

Interest Rates

1. RBA Objectives and Instruments

The Reserve Bank of Australia has several objectives, including “the stability of the currency, the maintenance of full employment”. These two objectives mean that price stability is an important goal, but that in pursuing this, the RBA must take into account the effects that its actions have on output and employment.

There are two possible channels through which monetary policy might influence the price level and economic activity:

- *By affecting the financial flows between borrowers and lenders.* Some people in the economy spend more than their income — they are net borrowers; others are net lenders. Monetary policy can influence the cost of borrowing (i.e. the interest rate) or — in the old, regulated financial system — it could directly restrict these flows, through credit ceilings on bank lending. If the price or quantity of financial flows alters, then people alter their behaviour. Investors may find that a project which was unprofitable at one rate of interest is now profitable at a lower rate of interest, and so they will proceed with the investment
- *By altering the money supply.* This transmission mechanism relies on the notion that people may find that they have too much

money in their pockets and will go out and spend it. If monetary authorities allow more money to be created in the economy, this will tend to boost spending.

The RBA can influence both these transmission mechanisms: they can influence financial flows between borrowers and lenders by influencing interest rates; at the same time, they can influence the rate of growth of the various monetary aggregates, with the highest degree of control over the the narrowest aggregates (such as M1), and less control over broader aggregates (such as M3¹). At various times, both of the transmission mechanisms have been the main focus of monetary policy.

-
1. M1 is cash plus at-call deposits at the trading banks; M2 is M1 plus trading bank term deposits; M3 is M2 plus savings bank deposits; *broad money* (BM) is M3 plus the net deposit liabilities of the non-bank financial institutions.

2. Two Theories of Monetary Policy

2.1 *OMOs to deposits to interest rates*

Money creation looks like this: the RBA engages in *open market operations* OMOs (for example, it sells bonds, thus reducing the volume of base money) which remove base money from the system. This leaves the banks short of required reserves, so they are forced to contract their balance sheets. This bids up interest rates, and bank deposits (the major component of M3) dwindle.

This sequence looks like:

OMO → bank reserves → deposits (M3)/
credit supply/interest rates

This is one theory of what happens.

2.2 *OMOs to interest rates to deposits*

Another is that OMOs directly influence the interest rate, by affecting the interest rate at the very short end of the yield curve: the “cash” rate. This is the basic block of the yield curve (a plot of interest rates against period of the asset, so that overnight cash rates is one extreme and ten-year bond rates is another). If cash rates are influenced, then other short-end rates are also affected. If OMOs bid down interest rates, this makes it easier for households and firms to borrow, and so (cet. par.) some previously postponed expenditure is now undertaken. This is reflected in the banks’ balance sheets by a growth in the demand for bank credit. The banks then need more deposits to fund their lending, and this is reflected in deposits (i.e. in the monetary

aggregates).

The sequence here is:

OMO → Interest rates → Demand for credit →
Deposits (M3)

Which is the exact transmission mechanism is not so very important, since the end result is the same. What is important is the interest elasticity of the demand for credit, which is the critical link between the RBA's actions and economic activity. Also important is that in both cases the RBA has the ability to influence interest rates, the quantity of lending, and the various components of the financial system's balance sheet which go to make up the different monetary aggregates.

More anon (from the RBA itself, no less).

Software to Accompany Gordon (6th ed.)

3. How to Access the Software

Borrow the disk from the Closed Reserve section of the Library: it's under Macroeconomics, and is named "Gordon". It's a DOS disk, for use in the Lab. There is also an eight-page leaflet of computer exercises, some of which we'll consider in class. Type `gordon` when in the top directory.

