Economics 302                                                     Menzie D. Chinn
Fall 2010                                                         Social Sciences 7418
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**Problem Set 2**

Due *in lecture* on ~~Monday, October 18th~~ **Wednesday, October 20th**. Be sure to put your name on your problem set. 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 |
| $T = TA_0 + tY$ | Tax function |
| $F = -fY$ | 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:
$a_0 = 800$; $b = 0.8$     $TA_0 = 200$; $t = 0.10$        $f = .05$; $GO_0 = 800$
$e_0 = 2000$; $d = 10$     $k = 1$; $h = 100$; $\mu_0 = 200$     $M_0 = 10000$; $P_0 = 1$

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 1000, 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 800, but $M/P_0$ increases to 10200. 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 1000, *and* $M/P_0$ is also increased to 10200 (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 insensitive to income.
4.2 Investment is insensitive to the interest rate.
4.3 The marginal tax rate is low.
4.4 Money demand is sensitive to the interest rate.

5. Given the following economy:

$$Y = AD \equiv C + I + G \qquad\qquad M^s/P = M^d/P$$
$$C = a + bY_d \qquad\qquad M^s/P = M_0/P_0$$
$$Y_d \equiv Y - T \qquad\qquad M^d/P = kY - hR + j(\$Wealth/P_0)$$
$$T = TA_0 \qquad\qquad \$Wealth \equiv M + B$$
$$I = e_0 - dR$$
$$G = GO_0 \qquad\qquad BuD \equiv G - T \text{ ; the price level is fixed}$$

5.1 Algebraically, derive the equilibrium income.
5.2 Show graphically what happens if the government runs a budget deficit, starting from initial budget balance.
5.3. Show in an IS/LM diagram what happens if the interest sensitivity of money demand is infinity.