Economic and Financial Research in the Reserve Bank in 1996

During the past year the Bank has continued to conduct research on a range of issues related to its areas of policy responsibility. Some of the major themes in 1996 were monetary policy and inflation, the behaviour of financial markets, international macroeconomic linkages, and developments in the Australian financial system. Results of this research are made available to the public in a number of forms including discussion papers, *Bulletin* articles and in an annual conference volume. This article provides a summary of papers released during 1996.[1]

Monetary Policy and Inflation

The interaction between monetary policy and the economy has been an ongoing theme of the Bank's research. A paper by Edey and Romalis provides an overview of the Bank's recent research in this area. The topic is divided into two parts: the operation of policy, and the effects of policy on the economy. On the first issue, the paper argues that standard textbook discussions of monetary policy often reflect an outdated conception of how policy is conducted, by assuming that policy is conducted through the money supply rather than the short-term interest rate. This distinction is argued to have important implications for the way policy is analysed. On the second issue, the paper summarises available evidence on six main channels through which monetary policy affects the economy. Research points to a fairly consistent qualitative picture as to how monetary policy affects demand and inflation, but there is considerable uncertainty about some parts of the transmission mechanism, such as the behaviour of the exchange rate. The paper reviews these results and outlines a number of reasons why the overall effects of monetary policy are in practice hard to quantify.

A perennial issue in monetary policy analysis concerns the information content of the monetary aggregates: do they provide information about prospects for inflation and output that can be useful for policy formulation? In Australia, as in a number of other countries, the monetary aggregates became quite unstable in the post-deregulation period, although some economists have continued to advocate their use as policy indicators. This issue is re-examined in a paper by Tallman and Chandra. Their approach is to construct statistical forecasts for inflation and GDP growth within the past two decades, and to test whether the inclusion of information about the monetary

1. Research papers referred to in this article, and other research material published during the year, are listed in the appendix.

aggregates significantly improves the accuracy of these forecasts. The results suggest that none of the aggregates tested would have made a consistent contribution to improving forecast accuracy over the period studied. There is some evidence of the aggregates having greater information content in the latter part of the sample, but the authors conclude that it is too early to tell whether this represents a sustained change in behaviour.

Some aspects of the inflation process are modelled in a paper by Simon which focuses specifically on the issue of structural change. The paper uses a modelling technique which allows the possibility of 'regime shifts' or structural changes in the process that determines inflation. This allows inflation to be described by simpler than conventional equations, with occasional shifts occurring between high and low inflation states. The author argues that this approach might be relevant to understanding shifts in inflation expectations if members of the public similarly base their expectations on simple models that are infrequently changed. Results presented in the paper suggest that inflation in Australia since the early 1960s can be reasonably well represented by such a model. Within this framework, major shifts in the inflation process are found in the early 1970s and the early 1990s.

Financial Markets

A number of papers analyse the behaviour of Australian financial markets and their role in transmitting the effects of monetary policy and other influences to the economy. The behaviour of the exchange rate is the subject of a study by Gruen and Kortian. The authors note that Australia's terms of trade, which are essentially driven by world commodity price cycles, have a powerful influence on the real exchange rate. In a qualitative sense this relationship is consistent with what would be expected from theory. However the theory also predicts that markets would smooth out part of the impact of terms-of-trade changes, to the extent that they are temporary or cyclical. Too great an exchange rate response would imply that markets were failing to anticipate the eventual return of the terms of trade to their longer-run trend. The study tests whether the degree of sensitivity of the exchange rate to the terms of trade is consistent with these principles, and finds that on average the degree of sensitivity is greater than the theory predicts.

Some related issues are taken up in a paper by Tarditi which looks at foreign exchange and long-term bond markets in Australia. The paper notes the strong influence of the terms of trade and also examines a number of other influences on the exchange rate, including interest rate differentials and budget and current account deficits. In modelling long-term bond markets the paper focuses particularly on the role of domestic inflation expectations and foreign bond market developments. A general feature of the results, consistent with Gruen and Kortian's paper, is that market behaviour differs in important ways from that suggested by standard theoretical models. For example, markets can over-react to movements in some variables and appear to be less forward-looking than is assumed in standard models.

