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Kui Yin Cheung
University of Wollongong

Lillian Cheung
University of Wollongong

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THE AUSTRALIAN EXPERIENCE

Kui Yin Cheung
Lillian Cheung

Department of Economics
The University of Wollongong
Northfields Avenue
Wollongong NSW Australia

Department of Economics
University of Wollongong
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ABSTRACT

In this study, we apply the J-test to a simple IS-LM model to test the relative effectiveness of fiscal and monetary policy on inflation and unemployment for the Australian economy over the period 1961-1990. Empirical ecvidence shows that there exists no significant relationship between the supply of (or demand for) money with inflation and unemployment. It is fiscal policy which is effective in managing both inflation and unemployment.

I. Introduction

Since the early 1970s, Australia has experienced high rates of inflation, relatively weak economic growth and rising unemployment.[1] The purpose of this paper is to compare the relative effectiveness of the fiscal and monetary policies in controlling inflation and unemployment. Hence, we have two hypotheses: the Keynesian model and the monetarist model for inflation and unemployment respectively. When the emphasis is on the supply of (or demand for) money as the sole contributing factor of inflation and unemployment, we have what is known as the monetarist approach. On the other hand, when the emphasis is only on taxes and government expenditures as the main determinants of inflation and unemployment, we come to what has been called the Keynesian approach.[2] The validity of these models is being tested here by employing the J-test proposed by Davidson and MacKinnon (1981) on the time series data of Australia for the period 1961 to 1990. However, the 1983 Accord might have led to a structural change in the economy and affect the relationship between fiscal and monetary policies on inflation and unemployment. Therefore, before applying the J-Test, a test for structural change would be carried out by using the dummy variables devices. The structure of the paper is as follows: the 1983 Accord is described in next section. Section III discusses the model and the properties of the J-test, while Section IV gives the empirical results. Conclusion is given in Section V.

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1   *OECD Economic Surveys (Australia) 1983-84*, June 1984, p. 7.
2   See Dornbusch and Fischer (1982), and Perkins (1982).

II. The Accord

In February 1983, a Statement of Accord by the Australian Labor Party and the Australian Council of Trade Unions regarding economic policy was ratified by a special conference of unions. The main elements of the Accord include support for a centralised system of wage determination and the establishment of a Price Surveillance Authority. Agreement was also reached that the maintenance of real wages should be a key objective, although this should be an objective over time in a period of economic crisis.[3]

The policy adopted by the Government elected in March 1983 differed substantially from those in earlier years in that inflation and unemployment were dealt simultaneously with consultation and consensus. The Government pursued a degree of fiscal stimulus in the 1983-84 Budget, combined with broadly neutral monetary policy to avoid the potentially inflationary effect of fiscal stimulus. The Accord argued for a return to centralised wage fixation, and with government's support for full cost of living adjustments. Unions, however, agreed to consult government when formulating claims.[4] To aid the prices and incomes agreement, a Price Surveillance Authority has been established to monitor prices nationally in areas where competition were limited. In short, the approach consists of an expansionary fiscal policy, a non-inflationary monetary policy and an accord on prices and incomes with the trade union. As a result, it provides a brake on inflation and avoids upward pressure on interest rates.[5]

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3   *ibid.*, p. 59.

4   Maxwell, P., p. 236.

5   *op. cit.*, OECD Economic Surveys (Australia) 1983-84, p. 26.

III. The J-Test

Consider the following two linear non-nested regression models: the Keynesian and monetarist models of inflation and unemployment respectively. The possible determinants of the monetarist inflation model include money supply, which can be specified simply as

$$H_0: P = \alpha_0 + \alpha_1 M + \mu_1$$

On the other hand, the determinants of the Keynesian inflation model consists of tax receipts and government expenditure. This can be written as

$$H_1: P = \beta_0 + \beta_1 T + \beta_2 G + \mu_2$$

In order to apply the J-test, we specify a maintained hypothesis H_0 and the alternative $H1$. Since $H1$ is not nested within H_0 and that H_0 is not nested within H_1, therefore, the truth of H_0 implies the falsity of H_1 and vice versa.[6] In other words, this suggests that there is information in H_1 that can significantly improve the explanatory power of H_0. We are, therefore, led to ask whether H_0 is adequate. For instance, the equation for testing between money supply (or H_0) and taxes (or H_1) as the possible cause of inflation can be presented as

$$P = (1 - \lambda)(\alpha_0 + \alpha_1 M) + \lambda \hat{P} + v$$

where λ is a mixing parameter, and $\hat{P}$ is the OLS predictor of P (the rate of inflation) under H_1:

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6   *op. cit.*, Davidson, R. and J.G. MacKinnon, 1981, p. 782.

$$\hat{P} = \hat{\beta}_0 + \hat{\beta}_1 T$$

where T is independent of v by assumption, and β_1 is also asymptotically independent of v, since the influence of any particular error terms on the estimates tend to zero as the sample size tends to infinity. Hence, $\hat{P}$ will be independent of v and thereby the significance of λ can be tested by using the conventional asymptotic t-test.[7] If H_0 is true, the true value of λ is zero. The t-statistics of λ are conditional on the truth of H_0 rather than H_1. Therefore, a t-statistic which is valid for testing the truth of H_0 will not be valid for testing the truth of H_1. In order to test H_1, the roles of H_0 and H_1 can be reversed, and the test is to be carried out again.[8]

In this paper, we specify six hypotheses and their six alternatives for testing the cause of inflation and unemployment respectively, which can be written as follows:

Monetary policy as maintained hypothesis:

1. H_0: Monetary policy H_1: Tax (T)
2. H_0: Monetary policy H_1: Government expenditure (G)
3. H_0: Monetary policy H_1: fiscal policy (T and G)

Fiscal policy as maintained hypothesis:

4. H_0: Tax (T) H_1: Monetary policy
5. H_0: Government expenditure (G) H_1: Monetary policy
6. H_0: Fiscal policy (T and G) H_1: Monetary policy

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7   *ibid.*

8   *ibid.*, p. 783.

IV. Empirical Findings

The 1983 Accord might have caused possible changes in the structure of the economy. It would be expected that response of inflation and unemployment to fiscal and monetary policies would be different in the pre- and post-Accord 1983 periods. A test for this structural change is being carried out here by using dummy variables. Consider the simple IS-LM model of a policy mix of inflation,

$$P_t = \alpha_0 + \alpha_1 T_t + \alpha_2 G_t + \alpha_3 M_t + \varepsilon_{1t}$$

where

P_t = the rate of change in the inflation rate
T_t = the rate of change in total government tax receipts
G_t = the rate of change in total government expenditure
M_t = the rate of growth in money supply, M2.

The unrestricted equation becomes

$$P_t = \beta_0 + \beta_1 D + \beta_2 T_t + \beta_3 DT_t + \beta_4 G_t + \beta_5 DG_t + = \beta_6 M_t + \beta_7 DM_t + \varepsilon_{1t}$$

where

$$D = \begin{cases} 0 \text{ for the pre-1983 period} \\ 1 \text{ otherwise} \end{cases}$$

Similarly, the unrestricted equation for unemployment is,

$$UM_t = \gamma_0 + \gamma_1 D + \gamma_2 T_t + \gamma_3 DT_t + \gamma_4 G_t + \gamma_5 DG_t + \gamma_6 M_t + \gamma_7 DM_t + \varepsilon_{2t}$$

where

UM_t = the rate of change in unemployment rate, and

$$D = \begin{cases} 0 \text{ for the pre-1983 period} \\ 1 \text{ otherwise} \end{cases}$$

The estimated results using annual Australian data are given as follows:

For the period 1961-1990

$$\hat{P} = 0.04 + 0.69D + 4.19T - 7.9DT + 0.17G + 0.37DG - 3.24M + 1.43DM$$
$$(0.10) \quad (0.46) \quad (1.75) \quad (-0.75) \quad (0.08) \quad (0.07) \quad (-0.90) \quad (0.19)$$

$$\overline{R}^2 = 0.09 \qquad RSS = 10.11 \qquad D.W. = 1.18 \qquad d.f. = 22$$

For the period 1965-1990

$$\hat{UM} = 0.13 + 0.14D - 1.38T + 0.29DT + 3.61G - 3.78DG - 0.93M - 0.08DM$$
$$(0.37) \quad (0.16) \quad (-0.76) \quad (0.05) \quad (2.71) \quad (-1.22) \quad (-0.41) \quad (0.02)$$

$$\overline{R}^2 = 0.22 \qquad RSS = 2.63 \qquad D.W. = 2.60 \qquad d.f. = 18$$
(t values are in parentheses.)

