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## **NOTES AND TOPICS**

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### **Official Economic Forecasting Errors in Australia, 1983-96**

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**A**USTRALIAN monetary policy is guided by forecasts formulated with varying degrees of formality and sophistication. Official forecasters aim to provide tolerably accurate quantitative advice on the course of the economy in the coming year and on the likely effects of different macroeconomic stabilisation policies.

Do official forecasts actually provide operational guidance to monetary policy-makers? Seriously deficient forecasts could, for example, lead the Reserve Bank of Australia (RBA) to believe wrongly that a recession or a boom is likely; or to do too little or too much; or to act too soon or too late.

#### **Official Forecasts 1983-96**

The Commonwealth Government publishes forecasts for the coming financial year in its budget papers. These forecasts underpin its revenue and expenditure estimates and the monetary and fiscal policies announced at budget time. The RBA's forecasts are not published.

In the absence of better published data, for the purposes of this note the budget forecasts will be assumed to be not significantly different from those that drove monetary policy. The budget papers between 1983/84 and 1995/96 have been chosen for study in order to avoid any structural breaks that might be attributed to changes in government in 1983 and 1996, or to the adoption of an inflation target by the RBA in 1996.

Over the 13 financial years to June 1996, real annual GDP growth in Australia averaged 3.5 per cent, while the mean of the official forecasts was a little less at 3.1 per cent (see Table 1). The means of the actual and official forecasts of inflation were identical (5.5 per cent).

The real issue is whether official forecasts in particular years helped monetary policy-makers determine the right course of action. For example, the narrower range of forecast real GDP growth (1.5 - 4.5 per cent), as compared with the actual range (-0.5 - 5.5 per cent), suggests that official forecasters may have been reluctant, perhaps

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for political reasons, to forecast marked recessions and booms. Two of only three real GDP growth forecasts below 2.5 per cent occurred in 1990/91 and 1991/92. By then, a slowing of the economy was undeniable; and both forecasts were, in any case, inaccurate with regard to both the depth of the recession and the strength of the subsequent recovery.

**Table 1**

**Official average one-year ahead forecasts for annual percentage increases in real GDP and consumer prices, financial years 1983/84-1995-96**

	<i>Real GDP (actual)</i>	<i>Real GDP (forecast)</i>	<i>CPI (actual)</i>	<i>CPI (forecast)</i>
Mean	3.5	3.1	5.5	5.5
Range	-0.5 - 5.5	1.5 - 4.5	1.0 - 9.3	2.25 - 7.5
MAE		1.05		1.2
95% interval		1.0 - 5.2		3.2 - 7.9
75% interval		1.9 - 4.3		4.1 - 6.9
50% interval		2.4 - 3.8		4.7 - 6.3

Notes: CPI: consumer price index. GDP: real gross domestic product in 1989-90 prices forecast on an expenditure basis before 1992-93 and on an average basis thereafter. MAE: mean absolute forecasting error. The confidence intervals are calculated using the MAE and are adjusted for the sample size being less than 30.

Sources: Derived from ABS (1997) and *Budget Papers*, various issues.

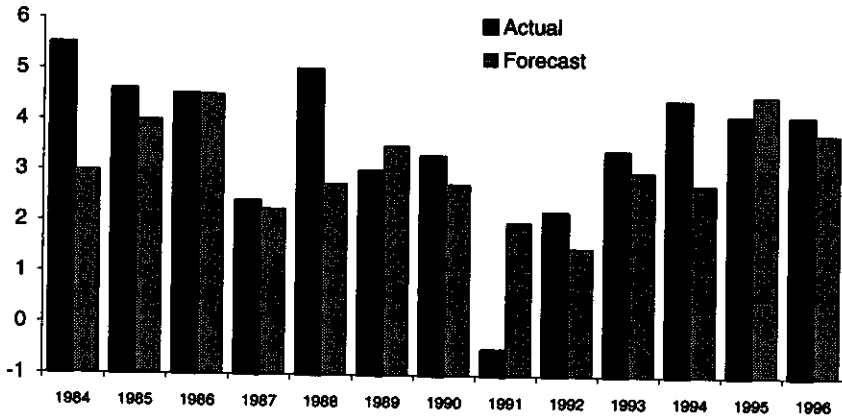
Official forecasts of real GDP growth in the early and mid-1980s were varied (see Figure 1). After underestimating the strength of the recovery by almost a half in 1983/84, actual and official forecasts of real GDP growth in the following three financial years were close to the outcome. However, the actual increase in real GDP in 1987/88 was almost twice the official forecast.

