

Risk and the Transformation of the Australian Financial System

Chris Ryan and Chris Thompson¹

1. Introduction

Financial systems in many countries have experienced tremendous growth and structural change over recent decades. Associated with this have been significant changes in the balance sheets of both households and businesses. While many of the developments have been common across countries, there are some areas in which the changes in Australia have been particularly pronounced. This paper documents the main changes in the balance sheets of households, businesses and financial institutions in Australia and discusses some of the policy issues that arise from these changes.

At the root of many of the changes in the Australian financial system has been the transformation of household balance sheets, of which two aspects stand out. The first is the substantial increase in household indebtedness, with the debt-to-income ratio of the household sector in Australia going from below average by international standards at the beginning of the 1990s, to above average now. The second is the shift in the composition of household financial assets, with a larger share of household savings being invested outside the banking system in assets that are more exposed to market risk, such as direct holdings of equities, superannuation and other managed funds. Taken together, these changes have had a significant effect on the size and structure of the financial system.

The counterpart to the strong growth in borrowing by households for housing is that financial intermediaries now hold an unusually high share of their assets in housing loans. At the same time, the reduction in the household saving rate, and reduced share of savings going into deposits, has been associated with an increased reliance by financial intermediaries on wholesale markets, particularly offshore wholesale markets, for their funding. Whereas foreign borrowing accounted for about 10 per cent of Australian banks' liabilities in 1990, this share has since tripled and is now high by international standards. Banks have also contributed to the rapid growth in the securitisation market, which is now one of the largest in the world.

The increase in household financial assets, and the increasing share of those assets invested in market-linked products, has contributed to the rapid growth of the funds management industry in Australia, which is now one of the largest in the world as a share of GDP and even in absolute terms. The growth in the funds management

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industry has also been associated with a blurring in the distinction between financial institutions as banks have diversified into this business.

Section 2 of the paper provides a brief description of the macroeconomic backdrop to these developments. Sections 3 and 4 document the main changes in the balance sheets of the household and business sectors over the past couple of decades, while Section 5 documents the associated changes in the size and structure of the financial system. Section 6 then canvasses three broad policy issues stemming from these developments:

- first, we consider the implications of the transformation of the household balance sheet for the stability of the banking system;
- second, we consider some of the implications of the increasing role and complexity of financial markets for the nature and dynamics of possible stress within the financial system; and
- finally, we look at some of the challenges posed by the difficulty of assessing risk, both at the economy-wide level and for individual households.

Our main conclusions are that: while the riskiness of banks' mortgage portfolios has increased, the banking system as a whole is very sound and well placed to weather unexpected adverse events; growth and innovation in financial markets has been beneficial in a number of dimensions but market disruptions, such as abrupt shifts in pricing, now have the potential to be more damaging than in the past; although there are some possible macro-prudential policy responses to any cyclical tendency to misprice risk, there are no easy ways to deal with this challenge; and finally, in light of the increase in the amount of risk that households are more directly exposed to as a result of the substantial growth of their balance sheet, we conclude that further steps may need to be taken to improve the risk management capabilities of households.

2. The Macroeconomic Backdrop

For well over a decade, the macroeconomic environment in Australia has been very supportive of financial stability. Since 1991, the economy has experienced 16 years of uninterrupted expansion. During this period, real GDP has grown at an average annual rate of $3\frac{3}{4}$ per cent. One consequence of this prolonged period of growth has been a gradual reduction in the unemployment rate from a peak of nearly 11 per cent in 1993 to about $4\frac{1}{4}$ per cent currently, which is the lowest rate in around 30 years. This reduction in unemployment has underpinned solid growth in household incomes for much of the period. The long-running expansion has also contributed to strong conditions in the business sector, with profitability and investment both high as a share of GDP. Australia's inflation performance has also been very good during this period. Since the adoption of inflation targeting in 1993, inflation has averaged $2\frac{1}{2}$ per cent – in the middle of the target – compared with the 1980s when it averaged 8 per cent. It is also noteworthy that both growth and inflation have been more stable in more recent decades (Table 1). In the current

Table 1: Output and Inflation Volatility
Standard deviations

	1970s	1980s	1990s	2000s
Output ^(a)	1.8	2.3	2.0	0.7
Inflation ^(b)	1.3	0.8	0.5	0.4

(a) Based on annual real GDP growth

(b) Quarterly CPI inflation excluding interest charges prior to the September quarter 1998 and adjusted for the tax changes of 1999–2000

Sources: ABS; RBA

decade, the standard deviations of GDP growth and inflation have both been less than half what they were in the 1980s.

Reflecting the improved inflation performance, nominal interest rates have been low and much steadier than for several decades. The policy interest rate, the cash rate, has averaged 5½ per cent since 1993, and moved within a range of just ¾ percentage points. This is a significant improvement on the 1980s when short-term interest rates averaged around 14 per cent and were significantly more volatile.

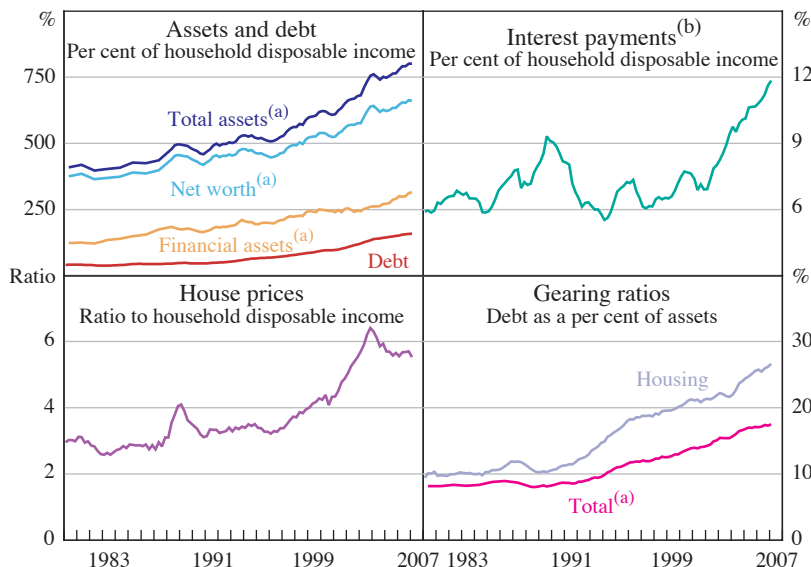
3. The Household Sector

As has been the case in a number of countries, it is developments in the balance sheet of the household sector, rather than the non-financial business sector, that have had the most effect on the financial system over the past decade. The most important developments in the household balance sheet have been the substantial increase in indebtedness and the change in the composition of financial assets.

3.1 Growth in the balance sheet

The significant increase in the size of the household balance sheet largely reflects the pace of borrowing by Australian households, which has been unusually rapid by historical and international standards. Since 1992, household debt has increased at an average annual rate of 14 per cent, compared with average growth of 6 per cent in nominal household disposable incomes. As a result, there has been a strong upward trend in the ratio of debt to annual disposable income (Figure 1). Whereas this ratio was around 50 per cent in the early 1990s, and low by international standards, it has since increased to around 160 per cent, which is at the top end of the range seen for many other countries. This upward trend in the debt-to-income ratio has meant that the household debt-servicing ratio – the ratio of interest payments to disposable income – has also trended upward, though not nearly as markedly, reflecting a decline in the average level of interest rates (Figure 1). Total household interest costs now account for 12 per cent of income, up from an average of 7 per cent in the 1990s.

The reasons for the significant increase in household borrowing in Australia since the early 1990s have been discussed extensively elsewhere, so they are only

Figure 1: Household Balance Sheets

Notes: Income is after tax and before the deduction of interest payments; excludes income of unincorporated enterprises in all ratios except for household assets and net worth to income

(a) Includes financial assets of unincorporated enterprises

(b) Includes the imputed financial intermediation service charge

Sources: ABS; RBA; REIA

summarised here.² On the demand side, the most important structural factor has been the shift in the early 1990s to a low-inflation and low-interest-rate environment. The more stable macroeconomic environment that accompanied this shift also played an important role in giving households the confidence to borrow more. This increase in borrowing capacity has been reinforced on the supply side by a marked increase in the availability of finance, spurred by financial deregulation in the 1980s and the associated increase in competition among lenders. As discussed in Section 5, this manifested itself in a number of ways, including through reductions in lending margins and the introduction of products that made credit available to a wider range of borrowers and on more flexible terms.

In terms of the composition of borrowing, the vast bulk of the growth in household debt since the early 1990s has been in loans for the purchase of housing, with this component now accounting for 86 per cent of total household debt, up about 10 percentage points since 1992. Moreover, a significant portion of the growth in housing debt has been for investment purposes (that is, buy-to-let), with the investor share of housing debt doubling over the period, to about one-third. The extent of investor participation in the housing market in Australia during this period has been unusually high by both historical and international standards, which partly reflects

2. See RBA (2003a) and Macfarlane (2003). Kent, Ossolinski and Willard (this volume) examine some of the factors behind the rise in household indebtedness in an international context.

speculative demand associated with the period of strongly rising house prices and also aspects of the tax treatment of residential property investments (including negative gearing, capital gains tax concessions and depreciation allowances).³

The corollary of the surge in borrowing for housing was a period of rapid growth in house prices, particularly from around the mid 1990s to late 2003. As a ratio to average annual disposable income, house prices rose from around 3½ in the mid 1990s to a peak of 6½ in 2003. Though this ratio has since fallen moderately, it remains high by both historical and international standards (Figure 1). Together with growth in financial holdings, this rise in house prices has contributed to the rapid expansion of the asset side of the household balance sheet. Since the early 1990s, household assets have grown at an average rate of about 10 per cent per annum, rising from the equivalent of 500 per cent of annual household disposable income to 800 per cent (Figure 1). As a consequence, the household gearing ratio – the ratio of household debt to the value of household assets – has risen much less than the debt-to-income ratio and is not especially high by international standards. That said, it has almost doubled since 1992, to 17 per cent (Figure 1). Taken together, the increase in both sides of the household balance sheet has resulted in a substantial increase in the net worth of the household sector. Currently net worth is equivalent to 6½ times annual household disposable income, up from 4½ times annual income in the early 1990s (Figure 1).

It is also noteworthy that around three-quarters of household debt in Australia is at variable interest rates, a share which is fairly high by international standards and broadly unchanged for a long period. This partly reflects the fact that variable-rate loans provide greater scope for making prepayments, which borrowers in Australia tend to favour because owner-occupier interest payments are not tax deductible. Around one-half of owner-occupier borrowers are ahead of schedule on their loan repayments, with one-quarter ahead by more than a month. The tendency for borrowers to build up prepayment buffers somewhat mitigates the interest rate risk arising from their use of variable-rate loans.

