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## **THE GLOBAL FINANCIAL CRISIS: CAUSES, CONSEQUENCES AND COUNTERMEASURES**

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Remarks to the conference: 'Australia in the global storm: A conference on the implications of the global financial crisis for Australia and its region'

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## **THE GLOBAL FINANCIAL CRISIS: CAUSES, CONSEQUENCES AND COUNTERMEASURES**

I would like to thank Victoria University of Technology and the organisers of this conference for the opportunity to speak to you today. The conference is concerned with an important and highly topical subject: what was at first called a 'sub-prime crisis', then later 'financial turmoil', and is now being called the Global Financial Crisis. Indeed, many financial systems around the world have been under extraordinary strain for the past year and a half. The macroeconomic and human consequences of that crisis are becoming all too clear.

These events have raised many questions for policymakers and for market participants. What caused this global financial crisis? Why did it develop in the way it did? What have been the consequences, both for the global economy and the financial system itself? And are there any countermeasures that governments and other policymakers can take, to reduce the costs of the present crisis, and to prevent a reoccurrence?

These are all good questions and will no doubt keep many of us busy in the period ahead. This morning, I would like to suggest a few answers to at least some of these questions.

### **Causes**

As with any large event in any field of human endeavour, it is never about just one thing. There were many causes of the financial crisis, some recent and some long-standing. I would like to focus on three of those causes today: the misperception and mismanagement of risk; the level of interest rates; and the regulation of the financial system.

Perhaps the most basic underlying driver of the crisis was the inherent cycle of human psychology around risk perceptions. When times are good, perceptions of risk diminish. People start to convince themselves that the good times will go on forever. Then, when the cycle turns, risk aversion increases again, often far beyond normal levels, let alone those seen during the boom.

We can see in Graph 1 how investors' perception of risk changed in the years leading up to the crisis. Yields on emerging market bonds or US companies at the riskier end of the spectrum all narrowed relative to those on US government bonds and other securities that are seen as very safe. More recently, those spreads have widened out dramatically, as investors became more risk averse, and the 'search for yield' turned into a 'flight to safety'.

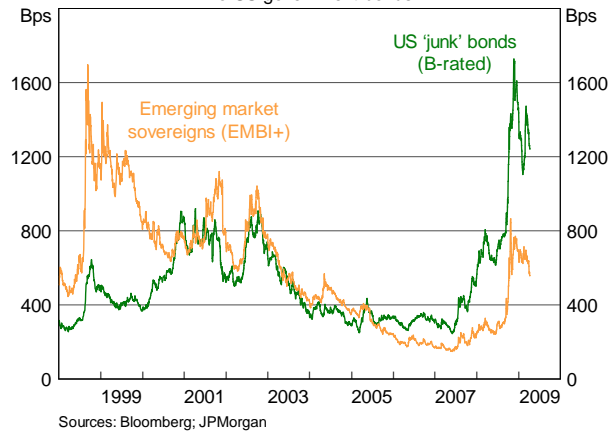
The effects of this boom-bust cycle of psychology are amplified when investors use leverage. Borrowing to purchase assets is lucrative when asset prices are rising, because all the upside beyond the interest costs goes to the investor, not the lender.

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But when times are bad and asset valuations are falling, investors' losses are magnified by leverage.

**Graph 1**

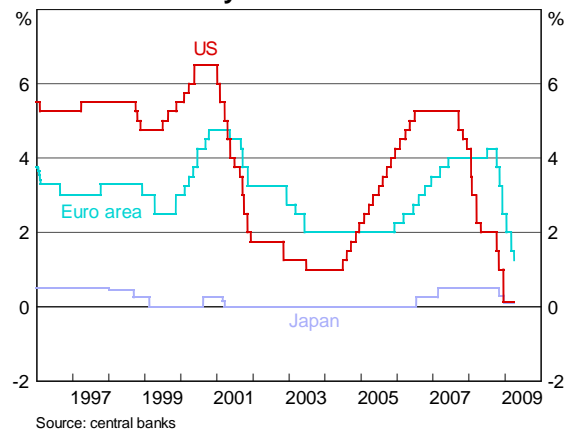
**Bond Spreads**  
To US government bonds



