

RISK MEASUREMENT – A CENTRAL BANK PERSPECTIVE

Address by Dr Philip Lowe, Assistant Governor (Financial System), to 59th International Banking Summer School, Melbourne, 5 September 2006.

Thank you very much for the invitation to speak tonight. The International Banking Summer School has a long and proud tradition, and I am delighted to be part of that tradition tonight.

It was with some trepidation though that I accepted the invitation, given that you have already had almost two weeks of discussion covering almost every area of modern banking. But when I looked at the program, I thought I saw a gap that I could usefully fill – and that was to provide a central banker’s perspective on at least one of the important issues that you have been discussing. And that issue is risk measurement.

Now on many issues, the perspectives of central bankers and bankers in the private sector are likely to be very similar. We both want a strong and stable economy; we both want deep and liquid capital markets; we both want healthy financial institutions; and we both want a robust payments system. But, of course, there are also areas where our perspectives are likely to differ, at least at the margin. One of these is how we think about risk.

No doubt, many of you spend much of your time measuring and managing risks in your own institutions. I hope though it comes as no surprise to you that central banks also spend a lot of time thinking about risk, and how to measure it. For central banks – like the Reserve Bank of Australia – that do not have supervisory responsibilities, the focus is on trying to assess risk in the financial system as a whole rather than measuring risk in individual institutions.

The central theme of my talk tonight is that this whole-of-system focus – with its emphasis on structural change and with its emphasis on common exposures across the system – can be just as relevant for managers in individual institutions as it is for central banks.

I would like to make it clear though that in raising this issue of risk measurement, and highlighting possible differences in perspective, it is not my intention to argue that one particular perspective is right, and another is wrong. Rather, I raise the issue with the more modest goal of simply sharing perspectives, in the hope that the better we understand one another, the better will be the dialogue between us.

Risk Measurement

As you are no doubt aware, most central banks have some type of broad responsibility for stability of the financial system. As part of fulfilling this responsibility, many – including the Reserve Bank of Australia – publish a *Financial Stability Review* on a regular basis. Having

read a number of these reviews over recent months, many seem to be struggling with the same underlying issue – how to measure risk in a financial system that is undergoing rapid structural change.

Structural change

While there are many aspects to this structural change, I would like to draw your attention to just two.

The first is the rapid transformation of household balance sheets. This transformation has a number of important dimensions, of which perhaps the most significant is the ‘grossing-up’ of balance sheets. Many of your banks have no doubt benefited significantly from this process, with very strong demand for housing finance right across the world. Debt levels have risen considerably in many countries, and so too has the asset side of the balance sheet, with house prices and households’ holdings of financial assets increasing sharply. To give you one example of this transformation, in 1995, the Australian household sector held debt equivalent to 66 per cent of its annual disposable income. Today, the figure is 153 per cent. The changes on the asset side of the balance sheet have been larger still, with the net worth of the household sector now equivalent to over six times annual income, up from four times annual income a decade ago.

Another dimension of this transformation of balance sheets is the significant increase in households’ holdings of market-linked financial assets. As I am sure many of you are acutely aware, gone are the days when bank deposits were seen as the logical place for household savings. Today, households hold a much more diverse array of financial assets, including equities, corporate bonds and market-linked pension funds. In Australia, collateralised debt obligations (CDOs) have even been marketed directly to the household sector. This general trend has no doubt created a range of opportunities for many of your banks, as you compete to offer customers innovative investment products.

The second structural change that I would like to draw your attention to is the ever-increasing role of wholesale financial markets – both domestically and internationally. These markets have become important to how many of you fund the growth in your balance sheets, and they play a central role in how you manage the risk on those balance sheets. Gone are the days when credit risk, for example, was held permanently on the balance sheets of your banks. Now it is actively traded in a range of markets; the growth of asset securitisation and credit derivatives are perhaps the best examples of this change. As I will discuss in a moment, an important consequence of this structural change is an increase in the interdependencies within the financial system – in a sense we have all become jointly dependent upon the smooth operation of these markets for the smooth operation of our own institutions.

These two structural changes – to household balance sheets and the increased reliance on markets – pose challenging questions to anyone trying to measure and understand risk: How are households with large holdings of market-linked assets going to behave during a period of market turbulence? How has the sensitivity of the household sector to bad economic news changed as a result of higher debt levels? Are markets pricing credit risk appropriately? Do those investors who now hold the credit risk understand exactly what they are holding?

