Answer Keys

# B.E. International Program

Faculty of Economics, Thammasat University

**Semester: 1/2011**
**EE 312 Macroeconomic Theory** **ID.No.....**
**Quiz # 1: September 1, 2011**

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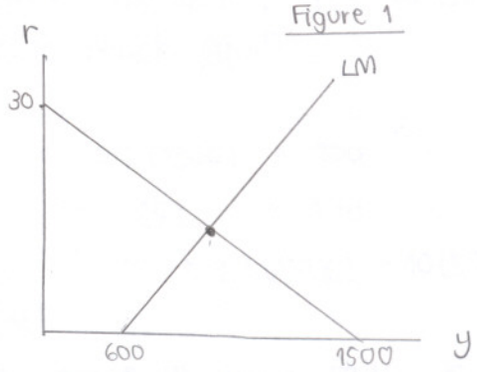
Suppose that a closed economy has the following features:

$C = 60 + 0.8Y^d$
$I = 150 - 10r$
$G = 250$
$T = 200$
$M^s = 100$
$M^d = 40 + 0.1Y - 10r$

Figure 1




1) Find the equations and draw graphs for the IS and LM schedules. What property is shared by all points along the IS schedule? Along the LM schedule?

For close economy, with information on component of aggregate expenditure given, we can reach equilibrium condition in product market as follow, using injection - leakage approach.

$I + G = S + T$, where $S = y^d - C$ and $y^d = y - T$

$150 - 10r + 250 = -60 + (1-0.8)Y^d + 200$

$400 - 10r = 140 + (0.2)(y - 200)$

$y = \frac{300}{0.2} - \frac{10}{0.2}r$ → IS curve equation ; $y = 1500 - 50r$

Equilibrium in money market occurs when money demand equals money supply.

$M^d = M^s$ * Note that $M^s$ here is fixed and is not responsive to r since it's determined by central bank policy

$40 + 0.1Y - 10r = 100$

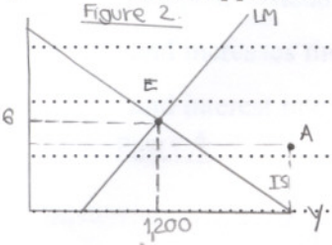
$Y = \frac{60}{0.1} + \frac{10}{0.1}r$ → LM curve equation ; $y = 600 + 100r$

IS curve is the curve showing all combinations of r and y representing equilibrium in product market. For all points along IS curve, they are all in equi$^m$ without excess demand / supply of goods.

LM curve is the line showing all combinations of r and y that produce equi$^m$ in money market. All points along the curve are in money market equi$^m$ without excess demand / supply of money.

IS has -ve slope, while LM has +ve slope, as plotted in graph figure 1.

2) Determine the equilibrium level of income and interest rate in this economy. Explain what happens when income is 1500 and interest rate is equal to 5.




For joint equilibrium of this economy, it occurs when both product and money market are in equi$^m$, simultaneously, at point E shown in graph figure 2.

At point E, $I+G = S+T$ and $M^s = M^d$, to obtain equi$^m$ level of Y and r, we equate IS with LM.

$1500 - 50r = 600 + 100r \rightarrow r^* = 6$, $Y^* = 1200$

At $y = 1500$ and $r = 5$ (point A shown in graph figure 2), equi$^m$ of economy can't be reached, so there will be adjustment to reach equi$^m$.

At point A, there is excess supply of goods.

$S > I$ $\begin{cases} S: -60 + 0.2(1300) = 200 \\ I: 150 - 10(5) = 100 \end{cases}$

At point A, there is excess demand for money $\begin{cases} M^d: 40 + 0.1(1500) - 10(5) = 140 \\ M^s = 100 \end{cases}$

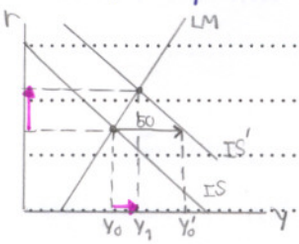
$M^d > M^s$

With excess demand for money, ppl. sell bond, price of bond falls, r rises.

