

Economics 14.02
Problem Set 2
Due Date: 2/25/04

Answer each as True, False or Uncertain. Give a one or two sentence explanation for your answer.

1. To combat a recession due to slow business investment, the President of the United States should raise interest rates rather than expand defense funding.
2. A monetary contraction cannot affect the public budget since it is not a fiscal policy.
3. If incomes increase by \$1, aggregate demand increases by less than one dollar.
4. The equality of national income and national output is an example of an equilibrium relationship.
5. Taxing the illegal or underground economy is not possible with either fiscal or monetary policy.
6. Firms often finance investment projects through retained earnings. If this was universally true, changing the interest rate would not influence investment. [When a firm makes a profit, it either pays dividends to its shareholders or retains the earnings for firm operations and investments. The expectation of the shareholders is that the investments from retained earnings will produce additional future dividends that outweigh the dividend lost in the current period.]
7. A monetary action consistent with the Federal Reserve selling bonds in the open market would be an increase in the reserve ratio.

Longer Problems:

1. The Money Multiplier – Assume the public holds $c\%$ of their money in the form of currency, banks are required to hold $\square\%$ of their deposits in reserves, and the demand for money is given by:

$$M^d = \$Y * L(i) = \$Y * (0.8 - 4 * i)$$

Initially the high-powered monetary base is \$100 billion and nominal income is \$10 trillion (the latter is assumed constant throughout this problem). Let c and \square take their approximate United States values of 40% and 10%.

- a. What is the demand for central bank money?
- b. Find the equilibrium interest rate.
- c. Write an equation relating the overall supply of money to the overall demand for money. Determine this equilibrium value. Show the two sides are equal at the interest rate you calculated in part b. Give the value of the money multiplier.
- d. What is the impact on the interest rate if the central bank money is increased to \$500 billion? How does the public shift their relative holdings of currency, checkable deposits, and bonds?
- e. Over the next ten years, tremendous growth in banking checkable-payment alternatives (e.g., debit cards) lowers the public's currency requirement to $c=20\%$. What happens to the interest rate (return to the case where central bank money is \$100 billion)? Explain the logic behind this result in terms of the money multiplier.
- f. In part e, holding nominal GDP constant, is the velocity of money rising or falling? How does this relate to the case study on pp. 70-71? How does this affect the central bank's control of monetary policy?

2. Closed Economy IS-LM Model – In this problem we return to a model abstracting from banks. The central bank directly controls the money supply, with real money balances set at \$1600. The government runs an unbalanced budget with expenditures of \$250 and taxes of \$200. Consumption, investment and the demand for real money balances are governed by the following behavioral relationships:

$$C = 200 + 0.25*Y_d$$

$$Y_d = Y - T$$

$$I = 150 + 0.25*Y - 1000*i$$

$$(M/P)^d = 2*Y - 8000*i$$

- Derive the IS relation (an equation with Y on the left side and the interest rate plus a constant on the right side).
- Derive the LM relation (it will be convenient for later use to rewrite this equation with the interest rate on the left side and all else on the right side).
- Find the equilibrium output level.
- Find the equilibrium interest rate (the LM relation is the easiest, but you can check your results with the IS curve, why?).
- What are the values of C , I and G ? Verify they add up to total income.
- Now suppose real money balances increase to $(M/P)=1840$. Solve for Y , I , C , and the interest rate. Describe in words and with a graph the effects of expansionary monetary policy. What is the absolute and relative change in consumption? investment? How does this relate to the focus of economic policy?
- Set $(M/P)=1600$ again. Now suppose government spending increase to $G=400$. Summarize and illustrate with a graph the effect of fiscal policy on Y , I , C , and the interest rate. Contrast the consumption response to that in part f, explaining why one is higher than the other.
- Now implement both changes simultaneously: $(M/P)=1840$, $G=\$400$. Solve for Y , I , C , and the interest rate. Describe in words and with a graph the combined effects of expansionary monetary and fiscal policy.