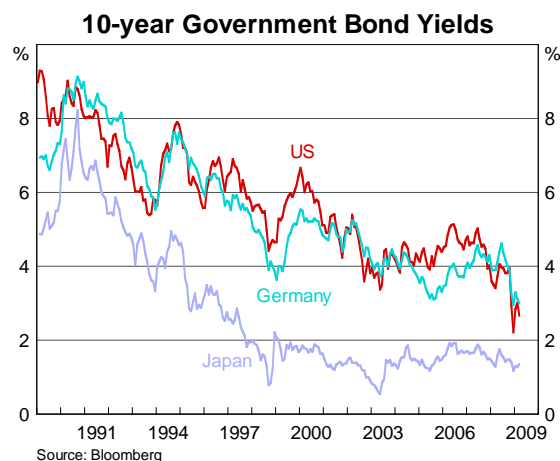
A second element that coincided with the perceptions of lower risk was the low level of interest rates in the early part of this decade. At the short end, policy interest rates in the major economies reached levels that were unusually low compared with history, as shown in Graph 2.

**Graph 2**

**Policy Interest Rates**



At the longer end, bond yields in the major economies were also unusually low over this period. As Graph 3 shows, this remained the case, even once policy rates started to rise starting in 2004. At the time, the low level of long rates was considered somewhat puzzling – a ‘conundrum’, as former Fed chairman Greenspan put it. Over time, though, many observers have come to the view that unusually strong investor demand had pushed long rates down. Amongst those investors were central banks and other government agencies in emerging and industrialised economies, which were accumulating foreign reserves.

**Graph 3**

Many observers were concerned about the way the low level of interest rates made higher leverage so attractive. Inflation pressures were quite subdued at that time, so the macroeconomic situation didn't necessarily warrant much higher interest rates. There has been plenty of debate, inside and outside central banks, on whether monetary policy should also respond to financial stability concerns. But there is also recognition in many quarters that low interest rates were not – and shouldn't be – enough to cause such a crisis on their own.

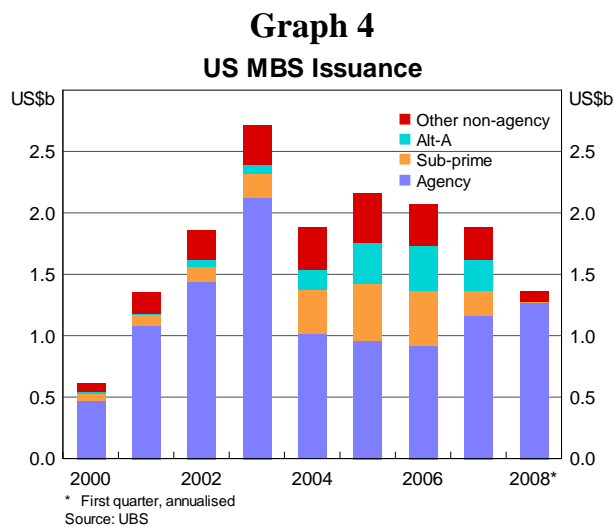
A lack of appropriate financial regulation in some countries is widely regarded as one of the important causes of the crisis. Many shortcomings have been identified in this area. These include: the capital requirements on complex financial products such as collateralised debt obligations (CDOs); the use of ratings provided by the private-sector rating agencies in the regulation of banks; the way credit rating agencies have themselves been regulated; and the structure of remuneration arrangements and the risk-taking incentives they create. Perhaps most crucially, many internationally active banks failed to perceive, or appropriately manage, the risks involved in certain financial products and markets, and regulators did not make them do better on this front.

### **The Build-up to the Crisis**

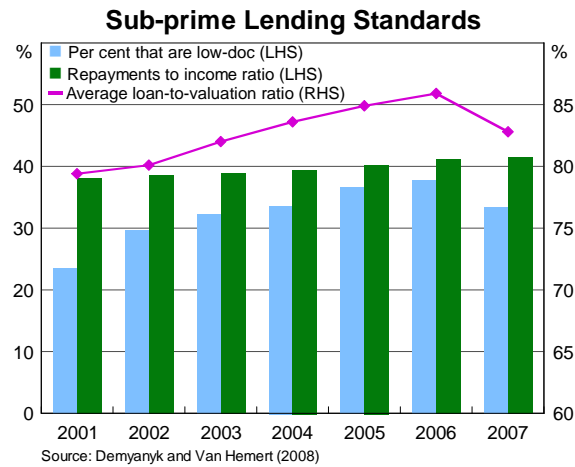
With this background in mind, I'd like to turn to the specifics of the build-up of tensions that finally broke as this financial crisis. Appetite for risk had been strong for some years; that risk was priced cheaply; and as a result, credit markets were booming and some measures of leverage were rising. The low price of risk was in fact regularly cited in the Bank's *Financial Stability Reviews* as a potential source of vulnerability for the global financial system.

