

Problem Set 2

Due *in lecture* on Tuesday, October 6. Be sure to put your name on your problem set, as well as *the (i) name of your officially designated teaching assistant and (ii) discussion section number*. Put “boxes” around your answers to the algebraic questions.

1. Suppose the economy is described by the following equations (so we are looking at a closed economy):

Real Sector

$Y = AD$	Equilibrium condition
$AD \equiv C + I + G$	Definition of aggregate demand
$C = a_0 + bY_d$	Consumption function
$Y_d \equiv Y - T + F$	Def'n of disposable income
$T = tY$	Tax function
$F = FT_0$	Government transfers spending
$I = e_0 - dR$	Investment function
$G = GO_0$	Government purchases spending

Asset Sector

$(M^d/P) = (M^s/P)$	Equilibrium condition
$(M/P)^d = \mu_0 + kY - hR$	Real money demand
$(M/P)^s = (M_0/P_0)$	Real money supply (with price level fixed)

- 1.1 Solve for the IS curve (Y as a function of R).
- 1.2 Solve for the LM curve (R as a function of Y). What is the channel by which monetary influences affect the real goods sector in this model?
- 1.3 Solve for the equilibrium values of Y .
- 1.4 Graph the IS and LM curves on one diagram. Clearly indicate the intercepts and the slopes.
- 1.5 What are the exogenous and endogenous variables?
- 1.6 What is the government spending multiplier? What is the monetary policy multiplier?

2. Suppose the equations in the model above assume the following values:

$$a_0 = 800; b = 0.8 \quad FT_0 = 200; t = 0.20 \quad f = .05; GO_0 = 1000$$

$$e_0 = 2000; d = 10 \quad k = 1; h = 100; \mu_0 = 200 \quad M_0 = 10000; P_0 = 1$$

- 2.1 Calculate the equilibrium values of Y , R , and I (call them Y_0 , R_0 , and I_0 , respectively).
- 2.2 Assume G increases to 1300, and is completely bond financed (no money printed). Calculate the new level of income, Y_1 , and hence calculate the numerical value of the government spending multiplier, $\Delta Y/\Delta G$ (OR calculate $\Delta Y/\Delta G$ and then find Y_1).
- 2.3 Calculate how much *investment* has been crowded out by the increase in G . Explain the crowding out *briefly* using words and a graph.
- 2.4 Suppose the G remains at 1000, but M/P_0 increases to 10300. Calculate the new equilibrium Y and R (call them Y_2 and R_2).

2.5 Calculate the monetary policy multiplier, $\Delta Y/\Delta(M/P)$.

3. Suppose that G is increased to 1300, and M/P_0 is also increased to 10300 (so that the fiscal policy is money-financed).

3.1 What is the new equilibrium Y and R (call them Y_3 and R_3)?

3.2 What is the new level of investment (call it I_3)? Relative to what occurs in question 2.3, why has a different amount of investment been crowded out?

4. Using the algebraic model provided in question 1, draw the IS-LM diagrams for the following situations:

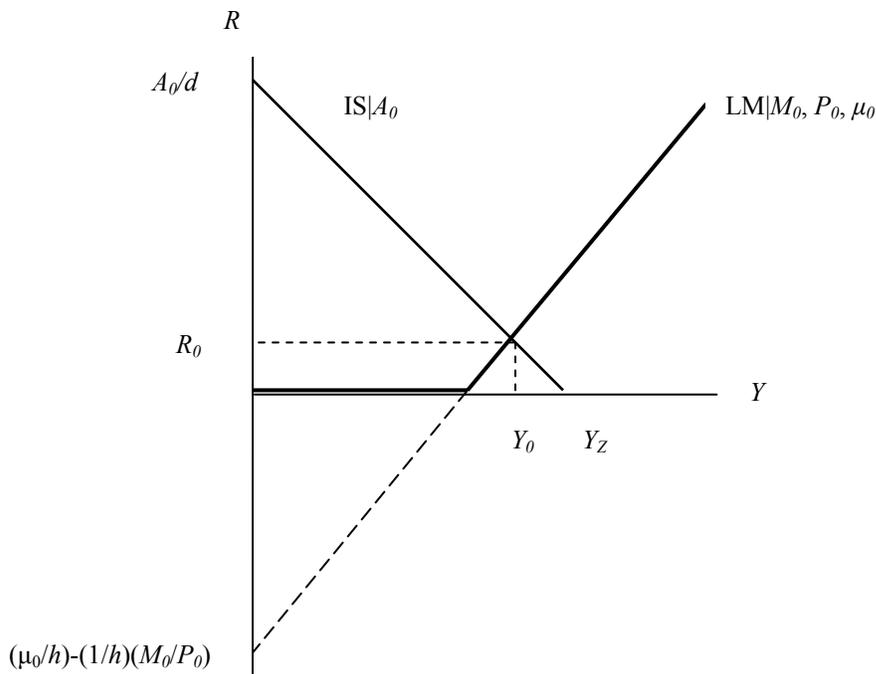
4.1 Money demand is sensitive to income.

4.2 Money demand is sensitive to the interest rate.

4.3 Investment is sensitive to the interest rate.

4.4 The marginal propensity to consume is hi.

5. Consider the following IS-LM diagram.



5.1 Using the above graph, show what happens if expansionary monetary policy is used (label the curve shift assuming $\Delta(M/P)$).

5.2 What is the maximal impact on income that can be obtained using monetary policy?

5.3 Show what happens if expansionary fiscal policy is used (label the curve shifts assuming ΔGO).