

Name _____ Date _____ last 4 PSU ID _____

Economics 304

Homework Lesson 9

67 points

Instructions: Please show all work or points will be taken off. Good luck!

Consider the following model of the economy

Production function: $Y = AKN - N^2/2$

Marginal product of labor: $MPN = AK - N$.

where the initial values of $A = 8$ and $K = 10$.

The initial labor supply curve is given as: $N^s = 20 + 9w$.

$$C^d = 401 + .50(Y-T) - 500r$$

$$I^d = 800 - 500r$$

$$G = 500$$

$$T = 100$$

$$M^d/P = 469 + 0.5Y - 1000r$$

Nominal Money supply $M = 4000$

We assume that expected inflation is zero ($\pi^e = 0$) so that money demand depends directly on the real interest rate (since $i = r$).

1 a) **(6 points)** Solve for the labor market clearing real wage (w^*), the profit maximizing level of labor input (N^*), and the full employment level of output (Y^*). Please show your work.

Draw two diagrams vertically with the labor market on the bottom graph and the production function on the top graph. Be sure to label everything including this initial equilibrium point as point A. **(10 points for completely labeled and correct diagrams)**

b) **(4 points)** Derive an expression for the IS curve (r in terms of Y). Please show all work

c) **(3 points)** Find the real interest rate that clears the goods market. Please show all work

d) **(3 points)** Find the price level needed to clear the money market. Please show all work

e) **(4 points)** Find the expression for the LM curve (r in terms of Y). Please show all work

Now draw four separate diagrams: (40 points total) Top left: a desired savings equals desired investment ($S^d = I^d$), Top right: a FE - IS - LM diagram, Bottom left: a money market diagram, Bottom right: An AD - AS diagram, locating this initial equilibrium point as point A. **BE SURE to LABEL all diagrams completely (10 points for each correctly drawn and labeled diagram...each diagram will have three different equilibriums points A, B, and C)**

SCENARIO #1 – AN LM SHOCK!

S1 a) (4 points) Now suppose that here is a shock to real money demand so that the new money demand function is:

$$M^d/P = 449 + 0.5Y - 1000r$$

Name and support two reasons why real money demand would change like this - please do your best to relate your answer to recent real world events.

S1 b) (6 points) What is the new, short run (fixed price level) expression for the LM curve? Please show all work.

S1 c) (4 points) What is the short run, Keynesian (fixed price) level of equilibrium output and real interest rate? Please show all work.

Please label these new short run conditions to your four diagrams as point B. Be sure to label diagrams completely with the inclusion of all the relevant shift variables like we did numerous times in the lesson.

S1 d) (4 points) Find the new price level associated with the long run general equilibrium.

Please label these long run conditions to your four diagrams as point C. Be sure to label diagrams completely with the inclusion of all the relevant shift variables like we did numerous times in the lesson.

S1 e) (4 points) Let us focus on the movement from point A to B (the short -run) in your money market diagram. **Explain why** (and in what direction) the real interest rate had to change to 'clear' the money market. Be as specific as possible as we talked about this a great deal in our video lectures!

S1 f) (5 points) From the Fed's perspective, is this long run adjustment in the general price level desirable, noting that the Fed's target for inflation = $\% \Delta P = 2\%$. If it is not desirable, then what can the Fed do to hit their inflation target? Would they conduct open market purchases or open market sales? Hint: feel free to use the quantity theory of money and Milton Friedman's famous quote as part of your answer.