One sector that took particular advantage of low long-term interest rates was the US mortgage market. American households traditionally took out fixed-rate mortgages, often guaranteed by the government-sponsored enterprises Fannie Mae and Freddie Mac – the GSEs. As rates fell, households refinanced in large numbers,

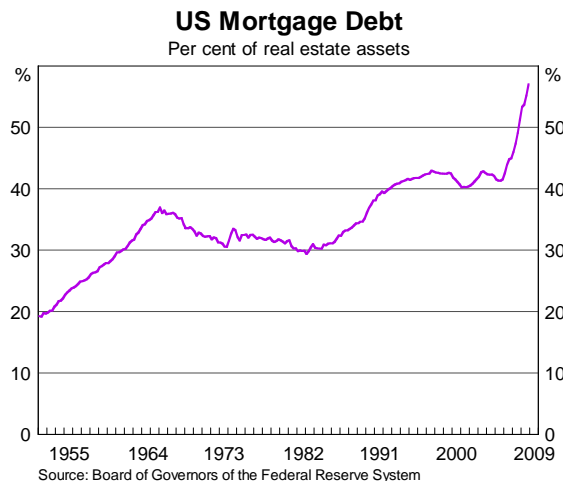
but this extra origination business dried up once rates started to rise again. Rather than shrink their business, US mortgage lenders pursued riskier segments of the market that the GSEs did not insure, as Graph 4 shows. This included the sub-prime segment, but also so-called ‘Alt-A’ and other non-standard loans involving easier lending terms. At the time, this was considered a positive development, because it was thought that it allowed more people to become homeowners. Products requiring low or no deposit, or with a low introductory interest rate were known as ‘affordability products’. They allowed households to pay the very high housing prices that their own stronger demand was generating.



As the US housing boom wore on, lending standards eased further. As Graph 5 shows, up until 2006 the sub-prime market segment increasingly allowed mortgages with very high loan-to-valuation ratios: that is, borrowers did not need much deposit. Low-doc loans became more common across the board. Negative amortisation loans, sometimes called ‘Pay-option ARMs’, also became more common. These are mortgages where the borrower can pick a repayment level that is so low that the loan balance actually rises for a while – something that is essentially unheard of in other countries.

**Graph 5**

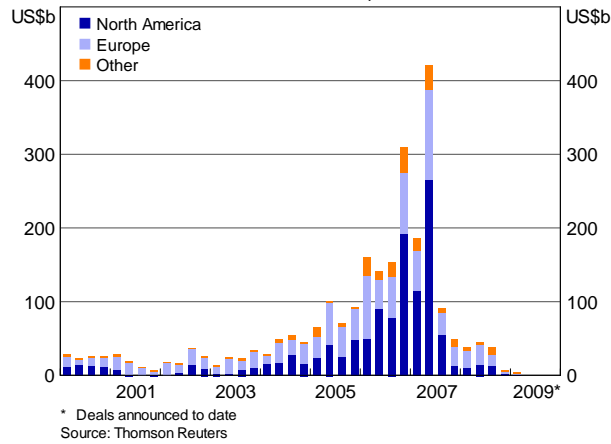
The result of all that mortgage borrowing was, as shown in Graph 6, an increase in leverage, defined to be the ratio of home mortgage debt to the value of the housing stock. This measure had been quite stable in the United States for a number of years. But it increased in those last couple of years of the boom, reaching around 45 per cent by the time prices peaked sometime in 2006. (The exact date depends on the price series used.) In Australia, the equivalent ratio is below 30 per cent. Since many homeowners own their homes outright, the US figure implies that many Americans had very little equity in their homes by the time the boom peaked. And of course, this measure of leverage has increased a great deal since US housing prices started to fall.