While the household sector as a whole has taken on substantially more debt, it is important to note that around one-third of households have no debt at all, and two-thirds have no owner-occupier housing debt, either because they own their home outright or rent. The proportion of households with debt has, however, been increasing over time, which means that aggregate debt and debt-service payments are being spread over a larger base of payers, so average debt and repayments per indebted household have not increased as much as the aggregate data suggest. Census data from the Australian Bureau of Statistics (ABS) show that the share of households with an owner-occupier mortgage increased from 28 per cent in 1991 to 35 per cent in 2006, despite the fact that the owner-occupier home-ownership rate remained fairly steady (at around 70 per cent). The increase was greatest among middle-aged households, in part reflecting a greater propensity for households to take on additional debt later in life to ‘trade up’ their houses, and an increased willingness of households to borrow against their housing equity for consumption and other purposes. There has also been an increase in the share of households

3. See RBA (2003b).

with investment property debt, with this increase also concentrated among middle-aged households.

Survey data also show that the bulk of household debt, particularly housing debt, has been taken on by higher-income households, who have relatively low gearing ratios, relatively low debt-servicing requirements, are more likely to have built up prepayment buffers, and hold significant financial assets.⁴ In short, the households that have done the bulk of the borrowing appear to be well placed to repay it. This is not to say that there are not some indebted households in vulnerable positions, but their number is relatively low and they account for a relatively small share of outstanding debt.

3.2 Composition of assets

As noted earlier, there has been strong growth in the asset side of the household balance sheet since the early 1990s, with roughly equal growth in the household sector's holdings of financial and non-financial assets. The share of non-financial assets, most of which is housing, in total assets is fairly high by international standards, at around 60 per cent. Given that households generally own only one or two residential properties rather than a more diversified portfolio, this suggests households are quite exposed to the idiosyncratic risk of house price movements.

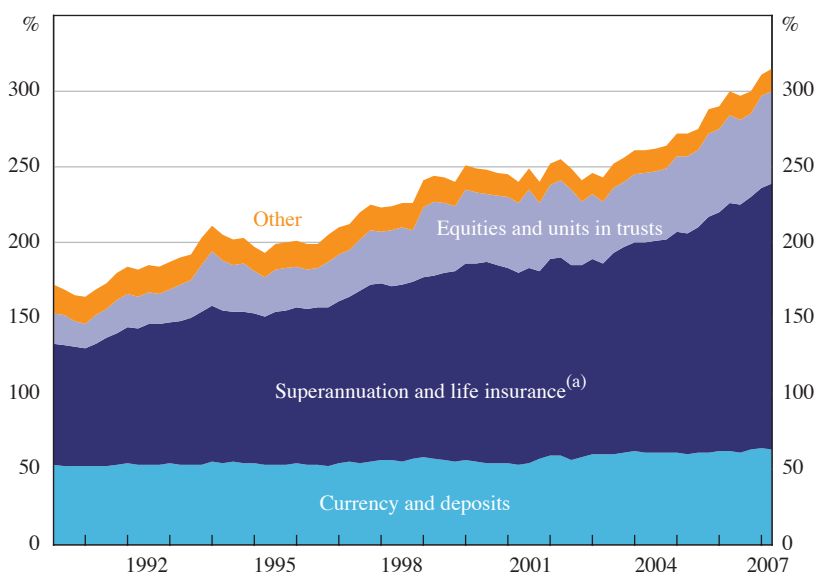
With regard to financial assets, the most notable trend over the past decade or so has been a shift towards assets that are more directly exposed to market risk, a trend that has been more pronounced than in a number of other countries. The household sector's total holdings of financial assets have risen from the equivalent of 170 per cent of annual household disposable income in 1990 to 315 per cent currently. Within this, holdings of cash and deposits have been relatively unchanged as a share of household disposable income, whereas assets held in superannuation (pension) funds and life offices have risen from the equivalent of 80 per cent to nearly 180 per cent of income (with a marked shift away from traditional defined benefit schemes towards defined contribution schemes), and direct holdings of equities and units in trusts have risen from 20 per cent to 60 per cent (Figure 2).⁵ In large part, these trends reflect a greater proportion of household savings being channelled towards institutional investors and direct equity holdings, but valuation effects from buoyant asset markets have also played a role.

The large increase in superannuation and life office assets reflects a number of government initiatives to boost retirement incomes, including the introduction in the early 1990s of compulsory employer superannuation contributions and various tax incentives to encourage voluntary retirement savings. The shift away from

4. The results discussed here are based on the Household, Income and Labour Dynamics in Australia (HILDA) Survey. For further details on the distribution of debt (and assets) based on the HILDA Survey, see 'Box A: A Disaggregated Analysis of Household Financial Exposures' in RBA (2005b, pp 20–22) and 'Box B: Disaggregated Analysis of Owner-Occupier Housing Debt and Assets' in RBA (2007, pp 26–28).

5. The bulk of life insurance assets relate to superannuation rather than conventional life insurance policies.

Figure 2: Household Financial Assets
Per cent of household disposable income



Notes: Includes assets of unincorporated enterprises

(a) Includes unfunded superannuation

Sources: ABS; RBA

defined benefit schemes towards defined contribution schemes reflects a number of factors, including: increased voluntary contributions as a result of tax incentives; employee demand for more portable pensions given greater workforce mobility; and employer preference for defined contribution schemes because of unpredictably longer life expectancy and the greater administrative complexity of operating defined benefit funds.⁶

Data from the Australian Prudential Regulation Authority (APRA) on the assets of superannuation funds by benefit structure show that defined benefit funds now account for less than 5 per cent of total superannuation assets, down from one-quarter in the mid 1990s. Although cross-country comparisons are complicated by measurement differences, the share of defined benefit superannuation assets in Australia appears quite low by international standards. While the shift towards defined contribution schemes has been beneficial in increasing the portability of superannuation and reducing the idiosyncratic firm risk attached to corporate defined benefit plans, it has also exposed households more directly to market and longevity risks.

The growth in the share of market-sensitive assets in Australian household financial holdings has mostly been in equities rather than bonds. In the case of direct financial holdings, the share of fixed-interest securities has fallen over the past decade and

6. See APRA (2007a, 2007b) for a discussion of these and other trends in the Australian superannuation industry, while CGFS (2007) discusses some of the factors behind the shift towards defined contribution schemes at the international level.

is very low, while the share of equities has increased. This is consistent with the finding of the Australian Securities Exchange's surveys of share ownership that the proportion of Australian adults that directly own equities increased from around 10 per cent to 40 per cent over the 1990s, and has been relatively stable since.⁷ Indirect holdings of assets through defined contribution superannuation funds and other managed investments have also tended to favour equities over bonds. For example, the share of superannuation fund assets held in equities has increased from 40 per cent to 60 per cent since 1990, while the share held in bonds has fallen from 20 per cent to 15 per cent.

It is also notable that there has been significant participation by retail investors in the markets for some sophisticated financial products in Australia. For example: retail and high net-worth individuals account for about two-thirds of the assets of Australian hedge funds, compared with less than one-half globally⁸; nearly one-half of domestic hybrid issues since the mid 1990s were initially taken up by retail investors; and between 2002 and 2005, retail investors purchased around 15 per cent of domestic collateralised debt obligation (CDO) issues (while so-called middle-market investors purchased an even greater share).⁹ Retail participation in these markets has been facilitated by a regulatory regime that does not restrict access to any financial products as long as the provider meets certain disclosure requirements, whereas laws governing the sale of financial products to retail investors in some other countries are more onerous. In some countries, retail investors – usually defined with reference to a threshold level of income, wealth or the size of the investment – are restricted from buying certain investments, such as hedge funds in the United States. While providing retail investors with the freedom to choose from a wide range of financial products obviously has important benefits, it also raises important challenges, which we discuss in Section 6.

4. The Business Sector

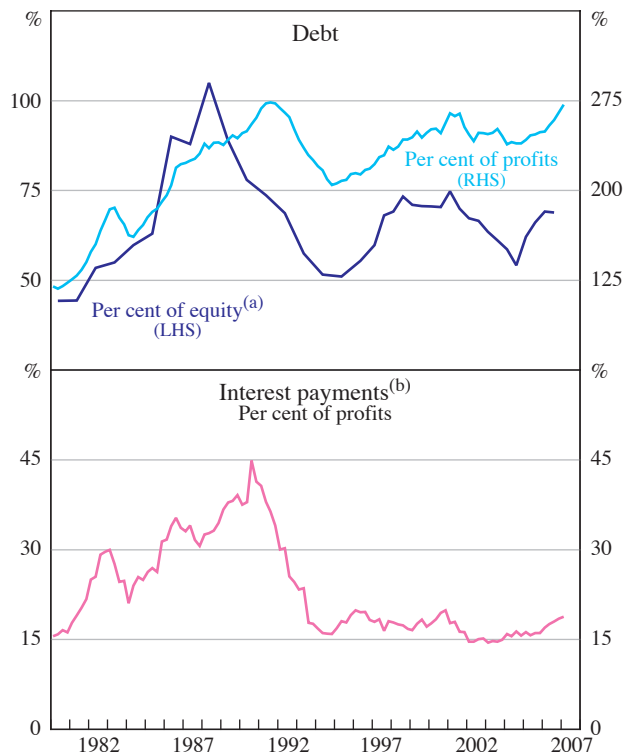
In contrast to the household sector, the business sector has not, at least to date, responded to lower interest rates and the more stable macroeconomic environment by significantly increasing its gearing. Unlike the household sector, many non-financial businesses spent the first half of the 1990s consolidating their balance sheets after the problems caused by excessive gearing in the late 1980s. While the growth rate of borrowing by businesses has stepped up in recent years, and is currently around its highest level since the late 1980s, business balance sheets overall remain in good shape.

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7. The increase in household direct shareholdings in the 1990s was partly due to the privatisation of many government-owned enterprises and the demutualisation of a number of privately-owned financial institutions.
 8. Households' indirect exposure to hedge funds has also increased as the proportion of superannuation funds investing in hedge funds has risen. According to Russell Investment Group, just under one-third of superannuation funds in Australia had invested in hedge funds in 2005, compared to almost none in 2001. Of those that had invested in hedge funds, the average allocation was also increasing, reaching 6 per cent in 2005 (see Jacobs and Black 2006).
 9. See RBA (2005a).

From an historical perspective, the second half of the 1980s stands out as a period of very rapid growth in business borrowing, driven by speculative activity associated with a boom in the commercial property market and competition among lenders following financial deregulation.¹⁰ Total debt of the non-financial business sector as a ratio to profits rose from around 180 per cent in the mid 1980s to 250 per cent by the end of the decade (Figure 3). The ratio of the book value of debt to equity for listed non-financial companies, which accounted for the bulk of the borrowing, roughly doubled between 1983 and 1988.

