

THE CHANGING STATISTICAL NEEDS OF CENTRAL BANKS

*Address by Mr GR Stevens, Deputy Governor, to
the Irving Fisher Committee for Financial Statistics
of the International Statistical Institute, Sydney,
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It is a pleasure to speak to you today about central banking and statistics, and particularly to see such a large gathering of statisticians, including from central banks, here in Sydney. It will be interesting to see whether there is a statistically significant impact on economic activity in the Sydney region as a result of your conference. I suppose that will depend on whether your rate and type of expenditure differs in a statistically significant way from that of the various other groups who occupy this precinct from week to week.

Today's proceedings are organised by a committee named for Irving Fisher. Reading just a little about his life, one is struck by the breadth of his endeavours. These were covered very nicely in a speech some years ago by Hans van Wijk, former chair of the Irving Fisher Committee.¹ Fisher worked on monetary theory, and on understanding the determinants of the rate of interest, saving and investment. The distinction between the nominal and real rate of interest – second nature to economists today – was first made by Fisher. He worked on index-number issues – the 'Fisher ideal index' is named after him. And he worked on understanding the nature of business cycles. A particularly insightful analysis of the role of asset price and credit fluctuations in propagating business cycles appeared in the 1930s.² I have noticed that this has been quoted with increasing frequency in recent years, as similar issues have resurfaced (a theme to which I want to return shortly). So it seems particularly apt that either as central bankers or as statisticians, or both, we remember Fisher.

Moreover central banks have long been intense users of statistics. Using the RBA as an example, our Economics and Financial Markets areas track several thousand individual economic and financial time series on a monthly or quarterly basis, for the purposes of making an assessment of current and prospective economic conditions as background for the Bank's monetary policy decision process. The majority of these data, particularly those seeking to measure the 'real' side of the economy and prices, are produced by other bodies, usually the official statistical agencies, both in Australia and abroad. Let me say at this point how much we, in the RBA, value the professionalism and assistance of the Australian Bureau of Statistics. The willingness of ABS officers to help our staff understand the nuances of the various series is a

¹ Available at <<http://www.ifcommittee.org/FisherBiogr.htm>>.

² 'The debt-deflation theory of great depressions', 1933, *Econometrica*, 1, pp 337–357.

great help as we try to put together the various pieces of the jigsaw that make up the Australian economy, in order to decide what we should do to preserve macroeconomic stability. I am sure that in other countries this relationship is equally vital.

Central banks are also major compilers of statistics in their own right. The bulk of central banks, for example, put together data on the balance sheets of banks and other institutions. This is usually a by-product of regulatory powers, a result in many instances of legislation for increased oversight of the banking system after the economic and financial collapses which happened in the 1930s, when Irving Fisher was at the peak of his career. Hence it is natural that it is usually central banks which publish measures of money and credit, as well as series for official interest rates, exchange rates and so on. A good many central banks publish data on the balance of payments as well, which I suspect is often a legacy of exchange controls. In many less-developed countries, the central bank is often one of the most capable and best-resourced institutions, and so is called on to bear additional statistical responsibilities. So central banks have a major interest in compiling, disseminating and using statistics.

I want to suggest, however, that the statistical needs and interests of central banks are changing, as is the data environment in which they operate. I will elaborate on this theme under three general headings:

- The growth of the financial sector, and especially of the size of the **balance sheet of the household sector** in the past decade or more, has significant implications for the way the economy is likely to behave in the future, for the kind of analysis central banks conduct and therefore for the sorts of statistics they need to have.
- New emphases in the mandates of central banks – in particular the explicit focus on **financial system stability** (as opposed to prudential supervision of individual institutions) – carry implications for data collections and the way we process them.
- The changing data environment, and in particular more **private provision of data**, provides both opportunities for central banks to exploit that information, but also some potential pitfalls.