**Graph 6**

US households weren't alone in gearing themselves up like this. Although corporate sectors around the world were by and large relatively restrained in their behaviour, there were some pockets where borrowing and gearing expanded a great deal. Some examples include the asset-backed commercial paper market, which is often used to finance entities that invest in other securities, and the leveraged loan market, often used to finance buyouts of companies. And as Graph 7 shows, leveraged buyout activity boomed, especially in North America and Europe. As with the mortgage

market, the excesses built up most where the financing structures were most opaque, and the underestimation of the risks was greatest.

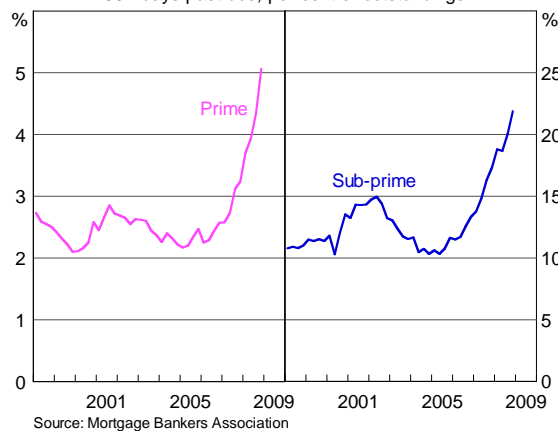
**Graph 7**  
**Global LBO Activity**  
Announced and completed



### The Onset of the Crisis

But you can't borrow your way to a good time forever, and this recent example of a credit-fuelled boom was no exception. The first signs of trouble were in the US mortgage market. Lending standards had eased so far – and outright fraud had gotten to be such a problem – that arrears rates started to rise more than lenders and investors expected. Graph 8 shows that the rise started in around 2006 for both prime and sub-prime mortgages, but became more obvious through 2007. The extraordinary thing was that, unlike in every other housing bust, arrears rates increased significantly before the labour market started to weaken.

**Graph 8**  
**US Mortgage Delinquency Rates**  
30+ days past due, per cent of outstandings

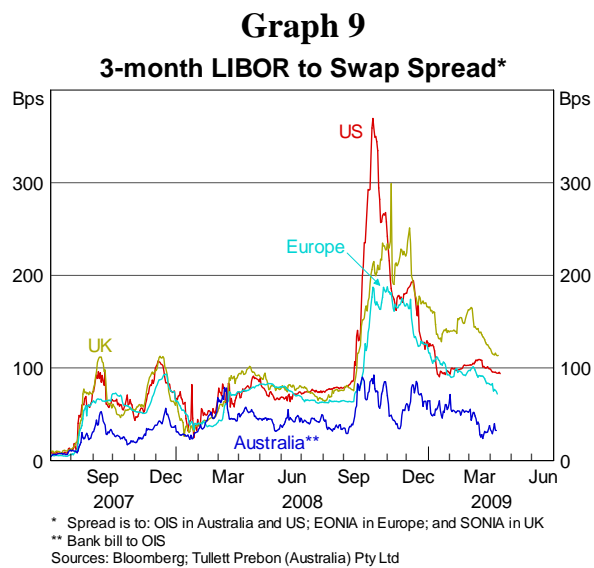


The first consequence of this was the failure of a number of US mortgage lenders. Some of these were brought down by early defaults, where the borrower didn't even

make the first payment. If a loan is securitised and sold, the lender typically has to compensate the buyers of the securities if the loan defaults soon afterwards.

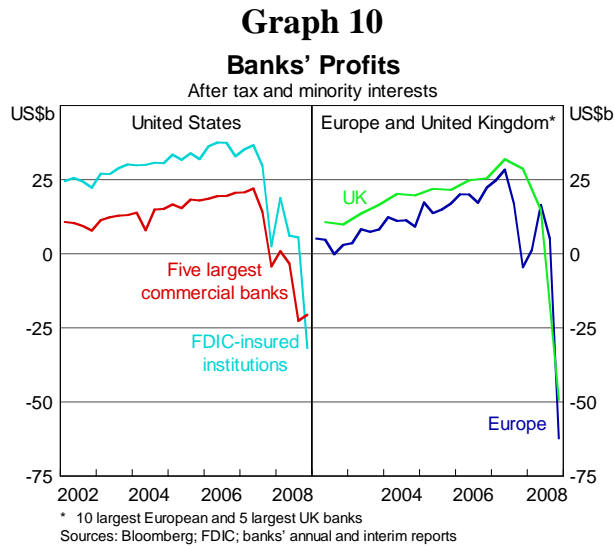
But not all of these losses on mortgages could be pushed back on the original lender or broker, especially if these had already gone out of business. After years of underestimating risks on mortgage-related and other complex securities, banks and other investors started to realise just how risky these securities were. They also started to realise that they didn't know how exposed their counterparties were to these losses. Following a series of loss announcements and suspensions of some bank-sponsored investment funds in mid 2007, market participants began to hoard liquidity. They were worried about their counterparties, but they were also worried about their own future liquidity needs.

