Problem Set 3

1. Answer by True, Uncertain or False. Explain your answer with a graph or analytically.

a. A fiscal expansion *must* increase consumption, output and investment.
b. A fiscal expansion coupled with a monetary expansion causes both output and the interest rate to raise.
c. Assume that Investment spending depends only on the interest rate, and not on output, and then a decrease in the budget deficit will cause investment spending to increase.
d. In an economy with financial intermediaries (banks), the Central Bank has a greater ability (the economic term would be "discretion") in moving the LM.

2. Consider the following Good Market model, where we have assumed a linear form for the investment.

$Y = C + I + G$
$C = c_0 + c_1(Y - T)$
$I = d_0 Y - d_1 i$

a. Interpret the two parameters d_0 and d_1. Solve for the equilibrium output in the good market.
b. Now you have the IS schedule. Show its slope in the i-Y space.
c. How does the slope depend on d_1 ? Give an economic interpretation.

Now assume that the money demand is the following (here P=1):

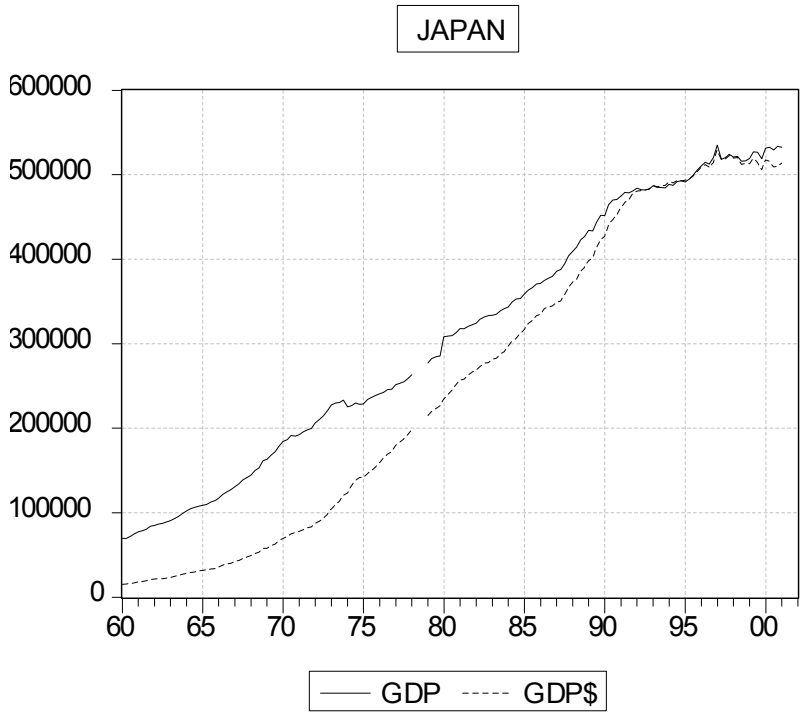
$YL(i) = eY - fi$

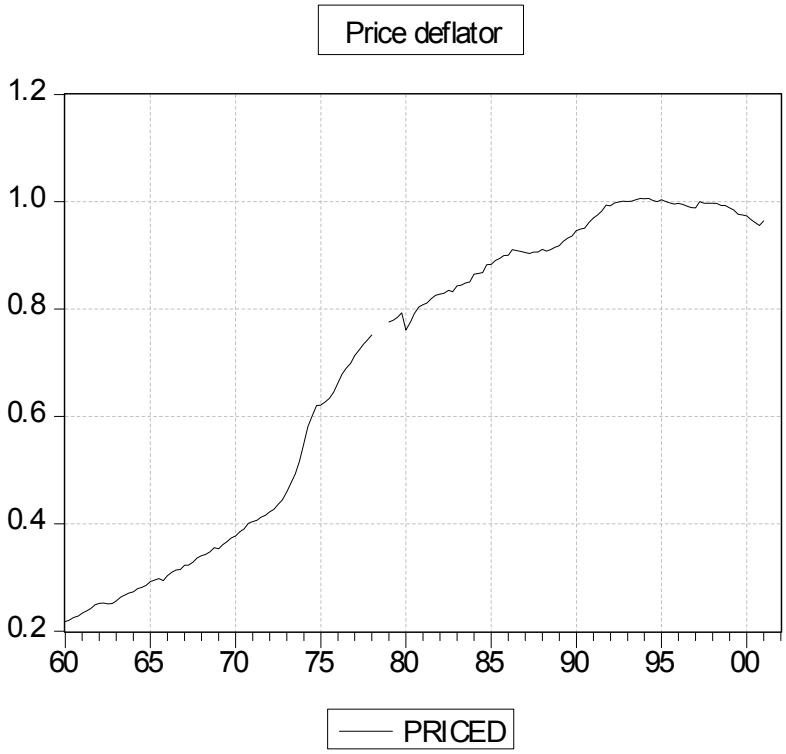
To be in equilibrium the money supply, M, must be equal to money demand.