4. The Top Menu

The program is laid out in menus and submenus.
The top menu includes:

- F1 Introduction and General Instructions**
- F2 The Simple Keynesian Model (Chapter 3)**
- F3 The IS-LM Model, Closed Economy (Chapter 4)**
- F4 The IS-LM Model, Open Economy (Chapter 5)**
- F5 Aggregate Demand and Aggregate Supply (Chapters 6–8)**
- F6 Shocks in the Static Aggregate Supply Model (Chapter 9)**
- F7 Shocks in the Dynamic Inflation Model (Chapter 9, Appendix)**

5. The First Sub-Menu — Simple Keynesian

- F1 Introduction
- F2 Set Initial Values for Coefficients and Parameters of the Model
- F3 Initial Equilibrium: Numerical Solution
- F4 Initial Equilibrium: Graphical Solution — Figure 3-3 (*How equilibrium is determined*)
- F5 Change Coefficients and Parameters of the Model
- F6 New Equilibrium: Numerical Solution
- F7 New Equilibrium: Graphical Solution — Figures 3-3 (*How equilibrium is determined*), 3-4 (*The change in equilibrium income caused by an increase in autonomous planned spending A_p*)
- F8 Mathematical Structure of Initial and New Model

6. The Second Sub-Menu — Closed IS-LM Model

- F1 Introduction
- F2 Set Initial Values for Coefficients and Parameters of the Model
- F3 Initial Equilibrium: Numerical Solution
- F4 Initial Equilibrium: Graphical Solution — Figure 4-5 (*The IS and LM schedules cross at last*)
- F5 Change Coefficients and Parameters of the Model
- F6 New Equilibrium: Numerical Solution
- F7 New Equilibrium: Graphical Solution — Figures 4-5 (*The IS and LM schedules cross at last*), 4-6 (*The effect of an increase in the money supply M^s/P with a normal LM curve and a vertical LM curve*), 4-7, 4-8 (*The effect on real income Y and the interest rate r of an increase in government spending G*)

7. The Third Sub-Menu — Open IS-LM Model

- F1** Introduction
- F2** Set Initial Values for Coefficients and Parameters of the Model
- F3** Initial Equilibrium: Numerical Solution
- F4** Initial Equilibrium: Graphical Solution — Figure 4-5 (*The IS and LM schedules cross at last*)
- F5** Change Coefficients and Parameters of the Model
- F6** New Equilibrium: Numerical Solution
- F7** New Equilibrium: Graphical Solution — Figures 5-9,10,11 (*Effects of increases in the money supply or government spending under fixed/flexible exchange rates.*)

8. The Aggregate Demand and Supply Sub-Menu

The fifth item in the main menu (Aggregate Demand and Supply) has a different sub-menu, which in turn has several sub-sub-menus. But then this is where the models are starting to get powerful and contentious.

- F1 Introduction
- F2 Review of Aggregate Demand Curve (AD) — ending with Gordon Fig. 6-1 (*Effect on real income Y of different values of the price index P*).
- F3 Review of Short-Run Aggregate Supply Curve (SAS) → a sub-sub menu:
 - F1 Derivation of Short-Run Aggregate Supply Curve (SAS) — ending with Figure 6-7 (*The labour demand curve N^d , the production function F , and the aggregate supply curve SAS for the whole economy*)
 - F2 Increase of Normal Wage and its Effect on Aggregate Supply — ending with Figure 6-8 (*The short-run aggregate supply curve SAS for two different values of the wage rate W_0 and W_1*)
 - F3 Decrease of Normal Wage and its Effect on Aggregate Supply — ending with Figure 6-8 (*The short-run aggregate supply curve SAS for two different values of the wage rate W_0 and W_1*)
 - F4 Technical Advance and its Effect on Aggregate Supply

F5 Supply Shock and its Effect on Aggregate Supply — ending with Figures 7-4 (*Effect of an adverse supply shock on output Y and employment N in the real business cycle model*), 7-7 (*Effect of a supply shock on the labour demand curve N^d , the production function F , and the aggregate supply curve SAS*)

End of sub-sub-menu F3.

