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Is Expansionary Fiscal and Monetary Policy Effective in Australia?

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Abstract

Purpose – This paper examines whether fiscal and monetary expansion would affect output in Australia.
Research design, data, and methodology – An extended IS-LM model which describes the equilibrium in the goods market and the money market is applied. The real effective exchange rate and the real stock price are included in order to determine whether there may be any substitution or wealth effect. The sample consists of Annual data ranging from 1990 to 2018. The GARCH process is used in empirical work to correct for potential autoregressive conditional heteroscedasticity.
Results – Expansionary fiscal policy reduces output; whereas, expansionary monetary policy raises output. In addition, real appreciation of the Australian dollar, a lower U.S. interest rate, a higher real stock price or a lower expected inflation would increase output. The finding that expansionary fiscal policy has a negative impact on real GDP suggests that the negative crowding-out effect on private spending dominates the positive impact.
Conclusions – Fiscal prudence needs to be pursued. Real depreciation of the Australian dollar hurts output. Monetary tightening in the U.S. generates a negative effect on Australia's output. A healthy stock market is conducive to economic growth as higher stock prices tend to result in the wealth and other positive effects, increasing consumption and business spending.

Keywords: Fiscal Policy, Monetary Policy, Exchange Rates, Expansionary Policy in Australia.

JEL Classifications: E52, E62, F41.

1. Introduction

The Australian government has engaged in expansionary fiscal and monetary policy to stimulate the economy. During the recent global financial crisis, the Reserve Bank of Australia (RBA) increased real broad money by 15.72% in 2007 and 9.72% in 2008 in order to provide more liquidity and credit. Mainly due to the decrease in the policy rate, the lending rate also dropped from a high of 8.91% in 2008 to 6.92% in 2009 in order to reduce the cost of borrowing by consumers and businesses. At the same time, fiscal expansion was pursued. The government net borrowing-to-GDP ratio rose from a low of -1.131% 2008 to a high of -4.811% in 2010.

This paper examines whether fiscal and monetary expansion would affect Australia's output and has several different aspects. First, this paper employs an extended IS-LM model, which describes the equilibrium in the goods market and the money market. In the money demand function, the real effective exchange rate and the real stock price are included in order to determine whether there may be any substitution or wealth effect. Second, a theoretical model is developed to discuss potential impacts of expansionary fiscal and monetary policy on equilibrium output. Third, an advanced econometric methodology is employed in empirical work so that potential residual problems can be solved.

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2. Literature Survey

Applying the IS-LM-Phillips curve model, Gali (1992) used money supply, money demand, IS and supply shocks to explain changes in output, prices, interest rates and money in the U.S. Supply shocks contributed to a large proportion of output fluctuations in the short run. The results matched well with the predictions of the IS-LM model.

Employing the SVAR model, Moreno (1992) examined macroeconomic shocks and business cycles in Australia and showed several major findings. Demand shocks raised aggregate output temporarily and prices permanently. Supply shocks played the more important role in the longer run. Technology shocks dominated supply shocks, raised aggregate output, and reduced prices. Shocks to crude oil prices and the supply of labor played smaller roles.

De Brouwer and O'Regan (1997) examined issues in applying monetary policy rules in Australia. A monetary rule was more useful if an inflation target is incorporated explicitly. A feedback rule with the output gap significantly reduced inflation volatility. Incorporation of the current and future information on inflation and output would improve the efficiency of the rule. De Brouwer and Gilbert (2005) analyzed the monetary policy reaction function in Australia and made several comments. The Reserve Bank of Australia (RBA) had not tied to a single simple rule after the post-floating period because it has experienced three different monetary policy operating regimes. The RBA had raised the real cash rate in response to a higher inflation rate. [The monetary policy reaction function based on inflation and output may be over-simplified because the RBA also responded to changes in the U.S. monetary policy and depreciation of the trade-weighted exchange rate if the inflation rate is greater than 2.5%. The simple monetary policy reaction function implied a neutral interest rate between 5% and 5.5%.

Huh (1999) applied the IS-LM model to study Australia's economy using five variables – IS, money demand, money supply, the world interest rate, and aggregate supply. His results were consistent with the predictions of the Mundell-Fleming model. Expansionary monetary policy resulted in a permanent depreciation and a temporary increase in output. An increase in IS or money demand led to appreciation; whereas, a higher world interest rate resulted in depreciation.

Brischetto and Voss (1999) investigated the effects of monetary policy in Australia based on an extended model employed by Kim and Roubini (1999). They showed that monetary policy had a graduate and delayed impact on the general price level and a small transitory impact on aggregate output and that monetary policy reduced fluctuations in aggregate output and the general price level.