It will not surprise you to hear that central banks spend a lot of time thinking about these and related questions. And, I hope that you do as well.

These questions are, however, fundamentally difficult to answer.

One reason for this is that structural change often means that the past is not a good guide to the future.

The history of monetary policy provides a good example of this general point. In the 1970s and 1980s, central banks believed that if they controlled the money supply then they would control inflation and output growth. This belief was bolstered by many studies that demonstrated a strong link between the money supply on the one hand, and inflation and output on the other. But structural change in the financial system meant that this relationship inevitably broke down. As new financial institutions emerged and new products were developed, the relationships of the past simply did not stand up. The result, as we all know, was a period of unexpectedly high inflation and disappointing economic outcomes.

So to repeat the key point here: relying on past relationships – no matter how well they are estimated – is problematic in a period of rapid structural change. Similarly, relying upon past returns as a good guide to future returns also poses problems. The difficulties are compounded if the period over which relationships are estimated, or returns calculated, does not contain an economic downturn. In Australia, this is increasingly becoming an issue, with the Australian economy now in its fifteenth year of uninterrupted expansion.

This observation about structural change and the stability of relationships is highly relevant to current discussions about the relationship between loan arrears, interest rates and unemployment in a number of countries. It is not unreasonable to conjecture that the general easing of credit standards has significantly changed the relationship between these variables. At any given level of unemployment and interest rates, the arrears rate is likely to be higher than it has been in the past. Indeed, we are currently seeing some evidence of this in Australia, with mortgage arrears rising in a strong economy. A lender that ignored this change, and relied heavily on historical data to assess risk in its mortgage portfolio is likely to find that in the next economic downturn, default rates are much higher than was predicted. This is especially likely to be so if the lender is relying on data primarily from the long expansion starting in the early 1990s.

Scenario analysis and common exposures

So how should one go about measuring risk in a world of structural change?

Again, this is a difficult question, and there are no simple answers. One possibility is to undertake wide-ranging scenario analysis. In particular, there are likely to be benefits in financial institutions spending more resources on analysing how they would perform under a range of adverse economic scenarios.

One advantage of conducting such analysis is that it can prompt you to think more concretely about the implications of structural changes in the financial system. I know from my own experience that when you are designing scenarios you are often forced to reflect upon the broad developments in both the financial system and the economy, and to ask what could plausibly go wrong. In the context of a private bank, this approach would naturally draw those

responsible for managing risk into thinking about not just the structure of the institution's own balance sheet, but also the structure of the other balance sheets in the economy.

This need to look beyond one's own balance sheet is perhaps an obvious point but it is an important one. The credit quality of an individual bank's own loan portfolio is dependent upon what is going on elsewhere in the system. If other institutions are lowering credit standards and rapidly expanding credit to a particular sector, then everyone's loans become more risky, even those loans made by institutions that have not lowered their credit standards. This is especially so if the rapid credit growth has led to the balance sheets of a large number of borrowers to become more vulnerable to a change in economic conditions. If such a change did occur, and high debt levels created strong financial headwinds, the credit quality of all lenders would no doubt be affected.

There are, of course, other examples of this idea that the risk in one's own balance sheet depends upon the behaviour of other balance sheets in the financial system. The ability of a bank to trade credit risk, for example, could be adversely affected by poor decisions by another institution, particularly if those poor decisions led to a period of market turbulence. Similarly, the ability of a bank to fund itself in a particular market could be adversely affected if another bank in the same market experienced difficulties.

The point here is that in measuring risk, one needs to be aware of what is going on in the financial system as a whole. It is not enough to look at what is going on in one's own balance sheet. Common exposures across the financial system matter.

As I mentioned, institutions have come to rely increasingly on markets to manage their portfolios, and as a result, the interdependencies in the system have increased. The global nature of many of these markets adds to these interdependencies. If something goes wrong in one important market, everyone can be affected, even those who are innocent bystanders. This means that we all need to be aware of potential imbalances building in markets, and the possibility that over-exuberance can lead to a day of reckoning.

I would like to make a couple more remarks about the benefits of scenario analysis, but before I do I would like to give you one concrete example of the importance of thinking about both structural change and common exposures. This example draws upon the recent experience in Australia where we have had an unprecedented boom in house prices and household credit.

