14.02 Principles of Macroeconomics
Problem Set 2
Fall 2004

Posted: Wednesday, September 22, 2004
Due in class: Wednesday, September 29, 2004

Part I. True/False/Uncertain
Justify your answer with a short argument.

1. Paradox of saving occurs when the attempts by people to save more lead to a decline in output and an increase in saving.

2. When mpc increases and investment decreases, goods market equilibrium output increases.

3. If investment is really sensitive to changes in the interest rate (b_1 large), then IS is flatter and fiscal policy is more effective. (assume: $I = b_0 - b_1 i$)

4. The price of bonds increases when the interest rate rises.

5. Monetary contraction and fiscal expansion together lead to an increase equilibrium output and interest rate.

6. The money multiplier is always less than 1.

Part II. THE MONEY MARKET
(all units are trillions of US $)

Money Demand: $M^d = \$Y\ (0.2 - i)$
Nominal Income: $\$Y = 2000$
Money Supply: $M^s = 300$

1. Find M^d for i = 10% and i = 5%.

2. What is the relationship between i and M^d.

3. Graph M^s and M^d and calculate the equilibrium i.

4. Alan Greenspan decreases M^s by 50.
What happens to money market equilibrium? (solve & graph)

5. Describe how the Fed changes i in the US.

Part III. Money Multiplier

Checkable deposits: D^d = \$900 billion
Total money supply: M^s = \$1800 billion
Reserve ratio: $\theta = 0.2$
Ratio of (CU^d / M^d) : $c = 0.5$

1. Find CU^d, R^d and D^d. in equilibrium.
2. Find the money multiplier.
3. Describe 2 different ways the Fed can decrease money supply.
4. If the Fed wants to decrease the money supply by \$500 million (in order to raise i), what amount of bonds would it have to sell/buy?

Part IV. IS - LM
(All units are millions of US dollars)

$C = 200 + (0.25)Y_D$
$I = 150 + 0.25Y - 1000\ i$
$T = 200$
$G = 250$
$(M/P)^s = 1600$
$(M/P)^d = 2Y - 8000\ i$

1. Find the equation for aggregate demand (Z).
2. Derive the IS equation.
3. Derive the LM equation.
4. Solve for equilibrium real output, interest rate, C and I.
5. Graph the IS-LM diagram of the above with correct labels.
6. Monetary expansion:
   Let M^s (nominal money supply) increase to 1840. Find equilibrium Y, i, C and I. What happens to Y, i, C and I when the Fed increases money supply through open market operations?
7. Graph part 6 (a new graph starting from part 5).
8. Fiscal expansion: (Continue from part 5)
   Let G increase to 400. Find equilibrium Y, i, C and I. What happens to equilibrium Y, i, C and I when government spending increases?
9. Graph part 8 (a new graph starting from part 5).

10. There is a sudden drop in consumer confidence and c_0 drops from 200 to 100. How can the government counterbalance the drop in GDP using government spending as a policy instrument?