Official forecasting of the inflation rate one year ahead during the recovery from the recession of the early 1980s was fairly reliable (see Figure 2). In 1983/84 and 1985/86, forecast and actual inflation were within half a percentage point of one another. However, the 1984/85 forecast of a significant drop in inflation to 5.25 per cent was confounded by an actual rate of 6.7 per cent — slightly below the figure for 1983/84. In 1986/87, the forecast inflation rate of 8 per cent was well below the actual rate of 9.4 per cent.

Official forecasting went badly astray at the end of the 1980s. The budget papers for 1989/90 reported that the government considered domestic demand to be exceptionally strong. However, by 1990/91 the economy dipped sharply into recession with real GDP growth becoming negative instead of slowing to the forecast 2 per cent. By late 1991, Australia's unemployment rate was in double figures for the first time since the 1930s. After the recession of 1991, official forecasters underestimated the strength of the recovery in 1991/92, 1992/93 and especially in 1993/94.

**Figure 1**

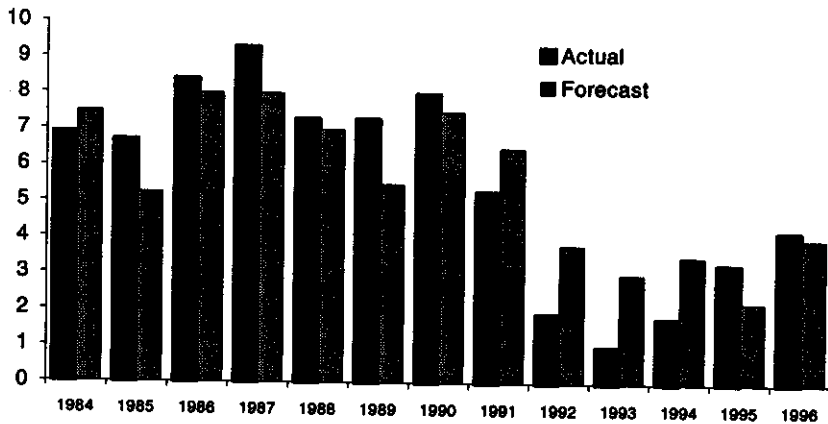
**Real annual percentage GDP growth, actual and forecast, 1983/84-1995/96**



Sources: derived from *Budget Papers*, various years and ABS (1997).

**Figure 2**

**Annual percentage CPI inflation rate, real and forecast, 1983/84-1995/96**



Source: derived from *Budget Papers*, various years.

Official forecasters also underestimated the dampening effect of the monetary contraction on inflation. Inflation for 1990/91 was forecast to moderate to 6.5 per cent, but fell to 5.3 per cent. In 1991/92, inflation was forecast to fall another 1.5 percentage points, but instead fell by more than twice that to less than 2 per cent. In 1992/93, the forecast inflation rate was three times the actual rate for that year and twice the actual rate in the following year. In 1994/95, the inflation rate was forecast to rise slightly on the previous 1.8 per cent but nearly doubled.

### **Analysis of Official Forecasting Errors**

A common method of measuring forecasting errors is the calculation of the mean absolute forecasting error (MAE). This statistic takes an average of the absolute differences between the actual and forecast values. Absolute values are used to avoid the loss of information from the summing of positives and negative values.

The MAE for official forecasts of real GDP growth between 1983 and 1996 was 1.05 per cent. This is about 30 per cent of the mean growth rate of real GDP for the period under study. The MAE for the inflation rate was 1.2 per cent, which is over a fifth of the mean inflation rate (see Table 1).

A common way of assessing the accuracy of forecasts is to calculate a 95 per cent confidence interval using the MAE. The 95 per cent interval covers the area that is two MAEs either side of the mean of the forecasts, amounting to an interval of four MAEs' combined width. The confidence interval indicates that, given the track record of the forecaster concerned, there is a 95 per cent chance that the actual value of the forecast variable will be in this interval. The narrower this 95 per cent confidence interval, the more likely it is that forecasts are close to actual outcomes on a regular basis. Pin-point accuracy is not expected, but forecasts must get reasonably near to have value. For example, a 95 per cent forecast interval for real GDP growth that is one percentage point wide could be regarded as satisfactory. It implies that there is a 95 per cent chance that a forecast is within 1 percentage point of the actual growth rate of real GDP for a given year. However, a confidence interval that is 5 percentage points wide is of little value because it covers almost every possible contingency. A forecast that next year there will be a boom or a recession or anything in between is not informative.