As a result, the asset-backed commercial paper market froze in several countries. The rates at which banks would lend to each other in overnight and term money markets started to widen. Normally these money market rates sit close to the policy rates set by central banks, but that relationship broke down in August 2007, as Graph 9 shows. Investor demand for certain kinds of mortgage-backed securities also dried up in the following months. Lenders that had depended on short-term money markets or securitisation therefore started to find it very difficult to obtain funding.



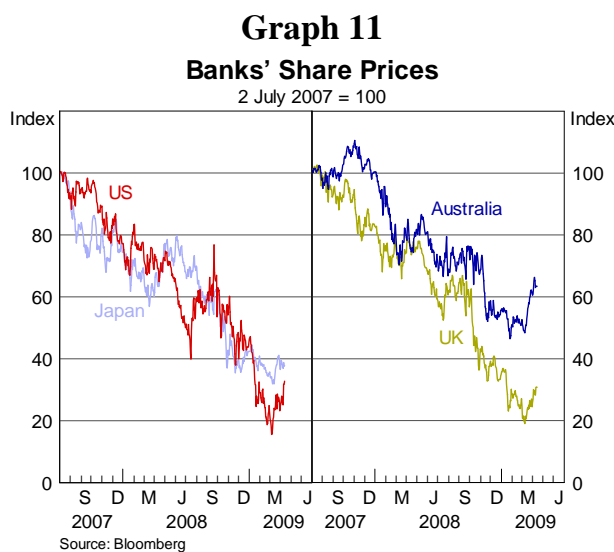
The easing of lending standards during the boom was especially marked in US mortgage markets, and so were its consequences. Compared to loans in most other countries, US mortgages are more likely to be packaged into securities. And if the market price of these securities should fall, accounting treatment often requires that the loss be recognised immediately, which is not the case for a traditional loan portfolio. For these reasons, it should not be surprising that banks' losses have been concentrated in securities holdings rather than traditional on-balance sheet lending. This meant that investment banks and others with large securities trading and investment books have been especially affected. The first major firm that had to be

rescued was Bear Stearns, but many others had already declared losses by then. As shown in Graph 10, total profits in several banking systems started to turn negative.



In this environment, banks' perceptions of risk increased, and they started to tighten lending standards. A feedback loop started to develop. Banks were becoming more risk-averse, but so were their customers, who started to pull back on spending. The major industrialised economies of the United States, euro area and Japan were already experiencing economic contractions by the first half of 2008.

As investors and others began to realise the macroeconomic consequences of the turmoil, other asset markets were also affected. Share prices fell sharply all over the world, especially for banks, as shown by the indices in Graph 11. Prices fell even further when Lehman Brothers failed.



Lehman had been an important player in many of the securities and derivative markets that were freezing up. It even had a sub-prime mortgage subsidiary, which it shut down in August 2007. Lehman had already incurred substantial losses in the quarters prior to its failure. And once people start to become concerned about a bank's solvency, it becomes very hard to prevent the loss of counterparty confidence that can bring that insolvency on.

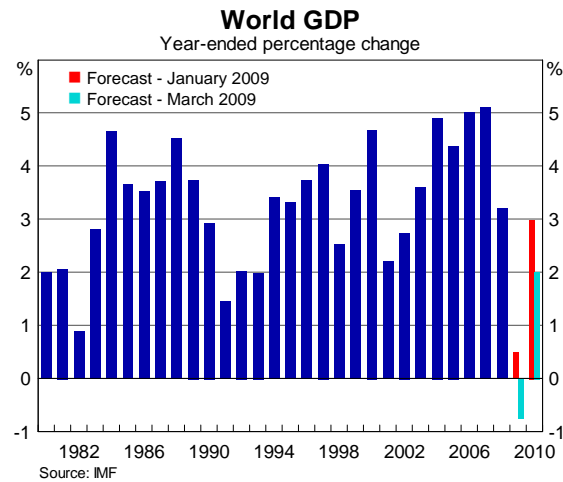
When Lehman failed, it triggered a further increase in risk aversion. There was a flight to the safety of government bonds, and away from emerging market and other assets. Yield spreads on traditionally risky assets widened further, as well as those on newer kinds of derivatives and securities such as credit default swaps or collateralised debt obligations.