Perotti (2005) studied the effects of fiscal policy on output and several other macroeconomic variables for five OECD countries including Australia. The fiscal multiplier tended to be small. Only the government spending multiplier in the U.S. during the pre-1980 period was greater than one. There was a lack of evidence that tax cuts were more effective than government spending increase or that the tax multiplier was greater than the government spending multiplier. The effects of fiscal expansion, including more government spending or a tax cut, became significantly weaker and were negative in most cases during the post-1980 period. There was evidence of a positive impact of government spending on long-term interest rates during the post-1980 period.

Ilzetzki, Mendoza, and Végh (2010) revealed that the effect of fiscal expansion depends on the exchange rate regime, government debt, trade openness, and the development stage based on a sample of 44 countries including Australia. The fiscal multiplier was zero under a floating exchange rate but relatively large under a predetermined exchange rate. The fiscal multiplier was negative in countries with a high level of debt. The fiscal multiplier was greater in closed economies than in open economies. The effect of fiscal expansion was greater in industrialized countries than in developing countries.

Furceri and Sousa (2011) analyzed the effects of government spending on private spending using a sample consisting of 145 countries, including Australia, during 1960-2007. They found that government spending crowded out consumption and investment spending and that the effects did not change much during the phase of a business cycle but differed significantly among geographical regions.

Using a sample of 61 countries, including Australia, and using the panel data technique, including the fixed effect and the random effect, Karras (2011) found that the estimated long-run fiscal multiplier ranged from 1.21 to 1.53 in the full sample, from 1.44 to 2.43 for countries with fixed exchange rates, and from 0.98 to 1.39 for countries with floating exchange rates. Hence, fiscal multipliers were more effective under fixed exchange rates than under floating exchange rates. Based on a sample of 179 developing and developed countries, including Australia, during 1970-2011, Karras (2014) also showed that the domestic multiplier was much higher in the least open economies than in the most open economies, and that the spillover effect is much greater in the most open economies than in the least open economies. These results suggested that there would be a tradeoff of the domestic multiplier and the spillover effect in the least open and most open economies.

Blanchard, Ostry, Ghosh, and Chamon (2016, 2017) applied an extended Mundell-Fleming model to study the impacts of capital inflows on 19 emerging markets, including

six Asian countries. They showed that bond inflows were contractionary due to currency appreciation; whereas, non-bond inflows also caused currency appreciation but reduce borrowing cost and were expansionary. Different policy tools needed to be used in combination in response to different types of inflows.

3. The Model

Suppose that aggregate expenditures are determined by real income, government tax revenues, government spending, the real interest rate, the real effective exchange rate, and the real stock price and that the demand for money is affected by the nominal interest rate, real income, the real stock price, the real effective exchange rate, and the world interest rate. Extending Romer (2006), we can express the IS and LM functions as:

$$Y = F(Y, T, G, R, \varepsilon, S) \quad (1)$$

$$M = L(R + \pi^e, Y, S, \varepsilon, R^*) \quad (2)$$

where
Y = real GDP or income,
T = government tax revenue,
G = government spending,
R = the real interest rate,
ε = the real effective exchange rate (An increase means real appreciation of the Australian dollar against other currencies.)
S = the real stock price,
M = real money supply,
π^e = the expected inflation rate, and
R^* = the world interest rate.

The sign of the real stock price in the money demand function is unclear because there may be a substitution effect and a wealth effect of the real stock price on real money demand (Friedman, 1988; Thornton, 1998). When the real stock price rises, real money balances become less attractive, and people tend to substitute stocks for real money balances. On the other hand, when real stock prices increase, real wealth rises as well, which would increase real money demand for transaction, precautionary and speculative purposes.

The sign of the real effective exchange rate in the money demand function is unclear because there may be a substitution effect and a wealth effect between real money demand and the real effective exchange rate (Arango & Nadiri, 1981; Jamal & Hsing, 2011). As the Australian dollar appreciates versus other currencies, people may substitute the Australian dollar for other currencies in order to reduce the cost of exchange for the Australian dollar or engage in currency trading to make a profit in the future. On the other hand, people tend to maintain a desired level of wealth, including real money balances relative to other currencies. When the Australian dollar appreciates, people tend to reduce real money balances in order to maintain a desired level of wealth.