F4 Aggregate Demand and Aggregate Supply Analysis — ending with Figures 6-2 (*The effect on the AD curve of a doubling of the nominal money supply M^s*), 6-3 (*The effect on the AD curve of a decline in planned autonomous spending A_0*)

F5 Technical Note about the Symbols Used — a reference to the Appendix to Chapter 4

9. The Next Sub-Menu — Shocks in the Static Aggregate Supply Model

The sixth item in the top menu (Supply and Demand Shocks in the Aggregate Demand–Aggregate Supply Model) includes a sub-menu:

- F1 Introduction
- F2 Supply and Demand Shocks in the Static AD–SAS Model — Figures 7-7 (*Effect of a supply shock on the labour demand curve N^d , the production function F , and the aggregate supply curve SAS*), 7-8 (*Effect on real GDP Y and the price level P of a higher oil price*).
- F3 Technical Notes — adaptive expectations (pp. 249–251)

10. The Last Sub-Menu — Shocks in the Dynamic Inflation Model

The seventh and final item on the top menu (Shocks in the Dynamic Inflation Model) includes a short sub-menu:

- F1 Introduction — Appendix of Chapter 9: Tables on pp. 279 and 282, Figures 9-11 (*The effect on the inflation rate p and output ratio Y/Y^N of an adverse supply shock that shifts the SP curve upward by 3 percent*), 9-3 (*The adjustment path of inflation p and real GDP Y to an acceleration of nominal GDP growth from zero to 6 percent when expectations fail to adjust*), 9-4 (*Effect on inflation p and real GDP Y of an acceleration of demand growth from zero to 6 percent*), 9-7 (*Adjustment path of inflation p and real GDP Y to a policy that cuts nominal GDP growth x from 10 percent in 1980 to 4 percent in 1981 and thereafter*), 9-6 (*Initial effect on inflation p and real GDP Y of a slowdown in nominal GDP growth from 10 percent to 4 percent*), 9-8 (*The effect on real GDP Y and the inflation rate p of three alternative growth paths of nominal GDP*).
- F2 Initialise the Model
- F3 Generate Shocks to the Model
- F4 Path of Inflation and Real GDP
- F5 Inflation and Real GDP over Time
- F6 Technical Note

11. Computer Exercises

11.1 *The Simple Keynesian Model*

1. The marginal propensity to consume (c) is set at 0.75. Leave this as the initial value.
 - a. Change c to 0.80. What happens to real income (Y)?
 - b. Change c to 0.70. What happens to Y ?
 - c. Changing c means changing the consumption patterns of the populace. Did Y increase or decrease significantly when you changed c ? How likely do you think it will be that c will change in the short run? In the long run? Are there any factors that might lead c to change? Are there any policies the government might pursue to encourage a change in c in the right direction?
2. Autonomous consumption (a) has an initial value of 250. Compare Y with this value and with a new value of 300. What happens to Y ? How significant a change is this? Do you expect there will be a change in a in the short run? In the long run? Try to imagine what a might have been like for a family in 1915, in 1970, and today. Would you expect the values to be similar? How does your answer affect the likelihood that a might change in the short run?
3. Now look at autonomous investment (I_p), with an initial value of 500.

- a. Change this to 550. What happens to Y ?
 - b. Change this to 450. What happens to Y ?
 - c. For a 10% change in investment (I_p), how much has Y changed? How might government encourage I_p ? Is this a policy you might expect most governments to follow? Why or why not?
4. Turn now to government spending (G), with an initial value of 250.
- a. Change G to 300. What happens to Y ?
 - b. Change G to 200. What happens to Y ?
 - c. For a 20% change in G , how much has Y changed? Compare with I_p : which seems to affect Y most? Now consider how easily government can change G or influence I_p : which one would government tend to focus on to increase Y ?

11.2 Chapter 4 — The IS-LM Model (Closed Economy)

1. In the equation $C = a + 0.75 Y_D$, leave 0.75 as the initial value of the marginal propensity to consume (c).
 - a. Change c to 0.80. What happens to Y ? What happens to r ? Do Y and r move together?

