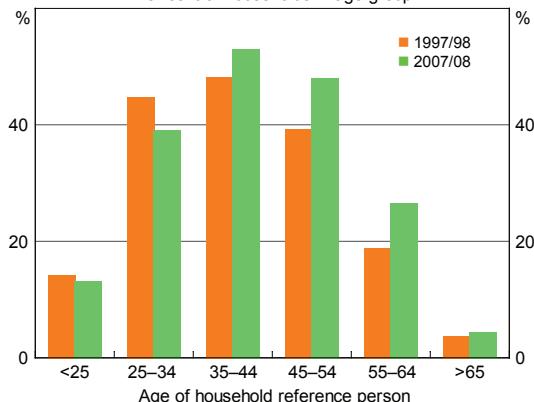
been taken on by middle-aged households. The proportion of 35–65 year olds with debt increased significantly through to 2008, as households have been more inclined to trade up to bigger or better located houses, and to buy investment properties. Households under 35 years of age (i.e. the group that would typically encompass first-home owners), in contrast, have seen a fall in the proportion with debt (Graph 5).

Another factor that has contributed to the resilience of household finances is that, by and large, the debt has not been used to increase consumption. Apart from some brief periods, household consumption has not been unusually elevated during this period of rising debt. Rather, the debt has mainly been used to acquire assets.

Perhaps the best, and most direct, indicator of households' capacity to support the increase in debt is the arrears rates on loans. This remains very low in Australia. The current arrears rate is around 0.7 per cent. This is one of the lowest rates among developed economies (Graph 6). Other data also suggest that households' aggregate debt-servicing capacity is quite strong: in recent years more than half of owner-occupiers have been ahead of schedule on the repayments on the loan they took out to buy their property.

Graph 5
Households with Owner-Occupier Debt

Per cent of households in age group



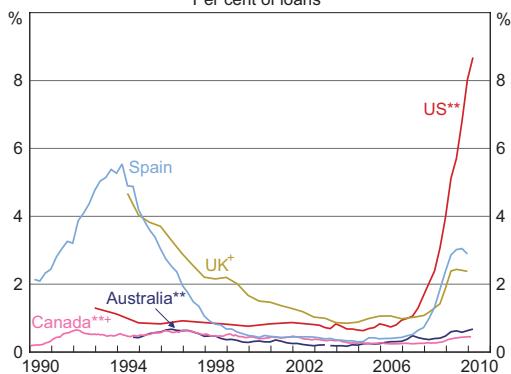
Sources: ABS; RBA

Within this relatively benign aggregate figure, pockets of stress have emerged from time to time. We saw this clearly in the south-western suburbs of Sydney following the sharp run-up in Sydney house prices over 2002 and 2003. More recently there are some signs of increased housing stress in south-east Queensland and Western Australia, again following sharp rises in house prices in these areas.

Another segment of the market that will bear close watching is first-home owners. They have accounted for an unusually high proportion of housing purchases over the past couple of years – around 40 per cent. This has reflected the incentives created

Graph 6
Non-performing Housing Loans

Per cent of loans*



* Per cent of loans by value. Includes 'impaired' loans unless otherwise stated.

For Australia, only includes loans 90+ days in arrears prior to September 2003.

** Banks only.

+ Per cent of loans by number that are 90+ days in arrears.

Sources: APRA; Bank of Spain; Canadian Bankers' Association; Council of Mortgage Lenders; FDIC; RBA

by various first-home owner concessions. Most of these purchases have been funded by floating rate mortgages, and the average loan to valuation ratio is relatively high, at around 90 per cent. Clearly, this group will be very sensitive to changes in interest rates.

In summary, if we look at the way the increase in household debt has been distributed, what households have done with the money, and the arrears rates on loans, it is reasonable to conclude that the household sector has the capacity to support the current level of debt. Having said that, the higher the level of debt the more vulnerable households are to shocks that might affect the economy. We at the Reserve Bank therefore welcome the fact that the household debt ratio has flattened out in recent years and, as Glenn Stevens remarked last week, there would be benefits in that stability continuing.

Foreign Debt

Let me now turn to the question of Australia's foreign debt.

