

Economics 14.02

Problem Set 3 Questions

Due Date – 3/17/03

PLEASE NOTE – When handing in your problem sets, please staple your answer sheets together. Any loose answer sheets will not be graded

I. True/False/Uncertain

1. An increase in the minimum wage would induce a higher unemployment rate unless firms simultaneously charged a lower markup.
- 2 One possible reason for the higher unemployment rate in Europe (relative to the US) is the greater extent of labor unionization in Europe.
- 3 The downward sloping nature of the Aggregate Demand curve is a natural example of the law of demand – consumers will demand less at higher prices.
- 4 The AD curve is flatter the higher is the interest-responsiveness of investment demand.
- 5 The IS-LM analysis (from chapters 3-5) corresponds exactly to a situation where the Aggregate Supply curve is horizontal.

II. The Supply Side

Suppose the wage setting relation is given by (P^e denotes expected price)

$$W / P^e = Z - 10u$$

where Z is the level of unemployment insurance provided by the government. Assume $Z=1$. The markup is 1. The production function is $Y = N$.

- 1) For $P = P^e$, what are the equilibrium unemployment rate and the equilibrium real wage? Suppose the labor force is 1000. What is the natural level of output?
- 2) Next, suppose the expected price is not equal to the actual price. Treat P^e as a parameter. Derive the AS curve (you should have an equation in which the only variables should be P, P^e and Y)? Show all your steps clearly.
- 3) From the AS curve you just derived, find an expression for the price when output is equal to the natural level you computed in (1). Provide some intuition for why the price turns out to be what it is.
- 4) Describe what happens to the AS curve when each of the following changes takes place, and provide some intuition for the change in the AS curve (give word answers – you may pick your own numbers to confirm mathematically that your answers are correct, but exclude the math from your answers)

- (a) the markup increases
- (b) unemployment benefits increase
- (c) sensitivity of the nominal wage to unemployment increases (only discuss what happens to the slope of the AS in this part)

III. The Demand Side

The IS and LM curves are respectively –

$$Y = c_0 + c_1(Y - T) + a_1Y - a_2i + G$$

$$M / P = m_0Y - m_1i$$

- 1) Find an expression for the slope of the AD curve (note – the relationship between Y and P will be nonlinear)
- 2) Describe what happens (and why, in economic terms) to the AD curve in each of the following cases –
 - (a) m_1 (called the interest-sensitivity of money demand) decreases
 - (b) c_1 increases (you can here confirm your answer to question 4 in Section I. above)

IV. Demand and Supply together

Consider an AS-AD framework. The economy is initially in medium run equilibrium. Consider the following two shocks

- 1) An increase in the money supply
- 2) An increase in the markup

These two shocks will move the economy from one medium run equilibrium to another. We call a graph that describes how a particular variable adjusts from one equilibrium to another the time path for that variable. So for each of the following variables, draw its time path

- (a) Output
- (b) Real Balances
- (c) Prices
- (d) Interest Rates

Denote the time of the shock t_0 (assume that this is also the time period in which the new short run equilibrium is reached) and the time at which the economy settles into the new medium run equilibrium t_2 . And correspondingly for each variable, use the subscript 0 for the initial equilibrium value, the subscript 1 for intermediate values, and the subscript 2 for the final equilibrium value.

Here is an example. Suppose you had to trace the evolution of consumption from time t_0 to time t_2 , and suppose consumption started at C_0 in medium run equilibrium, then

jumped to C_1 at the time of the shock, and finally returned to C_0 at time t_1 (so here $C_2 = C_0$), then your time path might look something like this (as in the diagram, do not worry about getting the curvature of the path correct, just use straight lines, but you must get the direction of change correct).