Those newer classes of assets were especially affected by the increase in the price of risk. They didn't have much history to use to measure their riskiness in the upswing, so the subsequent surprise factor in the downswing was greater. Also weighing on confidence is the fact that it is not clear if those asset classes can even survive. When markets are very liquid and risk premiums are low, the financial system can approach the textbook, complete-markets ideal, where every possible pattern of payoffs can be created and every individual risk can be hedged. But when risk appetite returns to a more normal, lower level, markets become less complete again. Some of the more exotic structured products might not survive as viable asset classes outside of a credit-market boom.

### **Consequences**

When risk aversion rises like this, the macroeconomic consequences can be severe. Since at least Keynes' day, it has been recognised that economies run in large part on confidence. When firms and consumers no longer feel confident, they pull back from spending. When banks and other financial institutions no longer feel confident, they pull back from lending. Projects that seemed likely to be profitable in the good times suddenly seem risky and less attractive. Bank regulation and behaviour might explain how a US mortgage crisis propagated into essentially a North Atlantic banking crisis. But trade and confidence effects explain why that North Atlantic banking crisis has escalated into a global problem.

The intensification of the current crisis following Lehman's failure in September saw the deterioration of many macroeconomic indicators. Industrial output contracted sharply in much of the world. Commodity prices had been booming earlier in the year, but declined significantly towards the end of the year. There was a sudden contraction in the volume of world trade. In this environment, forecasters have had to scale down their forecasts for output growth repeatedly. As Graph 12 shows, the IMF is now forecasting that global output will contract in 2009. This would be the first annual contraction in output since at least the second world war.

**Graph 12**

The weak global macroeconomic outlook implies that borrowers have become riskier. Some are likely to face greater difficulty servicing their debts. Bad loans normally rise relative to total lending when economies turn down, and the current global downturn will be no exception to this pattern. In the current environment, this could weigh on the profitability of already weakened banking sectors in the major economies.

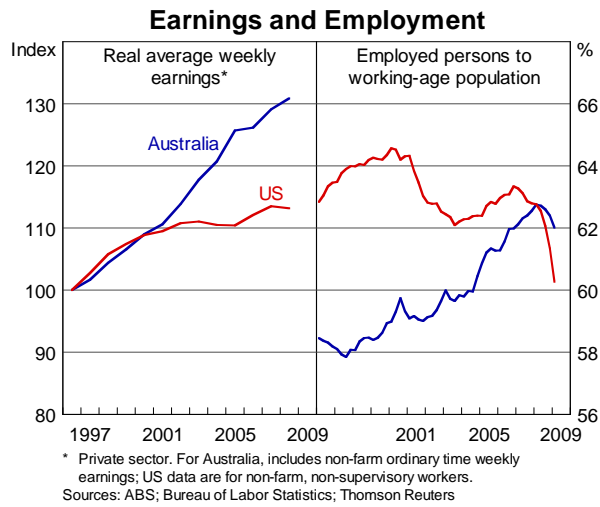
### **The Australian Scene**

The Australian financial system has withstood the shocks coming from overseas better than many others. Australian-owned banks have recorded solid profits over the past year. Unlike banks in many other countries, they have been able to raise additional capital where required from private investors, at only modest discounts to the market price of their equity at the time.

There are a number of reasons for their relatively good performance during a period of considerable turbulence. One of these is that they had not previously accumulated large exposures to the kinds of tradeable securities in which losses at other banks have been concentrated. Rather, Australian banks were focussed on their domestic lending business. Australia usually runs a current account deficit, so our banks were seeking offshore funding for their domestic activities, not casting around for foreign assets in which they could invest their domestic surpluses.