a. Interpret the two parameters e and f.
b. Show the slope of the LM curve in the i-Y space.
c. How does the slope depend on e ? on f ? Give an economic interpretation.
d. Solve for both the LM and IS equation and find the equilibrium output.
e. What is the impact of f on the efficacy of monetary policy? And of fiscal policy? Try to use your intuition in giving an answer.
f. As in e. for d_1.

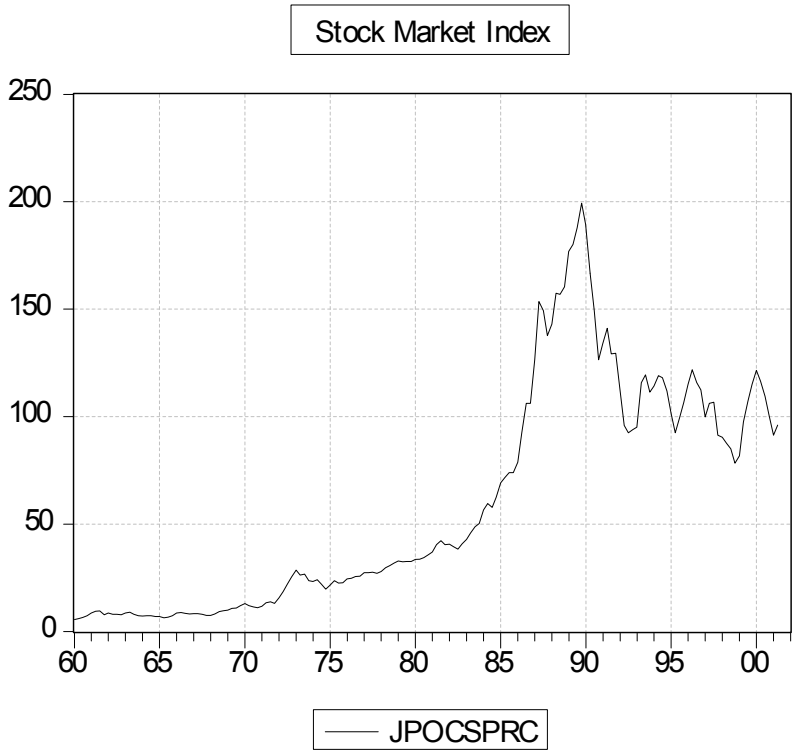
3. Japan and the liquidity trap.

Let us try to use what we have learned until now to analyze the economic situation in Japan during the 90's. To give you a larger picture consider the following two graphics. The first one plots the nominal and real GDP, the second the GDP deflator (remember that $P_t = \$GDP/GDP$) from 1960 until today.





The third graphic plots an index of Japanese stocks prices.