An example

First some basic facts. Between 1996 and 2003, house prices in Australia increased by 150 per cent, and household debt by 195 per cent. By 2003, both house prices and housing debt were increasing at annual rates of around 20 per cent. The boom was characterised by a strong speculative element, with households buying rental properties accounting for almost half of all housing loan approvals in 2003. This strong investor appetite was despite the average gross rental yield – annual rent divided by the value of the property – falling to around 3 per cent for houses.

Many lenders judged these developments to be highly favourable – credit growth was strong, collateral values were rising and the rates of mortgage arrears were at historical lows.

The RBA viewed the situation a little differently. It was concerned that if the rapid increases in credit and house prices continued, there was the potential for quite large corrections in house prices and household behaviour at some point in the future. The issue was not so much that these adjustments would imperil the health of financial institutions, but rather that they would lead to a period of protracted economic weakness, as households collectively restructured their balance sheets.

In effect, the millions of individual borrowing decisions by households and the millions of lending decisions by banks and other lenders had pushed the economy to the point where a combination of further rapid increase in house prices and debt posed considerable macroeconomic risks. Given this assessment, the RBA made its concerns widely known. It drew lenders' attention to the change in the structure of the household sector's balance sheet, and the risks that this posed. And it also drew households' attention to the likelihood that the then current trends in house prices were not sustainable.

As I said, the primary concern was not that these developments posed a threat to the health of individual financial institutions. It is fair to say that changes to the structure of banks' portfolios and the improvements in credit risk management over the past decade have fundamentally improved the resilience of the banking sector. It is, however, at the same time important to recognise that this increased resilience does not mean that the economy has become immune to financial shocks.

In the 1980s and 1990s, the stereotypical financial shock worked through financial institutions – banks incurred losses, they restricted the supply of credit and this created financial headwinds that retarded economic growth. In today's world the same process could conceivably occur, but the changes in the structure of the financial system make it much less likely. Instead the process is more likely to work through balance sheets of the non-financial sector. A deterioration in economic climate is more likely to be amplified by households (and to a lesser extent businesses) moving to less risky assets and restructuring their balance sheets, rather than by major problems in financial institutions. The result, nonetheless, could still be strong financial headwinds, causing a protracted period of sub-par economic growth.

In summary, the structural changes in the housing market and household balance sheets between 1996 and 2003 had greatly increased the economy's exposure to a common factor – that is, to the health of household finances. In the RBA's view, these developments were central to any assessment of financial risks to the Australian economy.

A few moments ago I talked briefly about the usefulness of scenario analysis in assessing risks in a world of structural change. The same applies to assessing risks where there are significant common exposures in the financial system. Where significant common exposures exist, we need to be conscious not only of our own decisions, but also of the decisions of all those around us. Scenario analysis can provide a framework for this to be done. Another advantage of this approach is that it allows all those who might have insights into the measurement and management of risk – the senior management, the dealing staff, the economists and the quantitative risk managers – to be part of this process.

Inevitably, using scenario analysis requires more expert judgment on behalf of those charged with managing risk than is sometimes the case with more conventional approaches. Some of you

may see this as a downside of this approach, although I see it as a strength. In a world subject to structural change and increasing interdependencies, there seems to be no substitute for expert judgment in the risk assessment and management process. Conducting scenario analysis is one way of providing the right framework within which this judgment is exercised.

In some countries, steps have already been taken down this path. This has been partly prompted by the stress tests conducted as part of the IMF's Financial Sector Assessment Program. In my view there is merit in making such stress tests a permanent part of the risk measurement process.

Australia is one of those countries that has recently undertaken a major stress test exercise. This exercise was a valuable learning experience for all those involved and provided an important vehicle for a dialogue between the banking industry and the authorities about the nature of risks in both individual institutions' balance sheets and the system as a whole. It is an exercise that we are keen to repeat in the future.

Conclusion

So let me try to bring this discussion to a close.

I would like to leave you with three key interrelated points.

The first is that changes to the structure of the financial system and balance sheets can fundamentally change historical relationships. We ignore these changes at our peril.

The second is that common exposures across financial institutions matter a lot, not only to the riskiness of an individual institution, but also to the economy as a whole. The increased reliance on markets increases these common exposures, as does the sustained increase in borrowing by the household sector. Again, we ignore these common exposures at our peril.

And third, scenario analysis may have an important role to play in assessing risks in a world of structural change and significant common exposures. This type of analysis encourages one to focus on the broad structural forces within the financial system. Ultimately, understanding these forces is as important to the successful management of a financial institution, as it is to a central bank in pursuing its responsibilities for monetary and financial stability.

Thank you for your time this evening. ✎