The 95 per cent confidence interval for official forecasts of real GDP growth is the interval 1.0 - 5.2 per cent. This confidence interval implies that official forecasters can say with only 95 per cent confidence that next year will bring a deep recession, or a strong boom, or something in between.

The 95 per cent confidence interval for forecasts of inflation is 3.2 - 7.9 per cent. This interval is more than 4.5 percentage points wide, suggesting that official forecasters have trouble distinguishing stable prices from rising inflation one year ahead. This suggests that official forecasts between 1983 and 1996 may have provided poor operational guidance on whether a monetary contraction, or a monetary expansion, or no change in policy was required.

Some observers might consider that it is more reasonable for official forecasts to operate within a 75 per cent confidence interval. The 75 per cent confidence interval

for official forecasts of real GDP growth between 1983 and 1996 was 1.9 - 4.3 per cent (see Table 1). This interval still includes a recession and a boom; and it covers almost the entire range of official forecasts published between 1983 and 1996. The implications of the 75 per cent confidence intervals for real GDP are similar to those for the 95 per cent interval: official forecasters have trouble distinguishing between strong and poor economic growth one year ahead.

The 75 per cent confidence interval for inflation is a band 3 percentage points in width (see Table 1). This is approaching the 2-3 per cent band that is common in inflation targets of central banks. Official forecasters may have been saying something useful about next year's inflation rate.

Other observers might consider it worthwhile to look at a 50 per cent confidence interval for official forecasts. The 50 per cent confidence intervals for real GDP and the inflation rate are both 1.5 percentage points wide. These intervals imply that official forecasters are reasonably accurate about half the time: that is to say, if their forecasts are acted upon, monetary policy changes in the right direction about 50 per cent of the time. Is this sufficient?

Friedman (1953) has argued that any alternative to a constant monetary growth rule must succeed more than 50 per cent of the time to warrant serious consideration. This is because, on 50 per cent of occasions, the monetary authority is adjusting monetary conditions in the wrong direction. The variance of a discretionary monetary policy injects additional instability and uncertainty into the market. However, a constant monetary growth rule, being changeless, would never be an independent source of uncertainty.

The Hawke Government of 1983-91 was aware of the poor value of the official forecasts supplied to it. According to John Edwards (1996:394), Paul Keating, the then Treasurer, had ceased to believe the forecasts coming from the bureaucracy by 1989. The poor official forecasts of that period were, perhaps for this reason, not thereafter a major independent source of instability. However, the unanswered question is what expectations about the course of the economy were guiding monetary and fiscal policy after 1989.

### **Policy Implications**

One purpose of official forecasting is to alert the RBA to the need to revise its monetary policy stance. However, the record of official forecasters from 1983 to 1996 suggests that they cannot say, with much better than 50 per cent accuracy, whether a monetary contraction, or a monetary expansion, or no action is likely to be the correct policy choice.

Given that official forecasts often seem to go astray, it would be useful to make the forecasting process more transparent. One possible reform is the publication of confidence intervals for the forecasts in the budget papers and in the RBA's semi-annual statement on monetary policy. These confidence intervals could be based on forecasting errors over the previous five or ten years.

A related transparency option has been developed by the Bank of England. Since February 1996, the Bank of England has published a probability distribution for its forecasts of the inflation rate; and it is considering publishing a similar probability distribution for output (King, 1997:10-12). A variation on this proposal is the publication of a central forecast and optimistic and pessimistic forecasts based on variations of the key assumptions in the central forecast.

A further accountability option is to require official forecasters to review their recent forecasts and explain where they went wrong and why, and how they intend to prevent the repeat of such errors.

Despite all their failings, the demand for macroeconomic forecasts seems as strong as ever. It is therefore important that the effectiveness of forecasts be evaluated from time to time, and that forecasters be as open as possible about how fragile and limited their forecasts are as indicators of the shape of things to come.

## References

- Australian Bureau of Statistics (ABS) (1997), *Australian National Accounts: National Income, Expenditure and Product 1995-96*, Canberra (Cat. No. 5204.0).
- Edwards, J. (1996), *Keating: The Inside Story*, Penguin, Melbourne.
- Friedman, M. (1953), *Essays in Positive Economics*, University of Chicago Press, Chicago.
- King, M. (1997), 'The Inflation Target Five Years On', Bank of England Home Page.
- Treasurer and Minister for Finance (various years), *Budget Papers*, AGPS, Canberra.

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