At the end of the 1980s, a combination of high interest rates and a marked weakening of the commercial property market contributed to defaults on some of the riskiest commercial property loans, and conditions worsened in the first years of the 1990s as the economy tipped into recession and problems became more widespread. This was the catalyst for a period of more conservative balance sheet management which saw business debt as a share of profits fall to about 210 per cent

Figure 3: Business Debt and Interest Payments



Notes: (a) Listed non-financial corporations; excluding foreign companies

(b) Includes the imputed financial intermediation service charge

Sources: ABS; Aspect Huntley; RBA; Statex

10. See Gizycki and Lowe (2000).

by the mid 1990s. The debt-servicing ratio fell sharply over this period, though this was partly due to the reduction in official interest rates (Figure 3).

Business borrowing picked up in the second half of the 1990s and, apart from a brief period early this decade, has continued to strengthen in the past few years. This has coincided with a period of very strong profitability and a boom in business investment. Aggregate non-financial business sector profits have increased at an average rate of 9 per cent per annum since 2002, and have risen to well above the long-term average as a ratio to GDP. While this has enabled businesses to fund a significant part of their investment through internally generated funds, external fund raising has also increased, rising from the equivalent of around 5 per cent of GDP in 2003 to over 10 per cent in 2006. The bulk of this has been in the form of intermediated credit, which has recently been growing at annual rates of around 17 per cent.

While the faster pace of business borrowing in recent years has resulted in a higher ratio of business debt to profits, it is still no higher than its early 1990s peak. Likewise, the debt-to-equity ratio for listed companies has risen to around 70 per cent over the past few years, but this is below the level reached around the turn of the decade and well below that in the late 1980s. Underlying the increase in the aggregate gearing ratio of listed companies over the past few years have been some divergent trends at the sectoral level. The very strong profitability of mining companies has allowed them to finance much of their investment out of earnings while reducing their debt levels. By contrast, the gearing of companies outside the mining sector has tended to rise, though this is mainly attributable to companies that had relatively low gearing to begin with.

Despite the increase in the ratio of business debt to profits, interest payments on business debt as a share of profits have remained little changed over the past decade or so, reflecting a fall in business lending rates over the period (Figure 3).

A prominent sign of the business sector's increased appetite for debt recently has been an acceleration in leveraged buyout (LBO) activity by private equity funds, with around \$14 billion of deals completed in Australia in 2006, compared with an average of \$1½ billion over the previous five years. While this has drawn cautionary comparisons with the LBO boom in the late 1980s (which ended badly for a number of the companies involved), the activity has been fairly limited: the deals have involved only a small number of companies – less than 30 in 2006; the value of transactions undertaken has been equivalent to only about 1 per cent of the stock market capitalisation, compared with 4 per cent in 1989; and the effect on aggregate business sector gearing to date has been minor. The number of deals has already begun to wane in 2007 as the cost of debt has risen, suggesting that this has been a fairly short-lived episode.¹¹

11. While the recent LBO activity is unlikely to be a threat to financial stability, it does raise a number of other public policy issues. For more details, see the article 'Private Equity in Australia' in RBA (2007, pp 59–73).

There are a few other notable trends in the composition of private non-financial business debt. First, while the bulk of debt continues to be intermediated – consisting of loans from domestic and offshore financial intermediaries – there has been an increase in the proportion that is sourced directly from capital markets, from around 10 per cent in the mid 1990s to 16 per cent. This should be supportive of financial stability to the extent that it disperses credit risk more widely. Second, within non-intermediated debt, there has been a greater tendency for companies to issue longer-term securities and to issue more of these securities within Australia, rather than offshore. This reflects the greater appetite of domestic institutional investors for these types of securities and the rapidly expanding pool of funds for them to invest. Finally, in terms of the composition of intermediated debt, there has been a shift towards variable-rate loans over the past decade, which implies that businesses are more exposed to interest rate risk than in the past, though their increased bond issuance has somewhat offset this.

5. The Financial System

The changes in household and business balance sheets discussed above have had significant effects on the size and structure of the Australian financial system. A number of these effects have been reinforced by increasing competition in parts of the financial system and ongoing financial innovation, particularly relating to the packaging and trading of risk. This section discusses the most important of these changes, namely: the impact of the growth in household and business balance sheets on financial institutions; the continuing strong profitability of the banking sector despite a rise in competition; and the growth of financial markets and the banks' increasing involvement within them.

5.1 Growth and change in the structure of the financial sector

The transformation of the balance sheets of the non-financial sectors has shaped many of the developments in the financial sector over the past decade or so. In particular:

- the rapid growth in the size of the financial sector;
- the transformation of banks' own balance sheets, largely reflecting households' rapid accumulation of debt and shift away from saving in the form of bank deposits; and
- the strong growth in the funds management industry, again reflecting changes in the financial position of households.

5.1.1 Growth of the financial sector

The first driving force behind the expansion of the Australian financial system following deregulation in the early 1980s was the rapid growth of business credit in the second half of the 1980s. The second, and more significant, force was the expansion of households' balance sheets, in particular the rapid growth of both their

debt and financial assets, as discussed in Section 3. While it is the international norm for growth in a country's financial sector to exceed growth in nominal GDP, the disparity in growth rates has been more pronounced in Australia than in a number of other countries. Total assets of the Australian financial system have risen from the equivalent of around 100 per cent of GDP shortly before financial deregulation to around 350 per cent, or \$3½ trillion (Table 2).

While this period has seen some blurring of the distinction between different types of institutions (for example, banks are now active in funds management) there are nonetheless four clearly identifiable shifts in asset shares over the past two decades: banks have increased their share of total financial sector assets (excluding their funds management businesses) from 42 per cent to 50 per cent; securitisation vehicles have grown to account for a significant share of financial sector assets by international standards, partly reflecting the emergence of non-bank mortgage originators as a significant source of competition in the housing loan market; the funds management industry has grown rapidly; and the combined share of entities that had previously enjoyed a regulatory advantage over banks has fallen sharply.¹² The combined

Table 2: Assets of Financial Institutions

	Ratio to GDP			Share of total assets		
	1987	1997	2007	1987	1997	2007
Deposit-taking institutions	75.6	105.4	177.9	47.3	48.2	51.5
Banks	66.4	100.4	172.3	41.6	45.9	49.9
– Major Australian-owned banks	45.7	63.7	107.6	28.6	29.1	31.2
– Other Australian-owned banks	13.6	20.4	26.7	8.5	9.3	7.7
– Foreign-owned banks	7.1	16.3	38.1	4.4	7.5	11.0
– Subsidiaries	..	9.1	12.1	..	4.2	3.5
– Branches	..	7.2	26.0	..	3.3	7.5
Credit unions and building societies	9.2	5.0	5.6	5.7	2.3	1.6
Other financial institutions	84.1	113.3	167.2	52.7	51.8	48.5
Registered financial corporations	30.7	22.1	19.9	19.2	10.1	5.8
Securitisation vehicles	0.0	3.7	23.7	0.0	1.7	6.9
Managed funds and life insurance	45.4	77.3	111.8	28.4	35.4	32.4
General insurers	8.1	10.1	11.9	5.1	4.6	3.4
Total	159.7	218.7	345.2	100.0	100.0	100.0

Notes: Figures as at June, except for 2007, which are for March. All figures are on an unconsolidated basis. Numbers may not add up due to rounding.

Sources: ABS; APRA; RBA

12. A fall in banks' share of financial sector assets from almost 70 per cent in the early 1950s to 40 per cent in the early 1980s was broadly matched by a rise in the share of finance companies and merchant banks (now collectively known as registered financial corporations) and non-bank deposit-taking institutions (credit unions and building societies), which had been relatively lightly regulated prior to deregulation. For further details on the changing structure of the Australian financial system see Edey and Gray (1996) and the article 'The Structure of the Australian Financial System' in RBA (2006b, pp 49–61). For a history of the impact of financial deregulation, see Grenville (1991).

share of assets held by large and smaller, regional Australian-owned banks has been broadly unchanged over the past two decades, with some acquisitions of the latter by the former, while foreign-owned banks have gained market share.¹³

5.1.2 Changes in the composition of banks' assets and liabilities

Households' rapid accumulation of debt, and shift away from bank deposits, has been associated with a change in the composition of banks' balance sheets: the share of housing loans in banks' total credit has risen; and the share of their funding from household deposits has fallen, causing them to rely more heavily on offshore wholesale funding (Table 3).

Table 3: Banks' Balance Sheets
Per cent, as at June

	1987	1997	2007
Share of credit			
– Housing	26	46	50
– Personal	9	9	9
– Business	65	45	42
Share of liabilities			
– Household deposits	45	34	20
– Other domestic	47 ^(a)	50	53
– Foreign	8 ^(a)	17	27

(a) For June 1987 data, 'foreign' comprises only the foreign-currency-denominated, non-resident liabilities of trading banks. As such, 'other domestic' includes A\$-denominated non-resident liabilities and any non-resident liabilities of savings banks.

Sources: APRA; RBA

Over the decade to 1997, the share of housing loans in banks' total credit rose from 26 per cent to 46 per cent, reflecting the pick-up in borrowing by the household sector and the deleveraging of the business sector. Despite the fact that total housing credit has grown more strongly than business credit for most of the subsequent period, the share of housing loans on banks' books has only increased by an additional 4 percentage points. This partly reflects the fact that banks have made greater use of securitisation to fund their mortgage lending during this period, with banks' securitised housing loans now equivalent to about 12 per cent of their total on-balance sheet loans. While securitisation allows for the transfer of credit risk, the banks' primary objective in securitising housing loans has been to fund more loans and to diversify their funding sources, not to affect the average credit quality of housing loans remaining on their balance sheets.

13. Davis (this volume) discusses some of the trends and issues associated with concentration in the Australian and other countries' banking sectors. Hall and Veryard (2006) examine some of the trends in the Australian banking sector over the past decade or so.

As well as securitising loans, banks have become more reliant on wholesale funding that remains on their balance sheets, much of which has been sourced from overseas. Since 1987, foreign funding has increased from 8 per cent of banks' total liabilities to 27 per cent currently, which is high by international standards (consistent, of course, with Australia having a fairly high current account deficit). However, nearly all of the banks' offshore borrowings are hedged; this hedging results in these borrowings costing the same, on average, as domestic wholesale funding; and the foreign investor base appears to be reasonably diverse.