Following the floating of the exchange rate and the removal of capital controls in the early 1980s,

both foreign investment in Australia and Australian investment abroad increased sharply as the Australian economy became more integrated into the global financial system (Graph 7). In net terms, capital inflows increased from around 2 per cent of GDP to around 4 per cent, and, in the latest decade, to an average of almost 5 per cent of GDP. The current account deficit widened correspondingly, since with a floating exchange rate the current account and capital account balances must be equal and offsetting, both being determined simultaneously through the interaction of a wide range of economic and financial forces.

The pick-up in net capital inflow meant that the ratio of net foreign liabilities to GDP rose. From around 20 per cent in 1980, it rose to around 50 per cent by 1995. It then flattened out for a decade, but in recent years the further increase in net capital inflow has seen the foreign debt ratio rise again (Graph 8).

Expressing foreign liabilities relative to GDP is, perhaps, the most common way in which people analyse them. For emerging markets, this measure has been shown to have some association with vulnerability to balance of payments crises. This is because emerging market economies often have a fixed or managed exchange rate and their foreign liabilities tend to be denominated in foreign currency, rather than domestic currency. In such instances a rise in the ratio of foreign liabilities to GDP does indicate increased vulnerability as it signals an increase in the country's foreign exchange risk and liquidity risk.

For a developed economy that can borrow overseas in its own currency, and which has a floating exchange rate, the significance of a rise in the ratio of foreign liabilities to GDP is less clear. It also needs to be kept in mind that, as economies develop, most financial variables rise relative to GDP. This seems to be a consequence of financial deepening. Expressing net foreign liabilities as a percentage of the total financing in the economy is, perhaps, more relevant, since it gives some indication of the proportion of the economy's funding that is coming from offshore.

In Australia, this ratio has remained relatively steady since the late 1980s, at a little over 20 per cent.

Foreign liabilities can also be measured relative to the physical capital stock of the country, giving an indication of the proportion of the capital stock being funded by foreigners. This ratio, too, has been relatively steady in Australia since the late 1980s, at around 10 per cent.

One could argue that housing assets should be excluded from this latter measure, since foreigners' participation in the housing market is relatively limited. On that basis, the ratio rose somewhat in the early 1990s, but has been relatively steady since.

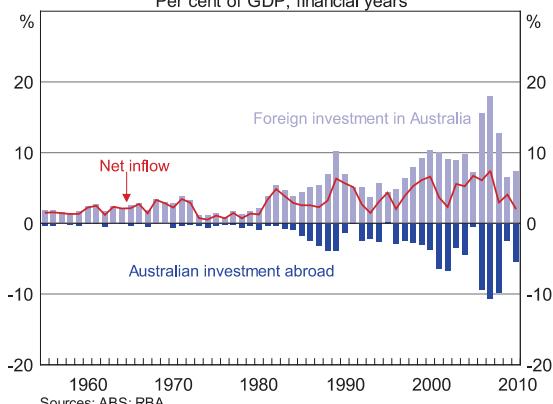
In short, these measures do not suggest the build-up of any significant disequilibrium in the economy resulting from foreign liabilities.

For developed economies with a floating exchange rate and the capacity to borrow offshore in their own currency, the risk from rising foreign liabilities is not that they will cause a traditional balance of payments crisis, but that they will undermine financial stability. The process by which this can happen typically starts with a country, for one or more reasons, becoming attractive to foreign investors. Capital floods in, overwhelming the capacity of the economy to use it productively. Credit is misallocated and eventually there is some form of a domestic financial crisis. This type of crisis can occur even in highly sophisticated economies, as illustrated by the recent sub-prime crisis in the United States.

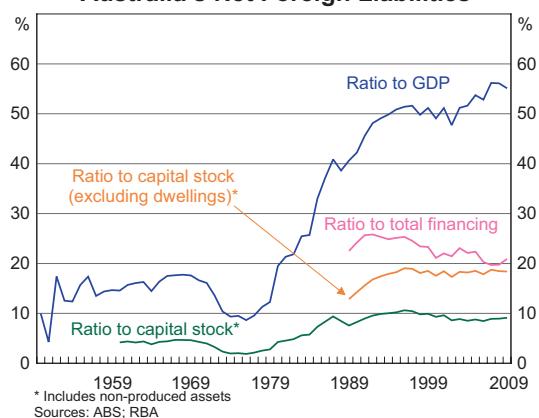
The policy challenge for countries in this situation is to ensure that the ready availability of offshore funds does not end up distorting or weakening the financial side of the economy.