International Linkages

It is well documented that Australian business cycles are strongly influenced by business cycles in other countries. There are several unexplained aspects of this linkage. For example Australian exports, the most obvious potential explanation for the link, do not seem particularly highly correlated with foreign business cycles. Another puzzle is that the United States economy seems to play a much bigger role in Australian business cycles than its share of our foreign trade would suggest. A paper by de Roos and Russell explores possible explanations for these facts. The paper looks at two main ways in which the United States business cycle might affect Australia. The first is through demand for Australian exports: the study suggests that an export channel is likely to be important notwithstanding the relatively low correlations between exports and foreign growth. Moreover, there is evidence that demand for imports is more cyclically sensitive in the United States than is the case for the other major economies, perhaps as a result of greater market openness. This characteristic gives the US a disproportionate effect on the Australian cycle. The second transmission channel studied works through international financial market linkages. The study finds that the US stock market has a significant influence on the Australian market, and, since stock markets tend to influence business investment in both countries, this fact also helps to explain the overall business cycle correlation.

A further paper by de Brouwer and Romalis looks at linkages between the Australian and US economies at an industry level. The paper reports evidence that output growth in Australia is significantly influenced by that in the US at an industry as well as an aggregate level. Industries where such an influence exists account for around two-thirds of aggregate production. Combined with other evidence, this is interpreted as suggesting that supply-side channels as well as aggregate demand effects are important in explaining the correlation of aggregate business cycles. The international correlations appear particularly strong in the manufacturing sector, and it is suggested that this may partly reflect the spread of technological innovations from the US to Australia. Notwithstanding the existence of these international linkages, the study also finds important domestic influences on output such as the operation of monetary policy.

The theme of international financial market linkages is taken up in a paper by Kortian and O'Regan. They examine daily data on stock, bond and foreign exchange markets in Australia and other countries in order to answer a number of questions about volatility and the nature of international market correlations. The results suggest that the United States is the country whose financial markets most strongly affect those in Australia. Among the findings is that there was a substantial increase in the correlation between the US and Australian bond markets during the period of bond market turbulance in 1994, and that this increased correlation has continued in the subsequent period. Another result is that cross-country linkages between markets for a given class of asset seem to be stronger than cross-market linkages within a country. The study goes on to document a number of other features of market behaviour including differences in the strength of international correlations during bull and bear market phases.

The Financial System

The subject of the Bank's annual conference in 1996 was 'The Future of the Financial System'[2]. As in previous years, the conference brought together participants from a variety of backgrounds including central banks, universities and the banking and finance industry. Two papers were contributed from within the Bank. The first dealt with historical trends in the Australian financial system, while the second discussed issues in financial regulatory policy. Other papers presented at the conference looked at trends in overseas financial systems, potential future developments in the industry, and broader regulatory policy implications.

Other Macroeconomic Issues

Remaining papers produced in 1996 dealt with the Australian superannuation system,

2. The introductory chapter of the conference volume, which contains a summary of the papers and discussion, was reprinted in the September *Bulletin*.

the behaviour of the share market, and the effect of the financial system on consumption spending.

A paper by Edey and Simon provides a review of the Australian superannuation system, aimed at placing the system in an international context. Like other industrial countries, Australia faces an ageing population over the next few decades, although the extent of population ageing is projected to be less severe than in many other countries. Australia is also moving relatively early, in international terms, to put in place a funded retirement income scheme for the majority of retirees, and is one of relatively few countries to choose a system of compulsory saving that is privately managed. The Australian superannuation system is still in the early stages of its development, however, as much of the projected accumulation of funds has yet to occur. The paper reviews a number of policy issues that have been raised by various commentators on the system. Perhaps the most important of these is the effect of the system on retirement decisions: it is argued that features such as the availability of lump-sum benefits tend to encourage early retirement. Another issue is the system's increasing complexity.

