Chapter 11: Applying the IS / LM Model [1]

1 Exercise: IS / LM Model (Mankiw 7e, p. 337)

Consider the IS / LM model.
Consumption function:

$$C = a + b(Y - T) \tag{1}$$

Investment function:

$$I = c - dr \tag{2}$$

Real money demand:

$$L(r, Y) = l_1 Y - l_2 r \tag{3}$$

Parameters:
$a > 0$, $0 < b < 1$, $c > 0$, $d > 0$, $l_1 > 0$, $l_2 > 0$

Given the information above, please answer the following questions:

a) Given equations (1) and (2), solve for Y as a function of r, G, T, and parameters (IS curve).

b) How does the slope of the IS curve depend on d, the interest rate sensitivity of investment?

c) Which will cause a larger horizontal shift in the IS curve, a \$100 tax cut or a \$100 increase in government spending?

d) Given equation (3), solve for r as a function of Y, M, P, and parameters (LM curve).

e) Using your answer from the previous part, how does the slope of the LM curve depend on l_2, the interest rate sensitivity of real money demand?

f) How does the size of the shift in the LM curve resulting from a \$100 increase in M depend on l_1? What about l_2?

g) Use your answers from parts (a) and (d) to derive an expression for the aggregate demand curve. You should solve for Y as a function of P, M, G, T, and parameters; the resulting expression should not depend on r.

h) Using your answer from the previous part, show that the aggregate demand curve is downward-sloping (negative slope).

i) Use your answer from part (g) to show that increases in G and M, and decreases in T, shift the aggregate demand curve to the right. How does this result change if parameter $l_2 = 0$ (real money demand does not depend on the real interest rate)?

[1] Econ 302, Week 14, 12/4/2009; UW-Madison. TAs Lihan Liu and Scott Swisher.

2 Exercise: IS / LM Model (from last week)

Consider the IS / LM model.
Consumption function:

$$C = 200 + 0.25(Y - T) \tag{4}$$

Investment function:

$$I = 150 + 0.25Y - 1000i \tag{5}$$

Fiscal policy:

$$G = 250 \tag{6}$$

$$T = 200 \tag{7}$$

Real money demand:

$$(\frac{M}{P})^d = 2Y - 8000i \tag{8}$$

Real money supply:

$$\frac{M}{P} = 1600 \tag{9}$$

Given the information above, please answer the following questions:

a) Derive the IS curve.

b) Derive the LM curve.

c) Solve for Y^*.

d) Solve for i^*.

e) Solve for C^*, I^*.

f) Let $\frac{M}{P} = 1840$; repeat parts (a) through (e). Comment on the direction of movement for equilibrium variables relative to the initial case $\frac{M}{P} = 1600$.

g) Let $\frac{M}{P} = 1600$, $G = 400$; repeat parts (a) through (e). Comment on the direction of movement for equilibrium variables relative to the initial case $G = 250$.