

ECON 110, Professor Hogendorn

Review Problem Set 10

Review Problems only, not to turn in:

1. *AverageJoe*. This problem's title comes from an old *Wall Street Journal* article entitled "Average Joe saw inflation coming."

The idea that inflation expectations could grow on their own is intriguing.

- (a) Draw the AD, AS, and LRAS curves, showing a long-run equilibrium where inflation expectations are 3%.
- (b) Now suppose inflation expectations rise to 5%. Graph and label the new AS curve and the new level of output.
- (c) Illustrate the movement from part (a) to (b) on a labor market diagram. Note that it's not labor demand that will shift, it's the wages that will go up due to the higher inflation expectations. Show that this causes unemployment in a sticky-wage environment.
- (d) Suppose the parliament of this economy grew concerned about the higher inflation, but were not able to convince the central bank to make any monetary policy changes. Could they bring inflation down themselves by raising taxes? Explain how this would/would not work.

2. *GermansNotWorking*. As you know from previous problems in this class, there are 243 workers in Germany.<sup>1</sup> Let's assume they all supply labor perfectly inelastically. Let the aggregate production function for the German economy be  $Y = f(L) = 100L^{3/5}$ .

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<sup>1</sup>This is only a rough approximation.

- (a) What is the labor demand curve for the German labor market? Explain how you found it and what assumptions you had to make about German firms to do this.
- (b) Graph the labor market and find the equilibrium real wage for this economy (*assuming the labor market clears*). Continuing to assume the labor market clears, what do you think is a plausible value for the unemployment rate? Explain.
- (c) Now suppose that an investment panic occurs, resulting in a leftward shift of labor demand. Wages are completely sticky, and unemployment rises to 10%.<sup>2</sup> Recall that Okun's Law is

$$\frac{Y^f - Y}{Y^f} \approx 2(U - U^N)$$

Assuming that Okun's Law holds, what is the level of German GDP  $Y$  after the investment panic.

- (d) Show how the situation of part (c) appears on an AD/AS/LRAS diagram. What is likely to happen next?

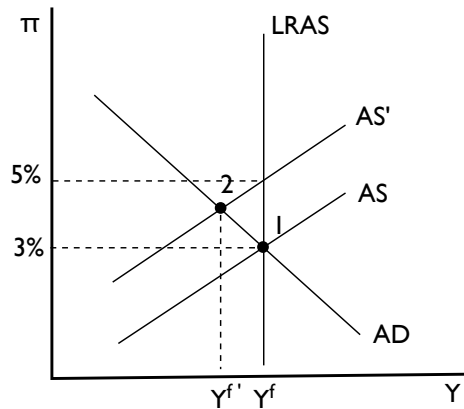
## Answers:

1. *AverageJoe\_a.*

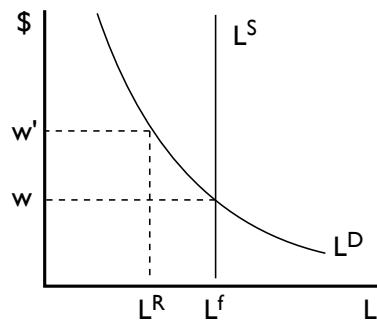
- (a) Since the inflation rate is equal to expectations, output will be at full employment at point 1. (You can see this from the equation for the ADI curve.)

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<sup>2</sup>So obviously if you picked more than 10% in part (b), you should lower it!.



- (b) The rise in inflation expectations causes a movement along the ADI curve. The economy moves into recession (point 2). Since these inflation expectations are irrational, there is downward pressure to go back to the old expectations, but it might take some time for people to realize this.
- (c) Wages rise due to the higher expected inflation. There is no corresponding shift in labor demand, so the level of employment falls to  $L^R$ .



- (d) Suppose the government raised taxes. If nothing else changed, this would increase government savings ( $S_G = T - G$ ), and if prices are sticky, this would reduce aggregate demand. AD would shift left. Since output is then even more below full employment, there is even more downward pressure on inflation expectations, and prices would come down more quickly.

So yes, this would work, but at the expense of a deeper recession.

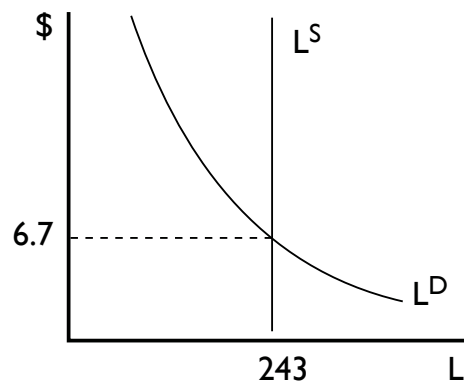
2. *GermansNotWorking*. As you know from previous problems in this class, there are 243 workers in Germany.<sup>3</sup> Let's assume they all supply labor perfectly inelastically. Let the aggregate production function for the German economy be  $Y = f(L) = 100L^{3/5}$ .

- (a) We can find labor demand by using the profit-maximizing condition for a firm whose profit function is written in terms of labor. This is  $pMP_L = w$ :

$$1 \cdot \frac{3}{5} 100L^{-2/5} = w \Rightarrow L^D(w) = \left( w \frac{5}{3 \cdot 100} \right)^{-5/2}$$

We assumed that there is only one good produced in Germany and its price is set to 1. We assume that all German firms can be modeled by one representative firm, and that this firm behaves like a perfect competitor.

- (b) The equilibrium real wage when all 243 workers are working will be  $\frac{3}{5} 100(243)^{-2/5} = 6.7$ .



Even though the economy is at “full employment,” there is still underlying structural and frictional unemployment. This

<sup>3</sup>This is only a rough approximation.

comprises the “natural rate of unemployment,” which might be around  $U^N = 0.05$ .

- (c) In this economy, the full employment level of output is  $Y^f = f(243) = 100(243)^{3/5} = 2700$ . Filling in this and the unemployment rates into Okun’s Law gives

$$\frac{2700 - Y}{2700} \approx 2(0.10 - 0.05) \Rightarrow Y = 2430$$

- (d) The panic has shifted AD to the left. Assuming there are no interventions by the government, there will be downward pressure on inflation and the economy will slowly move back toward equilibrium at point 3.