According to surveys by the ABS, *net* foreign currency debt on the balance sheets of Australian banks rose from A\$117 billion in June 2001 to A\$186 billion in March 2005 (Table 4). Of this, A\$168 billion was hedged in derivatives markets, mostly by cross-currency swaps but also by forward contracts, leaving a net foreign currency exposure on debt of only A\$18 billion.¹⁴ After accounting for banks' foreign currency equity positions, banks had a small net foreign currency asset position. For Australian borrowers, offshore hedged issuance is a cheaper source of Australian dollar funds than domestic wholesale issuance whenever the spread to swap they pay overseas plus the premium they pay to their cross-currency basis swap counterparty is less than the spread to swap they pay in Australia.¹⁵ Australian banks are extremely efficient at taking advantage of changes in the relative cost of offshore hedged funding and domestic wholesale funding with, for example, the average cost over the past six years of raising debt in the United States and swapping the proceeds into Australian dollars being almost identical to the average cost of wholesale domestic funding (Figure 4).¹⁶ Despite 80 per cent of outstanding offshore debt securities having been issued in the United States or United Kingdom, the ultimate nationality of the holders of these securities is likely to be more diverse than this suggests given that 43 per cent of offshore debt securities were issued in

Table 4: Banks' Foreign Currency Hedging
A\$ billion

	June 2001	March 2005
Net foreign currency position on debt	-117	-186
Derivative positions to hedge debt	102	168
Net foreign currency position on debt (after derivatives)	-15	-18
Net foreign currency position on equity (after derivatives)	26	23
Foreign currency position (after derivatives)	11	5

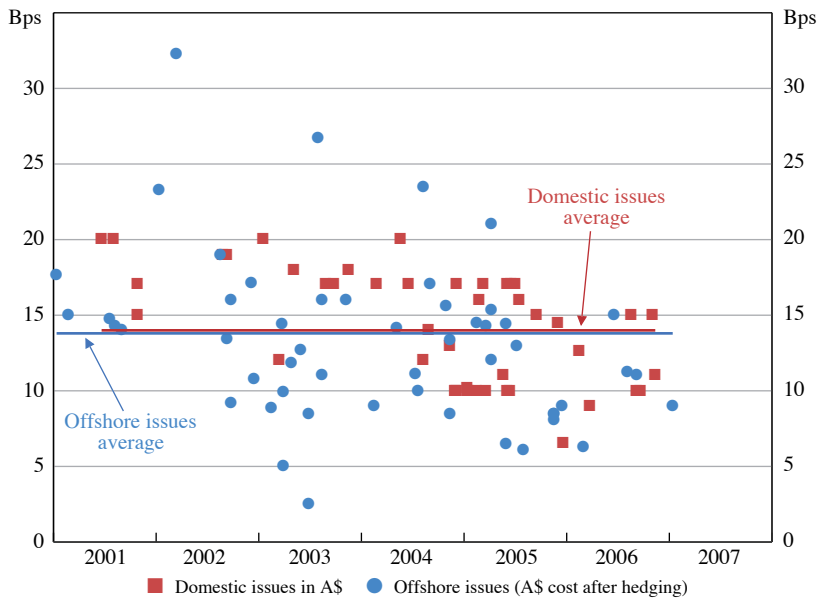
Source: ABS

14. See 'Box C: Foreign Currency Exposure and Hedging Practices of Australian Banks' in RBA (2006b, pp 42–43).

15. The main swing factor in the relative cost of the two types of funding is the cross-currency basis swap spread, which equilibrates *total* demand for Australian dollars under swap with total supply. It is quite sensitive to shifts in demand for, and supply of, Australian dollars under swap arising from debt issuance, which, in turn, is quite sensitive to changes in the spread (see Ryan 2007).

16. See RBA (2006a).

Figure 4: Australian Banks' Domestic and Offshore Issuance Costs Spread to bank bill swap rate



Source: RBA

US dollars, 21 per cent in euro and 11 per cent in pounds sterling. The average initial maturity of offshore bonds has also been rising, and at six years, is around the same as that for bonds issued domestically. Moreover, while in the past foreign investors have tended to be just as willing to roll over their debt securities as have domestic investors, should this prove to not be the case in the future, the Reserve Bank could provide Australian dollar liquidity in return for good collateral.

5.1.3 Funds management

Reflecting the transformation of household balance sheets and in particular, the rise in superannuation, the Australian funds management industry has grown rapidly over the past two decades, with consolidated funds under management of around \$1 trillion, compared with \$200 billion in 1990. Growth of superannuation funds has been particularly rapid, reflecting the introduction of compulsory employer contributions in 1992 and the concessional taxation of superannuation. As a result, superannuation funds' share of total funds under management has risen from just under 40 per cent in 1990 to around 55 per cent. But other parts of the funds management industry have also grown quickly, boosted by: increased financial consciousness and a search for higher returns; the strength of world equity markets; and the demographic trend of 'baby boomers' entering the wealth accumulation phase of their life. By international standards, the Australian funds management industry is large in absolute terms, not just as a ratio to GDP. Even taking into account the

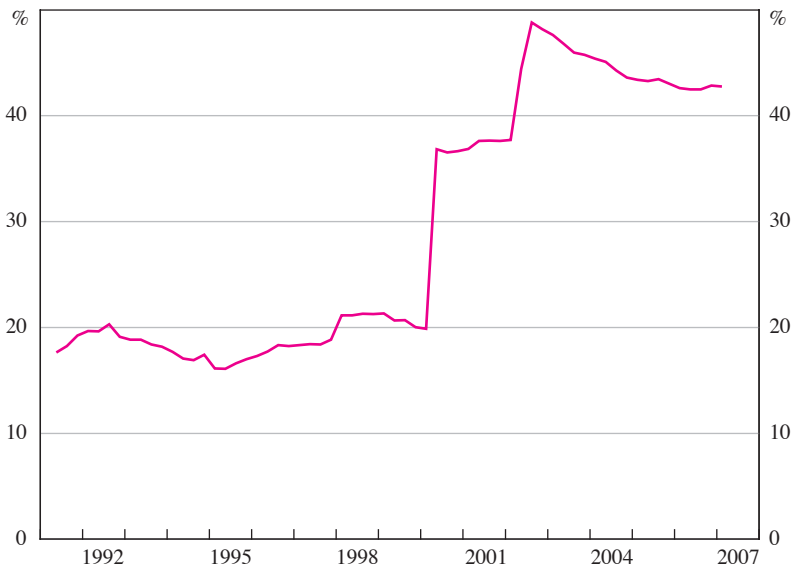
retirement vehicles not captured by some international comparisons, the Australian industry appears to be one of the world's 10 largest.

One form of managed fund that has risen to prominence in recent years has been hedge funds, which have increased their share of funds under management to around 6 per cent, largely because of a broadening of their investor base.¹⁷ In Australia, hedge funds are subject to the same registration, operational and disclosure requirements as all other parts of the funds management industry. These requirements do not preclude the use of non-traditional investment strategies, even where a fund is offered to retail investors. Reflecting this, and as noted in Section 3.2, high net-worth individuals and retail investors accounted for two-thirds of hedge fund assets under management as at mid 2006, compared with less than one-half for the global hedge fund industry. In addition, superannuation funds have increased their allocations to hedge funds, with around one-third of superannuation funds now investing in them. A relatively large proportion, around one-third, of Australian hedge funds are fund of hedge funds that invest in pools of single-manager funds. Among Australian single-manager funds, the predominant strategy is the relatively straightforward one of long-short equity positions. It appears that the Australian hedge funds' exposure to structured credit instruments, such as CDOs, is low by international standards and that most of these exposures are not highly leveraged. The Australian banks' credit exposure to the hedge fund industry is also very small, reflecting two factors: the fund of hedge funds make little direct use of prime brokerage services (as opposed to the underlying, predominantly offshore, funds); and the Australian single-manager funds tend to use global investment banks as their prime brokers.

More generally, however, the Australian banks have become significant providers of funds management products themselves, with three of the four largest banks having acquired large existing funds management vehicles and the other having formed a joint venture. These asset acquisitions boosted banks' total share of retail funds under management from around 20 per cent in the 1990s to nearly 50 per cent earlier this decade, although more recently their share has fallen back a little (Figure 5). Reflecting these acquisitions and the general performance of managed funds, banks' income from funds management has risen from 1 per cent of their total income in 1995 to 13 per cent in 2006, which is fairly high by international standards.

17. See Jacobs and Black (2006).

Figure 5: Banks' Retail Funds under Management
Per cent of total



Note: Australian-owned banks

Source: Plan for Life Pty Ltd

5.2 Competition and profitability in the banking sector

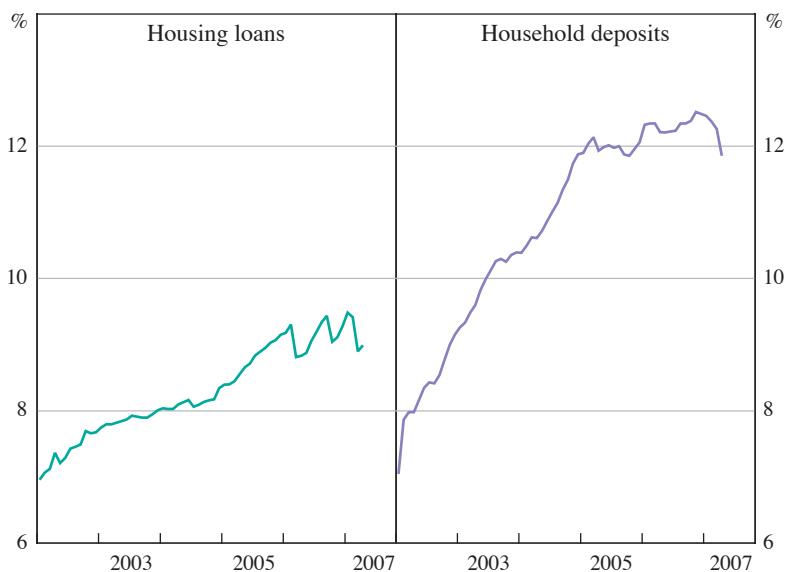
As noted in Section 3, increased competition in the market for housing loans has been a significant complement to the increase in household demand for such debt. This increase in competition has greatly increased the availability of housing finance which means that, for a given level of unemployment and interest rates, a higher share of loans is likely to be in arrears than in the past. While arrears rates have risen in recent years, they remain low by historical and international standards.

The first major wave of competition in the housing loan market occurred in the mid 1990s with the catalyst being the entry of specialist non-bank lenders (mortgage originators), who were able to undercut banks for several reasons: the banks had raised the margins on their housing loans in the early 1990s to compensate for their poorly performing business loans; the banks' extensive branch networks remained costly at a time when mortgage originators were able to circumvent the need for branches by employing mobile lenders; and the banks' funding advantage of low-cost retail deposits was being eroded by the shift to a low-inflation and low-interest-rate environment. This meant that it was no longer prohibitively expensive for mortgage originators to raise funds by issuing mortgage-backed securities at market rates. The banks responded to this competition by reducing the spread between their standard variable home loan rates and the cash rate by about 3 percentage points between 1993 and 1997. Margins on investor housing loans fell by even more, with the margin that used to exist between these loans and owner-occupier housing loans eliminated by the mid 1990s.

