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ECO 209Y
MACROECONOMIC THEORY

Solution to Problem Set 12
(Odd numbers only)

1. a) First, we must obtain the expression for the aggregate expenditure function:

$$\begin{aligned} AE &= C + I + G \\ &= (60 + 0.8YD) + (200 - 20\,i + 0.2\,Y) + 300 \\ &= 560 + 0.8\,YD - 20\,i + 0.2\,Y \\ &\qquad \text{where } YD = Y - 0.25\,Y + 50 = 50 + 0.75\,Y \\ &= 560 + 0.8\,(50 + 0.75Y) - 20\,i + 0.2\,Y \\ &= 600 + 0.8\,Y - 20\,i. \end{aligned}$$

In equilibrium, $Y = AE$:

$$Y = 600 + 0.8\,Y - 20\,i \rightarrow 0.2\,Y = 600 - 20\,i \rightarrow Y = 3000 - 100\,i.$$

And solving for i we obtain the equation for the IS curve:

$$i = 30 - 0.01\,Y.$$

b) The LM curve is found from the money market equilibrium:

$$L = M/P \rightarrow 0.2\,Y - 10\,i = 300/P$$

And solving for i we obtain the equation for the LM curve:

$$10\,i = 0.2\,Y - 300/P \rightarrow i = 0.02Y - 30/P$$

If $P = 1$, then the equation for the LM curve is: $i = 0.02Y - 30$.

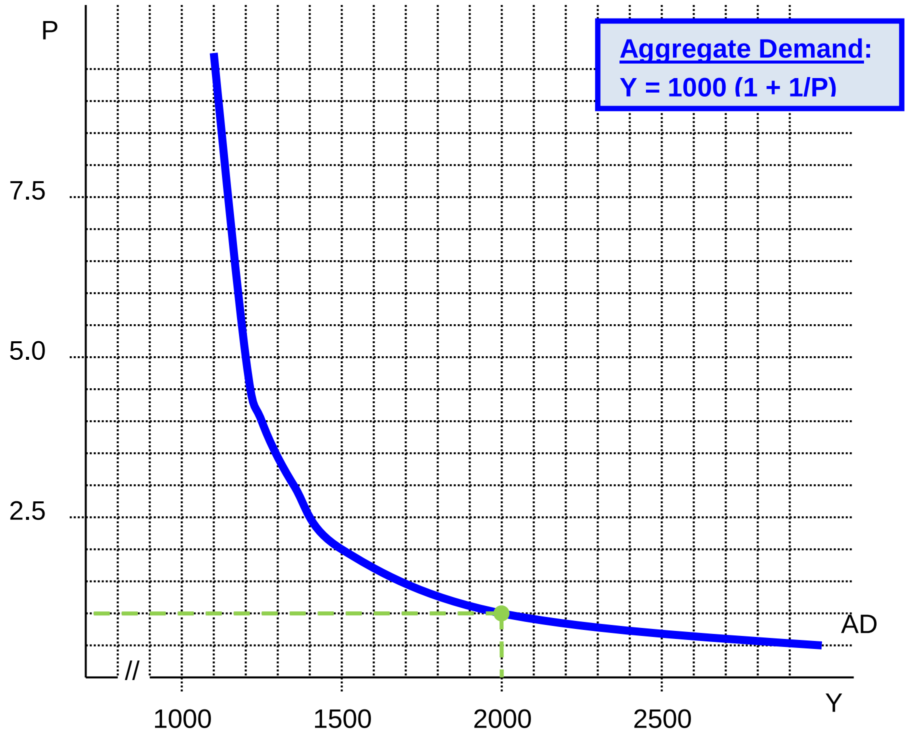
c) To find the equation for the AD curve we must equate the IS and LM curves:

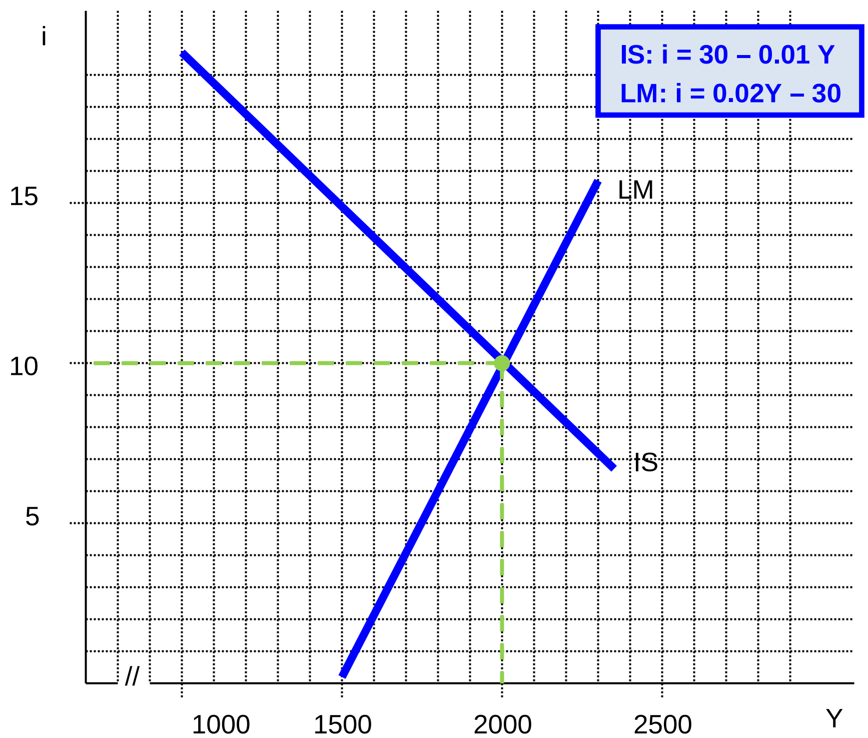
$$30 - 0.01\,Y = 0.02\,Y - 30/P \rightarrow 0.03\,Y = 30\,(1 + 1/P) \rightarrow Y = 1000\,(1 + 1/P).$$

d) An increase in G causes the AE curves corresponding to each level of the rate of interest to shift up by exactly the change in G. Therefore, at each level of the rate of interest the goods market will now be in equilibrium at a higher level of income. This means that the IS curve shifts to the right, and this horizontal shift is equal to the simple expenditure multiplier times the change in G. Therefore, at each price level the goods market and the money market will be simultaneously in equilibrium at a higher level of income. This, in turn, means that the AD curve shifts to the right, and this horizontal shift is equal to the fiscal policy multiplier times the change in G.

e) An increase in M creates a situation of excess supply in the money market and the rate of interest falls. Therefore, at each level of Y the money market will now be in equilibrium at a lower the rate of interest. This means that the LM curve has shifted to the right. Therefore, at each price level the goods market and the money market will be simultaneously in equilibrium at a higher level of income. This, in turn, means that the AD curve has shifted to the right, and this horizontal shift is equal to the monetary policy multiplier times the change in M/P.

f)


P
7.5
5.0
2.5
Aggregate Demand:
Y = 1000 (1 + 1/P)
AD
1000
1500
2000
2500
Y


i
15
10
5
IS: i = 30 – 0.01 Y
LM: i = 0.02Y – 30
LM
IS
1000
1500
2000
2500
Y