The Financial Sector and Balance Sheets

For a long time, data from the ‘real’ side of the economy were of primary interest to macroeconomic policy-makers. This presumably followed the intellectual currents in economics. The development of national income accounting in the 1940s, and the growing optimism about the capacity of macroeconomic policy to deliver consistently high levels of output and employment, emphasised the measurement, forecasting and control of aggregate demand. The various partial indicators of economic activity, culminating in the quarterly estimates of national income and spending, were the raw statistical materials with which generations of economists learned to work their trade. Of course, central bankers always paid a good deal of attention to financial data like interest rates, lending, credit and money data, but even in central banks I suspect that until the mid 1970s most of the prestigious analytical jobs were in the areas dealing with the real economy. This period was also the heyday of large-scale macroeconomic model building, usually with great detail on the expenditure side of national accounting and with associated data requirements. It’s worth noting, incidentally, that these models typically failed

to capture adequately the inter-linkages between the real and financial sides of the economy. For some time, of course, the financial side was seen as just a passive add-on – many people thought that changes in balance sheets didn't matter much, and that movements in asset prices were of second-order importance. A common view for many years, in fact, was that monetary policy didn't matter much.

As the intellectual battle raged over what activist stabilisation policy could, in fact, achieve, the economic and financial upheavals of the 1970s ushered in a period in which financial variables were suddenly seen as much more important – money did matter after all – and discussion focused much more on financial quantities. There was the observed correlation between measures of the money stock and the price level. Irving Fisher's Equation of Exchange, $MV=PQ$, made an appearance here, as the quantity theory of money was turned into a policy prescription of beguiling simplicity: if only central banks could control 'M', they would in due course stabilise 'P'.

That idea seemed very appealing in the mid 1970s, but as we all know, the policy process turned out to be more complex than that. Today is not the time to explore all that again. It suffices to say that, despite tremendous efforts in developing and analysing a host of measures of money, attempts to impart stability by targeting closely the money stock were much less successful in practice than in theory. Most countries have moved away from that idea towards some sort of implicit or explicit targeting of the ultimate objective, prices, using the short-term nominal interest rate as the instrument.

Yet it would be a mistake to think that this shift signifies that the behaviour of the financial sector has once again come to be viewed as unimportant to the economy. On the contrary, the way in which the financial system responds to financial prices, to regulation (or deregulation) and to the demand for products by the household and business sectors, and the way in which it is constantly innovating, has a major bearing on the path of economic activity. Moreover, the importance of these links is growing.

Opinions vary on whether or not this is a good thing. It has been claimed, for example, that the growth of derivatives markets potentially enhances economic stability, insofar as risks inherent in life can be shifted from those who do not wish to run them to those who do. It has also been claimed that such innovations are highly dangerous – 'financial weapons of mass destruction' was one colourful description.³ Either way, an interaction of financial processes with the real economy is in mind; what is at issue is where the risks inherent in economic life are ultimately borne, and whether the people running them understand them and have been paid an appropriate price to do so. This is an area where the statistical collections find it hard to keep up, particularly with the proliferation of financial activity which crosses national borders or occurs off-balance sheet.

Another trend which is playing a powerful role in the modern economy is the growth in the household sector's assets, occurring in parallel with the increase in households' access to credit. The growth of aggregate wealth, together with the constant search for new products and new business by financial intermediaries, has seen the increasing collateralisation of the

³ Available at <<http://www.berkshirehathaway.com/letters/2002pdf.pdf>> (Chairman's letter, p 15).

housing stock. Your home was always the collateral for a mortgage loan, of course, but these days you are much more likely to be using it as collateral for a loan for some other purpose as well. Possibly you are doing so at a stage in life when you would traditionally have been debt free. If you are at all creditworthy, moreover, there is no shortage of institutions lining up to lend to you.

This is a major issue in several countries, and we have seen extensive (and as yet largely unresolved) debates about what amount of household debt is 'sustainable'. Perhaps the trend towards larger and more leveraged household balance sheets has largely run its course. Certainly for Australia, our analysis of its main underlying causes has tended to suggest that it should be a one-time portfolio adjustment, not a permanently different trend rate of growth in debt. But it is also possible that we are some time from seeing any end to that adjustment process since, in principle, there is no obvious reason why a much higher proportion of the housing stock might not yet be collateralised. If it were, there would be a lot more borrowing ahead. Either way, with the stock of household wealth now twice as large, relative to the flow of current income, as it was in the early 1980s, and the equity contained therein much more accessible via products such as redraw facilities and home equity loans, and more recently reverse mortgages, these changes have the potential to exert bigger influences on economic performance than in the past.