Competition in the housing loan market has intensified during the past decade, as has competition in the markets for a range of other banking products, such as business loans and retail deposits. One of the main factors supporting competition during this period has been the emergence of brokers, who make it easier for borrowers to compare the costs and features of different loans. In the housing loan market, brokers are now estimated to account for more than one-third of new loans and they are also now very active in the market for small business loans. Price discovery has been further improved by the increased use of online information services, which also make it easier for borrowers to compare products across different institutions. The potential for relatively high returns in the market for newer housing loans, such as ‘low-doc’ and ‘non-conforming’ loans, has also attracted competition in those segments, while the moderation in demand for housing loans in the past few years has boosted competition in the business loan market.

Foreign-owned banks have also been a stronger competitive force in retail banking markets in recent years, and continue to be very active in large business banking.¹⁸ Their recent focus on retail banking has been facilitated by the more widespread distribution of banking services via the internet which has helped them overcome the disadvantage of having relatively small branch networks. Reflecting this, foreign-owned banks’ share of the housing loan and retail deposit markets picked up in the first half of the decade before levelling out as other institutions responded to the increased competition by offering similar products (Figure 6).¹⁹

Figure 6: Foreign Banks’ Market Shares
On-balance sheet, per cent of total bank outstandings



Source: APRA

18. See ‘Box C: Foreign-Owned Banks in Australia’ in RBA (2007, pp 47–49).

19. Interestingly, with Australian-owned banks now competing more strongly on non-branch originated products, at least one foreign-owned bank is embarking on a significant expansion of its branch network.

Regional banks have also been marketing themselves more aggressively in recent years, including outside their home states, but have so far been less successful than the foreign-owned banks in gaining market share.

The increase in competition in the past decade has seen further reductions in margins on housing loans. Whereas the banks' standard home loan indicator rates have moved in line with the cash rate for most of the past decade, the actual margins to the cash rate have narrowed by a further 30–35 basis points, reflecting the increased size and availability of discounts being offered on housing loan indicator rates. There have also been various product innovations in the housing finance market, with lenders introducing products that better meet the needs of certain types of borrowers, such as those with irregular incomes or impaired credit histories. Examples of these products include low-doc loans, non-conforming loans and interest-only loans. Specialist non-bank lenders were often the first to begin marketing these products but banks now also offer them, although to date they have had very little involvement in the non-conforming loan market. As a result of the increased competition, the margins on many of these newer products have fallen more sharply than on standard housing loans, though, to date, they have still proved very profitable to lenders. For example, the margins to the cash rate on low-doc and non-conforming loans, of around 160 basis points and 290 basis points, respectively, compare with losses of about 1 basis point and 29 basis points, respectively, in 2006 (Table 5).

As well as price reductions and product innovations, competition in the housing finance market has also been associated with some other changes to lending practices. For example, the debt-serviceability criteria that lenders use in assessing loan applications have been eased and they have begun to make greater use of lower-cost electronic and off-site property valuation techniques.²⁰

As is to be expected, given the increased availability of finance, there has been some increase in arrears rates on housing loans in recent years. The share of non-performing housing loans on the banks' domestic balance sheets has roughly doubled since 2003, to around 0.4 per cent, but this is still lower than it was for most of the 1990s. Arrears rates on securitised low-doc and, especially, non-conforming loans have risen by more than for standard loans over the past few years (Figure 7), but for non-conforming loans, which account for only about 1 per cent of the stock of housing loans, the arrears rate is still lower than that on US sub-prime loans.

Aside from housing loans, there has also been strong competition in other banking products in the past decade. In the business loan market, for example, competition has contributed to a reduction in the spread to the cash rate on both small and large business loans of about 250 basis points over the past decade. (The margin on small business loans fell more quickly earlier in the period, in part reflecting the increase in the share of these loans that was secured by residential property.) However, despite the increased competition for business loans, the arrears rate on these loans, at around 1 per cent, is actually lower than several years ago.

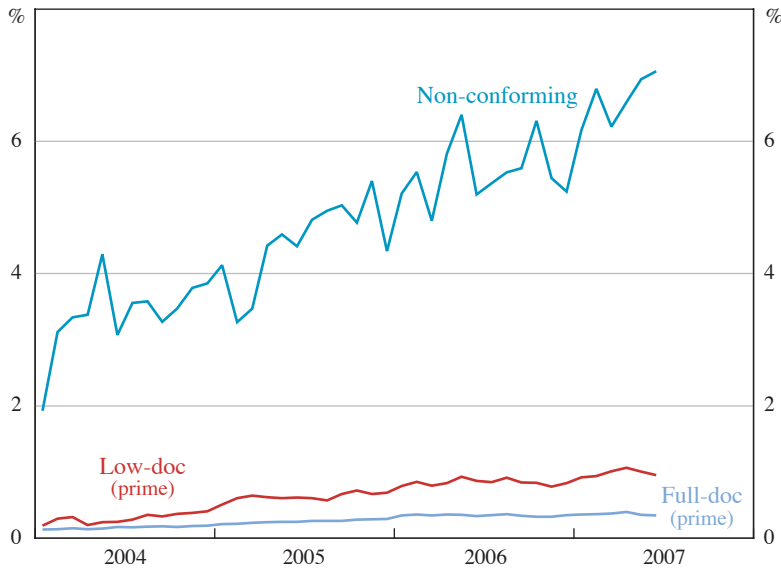
20. See RBA/APRA (2007) and Laker (2007) for further information on these and other changes in housing lending standards.

Table 5: Housing Loans

	Interest margin Spread to cash rate, basis points				Losses Basis points				Share of approvals Per cent				Share of outstandings Per cent	
	2000	2002	2004	2006	2000	2002	2004	2006	2000	2002	2004	2006	2000	2007
Prime loans														
– Full-doc	155	145	135	120	2.9	1.6	0.7	0.9	>99	96	88½	88	92	
– Low-doc	270	250	230	160	..	..	..	..	<½	3	10	10	7	
Non-conforming loans	..	425	390	290	..	..	5.0	29.0	<½	1	1½	2	1	

Sources: ABS; RBA; Standard and Poor's; banks' annual reports

Figure 7: Housing Loan Arrears
90+ days past due, per cent of outstandings



Note: Based on securitised loans

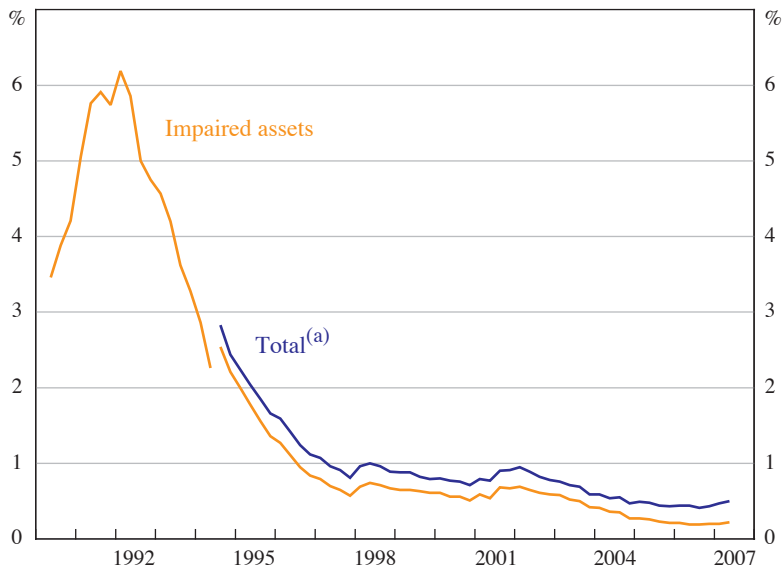
Sources: RBA; Standard & Poor's

The share of *all* loans on banks' balance sheets that are non-performing is, at just under 0.5 per cent, very low by historical standards, reflecting the shift from business to housing loans as well as the good economic conditions (Figure 8). Moreover, the share of all loans that are in arrears and not well secured by collateral, that is, 'impaired assets', remains extremely low at 0.2 per cent. International comparisons of impaired asset ratios also suggest the quality of loans on Australian banks' balance sheets is very high, though in part this should be expected given the relative performance of the Australian economy in recent years.

Despite the further increases in competition, the Australian banking sector has remained very profitable, with the pre-tax return on equity of the five largest banks averaging about 20 per cent and showing very little variation since recovering from its sharp fall in the early 1990s. The various developments discussed above have, however, resulted in significant changes in the composition of these returns (Figure 9).

The downward pressure on margins on both housing and business loans has seen the five largest banks' overall lending margins to the cash rate fall from around 3 per cent in 1994 to 1½ per cent. This, combined with some contraction in the margins on deposits in the past few years, has resulted in these banks' net interest margins falling from around 4 per cent to around 2¼ per cent. This has, however, been more than offset by the rapid growth of lending, resulting in net interest income growing at an average annual rate of just over 6 per cent since the mid 1990s. At the same time, these banks' non-interest income has grown at an annual average rate of 10 per

Figure 8: Banks' Non-performing Assets
Consolidated, per cent of on-balance sheet assets



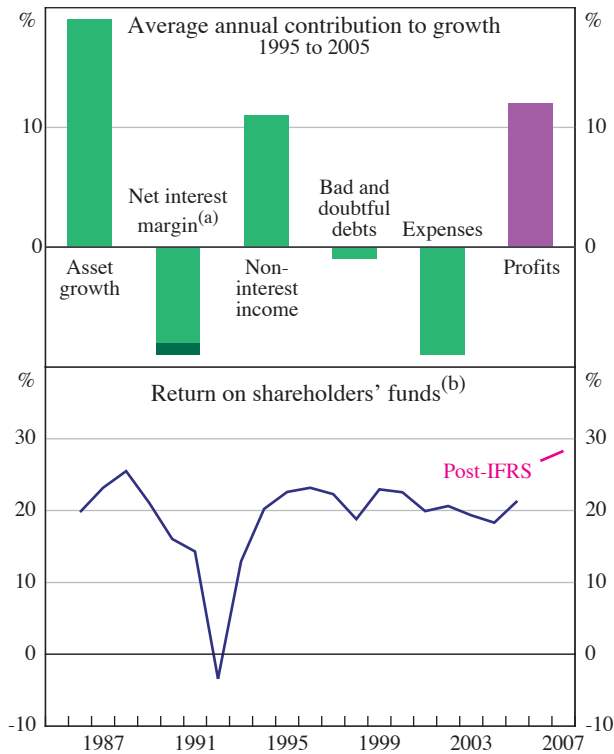
Note: (a) Includes 90+ days past-due items that are well secured

Source: APRA

cent, reflecting the strong growth in income from their wealth management activities, while write-offs from bad and doubtful debts have detracted only slightly from profits, and costs have grown at an average annual rate of a little over 5 per cent. The relatively moderate rate of growth of costs largely reflects the rationalisation of branch networks (at least until a couple of years ago) and their replacement with electronic services such as ATMs, EFTPOS terminals and telephone/internet banking, as well as the application of technology in other areas such as transactions processing and loan origination. With costs growing by about 5 per cent per annum, and total income by 8 per cent per annum, the aggregate cost-to-income ratio of these banks has fallen from a little over 60 per cent in 1995 to 48 per cent in 2006.