- b. Change c to 0.70. What happens to Y ? What happens to r ? Do Y and r move together?
 - c. Evaluate the change in magnitude in Y and r for the change in c . How sensitive is r to changes in c ? Is it more sensitive when c goes up than when it goes down, or vice versa? What does this imply for the ability of the economy to recover from a recession if c drops?
2. Now use the initial value of 1000 for I_p . Change this to 900. What happens to Y ? What happens to r ? For a 10% drop in I_p , how much do Y and r change? Which one is more sensitive to changes in I_p ?
3. Use the initial value of zero for G . Now change this to 1000. What happens to Y ? What happens to r ? Compare the magnitudes of change. Does your answer suggest policies the government might pursue to pull the economy out of a recession in the short run? What if the recession is prolonged?
4. The demand for real money balances $((M/P)^d)$ is given as $0.5 Y - 100 r$. Let's change the response of money demand to a \$1 change in income (Y) at a fixed interest rate (Gordon's h) and watch what happens to money demand.
 - a. Change $0.5 Y$ to $0.6 Y$. What happens to the LM curve? What happens to r ?

- b. Change $0.5 Y$ to $0.4 Y$. What happens to the LM curve? What happens to r ?
 - c. How sensitive is r to changes in Y ? What does this suggest will happen to r in a recession if Y falls considerably? How quickly would you expect r to adjust?
5. The real money supply (M^s/P) is given as 1000. Compare the initial value to the following changes:
- a. Change 1000 to 1500. What happens to Y ? What happens to r ?
 - b. Change 1000 to 500. What happens to Y ? What happens to r ?
 - c. How sensitive is Y and r to changes in the supply of money? Based on your answers to this, is the government likely to use changes in the money supply to stimulate the economy? To pull an economy out of a recession? Now compare the effects on the economy from changes in G and changes in the money supply. Which one will the government favour to stimulate the economy? To pull an economy out of a recession?

11.3 Chapter 5 — The IS-LM Model (Open Economy)

In the Open Economy IS-LM Model, the exchange rate (e) is given by $e = 25 r$.

- a. Change e to $50r$. What happens to Y ? What happens to r ? What happens to the IS curve?
- b. Change e to $10r$. What happens to Y ? What happens to r ? What happens to the IS curve?
- c. How sensitive were Y and r to changes in e ? Were Y and r more sensitive to a positive change in e or vice versa?

11.4 Chapters 6–8 — The Aggregate Demand/Aggregate Supply Model

After the on-disk review of the AD curve, review the SAS curve when:

- the nominal wage W rises and falls,
 - there is a technology advance, and
 - there is a supply shock (such as the oil-price rises of the 1970s).
1. Use the 850 initial value of investment I_p :
 - a. Change 850 to 1050. What happens to the AD curve? In the short run, what happens to Y and the price level P ? What happens in the long run?
 - b. Change 850 to 650. What happens to the AD curve? In the short run, what happens to Y and P ? What happens in the long run?
 - c. Considering your answers, how likely is it that the government will try to encourage investment to stimulate the economy?

2. Use the 550 initial value for government purchases (G):
 - a. Change 550 to 850. In the short run, what happens to Y and P ? What happens in the long run?
 - b. Change 550 to 400. In the short run, what happens to Y and P ? What happens in the long run?
 - c. Considering your answers, what is the likely short-term effect of an attempt to lower the budget deficit ($T - G$) by reducing G ? Would it be advisable to pursue such a policy?
3. The initial value for taxes (T) is 400:
 - a. Change 400 to 750. In the short run, what happens to Y and P ? What happens in the long run?
 - b. Change 400 to 250. In the short run, what happens to Y and P ? What happens in the long run?
 - c. Considering your answers, what is the likely short-term effect of an attempt to lower the budget deficit ($T - G$) by raising taxes (T)? What is the likely effect of an attempt to lower the budget deficit ($T - G$) by both raising taxes (T) and lowering government spending (G)? Would it be advisable to pursue both policies at once?

4. The initial value for the money supply (M^S) is 1000.
 - a. Change 1000 to 2000. What are the short-term effects on Y and P ? The long-term effects?
 - b. Change 1000 to 500. What are the short-term effects on Y and P ? The long-term effects?
 - c. Considering your answers, how likely is it that the government will use monetary policy to stimulate the economy? How likely is it that government will contract the money supply to deal with inflationary pressures?
5. Of the policies you have just considered, which ones are the easiest to implement? Which ones are the most effective? Is there an inbred bias towards certain policies?