Macroeconomics: Assignment 5

(Deadline: at the beginning of Lecture 6)

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1. Readings: Look at the newspapers and magazines for the past few weeks. Are there any discussions about the short term and long term economic goals? How do you interpret these discussions?
2. Suppose that the money demand function is

$$(\frac{M}{P})^d = 1000 - 100r$$

where r is the interest rate in percent. The money supply M is 1000 and the price level P is 2.

   a) Graph the supply and demand for real money balances.
   b) What is the equilibrium interest rate?
   c) Assume that the price level is fixed. What happens to the equilibrium interest rate if the supply of money is raised from 1000 to 1200?
   d) If the Fed wishes to raise the interest rate to 7 percent, what money supply should it set?

3. The following equations describe an economy.

$$Y=C+I+G$$

$$C=120+0.5(Y-T)$$

$$I=100-10r$$

$$G=50$$

$$T=40$$

$$(\frac{M}{P})^d = Y - 20r$$

$$M=600$$

$$P=2$$

   a) Identify each of the variables and the briefly explain their meaning.
   b) From the above list, use the relevant set of equations to derive the IS curve. Graph the IS curve on an appropriately labeled graph.
   c) From the above list, use the relevant set of equations to derive the LM curve. Graph the LM curve on the same graph you used in part (b).

d) What are the equilibrium level of income and equilibrium interest rate?

4. This problem asks you to analyze the IS-LM model algebraically. Suppose consumption is a linear function of disposable income:

$$C(Y-T)=a+b(Y-T)$$

where $a>0$ and $0<b<1$. The parameter b is the marginal propensity to consume, and the parameter a is a constant sometimes called autonomous consumption. Suppose also that investment is a linear function of the interest rate:

$$I(r)=c-dr$$

where $c>0$ and $d>0$. The parameter d measures the sensitivity of investment to the interest rate, and the parameter c is a constant sometimes called autonomous investment.

a) Solve for Y as a function of r, the exogenous variable G and T, and the model's parameters a,b,c, and d.

b) How does the slope of the IS curve depend on the parameter d, the interest sensitivity of investment? Refer to your answer to part (a), and explain the intuition.

c) Which will cause a bigger horizontal shift in the IS curve, a $100 tax cut or a $100 increase in government spending? Refer to your answer to part (a), and explain the intuition.

Now suppose demand for real money balances is a linear function of income and the interest rate:

$$L(r,Y)=eY-fr$$

where $e>0$ and $f>0$. The parameter e measures the sensitivity of money demand to income, while the parameter f measures the sensitivity of money demand to the interest rate.

d) Solve for r as a function of Y, M and P and the parameters e and f.

e) Using your answer to part (d), determine whether the LM curve is steeper for large or small values of f, and explain the intuition.

f) How does the size of the shift in the LM curve resulting from a $100 increase in M depend on

i. the value of the parameter e, the income sensitivity of money demand?

ii. the value of the parameter f, the interest sensitivity of money demand?

g) Use your answer to part (a) and (d) to derive an expression for the aggregate demand curve. Your expression should show Y as a function of P; of exogenous policy variables M,G, and T; and of the model's parameters. This expression should not contain r.

h) Use your answer to part (g) to prove that the aggregate demand curve has a negative slope.

i) Use your answer to part (g) to prove that increase in G and M, and decreases in T, shift the aggregate demand curve to the right. how does this result change if the parameter f, the interest sensitivity of money demand, equals zero? explain the intuition for your result.