The returns on equity for the other Australian-owned banks have, on average, been at least as high as for the five largest banks in recent years, and the sector's overall return on equity has been higher than for the banking sectors in most G10 countries.

Figure 9: Profit Before Tax
Five largest banks



Notes: (a) The dark green area represents the cross-product term arising from the interaction between margin compression and asset growth.

(b) Data for 2007 are annualised half-year results; four largest banks only prior to 1993; from 2006 data are on an IFRS basis, prior years are on an AGAAP basis.

Sources: RBA; banks' annual and interim reports

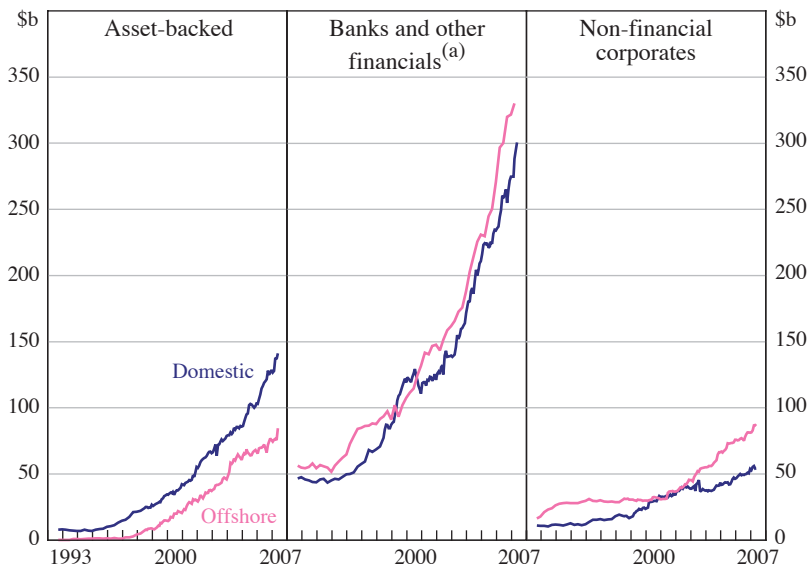
5.3 Financial markets and credit risk transfer

The growth of financial markets has been an important feature of the financial landscape in Australia over the past decade or so, with banks playing an ever-increasing role within these markets. An indication of the growth in financial market activity in Australia is given by the annual turnover in all financial markets, which surpassed A\$100 trillion in 2005/06, over three times the value of turnover in the mid 1990s. Much of the growth in financial markets over this period can be linked to the transformation of household and business balance sheets. As noted earlier, the rapid expansion in households' debt and the reduced share of their savings invested in bank deposits has resulted in banks and other financial institutions becoming very active issuers of securities in capital markets, and at the same time, the rapid growth in the funds management industry has provided a ready source of demand for these and other securities. Banks have also been very active in the growth of

derivative markets, both in managing the risks associated with their funding and lending activities and in providing risk management services to clients.

One of the most important aspects of the growth of financial markets in Australia has been their increasing role in facilitating financial intermediation. The clearest example of this is the rapid growth in the securitisation market, especially for residential mortgages which make up the vast bulk of securitised assets in Australia. Since the mid 1990s, the value of asset-backed securities issued in Australia has increased nearly seventeen-fold, from \$8 billion to \$140 billion, accounting for about one-quarter of the overall growth of the domestic non-government debt securities market (Figure 10). Banks have been responsible for about half of this issuance and they have also been active in issuing own-name paper to help fund their lending growth. The value of outstanding debt securities issued by all financial institutions into the domestic market has increased from about \$45 billion in the mid 1990s to \$300 billion (two-thirds of this is short-term paper, primarily certificates of deposit). Financial institutions' offshore issuance has been somewhat stronger, with around \$330 billion currently outstanding.

Figure 10: Debt Securities Outstanding



Note: (a) Excludes bills

Sources: ABS; APRA; Austraclear; RBA; Westpac

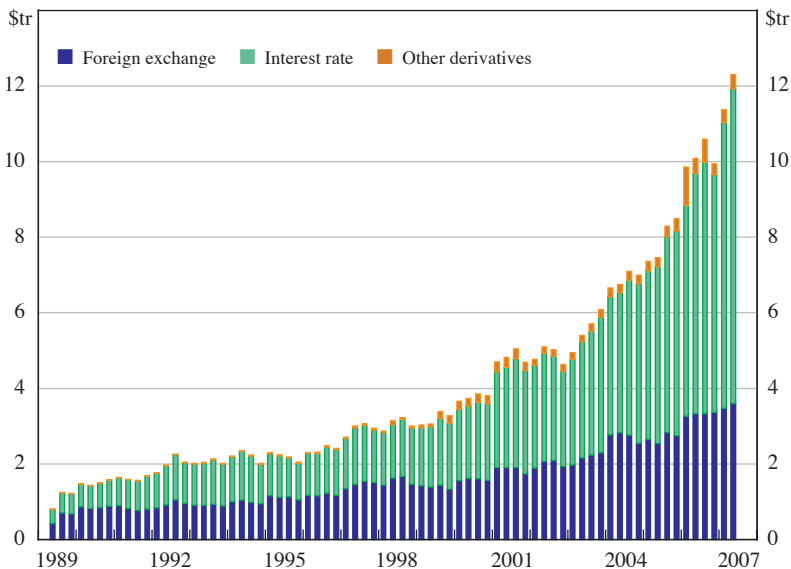
While financial markets are playing an important role in facilitating financial intermediation, they are also becoming an increasingly important *direct* source of finance for non-financial businesses. The value of non-financial corporate bonds and commercial paper issued in Australia has increased nearly five-fold since the mid 1990s, from \$12 billion to \$55 billion currently. Equity raisings have also been an important source of finance to businesses: the market capitalisation of the

Australian Stock Exchange as a ratio to GDP has risen by 80 per cent since 2000, with net equity issues accounting for roughly one-fifth of this growth. Reflecting these developments, the share of private non-financial corporations' overall funding obtained through the banking system has declined from a peak of around 55 per cent in 1990, to about 30 per cent currently.

While the share of funding sourced from financial markets has increased, this has not diminished the importance of banks within the financial system. In addition to their own debt issuance, banks have been increasingly active in providing a range of risk management and other financial services. For example, banks have been instrumental in the growth of the non-government debt markets as arrangers of debt issues by their corporate customers. Banks have also been very active in the growth of derivative markets, which they use to provide risk management services to their clients and to manage risks on their own balance sheet, such as the foreign exchange risk that arises from their offshore borrowings. An indication of the overall growth in banks' derivatives activity is provided by the gross notional principal value of their outstanding derivatives, which has risen from a little over \$2 trillion in the mid 1990s to \$12 trillion (Figure 11). This is equivalent to around 7 per cent of their on-balance sheet assets in credit-equivalent terms. As shown in Table 6, there has been substantial growth in turnover in a range of derivative markets in Australia since the late 1990s and banks have accounted for a large and, in some cases, increasing share of this turnover.

Notwithstanding the very large gross positions that banks have in derivative markets, they tend to carry only small unhedged positions and therefore have

Figure 11: Banks' Derivatives
Notional principal



Source: APRA

Table 6: Financial Market Activity and Banks' Involvement

Instrument	Growth in turnover	Banks' share of annual turnover	
	Per cent	Per cent	
	1998/99–2005/06	1998/99	2005/06
Repurchase agreements	243	47	43
Interest rate swaps	738	61	68
Cross-currency swaps	568	59	63
Forward rate agreements	495	78	86
Interest rate options	306	37	62
Credit derivatives	394	64	66
Currency options	44	84	47

Notes: The comparison of credit derivatives turnover is between 1999/2000–2005/06. Banks' share of turnover excludes in-house transactions.

Source: AFMA

relatively little exposure to market risk. Accordingly, the market value-at-risk for the large banks has been equivalent to about 0.04 per cent of shareholders' funds for the past few years, significantly below that of some of the globally active banks.²¹ Consistent with their low exposure to market risk, trading and investment activities account for a relatively small share, about 5 per cent, of banks' total income on average, although there is some divergence across institutions. Aside from their trading activities, banks also generate income from other financial market activities, such as broking, underwriting and syndication.

Credit derivatives have received a lot of attention globally in recent years. In Australia, this market is still quite small by international standards, though it has grown rapidly over the past few years and is likely to continue to grow strongly in the years ahead. According to data from the Australian Financial Markets Association (AFMA), there was \$77 billion of credit derivatives outstanding in the Australian market as at June 2006, compared to \$12 billion six years earlier. Annual turnover has increased five-fold over this period, with banks continuing to account for about two-thirds of turnover.

Despite accounting for a large share of turnover in credit derivatives, in net terms the major Australian banks have used these instruments to shed credit risk equivalent to only about 1 per cent of their assets, with gross positions that are not a great deal higher. Consistent with this, credit derivatives account for only about 1 per cent of banks' total outstanding derivative positions. In terms of the main types of instruments being used in the Australian market, single-name credit default swaps (CDS) that reference investment-grade entities continue to dominate. Currently, there are publicly quoted CDS prices for about 40 companies in Australia. Consistent with

21. Here value-at-risk is calculated using a 99 per cent confidence interval and a one-day holding period.

international trends, there has been some growth recently in multi-name basket and index swaps and also in total return swaps.

While credit derivatives are still a fairly small part of the Australian market, credit risk transfer has nonetheless been occurring on a significant scale by virtue of securitisation, even if its primary objective has been to fund loans. The small but rapidly growing syndicated loan market is also a form of credit risk transfer.²²

Another recent development in Australia is the emergence of markets in collateralised debt obligations (CDOs) and collateralised loan obligations (CLOs).²³ These markets were slow to develop since the first domestic CDO issue in 1997, but issuance has picked up noticeably in the past few years, with just over \$15 billion currently outstanding. Recently there has been a shift towards synthetic structures and more complex variations, consistent with overseas trends. Overall, as with the market for credit derivatives, CDO and CLO markets in Australia are still relatively small, though developments overseas point to continued growth in the years ahead. The growth in these markets, and banks' involvement in them, raises a number of policy issues, which are discussed below.

6. Policy Issues

In this section we discuss some of the broad policy issues, particularly as they relate to the stability of the financial system, arising from the developments documented above.