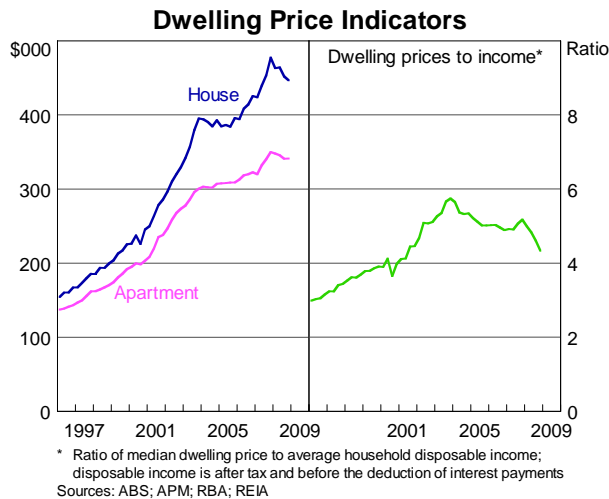
Another reason is that housing and mortgage markets did not become as over-extended as in the United States. For a start, the underlying position of the household sector was better in Australia. Graph 13 shows two aspects of this point. First, in the left panel, the real earnings of average Australian workers were growing much faster than in the United States. Second, in the right panel, the total incomes of typical Australian households have been further boosted by the tight labour market. The employment-to-population ratio has been rising here; by contrast, in the United States, it never really recovered from their 2001 recession.

**Graph 13**



The housing market in Australia also wasn't so over-extended, and in any case it had already had its boom. As the left panel of Graph 14 shows, the truly rapid growth rates in national housing prices had ceased around the end of 2003, especially for apartments. The Australian market was going through a period of consolidation when the US market melted down. Prices were still rising in Australia, especially in Perth and other areas affected by the mining boom. But unlike in the United States, housing supply had not boomed in the same way for the past five years. There simply has not been an overhang of supply built up that would subsequently weigh on prices.

**Graph 14**



In thinking about the sustainability of a particular level of housing prices, we must take many things into account. Theory and experience suggest that average inflation, credit constraints, tax rates and the distribution of income all matter to the so-called user cost of housing, and thus equilibrium housing prices. Just looking at one thing – say the ratio of prices to household incomes – is really not enough. In addition, looking at one type of housing in isolation – say, detached houses – only gives a guide about movements, not a level that can be compared across countries. So it's

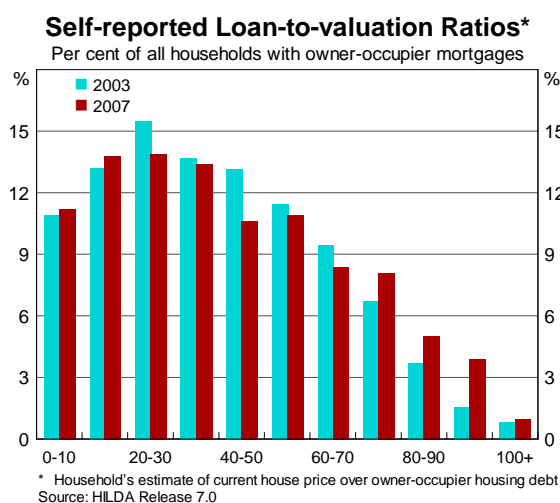
best to use prices of all dwellings, houses and apartments together, and assess the whole market. The right-hand panel of Graph 14 shows overall dwelling prices as a ratio to post-tax income. This is not a measure of sustainability or equilibrium housing prices, because all those other determinants of equilibrium user cost also change over time. But even taking this crude measure as a guide, since 2003, dwelling prices have been rising more slowly than household incomes in Australia.

Another reason the Australian housing market was less over-extended was that lending standards did not ease as much as in the United States. Sitting on the other side of the world, it's easy to lose sight of just how far lending standards did decline in the US mortgage market. Low-doc loans exist in Australia but they are less common. And in contrast to common practice in the United States, low-doc didn't mean providing no documentation at all. No-deposit mortgages are also less common in Australia than they were in the United States over the boom period.

One reason for the more moderate easing in standards here is that the regulatory arrangements concerning mortgage lending are different. For example, Australia's prudential regulator, APRA, raised capital requirements on certain kinds of riskier mortgage products. There are also important differences in consumer protection laws concerning lending, and in the way foreclosure law affects lenders' decisions, as was detailed in the Bank's *Financial Stability Review*, released last month.