As the recipient of large amounts of offshore funds for much of the post-float period, Australia has had to remain alert to these challenges. By and large, it has been able to successfully absorb significant amounts of offshore capital over many years. There are several factors that have contributed to this:

Graph 7
Private Capital Flows



Graph 8
Australia's Net Foreign Liabilities



- First, the country's foreign liabilities are virtually all either in Australian dollars or hedged back to Australian dollars². Australia is able to do this because foreign investors are happy to hold a certain proportion of their assets denominated in Australian dollars. This means that Australian borrowers do not face foreign exchange risk on the capital sourced from overseas. Therefore, if sentiment turns and the exchange rate falls, domestic borrowers are largely unaffected. The large swings in the exchange rate of the Australian dollar that have occurred over the

² D'Arcy P, M Shah Idil and T Davis (2009), 'Foreign Currency Exposure and Hedging in Australia', RBA Bulletin, December, pp 1–10.

past couple of decades in no way threatened the corporate and financial sectors.

- Second, the offshore capital that has flowed into Australia has been used essentially to fund high levels of investment. Australia uses foreign capital not because its national saving ratio is low, but because its investment ratio is high by the standards of developed economies (Table 2). In the past decade, for example, the national savings rate in Australia has averaged 22 per cent, much the same as in Europe and well above the figure of 15 per cent in the US and UK. Over the same period, the investment ratio in Australia averaged 27 per cent, whereas in most developed economies it has averaged around 20 per cent. This high ratio of investment to GDP is, I believe, an indication that Australia is using foreign capital productively, and sustaining the capacity of the country to service that capital.
- Third, credit standards, by and large, have remained robust and the amount of capital wasted through bad loans has remained limited.

Table 2: Gross National Saving and Investment

Per cent of nominal GDP, average for 2000–2009

	National saving	National investment
Australia	22	27
Canada	23	21
France	20	20
Germany	22	18
Japan	27	23
United Kingdom	15	17
United States	15	19

Sources: ABS; IMF

Foreign Borrowing by Banks

Within Australia's total foreign liabilities, the proportion accounted for by the foreign borrowing of Australian banks has increased. Virtually all this rise took place through the decade of the 1990s. Banks accounted for a little over 20 per cent of Australia's

foreign liabilities in 1990 but, by 2001, this had risen to around 40 per cent. It has not changed much in the past decade (Graph 9).

Part of this trend was the result of banks adjusting their balance sheets following financial deregulation and the growth of financial markets. These developments gave banks the opportunity to move from deposit funding to various forms of funding through markets, as a way of diversifying funding sources or reducing funding costs (Graph 10).

The growth of the superannuation industry, following government decisions to promote compulsory superannuation, probably contributed to this trend. Firstly, it meant households became less inclined to hold their savings as bank deposits, and second, the pool of funds created by superannuation increased demand for securities such as bank securities.

Within this trend away from deposits to funding through securities markets, there were also forces that resulted in banks increasing their use of offshore funding. As an example, a substantial proportion – about 20 per cent – of superannuation savings flow offshore, mainly into foreign equities. This reduces the pool of savings available domestically to banks and, other things equal, increases the amount of offshore funding banks need to undertake.

It is also an inescapable fact that, with Australia running a current account deficit, some funding for the economy needs to come from offshore. Households, by and large, cannot borrow offshore and the government sector has not had much need for offshore funding. That leaves the corporate and the financial sectors. Of these, the financial sector has a comparative advantage in offshore borrowing, because of the relatively high credit rating of Australian banks, both compared with Australian corporations and, in recent years, with banks in other countries.

Banks in Australia have therefore established a significant role in intermediating the flow of funds from overseas to Australia. Banks in countries where

there are surplus savings, such as those in Europe, play a similar role, though in reverse; they channel funds from domestic savers to offshore.