- The first of these is the implications of the transformation of household balance sheets for the stability of the Australian banking sector. Our main conclusion here is that, while the riskiness of mortgage portfolios has increased somewhat over recent years, the Australian banking system is sound and well placed to weather unexpected adverse events.
- The second is the implications of the rapid growth of financial markets – and the banks' ever-increasing reliance on these markets – for the nature and dynamics of stress within the financial system. While acknowledging the long-term benefits of these developments, we conclude that disruptions in markets, including abrupt changes in pricing and market liquidity, have the potential to be more damaging than in the past.
- The third issue is the challenge posed by the inherent difficulty of measuring risk. We discuss two aspects of this. The first, and most important from a financial stability perspective, is dealing with periodic bouts of mispricing of risk, which have the potential to amplify the financial dimension of an economic cycle and, *in extremis*, induce financial instability. Here we touch on a couple of possibilities but conclude that there is no easy solution. The second relates to households and the challenge of equipping them with the knowledge and tools they need to manage the increased risks resulting from the transformation of their balance

22. See RBA (2005c).

23. See RBA (2005a).

sheets. Here, we conclude that while mismanagement of this increased risk may not threaten financial stability, there may be scope for further improvements in areas such as financial literacy and financial product disclosures.

6.1 Implications of the transformation of household balance sheets

As discussed earlier, the strong macroeconomic conditions of the past decade and a half have provided a very favourable operating environment for Australian financial institutions, characterised by: a low and relatively stable level of interest rates; strong demand for credit; low bad debts; and strong profitability. These benign conditions, together with ongoing competition, have resulted in some repricing of risk and a relaxation of lending standards.

While the relaxation of lending standards has made banks' mortgage portfolios riskier (for given economic conditions) than in the past, the relaxation (to date) needs to be kept in perspective.

First, much of the fall in interest margins on standard housing loans most likely reflects efficiency gains rather than an under-pricing of risk, and the relatively sharp decline in margins on non-standard products, such as low-doc and non-conforming housing loans, largely reflects a correction to very high margins on these products in the past. Also, notwithstanding the fact that the past may not be a good guide to the future, margins on all types of housing loans remain many times larger than recent loss rates and in some cases higher than margins on comparable products in other countries.

Second, despite the increased popularity of non-standard loans, their share of the *stock* of all housing loans is, at least to date, still low and is an even lower share of loans on the books of the largest entities. Moreover: unlike with US sub-prime housing loans, non-conforming loans in Australia (whose share is extremely low) generally do not carry a potential shock in the form of a step-up to market rates after a period of introductory low interest rates; low-doc and non-conforming loans tend to have relatively low loan-to-valuation ratios (LVRs); and, for APRA-regulated entities, almost all loans with an LVR greater than 80 per cent have 100 per cent mortgage insurance as this is a prerequisite for a concessional capital charge.

Finally, it is important to bear in mind that survey data suggest that, despite the increase in allowable debt-servicing ratios, the majority of debt has been taken on by households who should be best able to service it. Consistent with this, arrears rates, while having risen in recent years, remain low by international standards, despite the fact that there has been some tightening of monetary policy.

Looking at the credit risk on banks' total loan portfolios, this is most likely lower than in the past. Despite some relaxation of lending standards for mortgage lending, the qualifications noted above mean that, in the absence of a further, significant, relaxation in lending standards, losses from lending for housing are still likely to be significantly lower and less variable than losses from lending to businesses. As a result, the creditworthiness of banks' total loan portfolios has benefited from the shift in their composition resulting from the rapid growth of housing credit.

In addition, even though lending to businesses is more risky than lending for housing (and business loan margins have fallen) there are a number of favourable aspects of banks' current business loan portfolios. First, business balance sheets are, overall, in good shape, so there would have to be a very sharp contraction in activity for there to be a significant decline in the credit quality in the business sector. Second, banks' risk management techniques are better than in the past: for example, business loan concentration is considerably lower than a decade or so ago; lending for commercial property, while having risen quickly of late and having been the most common form of problem lending around the world to date, has not been associated with the oversupply of commercial property that existed in the late 1980s; and loans to finance LBOs represent less than 1 per cent of Australian-owned banks' total loans.

In light of all these considerations, our view is that the Australian banking system is very sound. This view is supported by various stress tests recently undertaken as part of the International Monetary Fund's (IMF) assessment of the Australian financial system under its Financial Sector Assessment Program (FSAP).²⁴ In work undertaken jointly with the Australian authorities and the five largest banks, these banks were subjected to a stress test intended to measure their resilience to a large fall in various asset prices, a large increase in their wholesale funding costs because of a sharp deterioration in investor sentiment, and a recession. Among the various changes assumed to occur over the course of 2006 were: a 30 per cent fall in house prices; a significant depreciation of the exchange rate; higher wholesale funding costs for banks and unchanged official interest rates; a short recession in which real GDP falls by 1 per cent, driven by an unprecedented 2½ per cent contraction in household consumption; and an increase in the unemployment rate and inflation rate of about 4 percentage points and 2¼ percentage points, respectively.

In aggregate under this scenario, the banks reported a fall in profits relative to the second half of 2005 of around 40 per cent after 18 months, easing to 25 per cent after another 18 months – although there was considerable variation in the individual banks' results, none of the five banks reported a loss during the forecast period. Around one-half of the fall in aggregate profits came from an increase in bad debt expenses: households' cutbacks in consumption in order to continue servicing housing loans (together with prepayment buffers and mortgage insurance) restrained the losses on housing loans but contributed to the general slowdown in the economy, which resulted in an increase in business bad debt expenses. Most of the remaining fall in profits was due to increased funding costs and lower income from wealth management operations.

While there were some caveats associated with the exercise, one of which was the surprisingly large variation in outcomes across banks, on balance we consider the results of this stress test as providing support for our assessment that the banking system in Australia is well placed to withstand a major adverse shock.

24. See IMF (2006) and Section 3.2 of RBA (2006c, pp 46–49). The FSAP also involved a partial update of APRA's 2003 mortgage portfolio stress test. See APRA (2003) for details of this earlier stress test.

6.2 Growth and innovation in financial markets

In Section 5.3, we discussed some features of the growth of financial markets in Australia, the main points being: banks have become increasingly reliant on these markets; some of the newer risk transfer markets, such as credit derivatives and CDOs, are still very small in Australia but global trends suggest they will continue to grow; and the growth in the role of financial markets has been associated with growing interdependencies between market participants.

On the whole, the growth and innovation within financial markets offers considerable benefits and should be positive for financial stability in the long run: financial markets represent an important source of funding and investment diversification; financial market innovations have increased the marketability of risk, thereby in principle allowing risk to be better priced and allocated; and the emergence of new players, such as hedge funds, which can be active risk-takers in markets for complex and illiquid instruments, increases the heterogeneity of market participants which, at least in good times, enhances overall market liquidity.

However, the growth in the role of financial markets and the rapidly expanding range and complexity of financial instruments being traded does raise a number of policy issues. These issues centre on the increased interconnectedness of financial system participants and their common reliance on the smooth operation of financial markets as well as the increased opaqueness of risk that may have resulted from the rapid innovation in risk transfer markets.

As noted earlier, financial markets now play a much greater role than in the past in the funding and risk management activities of many financial system participants and, at the same time, there has been an increase in the inter-linkages between participants through their trading and other activities. A system with more connections between participants should be more resilient to most kinds of shocks because the effect of the shock is likely to be more widely dispersed and so absorbed more easily by individual participants. For example, the securitisation of a significant proportion of Australian housing loans means that a deterioration in the credit quality of these loans would see the losses spread from a relatively concentrated group of lenders to a combination of these lenders and a large number of investors. However, as the financial system becomes more dependent on the smooth operation of financial markets, this raises the potential for market disruptions to have more wide-ranging and detrimental effects than in the past. A disruption in derivative markets, for example, could make it more difficult for institutions to hedge their risk exposures and, in certain situations, large price movements in illiquid markets could lead to significant mark-to-market losses, potentially exacerbating the problems. While the greater interconnectedness of market participants should reduce the probability of a market disruption becoming a major crisis, if a crisis was to occur, then the inter-linkages could spread the impact around the financial system more rapidly and widely than in the past. This has prompted some to suggest that we may be moving to a world of less frequent but potentially higher impact crises.²⁵

25. See, for example, Gieve (2007).

A challenge raised by the increasing pace and complexity of innovation in financial markets is that many of the newer products, such as credit risk transfer instruments, may not be well understood. In the transition period, it is possible that the risks associated with these products are not being measured accurately or, even if they are, not well understood by all participants. Exacerbating this is the fact that many of these products have only existed during a period of favourable economic conditions, so their market liquidity has not been fully tested under stressful conditions.

While credit risk transfer markets can help disperse credit risk more widely, they can also make the ultimate destination of credit risk within the financial system more opaque. While there is generally more information available about the risk exposures of regulated financial institutions, much less is known about the risks carried by unregulated institutions, such as hedge funds, which have become active players in credit risk transfer markets. Much of the recent discussion on hedge funds has revolved around concerns about the lack of information about them and measures that might be taken to improve this situation.

The greater use of credit risk transfer instruments can also lessen the incentives of the originating institution to monitor the creditworthiness of the end-borrower, while the ultimate holder of the credit risk exposure may lack expertise in credit assessment. This raises the concern that the longer the chain from originator to the final holder of the risk, the greater is the danger of loss of information and misaligned incentives, undermining the ability of market participants to properly assess risk.

CDOs based on US sub-prime housing loans provide a good example of a product in which the risks may not have been well understood, not well priced – indeed the CDOs were lacking liquidity even in relatively good times – and ultimately resided in some surprising places. Part of the problem with these instruments reflects the fact that tranching, and the methodology behind the credit ratings that are assigned to the individual tranches, are not fully understood by all investors. Because lower tranches of CDOs represent a buffer for upper tranches, the latter can have a AAA rating even if the underlying assets are of poor credit quality. However, some credit rating agencies have assigned ratings on the basis of the risk of the tranche bearing *any* loss. But once a tranche bears any loss, it bears all further losses until its value is wiped out. As a result, a AAA-rated tranche of a CDO is riskier than a AAA-rated untranching bond (where losses would be spread across all investors in the bond). While this is why the former carries a higher interest rate, it is not clear that the reasons for this higher return are well understood by the less sophisticated investors in the market. While the amount of CDOs issued in Australia is still relatively small, and the holdings by Australian entities of CDOs issued elsewhere in the world appears to be quite small, there is, as noted earlier, fairly active participation by retail and middle-market investors in the CDO market, who are more likely to overestimate the risk-adjusted return.

Another, important, part of the problem with CDOs based on US sub-prime housing loans was leverage. Many holders of these instruments were using them as collateral to fund additional investments. As the value of the collateral was marked-to-market and margin calls by lenders could not be met, the collateral had to be

sold, putting further downward pressure on its price. The existence of leverage thus exacerbated the problem. Spillovers into corporate bond markets more generally then saw sharp falls in the value of funds with highly leveraged exposures to the corporate sector.