The results for both the inflation and unemployment equations indicated that all the t-values of β_s' (1, 3, 5, 7) and γ_s' (1, 3, 5, 7) are insignificantly different from zero, and this implies that there is no evidence of any structural change in both the relationship of fiscal and monetary policies with inflation and unemployment. We are also interested in the overall effect of the Accord on both equations (that is, in testing if β_s' (1, 3, 5, 7) and γ_s' (1, 3, 5, 7) as a group are all equal

to zero.) The calculated F[4, 18] and F[4, 14] statistics for both the inflation and unemployment model are 0.16 and 0.98 respectively, which are obviously less than the corresponding F values (2.93 and 3.11) at 5 per cent significance level. Thus we cannot reject the null hypothesis and conclude that the dummy variables as a group are not significantly different from zero. This implies that there is no structural change in the post-Accord 1983 period. The estimated results of the J-Test for the whole period (1961-1990) are given in Table 1 and 2 with the variables marked *m* as the maintained hypotheses. The values below the variables denote the estimated t-statistics of the parameter λ of the particular variable. Durbin-Watson's d-statistics and -2 log likelihood of each model are also given in the table.

It is shown that, with monetary policy (via the use of M2) as a maintained hypothesis, both tax (T) and combined tax and government expenditure (TG) have significant t-statistics. Based on the Akaike Information Criterion (AIC) (Akaike, 1973)[9], the model with tax as policy appears to be the better model. Government expenditure, however, appears to have no significant impact on inflation. This confirms the relative effectiveness of tax as an instrument in controlling inflation. Also from Table 1, it appears that, when the maintained hypothesis is either tax (T), government expenditure (G), or a combination of both (TG), controlling the supply of (or demand for) money does not have a significant effect on inflation. Thus, fiscal policy tended to have a greater impact than monetary policy on inflation.

With regard to unemployment, fiscal policy again indicated greater effect on unemployment than did monetary policy for

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9   AIC = {-2 ln maximised likelihood + 2 (number of independent parameters estimated)}.

the 1965-1990 period (see Table 2). With monetary policy as a maintained hypothesis, it is the government expenditure (G) alone and the combined tax and government expenditure (TG) which have the significant t-statistics. Tax receipts (T) alone did not show any significant impact on unemployment. Again, based on the Akaike's Information Criterion, government expenditure alone as policy appears to be the better model in solving unemployment. In this case, it appears that controlling the supply of (or demand for) money does not have a significant effect on unemployment either.

V. Conclusion

In this study, we apply the J-Test to a simple IS-LM model to test the relative effectiveness of fiscal and monetary policy on inflation and unemployment for the Australian economy during the period 1961-1990. In both the inflation and unemployment models, it appears that monetary policy did not work well over the study period. There exists no significant effect on inflation and unemployment by controlling the supply of (or the demand for) money, M2. It is fiscal policy which is effective in managing both inflation and unemployment. With monetary policy (via the use of M2) as a maintained hypothesis, tax (T) alone appears to be the most effective policy in controlling inflation; while government expenditure (G) alone appears to be the most effective tool in solving unemployment. In sum, it is the superiority of fiscal over monetary policy which was most effective in controlling inflation and unemployment in Australia over the study period.

Table 1   Modelling Inflation (1961-1990)

Policy	M	T	G	TG	D W	Log-Like
Model 1	m	2.20*			1.25	-26.69
Model 2	m		1.05		1.51	-28.56
Model 3	m			2.19*	1.24	-26.70
Model 4	1.55	m			1.25	-26.69
Model 5	1.46		m		1.51	-28.56
Model 6	1.52			m	1.25	-26.68

Note: * denotes significant at 5% level.

Table 2   Modelling Unemployment (1965-1990)

Policy	M	T	G	TG	D W	Log-Like
Model 1	m	1.39			2.38	-13.56
Model 2	m		3.25*		2.36	-9.68
Model 3	m			3.26*	2.37	-9.66
Model 4	0.20	m			2.38	-13.57
Model 5	-0.29		m		2.36	-9.68
Model 6	-0.30			m	2.37	-9.66

Note: * denote significant at 5% level.

APPENDIX: DATA

Data used in this article consist of M (log differences of M2 money stock multiplied by 100), P (log differences of the CPI multiplied by 100), T (log difference of total government tax receipts multiplied by 100), UM (log difference of unemployment rate multiplied by 100), and G (log Differences of total government expenditure.) The M2 money stock is from the International Financial Statistics, IMF, various issues; the CPI series, the unemployment rate series, the total government tax receipts series, and the total government expenditure series are from the *Australian Economic Statistics*, Reserve Bank of Australia, 1949-50 to 1989-90.

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