Yet the statistical information about some important elements of these phenomena is poor. Take dwelling prices, a key ingredient in estimating aggregate household wealth. In Australia, there are five series that are routinely used. Because dwellings are far from homogeneous, and change hands only infrequently, getting a good representation of the true change in price of existing dwellings from one quarter or year to the next is much more difficult than, for example, getting a reasonable index of changes in share prices. A major problem is that compositional effects on the observed mean or median price of dwellings can be very large if transactions shift between high and low-value parts of the property market between one observation and the next. Another problem is that most series tend to be dated from the time a property settlement is advised to official records, which may be some months after the sale and price were agreed. Some series try very hard to overcome these sorts of problems, but at the cost of being either untimely or highly prone to revision (or both). Other series are more timely but are unable to overcome technical flaws and so contain a high degree of short-term variability. Memo to statisticians, in central banks or elsewhere: policy-makers need better data on housing prices.

In Australia, the ABS is responding to this challenge with efforts to improve their house price series. The RBA very much welcomes this, and has been pleased to have the opportunity to be involved in the discussions that the ABS has had with various interested parties. In an ideal world, we would perhaps collect data from real estate agents at the time that sales and prices are first agreed. This would offer near-universal coverage and a high degree of timeliness, and allow collection of more data on the characteristics of each house, allowing more control for compositional effects and quality changes. However, for cost-benefit reasons, including considerations of reporting burdens, the ABS has decided instead to collect data from financial institutions providing finance for transactions. Although this may not be quite as comprehensive or as timely as an ideal data set, it will still be a major improvement compared with collecting data from state governments after the settlement of transactions. We look forward to being able to use the new series in due course.

Better data on house prices will be valuable, but central banks also need a good sense of people's behaviour in response to changes in asset prices. How do we get this? Traditionally, this sort of question has tended to be addressed by using time series for spending and wealth to estimate 'wealth effects', with the answer usually being that for every dollar of wealth change, there is an effect of a few cents on spending. But such estimates could well be hopelessly outdated given the immense increase in the capacity to borrow against collateral that has extended even to people of fairly modest incomes in the past decade. Hence there are demands for direct answers to questions like:

- What do people actually do with the equity extracted from dwellings through borrowing?
- How are debt and wealth distributed across the population by income, or by age or region?
- How is changed borrowing behaviour likely to affect the inter-generational transfer of wealth?

There is growing tendency to look to direct surveys of the population for the answers to these questions. Here let me make mention of a survey that the RBA is currently working on, which focuses on the extent to which households used mortgage finance for non-housing purposes over 2004. The Bank engaged a private research firm to conduct the survey, which was designed jointly, drawing on the Bank's existing knowledge about household debt, and the research firm's expertise in questionnaire design. The main field work was undertaken in January and February this year and the Australian public were generally very co-operative. Indeed, Reserve Bank staff took a number of calls, emails and letters from people taking an active interest in the survey (though also, it must be said, a number of calls telling us to mind our own business!). The results will be published later this year.

An earlier example of using customised survey data to address a specific issue was the survey of hedging practices of Australian enterprises in late 2001. This was conducted by the ABS with major input and funding from the RBA. It was motivated by the fact that while Australia had very substantial foreign liabilities, the foreign currency exposures reported by the financial sector were very small (as would be expected given that such exposures carry capital requirements). Clearly these entities engaged in substantial hedging, but we knew little about the other sectors of the economy. Hence we approached the ABS to carry out a survey to fill in the missing pieces. What we found was that even though net liabilities to foreigners were (and still are) substantial, the Australian community as a whole had, at end 2001, a modest net *foreign currency asset* position. The difference is of course due to the fact that foreign demand for Australian dollar-denominated assets was substantial, which has remained true in the period since. Hence while absorbing substantial resources from abroad, Australian entities were not, by and large, accumulating large foreign currency risks. This was a very important fact to know, and I think it has had a significant impact on the views various observers, including ratings agencies, have formed about the country's external accounts. Work is currently under way in the ABS for an update of this survey, with substantial funding support from the RBA.