Solving for Y and R simultaneously, we derive equilibrium real GDP as:

$$\overline{Y} = \overline{Y}(G - T, M, \varepsilon, R^*, S, \pi^e) \quad (3)$$

The Jacobian for the three endogenous variables can be written as:

$$|J| = [-L_R(1 - F_Y) - F_R L_Y] > 0 \quad (4)$$

The effect of government budget deficit on equilibrium real GDP can be expressed as:

$$\partial\overline{Y}/\partial(G - T) = [-(F_G - F_T)L_R]/|J| > 0 \quad (5)$$

The impact of real money supply on equilibrium real GDP is given by

$$\partial\overline{Y}/\partial M = -F_R/|J| > 0 \quad (6)$$

The partial derivative of equilibrium real GDP with respect to the real effective exchange rate is given by:

$$\partial\overline{Y}/\partial\varepsilon = [-F_\varepsilon L_R + F_R L_\varepsilon]/|J| < 0 \text{ or } > 0. \quad (7)$$

The effect of the real stock price on equilibrium real GDP can be written as:

$$\partial\overline{Y}/\partial S = (-F_S L_R + F_R L_S)/|J| < 0 \text{ or } > 0. \quad (8)$$

These analyses suggest that expansionary fiscal policy is expected to raise equilibrium real GDP, that expansionary monetary policy is expected to increase equilibrium real GDP, that the effect of real appreciation of the Australian dollar on equilibrium real GDP depends on the sign of L_ε, and that the impact of a higher real stock price on equilibrium real GDP is unclear depending upon the sign of L_S. Although $\partial\overline{Y}/\partial(G - T) > 0$, the sign may be zero or even negative due to the crowding-out effect, which indicates that positive effect of government deficit- or debt-financed spending tends to be cancelled out by the negative effect of reduced consumption and investment spending.

4. Empirical Results

The data were collected from the Reserve Bank of Australia and the International Financial Statistics, which is published by the International Monetary Fund. Real GDP is measured in billions. The government deficit is expressed as a percent of GDP. Fiscal policy is represented by the government borrowing-to-GDP ratio. Real broad money is measured in billions. The world interest rate is represented by the U.S. government bond yield. The nominal stock price index is divided by the consumer price index to derive the real stock price. The expected inflation rate is the average inflation rate of the past three years. Real GDP, real broad money, the real stock price and the real oil price are expressed on a log scale. Other variables are measured in level due to possible negative values before or after log transformation. The sample consists of annual data ranging from 1990 to 2018. The quarterly data for government borrowing are not available.

The ADF test on the residual is applied to detect if there would be any cointegration among these time series variables. The value of the test statistic is estimated to be -3.9495 as compared to the critical value of -3.5742. Hence, these variables are cointegrated and have a stable long-term relation.

Table 1 reports the estimated regression. The GARCH model is employed in empirical work to correct for autoregressive conditional heteroscedasticity. Approximately 99.44% of the variation in real GDP can be explained by the six right-hand side variables. The coefficients of all the variables are significant at the 1% or 10% level. Real GDP has a positive relation with real broad money, real appreciation of the Australian dollar and the real stock price and a negative relation with the government borrowing-to-GDP ratio, the U.S. interest rate, and the expected inflation rate. The finding that expansionary fiscal policy has a negative impact on real GDP suggests that the negative crowding-out effect on private spending dominates the positive impact. The mean absolute percent error is estimated to be 1.7016%, suggesting that the forecast error is relatively small.

Specifically, a 1% increase in real broad money would raise real GDP by 0.4528%. If the U.S. interest rate rises 1 percentage point, the log of real GDP would decline by 0.0378. If the real stock price increases 1%, real GDP would increase by 0.0624%. When the expected inflation rate rises 1 percentage point, the log of real GDP declines by 0.0022.

Table 1: Estimated Log(Real GDP) in Australia

Variable	Coefficient	z-Statistic	Probability
Constant	0.729725	323.7460	0.0000
Government borrowing-to-GDP ratio	-0.010344	-9.912534	0.0000
Log(Real broad money)	0.452768	1748.554	0.0000
Log(Real effective exchange rate)	0.005448	4.053217	0.0001
Interest rate in the U.S.	-0.037762	-21.65065	0.0000
Log(Real stock price)	0.062381	24.03889	0.0000
Expected inflation rate	-0.002168	-1.750593	0.0800
R-squared	0.994434		
Adjusted R-squared	0.992915		
Akaike information criteria	-4.756219		
Schwarz criteria	-4.331886		
Sample period	1990-2018		

5. Summary and Conclusions

This paper has examined whether expansionary fiscal and monetary policy would affect Australia's output. Expansionary fiscal policy reduces real GDP; whereas, expansionary monetary policy raises real GDP. In addition, real appreciation of the Australian dollar, a lower U.S. interest rate, a higher real stock price or a lower expected inflation would raise real GDP.

There are several policy implications. Because expansionary fiscal policy has a negative impact on real GDP, fiscal prudence may need to be exercised. Monetary policy plays a more significant role. A healthy stock market is conducive to economic growth as higher stock prices tend to result in the wealth and other positive effects, increasing consumption and business spending.

Potential future research may apply the IS-MP-AS model (Romer, 2000, 2006) to examine the impacts of expansionary fiscal and monetary policies on real GDP. The advantage of this model is the incorporation of the monetary policy reaction function and inflation targeting to replace the LM function. Empirical results would determine which model would work better for Australia.

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