$r\uparrow \rightarrow I\downarrow \rightarrow Y\downarrow \rightarrow M_t^d\downarrow$, $M_s^d\downarrow$. Reduction in $M^d$ brings back money market equi$^m$ and reduction in Y brings back product market equi$^m$.

3) "If government increases it s expenditure and taxes by the same amount: $\Delta G = \Delta T = 50$, equilibrium income will also increase by 50." Do you agree with this statement? Why or why not? Provide your calculation and economic reasoning.

Disagree - To consider the net effect on Y, not only product market, but also money market must be taken into account.




igure 3

With balance budget policy, $\Delta G = \Delta T = 50$.

This will lead to increase in Y, since multiplier effect of G is larger than that of tax. Multiplier effect of G: $\Delta Y = \frac{1}{1-b}\Delta G$, while tax multiplier effect: $\Delta Y = \frac{-b}{1-b}\Delta T$, So, multiplier of balance budget $= 1$ or $\Delta G = \Delta T = \Delta Y$.

Hence, change in Y due to balance budget multiplier is 50, causing IS to shift right from IS to IS' in Figure 3.

However, the net effect on change in income depends on money market equi$^m$ as well (LM curve). We have to equate new IS with old LM.

With $T = 250$, $G = 300 \rightarrow$ IS: $y = 60 + 0.8(y - 250) + 150 - 10r + 300$

$y = 1550r - 50r \rightarrow$ New IS

Old LM: $y = 600 + 100r$

New joint equi$^m$: $1550 - 50r = 600 + 100r$

$950 = 150r$

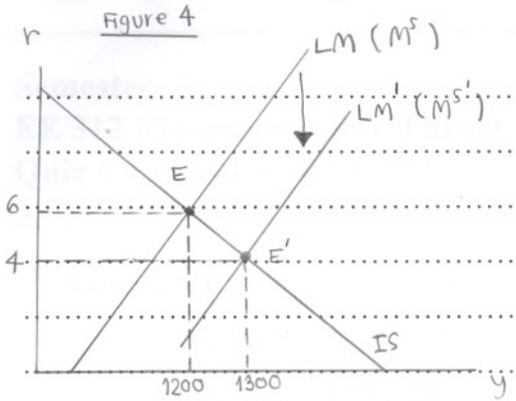
$r = 6.33$

$Y = 1233.33 \rightarrow \Delta y = 33.33$

Net change in Y is only 33.33 which is less than 50 due to crowding out effect. The increase in r leads to decrease in I and Y canceling some part of original Y.

4) Suppose instead of fiscal policy, the government uses expansionary monetary policy and increases money supply to 130. Find the new equilibrium level of income (Y) and interest rate (r). Provide economic reasons for the change in income.

Figure 4




With expansionary monetary policy by increasing $M^S$ from 100 to 130. $M^S$ curve shifts right causing r to decrease. At each and every level of national income Y, r is lower so LM shifts right from LM to LM' in figure 4. Equilibrium for whole economy is moved from point E to E'.

With new LM curve (LM'), at original equim level of r (r=6), there is excess money supply, so r will adjust lower since people will buy bond making price of bond increase.

When r decreases, investment will increase and national income (Y) increase until it reaches new equilibrium at E'.

IS equation ; $y = 1500 - 50r$

New LM equation ; $130 = 40 + 0.1y - 10r$

$90 + 10r = 0.1y$

$y = 900 + 100r$

New equilibrium level of r and y are

$1500 - 50r = 900 + 100r$

$600 = 150r$

$r = 4$, $y = 1,300$

Equilibrium level of income is increased from 1200 to 1,300 and equilibrium level of interest rate decreases from 6 to 4 after expansionary monetary policy.