The rapid expansion and innovation in financial markets can also give rise to other challenges. For example, operational risks arise if the expansion of the market's technical infrastructure lags behind the growth in volumes. This problem was evident in the market for CDS a few years ago, where deficiencies in processing and settlement systems meant that there was a significant backlog of unmatched trade confirmations. The complexity of some of the newer instruments also raises the importance of documentation and legal risks, while counterparty credit risk is also becoming a more important concern than in the past.

In conclusion, and as discussed in Borio (this volume), the rapid growth and innovation in financial markets has the potential to give rise to more frequent bouts of volatility than in the past, with intermediaries being far from sidelined from these events. Whether or not this increase in volatility leads to financial instability remains to be seen. It is encouraging that recent episodes of market volatility have largely been short-lived and fairly well contained, although it is not clear that this would be the case in a less favourable economic climate.

6.3 Risk assessment challenges

The fact that risk is inherently difficult to measure, and that there is a tendency (even if modest) for people to underestimate risk in good times and overestimate risk in bad times, potentially amplifies the financial dimension of an economic cycle and, *in extremis*, induces financial instability.²⁶ This is one reason why the recent widening of credit spreads in financial markets, after several years of narrowing to near-historic lows, has been welcomed by some commentators. Concerns about potential mismeasuring of risk in the upswing of the cycle have prompted some to suggest a more activist role for prudential and/or monetary policy as a counter balance.

One suggested proposal is to require banks to increase their capital during good times, when *latent* risk is building up, in order to provide a buffer of capital for the inevitable downturn and crystallisation of risk. Another proposal has been for monetary policy to be tightened, even if not required for short-term inflation control, in order to reduce the build-up of latent risk. There is, however, no consensus for either of these policy actions. First, it is extremely difficult to predict the timing of the economic cycle, as evidenced by the exceptionally long period of expansion currently enjoyed by Australia, and hence extremely difficult to judge the timing of such policy measures. Second, it is extremely difficult to calibrate changes in capital requirements or interest rates over the course of the cycle to changes in the appetite for risk. This would be true even if the extent to which the mismeasurement of risk

26. See Borio, Furfine and Lowe (2001) and Lowe (2002) for a discussion of the difficulties of measuring the time dimension of credit risk and some of the implications.

changed over the course of the cycle was fairly consistent from one cycle to another, which it is not. Third, there is no political consensus for such policy measures.

In our view, then, activist prudential regulation, or at least activist use of capital requirements, and/or activist monetary policy would be of fairly limited use in dealing with any tendency for risk to be mismeasured over the cycle. Prudential policy more generally, however, is clearly a powerful tool for helping to ensure that financial institutions have appropriate risk management systems in place and the central bank's own communications to the public – such as the RBA's attempts to 'talk down' the housing market in 2002 and 2003 and the more general risk assessments contained in its *Financial Stability Review* – can also be useful.

This leaves us with the conclusion that, at the macro level, there is not a great deal that can be done about occasional bouts of mispricing of risk. There is, however, a more micro-oriented dimension to the difficulty of assessing risk: it is likely that not all households fully understand the risks that they are increasingly taking on, especially given the increase in the complexity and range of financial products that are available to them. While this may not necessarily threaten financial stability, it is an important issue and one for which there does appear to be scope for further progress.

The significant increase in the size and changes in the composition of the household balance sheet over the past couple of decades has left many households wealthier, but also more directly exposed to financial risks than they were in the past. While individuals have always been the ultimate bearers of risk in the economy, in the past the true incidence of risk was more opaque and typically thought of as being borne by institutions rather than households. In a defined benefit superannuation fund, for example, the market risks associated with the investment of the fund's assets are not borne by the fund's members, but are indirectly borne by those households that own shares in the fund's sponsor. By contrast, market risks are borne directly by the members of a defined contribution fund. The increased transparency and, arguably, increased concentration of risk-bearing by households therefore poses the challenge of ensuring that households have the knowledge and tools necessary to understand and manage this risk.

The scope of this challenge is illustrated by the (few) surveys of financial literacy that have been carried out in Australia, all of which show a fairly low level of financial understanding among many people.²⁷ The first national survey of adult financial literacy was commissioned by ANZ Bank in 2002 and updated in 2005.²⁸ The Commonwealth Bank also commissioned a survey in 2004.²⁹ Despite some

27. In Australia, the recent collapses of property developers Westpoint, Fincorp, Australian Capital Reserve and Bridgecorp also raise the concern that some households may have difficulty understanding the financial risks of investment products. The debentures and unsecured notes that these companies sold to retail investors to fund their operations carried significantly higher interest rates than other fixed-interest investments, such as term deposits, but it is not clear that all their investors understood the higher risks involved. The fact that some investors had apparently devoted the bulk of their savings to these securities strongly suggests they did not.

28. See ANZ (2005). ANZ has also committed to updating this survey in 2007.

29. See Commonwealth Bank Foundation (2004).

differences, a clear finding from these and other Australian surveys, and from surveys conducted overseas, is that there is a definite lack of financial skills and knowledge among people with certain demographic characteristics.³⁰ The lowest levels of financial literacy tend to be associated with people with lower levels of education, people not working or in unskilled work, people with lower incomes and/or lower levels of saving, single people and people at the extremes of the age profile (18–24 and over 70). The finding that there is a strong correlation between financial literacy and socio-economic status suggests that educational initiatives should be targeted at these high-risk groups. They may, however, have to be very actively targeted, given that surveys also suggest that many people overestimate their level of financial literacy and therefore may be less likely to seek information or undertake further education.

Recognising the importance of raising financial literacy standards, a range of initiatives are already under way to improve financial literacy in Australia. The Australian Government established the Financial Literacy Foundation in 2005 as part of a national strategy to improve financial education and literacy standards. The Foundation has undertaken a range of measures, including: conducting a nationwide information campaign to raise awareness of financial literacy and its benefits; developing a website for financial literacy information and education resources; assisting in developing financial literacy programs in schools and workplaces; researching a range of financial literacy issues; and acting as a coordinating body for the range of initiatives being undertaken elsewhere. As the agency responsible for investor protection, the Australian Securities and Investments Commission (ASIC) has also been active in educating retail investors about financial products and retirement planning, partly through a dedicated consumer website that provides information on a range of investor education topics. As well as these actions from within the official sector, many financial institutions have launched community initiatives aimed at improving literacy levels, and a number of organisations have introduced workplace programs to improve the financial literacy of their employees. While the initiatives currently under way are undoubtedly a step in the right direction, further efforts to improve financial literacy are likely to be needed.³¹

Also very important is having a strong regulatory and supervisory regime for the retail financial services industry. Certainly, this aspect has attracted increased attention over the past decade, with the most important development being the introduction of the *Financial Services Reform Act 2001* (FSRA), which brought various financial products and services under a consistent licensing and disclosure regime and established standards of conduct for financial service providers dealing with retail investors. We briefly discuss two aspects of the regulatory framework: product disclosure and the financial planning industry.

30. See Marcolin and Abraham (2006) for a discussion of the results from various financial literacy surveys undertaken in Australia, and see RBNZ (2007) for a more general discussion of financial literacy issues.

31. See OECD (2005) for a comprehensive international review of financial literacy initiatives.

In the Australian regulatory approach, disclosure plays a central role in helping to support market discipline – in principle, if retail investors are given sufficient information about a financial product then this should enable them to make an informed investment decision. But such an approach obviously places a premium on financial literacy as it relies heavily on the ability of investors to understand the information that is presented to them and make appropriate decisions based on that information. There has been some concern in Australia that the increased quantity and accessibility of financial information that comes from a disclosure-based regime may not be sufficient to help retail investors make the best investment decisions. A common criticism is that product disclosure statements and prospectuses have become long and complex, with their content driven by legal considerations rather than by the needs of retail investors. ASIC is trying to address these concerns via initiatives to help financial advisors and fund managers meet their disclosure requirements. For example, it has issued policy guidance to industry on preparing product disclosure statements, in which it emphasises the importance of the ‘clear, concise and effective’ requirement of the legislation over formulaic material intended to safeguard against legal liability. Also, in an effort to simplify product disclosures, ASIC now allows certain financial products to be sold with a shorter product disclosure statement or prospectus containing a smaller, core set of information than usual.

Going forward, there are likely to be benefits in further considering how best to provide retail investors with information about the benefits and risks of financial products. While the size of product disclosure documents is one aspect of this, another important issue is whether the language being used in these documents is appropriate for retail investors. There may also be some benefit in looking at other ways of summarising the risks of investment products. In the case of debt securities, one possibility could be to increase the role of credit rating agencies, either by requiring certain products be rated and for that rating to be disclosed in public offer documents and advertising, or requiring unrated issuers to state why they have not obtained a rating. Credit ratings have the advantage of providing a simple summary measure of the risk of an investment made by independent experts. However, any ratings-based approach would still need to ensure that investors understood what different ratings meant, and consideration would also need to be given to which rating agencies would be approved to provide the ratings and which instruments would carry the requirement.

Regarding the financial planning industry, an ongoing issue relates to the general reluctance of households to pay for financial advice on a fee-for-service basis. Instead, there is an overwhelming preference for commission-based advice, despite the conflicts of interest that can arise in this situation. In this regard, the requirement under the FSRA for financial advisors to provide their clients with a ‘statement of advice’ has been an important step in helping deal with this problem. These statements must explain the basis on which advice is given and include information about all remuneration, including commissions, and potential conflicts of interest. However, there still appears to be a further need to strengthen standards among professional advisors. A ‘shadow shopper’ survey of superannuation advice undertaken by ASIC in 2006 showed that in 16 per cent of cases, the advice given was not reasonable

in light of the client's needs (as required by law) and that unreasonable advice was more common where the advisor had a conflict of interest.³²

Another policy challenge related to households' increased risk burden is to ensure that households have access to suitable financial products and tools to help them manage risk. While a discussion of the types of products that may be needed is beyond the scope of this paper, we do note that Australian households currently make relatively little use of a number of risk mitigation tools that already exist, such as fixed-rate loans and some insurance products (such as mortgage payment insurance and life insurance).³³ To some extent, this may reflect the accumulation of financial assets by some households as well as the prolonged period of economic expansion and low and stable interest rates, which has given people increased confidence about their employment prospects in the future. However, it is also possible that the low use of these products is due to lack of awareness or a perception that they are too complicated, costly or ill-suited to many households' needs. In the case of life insurance, for example, it would appear that product complexity has been a factor, with an increasing number of life insurance providers in Australia now moving to simplify their products and streamline the application processes. There may be some benefit in improving consumer awareness of the benefits of certain risk mitigation tools and working to ensure that such products are accessible to households.

Our conclusion with respect to the difficulties in measuring risk can be summarised as follows: while there is not a great deal that can be done at the macro level, there does appear to be scope for further progress to be made at the micro level to bolster households' risk management capabilities, including with respect to financial literacy, financial product disclosure, standards within the financial planning industry and the use of certain risk management tools.

32. See ASIC (2006).

33. See IMF (2005) for a discussion of various investment and risk management products.

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