These are just two examples of the use of one-off surveys. In due course, regular statistical collections may well adapt to provide more information on some of these questions, but that takes time. Hence, I think there could well be more of this sort of approach by central banks in

future: use of customised survey information to address specific questions which arise because of fast-moving structural change in the economy.

An implication of this for central bank statisticians could be, I suppose, that a somewhat different set of skills might be required. Time series expertise – I can recall in the past reading, or trying to read, lengthy papers on the X-11 seasonal adjustment technique as applied to monetary data – might be relatively less in demand, and knowledge of how to design, implement and interpret surveys giving a cross section or panel data set, more in demand. Central banks might of course need to contract out for that expertise – and may well use official agencies for that purpose, though there is ample competition from private firms.

Changing Mandate

Not unrelated to the growing size and complexity of the financial sector of the economy is the rise in emphasis on financial system stability as a ‘charter item’ for central banks. Financial stability as an objective has, of course, been around for as long as central banking. The lender of last resort function – to liquefy the system in times of crisis – was in fact a major part of the *raison d’être* of the modern central bank. But we have seen in the past decade or so a clearer focus on identifying potential threats to system stability and working to reduce them. This has been reflected in the structure of some central banks, as for example in the ‘stability wing’ of the Bank of England, and the creation of a System Stability function in the RBA. It has also been reflected in the advent of regular publications about stability issues by central banks, in our case the *Financial Stability Review* now published twice each year.

In this audience it is worth asking: what is the data set needed for this task?

Thus far, in our own experience and, as best I can tell, that of some other central banks, the data used by the work on system stability overlap to some extent with those used by the macroeconomists in their monetary policy work. In our case, aggregates for credit, household sector debt-servicing burdens, risk spreads and so on are commonly used for both types of work. That is because the ranking question of late has been whether the extent of additional household leverage amounts to a risk to financial stability. It turns out that this pretty much depends on whether it constitutes a risk to macroeconomic stability first. That is, our assessment is that high household debt is unlikely, of itself, to lead directly to distress for lenders, or to a growth slump. Where there is a risk is that some other contractionary shock might be amplified by high levels of debt, with potential impacts on the economy. That might affect financial firms’ profitability indirectly.

Thus far, then, the data sets used by the macro policy people and those by the financial stability people have been similar. As our work on system stability issues continues to develop, however, I suspect we will need different sorts of statistical tools. There are likely to be two dimensions.

First, while to date stability analysts have mostly been content to work with aggregates – that is, *mean* outcomes – they are becoming much more interested in the *dispersion* of experiences around the mean. The question will be not just how much debt is there, but who has it, and what are their other characteristics? To take one example, the household debt-servicing ratio in Australia is higher now than it has been before. But the implications of this may be quite

different if it is mainly high-income earners who have the largest debts (for which there does seem to be some evidence) compared with what would be the case if the debt is concentrated unduly in people of low incomes. Similarly, on the side of exposures to risk in the financial sector, the question will be: where does it reside? The apparent total amount of risk could look quite acceptable but the concentration might not be.

Second, there will be intense focus on the inter-linkages – the *correlations* – between institutions, portfolios and markets. In a full assessment of the resilience of the financial system in the face of an event which affects housing prices, for example, the direct effect on a bank's portfolio of housing loans of lower house prices and/or higher unemployment is only part of the story. Other elements would include how the bank's portfolio of *business* loans would be affected by the same event, including through the second-round effects of households' spending responding to the deterioration in their financial position. A shock large enough to cause the household sector significant problems in servicing mortgages would presumably be associated with some belt tightening for business borrowers too. Hence there could be a correlation between the two portfolios, and not necessarily the same one as in the past.

These interrelationships point to stress testing, for individual institutions and systems, as the way in which assessments of stability and resilience need to be conducted. The raw materials for the required data sets here are the historical loan portfolios, defaults experience and so on of the individual lending institutions. For the most part, these are in the hands of the institutions themselves and the bodies which collect the prudential data. The processing of these raw data to produce a fully-developed stress test of the system will be in the hands of the institution responsible for assessing the stability of the system – which is usually the central bank. This points to the need for arrangements which foster close co-operation, particularly where the central bank is not the bank supervisor and hence may not collect data directly (as is the case in Australia).