Visual investigation suggests you that Japanese economic activity has been stagnant since the collapse of the speculative asset-price bubble in the 1990. Since the mid-1991, the Bank of Japan (the Japanese central bank) has used open-market operations to guide the interest rate down to historical low levels. Despite the BOJ policy, economic activity in Japan was uncharacteristically weak over most of the recovery. Although several reasons have been put forward to explain this sustained weakness of the economy, few are more intriguing (especially for a Central Bank) than the possibility that monetary policy was largely ineffective because the Japanese economy entered a Keynesian "liquidity trap"…

Assume that the money demand is of the following form:

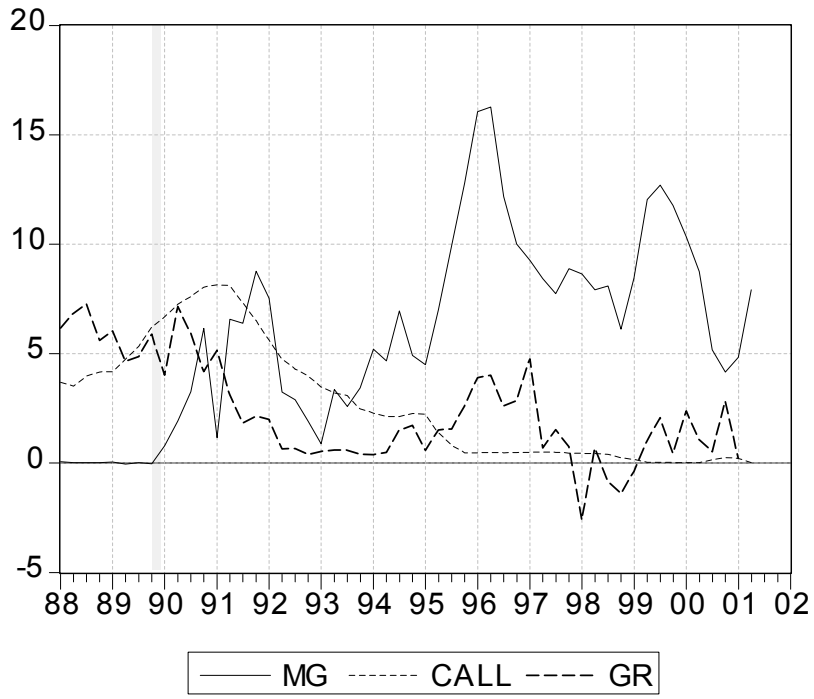
$M = Y^c(i - f)^d$ *where* $d<0$ *and* $0<c<1$.

(if you want you can use $c=1$ *and* $d= -1 \Rightarrow M=Y/(i-f)$*).*

Thus the difference with the specification you have seen in class is that the real demand of money is a function of real income and the *spread* (difference) between the nominal interest rate and a critical interest rate f (floor). As such, money demand depends on how far away the nominal interest rate is away from the liquidity floor, rather than uniquely on the level of the nominal interest rate.

a. Plot the demand for real money in the i-M space. (Consider only $i \geq f$ and be careful in observing what happens when i is close to f.)
b. Assume that the supply of money is perfectly controlled by the Central Bank, and it is equal to M^s. Draw the LM curve in the i-Y space. (remember f).

c. Consider the usual IS schedule, using the LM you have drawn in b. comment the following graph representing the 90's in Japan. (call is the interest rate, gr is the annual rate of growth of the real gdp and mg is the rate of growth of M1)



4. Monetary aspects of fiscal policy.

Consider the standard IS-LM model, where for simplicity the investment does not depends on Y:

$Y = C + I + G$
$I = d_0 - d_1 i$
$C = c_0 + c_1(Y - T)$
$G = \underline{G}$
$T = \underline{T}$
$M = eY - fi \qquad (LM)$

We will study the effects of fiscal policy in the presence of a budget deficit. Thus we will keep *T* (taxes) constant.

a. Represent and explain the effect of an increase in G in the usual *i-Y* space, keeping everything fixed.
b. Now consider that the money the Government spend must come from somewhere. Our first case will be to assume that the fiscal authority can force the Central Bank to print money, thus the increase in G is coupled with an equal increase in M. Represent and explain the previous policy in the *i-Y* space.
c. Today in modern economies the Central Bank is independent of the fiscal authority, thus if taxes remain fixed the government must finance the increase

in G by emitting bonds. To study this case we must modify the standard model in the following way:

$$C = c_0 + c_1(Y - T) + mW$$

$$L(W,Y,i) = hW + eY - fi$$

$$W = M + B$$

Where W is wealth and B is bonds. Study the impact of an increase in G financed with an increase in B (M^s and T are fixed). (a graphic analysis is sufficient)