

ECON 110, Prof. Hogendorn

Review Problem Set 9

1. *SimpleKeynes*. Suppose that the ADI curve for a simple economy with one good is given by  $\pi = 0.04 - (Y - 1)$  where  $\pi$  is inflation,  $Y$  is the GDP, and 1 is the full employment level of GDP.
  - (a) Graph the ADI curve and the full employment level of output. If inflation is stuck at 4.5% ( $\pi = 0.045$ ), what is the short-run equilibrium output?
  - (b) Suppose that firms in this economy become very excited by a new technology and decide to increase desired investment by 0.02 units of GDP. (I.e. the ADI shifts 0.02 units to the right.) Inflation remains stuck at 4.5%. Graph and find the new equilibrium output.
  - (c) In the long run, inflation can adjust. What will happen?
2. *UchitelleMoney*. Consider the change from part (a) to (c) of the Uchitelle problem, but now suppose there is money in the economy. Specifically, the money supply is 10 dollars and velocity is 10. Price is initially 1.
  - (a) If the money supply and velocity do not change, what is the change in the *nominal* price of hamburgers and the *nominal* wage?
  - (b) If the central bank wanted to maintain the price of 1, how would it have to change the money supply? Illustrate your answer with a graph of money supply and money demand.
3. *OkunsLaw*. Suppose the natural rate of unemployment is 4%. Let current unemployment be 6% due to a Keynesian recession.

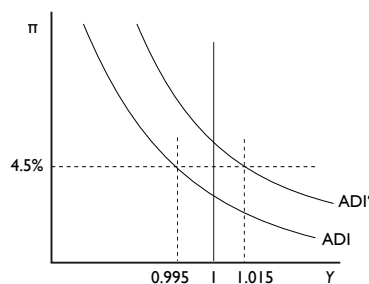
- (a) Is the difference between  $U$  and  $U^*$  attributable to frictional or cyclical unemployment? Explain.
- (b) How large is the GDP gap?

### Answers to Review Problem:

#### 4. *SimpleKeynes\_a.*

- (a) With inflation stuck at 0.045, output must be found by solving:

$$0.045 = 0.04 - (Y - 1) \Rightarrow Y = 0.995$$



- (b) Since output is now 0.02 units higher at any level of inflation, we can see that it must be 1.015 at the fixed inflation rate.
- (c) In part (b), output is above the full employment level of output. Therefore, there will be a tendency for inflation to rise. the rising inflation will tend to reduce aggregate demand, and the economy will move back toward the full employment level of output.

- 5. *UchitelleMoney\_a.* After the change, we still need  $MV = PY$ . Since  $MV = 100$  is unchanged, and the new  $Y$  is 108.6, then the only way to maintain the quantity equation is for the price of hamburgers to fall to  $P = 0.92$ . We know that the real wage rises from 0.78 hamburgers to 0.95 hamburgers, but the nominal wage only rises from  $0.78 \cdot 1$  to  $0.95 \cdot 0.92=0.87$ . Thus, if Uchitelle is thinking in nominal terms, he would not see a very large increase in nominal

wages. This might make him think that things are worse than they really are.

If the central bank wants to maintain  $P = 1$ , then  $PY = 108.6$ . With  $V = 10$ , a money supply of  $M = 10.86$  would maintain the quantity equation. Thus, the central bank would have to create 86 cents.

6. *OkunsLaw\_a.*

- (a) Since the natural rate of unemployment already includes prevailing frictional and structural unemployment, the only type of unemployment that occurs when the economy is away from “full employment” is cyclical.
- (b) Using Okun’s Law, we know that the unemployment gap is 2%. Thus, the GDP gap is 4%.