There is a natural tendency to believe that it is riskier for banks to borrow offshore than to lend offshore. Events over the past few years, however, have shown that one activity is not intrinsically more risky than the other. It is a matter of how the risks are managed. In the lead up to the financial crisis, for example, European banks were running very significant risks through their offshore lending, not only in terms of the credit quality of the US assets they were buying, but also in terms of the short-term nature of some of the funding transactions that supported those assets. The US dollar shortages that keep recurring in global money markets are manifestation of those funding risks. These risks were largely unrecognised and, it seems, not very well managed.

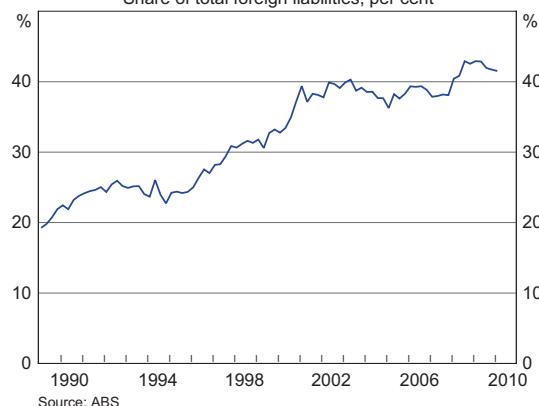
The Australian banks have long recognised the risks that come from their business model, and, in my experience, are very focused on understanding those risks and managing them. This contributed to their relatively good performance through the global financial crisis.

Conclusion

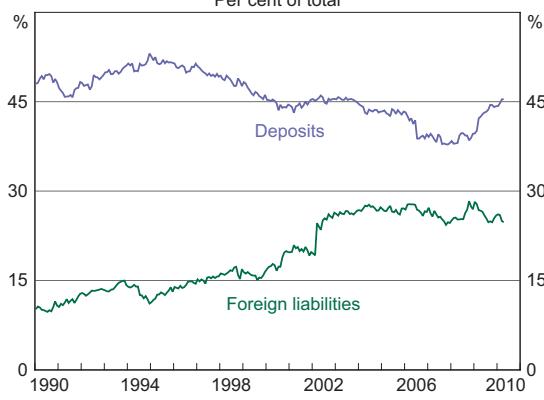
You may have noticed that I have not given categorical answers to the three questions I listed at the start of my talk. This is because I don't think it is possible to give simple 'yes' or 'no' answers to these questions.

However, looking at a broad range of financial data, and considering the fact that the Australian economy and financial system have exhibited a high degree of stability over many years, despite the many global events that have tested their resilience, is, I think, grounds for confidence that the economic and financial structure that has evolved in Australia is sustainable. ☙

Graph 9
Australian Banks' Foreign Liabilities
Share of total foreign liabilities, per cent



Graph 10
Banks' Funding Liabilities*
Per cent of total



* Change to reporting requirements in March 2002
Sources: APRA; RBA

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Most of the publications listed below are available free of charge on the Bank's website (www.rba.gov.au). Printed copies of these publications, as well as a wide range of earlier publications, are also available on request; for details refer to the enquiries information at the front of the *Bulletin*.

Statement on Monetary Policy

These statements, issued in February, May, August and November, assess current economic conditions and the prospects for inflation and output.

Financial Stability Review

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.

Annual Reports

- Reserve Bank of Australia Annual Report
- Payments System Board Annual Report

Research Discussion Papers (RDPs)

This series of papers is intended to make the results of current economic research within the Bank available for discussion and comment. The views expressed in these papers are those of the authors and not necessarily those of the Bank.

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Conference volumes have been published since 1993. The most recent titles are:

- Reserve Bank of Australia 50th Anniversary Symposium, July 2010
- Inflation in an Era of Relative Price Shocks, May 2010

- *Lessons from the Financial Turmoil of 2007 and 2008*, October 2008
- *The Structure and Resilience of the Financial System*, November 2007
- *Demography and Financial Markets*, October 2006
- *The Changing Nature of the Business Cycle*, October 2005
- *The Future of Inflation Targeting*, November 2004
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The Bank periodically produces other publications that may take the form of submissions to inquiries, surveys or consultation documents. Some recent examples include:

- *Submission to the Inquiry into Access of Small Business to Finance*, March 2010
- *Submission to the 16th Series Review of the Consumer Price Index*, March 2010
- *A Revised Interchange Standard for the EFTPOS System*, November 2009
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