The kinds of analysis needed for a robust treatment of system stability also require substantial analytical and statistical skills in central banks: it's not just a matter of having the right data but being able to use it. Many countries have found this to be the case when participating in the Financial Sector Assessment Programs, or FSAPs, run jointly by the International Monetary Fund and the World Bank. This is a comprehensive process which assesses the strength of a country's financial system, and often involves stress testing which moves well beyond the single-factor sensitivity tests which banks and their supervisors usually conduct. Australia will begin our own FSAP later this year, and the Reserve Bank is chairing the stress test exercise, working with APRA, the Treasury and the private sector.

Changing Data Environment

A third feature of the statistical landscape today is the proliferation of data collected and disseminated by private sector entities. One of the most common examples is industry associations or individual firms compiling data on aspects of business conditions. At last count there were, for example, some thirteen nationwide and several regional surveys of business conditions in the Australian economy or major parts of it. Another area is measures of housing prices, where private associations or research companies produce four of the five recognised series.

Some of these private data sets command, rightly, the attention of economists and policy-makers. The issue of quality of data is key, however. Where an entity which has a vested interest is releasing data, upon which they then base claims for advancing their own opinions or agenda, we should take care. Some private surveys one occasionally sees could only be described as crude advertising or propaganda. Not so long ago a new series for housing prices in Australia was launched, with great fanfare, by a lending institution. It turned out that the prices used were based mostly on potential borrowers' own subjective valuations of their own houses, rather than any actual transactions. The index was compiled by the lending department of the institution in question and appeared to be a marketing tool rather than a serious attempt to measure prices. Somehow it was not surprising that it showed significant rises in prices, when the better-known series were tending to show a decline. These sorts of series don't deserve to be taken seriously.

Part of the art of policy-making is developing a sense of how to distinguish noise and signal from this mass of 'information'. Before placing too much weight on an indicator, some knowledge of how it is put together is obviously important. To this end, it is often worthwhile for people in the policy analysis process to develop a good dialogue with the compilers of these data. On occasion, well-trained people in the bureaucracy have been able to suggest methodological improvements to privately-compiled surveys.

No survey of economic conditions should have much weight attached to it until we have seen its performance over a period of time long enough for some business cycle fluctuations to be observed. I grant that, in Australia, a very long expansion means that this test is getting a bit demanding. But even within an expansion there are fluctuations in the pace of growth and a good business survey should pick these up. Most surveys will be found, in my experience, to have given some false signals as well as some genuine ones. This issue of type I versus type II errors can be critical in judging the state of affairs at key points in the business cycle, using survey data.

It is in the area of financial prices where the proliferation of private data is perhaps most marked. The vast bulk of data on pricing of financial instruments is privately compiled, a result of the size of private financial markets and their continuous nature. Where financial instruments are traded on exchanges, their prices are easily observed, and there are relatively few challenges associated with compiling pricing data. However, with the increasing shift towards over-the-counter (OTC) and non-standard products, this task is more difficult and it becomes necessary to rely more on financial institutions' proprietary data. There is no real alternative to this, but of course we need to take care to be satisfied as to the accuracy and impartiality of the data and it is incumbent on private providers of data to be prepared to provide some assurance here. As central banks increasingly use such data sets to infer market attitudes to risk and expectations about the future (a process which incidentally requires increasingly sophisticated analytical skills), all these issues seem likely to grow in importance over the years ahead. Many challenges will surely come our way.

Conclusion

Central banks are heavy consumers of information, and hence of statistics, and always will be. But the nature of the information we need to do our job, both in the monetary policy field and

the financial stability field, is changing. The larger and more dynamic role played by the financial sector, and the greater prominence and impact of swings in household balance sheets, raise as many challenges for our statistical collections, and for the way we process them, as they do for policy itself. Just as supervisors of financial institutions or markets need to keep pace with developments, the challenge before our statisticians is to keep the nature and coverage of our collections fresh and relevant in a changing world. This is particularly pertinent for financial data. Just as important, a capacity to use relevant data to calibrate previous and potential future correlations between portfolios, institutions and markets is key to a sound assessment of stability and resilience of the system as a whole.

This is a big task, which will never be finished. Let us grapple with it with vigour. But first, enjoy the rest of your visit to Sydney. ✨