The tax systems also differ between the two countries. Australian households cannot deduct the interest on their own home's mortgage against their tax, so they are not effectively encouraged to keep their mortgage balances high. Many Australian households pay off more than they have to. In doing so, they accumulate potential redraws that serve both as precautionary saving and an additional buffer of equity against falls in housing prices.

Partly as a result of these tax and regulatory differences, Australian households by and large have more of a financial buffer against falls in housing prices than their American counterparts did. Timely data are hard to come by, but we can look at current loan-to-valuation ratios based on households' own assessments of their mortgage balance and the current value of their home, using the HILDA survey. The distribution of these loan-to-valuation ratios, as seen in Graph 15, saw an increase in the proportion of households with high ratios between 2003 and 2007. Overall, though, that proportion remained low compared with the United States. It seems that relatively few households in Australia face going into negative equity, even if housing prices do fall somewhat. By contrast, in the United States, some private-sector estimates suggest that more than 10 per cent of mortgage borrowers are already in negative equity, perhaps as many as one in six. Thus a much greater proportion of US homeowners risk defaulting if they get into repayment difficulty, because they cannot easily sell or refinance if the mortgage is worth more than the home.

**Graph 15**

As the crisis has unfolded, there are signs that Australian banks and other lenders have become more risk-averse and they have tightened lending criteria somewhat. However, it appears that good quality borrowers can still obtain and roll over credit. The Australian household and business sectors have also become much more risk-averse than in recent years. Some indicators of this change include higher household saving, and a shift from debt to equity funding by some firms. Their demand for credit has weakened as they have become more cautious. Together with those tighter lending standards, this has contributed to a slowdown in credit growth.

### Countermeasures

At this stage, policymakers around the world are focussing on solving the immediate problems in the banking system. Governments and central banks are also providing macroeconomic stimulus through fiscal and monetary policy easing. Restoring the global banking system to health is a precondition for a recovery in credit supply and economic activity. As such, it has to take priority over longer-term reforms.

In this environment, the need for credible steps to restore the health of the financial system is crucial. Governments in the most-affected countries have provided substantial support to financial institutions and markets, especially since Lehman's failure. Most have ensured banks' access to funding by guaranteeing wholesale debt issuance; some have injected capital into banks; and a few have helped banks to reduce the risk in their balance sheets.

There are several ways of undertaking this de-risking of balance sheets. Governments can buy the assets outright and place them in an entity separate to the bank; they can insure assets remaining on banks' balance sheets against losses; or, they can invest in joint investment funds that buy the assets. Each of these approaches has been used in at least one country in the recent crisis. At this stage it is hard to say if there is one right way to deal with these issues. The important thing is that they are dealt with.

Despite these considerable efforts, confidence in the financial system remains fragile. Some market-based indicators of confidence have nonetheless improved in recent weeks. Money market spreads have retraced much of the increase that occurred following Lehman's failure. Equity markets have also staged a partial recovery, especially after the US government released further details about their own programs for de-risking bank balance sheets.

On top of these efforts to deal with the immediate problems, there is also considerable focus on reforms to the financial system architecture, to prevent a similar crisis from occurring again. Policy initiatives under discussion include changes to the regulation of credit rating agencies, the pay incentives faced by financial institutions and their staff, and the regulation of bank capital and liquidity.

Many of these initiatives have been developed under the auspices of international groupings of central banks and bank regulators, such as the Financial Stability Forum, now known as the Financial Stability Board, and the Basel Committee on Bank Supervision. Both groupings have expanded their memberships in the past few weeks, in particular to include major emerging economies. Australia was already represented on the Financial Stability Forum, and is one of the countries that have just joined the Basel Committee.

Central banks and other authorities around the world are working together to deal with the crisis and finalise these initiatives. Some of the reforms being considered will take a couple of years to be introduced. The global financial system is therefore facing a period of change. The present financial crisis has followed a period in which the price of risk was unusually low and conducive to the build-up of excesses in credit markets. These easier conditions are unlikely to return any time soon. What happens over the next few years, at least, is highly uncertain. For the time being, credit conditions will probably still be tighter than had been the case a few years ago. There will probably be less financing available for asset acquisition. Among the important open questions are: how quickly the banking systems in major economies can repair their balance sheets; and how quickly confidence can be restored.