A paper by Andersen and Subbaraman studies the behaviour of the Australian share market and its implications for business investment. Two related questions are addressed. The first is concerned with the efficiency of share prices in reacting to relevant information. In line with similar studies overseas, the paper reports some evidence that the Australian share market may deviate from efficient pricing over short periods, though this is not evident over longer periods. The second issue concerns the effect of share-price movements on business investment. To investigate this, the paper develops estimates of 'fundamental' and 'speculative' components of share prices, and tests the effects on investment of each component. The results suggest that only the fundamental component has a significant effect on investment spending, although the timing of equity raisings appears to be influenced by both components of the share price.

Finally, a paper by de Brouwer looks at the effects of financial constraints on consumer spending. It is expected that, where financial systems are heavily regulated and access to credit is restricted, consumer spending will tend to be determined largely by current income. This can be contrasted with more liberalised financial systems, under which consumers have more scope to smooth their spending patterns and consumption is expected to be more closely related to 'permanent' or longer-term income. The paper tests this theory using the experience of a range of countries in the Asian region with differing financial systems. The pattern that emerges is broadly consistent with the theory: the experience of Australia and selected East Asian countries suggests that financial liberalisation eases constraints on consumption smoothing. However, the experience also suggests that there is no simple connection between a country's financial system and its average saving and investment performance.

Appendix: Research Material Released in 1996

Conference Volume

The Future of the Financial System, edited by Malcolm Edey, contains papers prepared for a conference held in July 1996, an introduction by the editor and summaries of the discussion. There were two papers contributed by Bank authors:

Edey, M. and B. Gray, 'The Evolving Structure of the Australian Financial System'.

Thompson, G., 'Regulatory Policy Issues in Australia'.

Four additional major papers were commissioned. These were written by Richard Dale of Southampton University, E. Philip Davis of the European Monetary Institute, David T. Llewellyn of Loughborough University and Stephen Prowse of the Federal Reserve Bank of Dallas.

In addition there were four shorter papers by senior participants in the Australian finance industry: Robert Joss, William Ferguson, Rob Ferguson and Tony Cole.

Research Discussion Papers

9601 Gruen, D. and T. Kortian, 'Why Does the Australian Dollar Move So Closely with the Terms of Trade?'.

9602 de Brouwer, G., 'Consumption and Liquidity Constraints in Australia and East Asia: Does Financial Integration Matter?'.

9603 Edey, M. and J. Simon, 'Australia's Retirement Income System: Implications for Saving and Capital Markets'.

9604 Edey, M. and J. Romalis, 'Issues in Modelling Monetary Policy'.

9605 Edey, M. and B. Gray, 'The Evolving Structure of the Australian Financial System'.

9606 Tallman, E. and N. Chandra, 'The Information Content of Financial Aggregates in Australia'.

9607 de Roos, N. and W. Russell, 'Towards an Understanding of Australia's Co-Movement with Foreign Business Cycles'.

9608 Tarditi, A., 'Modelling the Australian Exchange Rate, Long Bond Yields and Inflationary Expectations'.

9609 Kortian, T. and J. O'Regan, 'Australian Financial Market Volatility: An Exploration of Cross-Country and Cross-Market Linkages'.

9610 Andersen, M. and R. Subbaraman, 'Share Prices and Investment'.

9611 Simon, J., 'A Markov Switching Model of Inflation in Australia'.

9612 de Brouwer, G. and J. Romalis, 'External Influences on Output: An Industry Analysis'.

Articles of General Interest in the Reserve Bank *Bulletin*

'Diversity of Exports and Australia's Terms of Trade', Reserve Bank of Australia, *Bulletin*, January.

'Recent Developments in the Australian Dollar Offshore Bond Market', Reserve Bank of Australia, *Bulletin*, March.

'Recent Trends in the Structure of the Financial System', Reserve Bank of Australia, *Bulletin*, April.

'Australian Financial Markets', Reserve Bank of Australia, *Bulletin*, May.

'The Evolution of the Housing Loan Market in Australia', Reserve Bank of Australia, *Bulletin*, June.

'Bank Branch Trends in Australia and Overseas', Reserve Bank of Australia, *Bulletin*, November.

'Managing Market Risk in Banks', Reserve Bank of Australia, *Bulletin*, December.

'Measuring Wages', Reserve Bank of Australia, *Bulletin*, December.