

## ECON 110, Prof. Hogendorn

### Problem Set 9

1. *OldGermansMoney*. Suppose that Germany output is  $Y = 4374$  beers now, and will fall to  $Y = 3713$  beers in the future due to population decline. If the European Central Bank (which acts as Germany's central bank plus the other countries that use the Euro) does not change the money supply over the years and velocity does not change, will there be deflation or inflation in Germany? Show what happens on a graph of  $P$  as a function of  $M$  and also mathematically.
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. *Sticky*. Let the economy-wide labor demand curve be  $L(w) = 1000 - 20w$ . Let economy-wide labor supply be  $\mathcal{L} = 800$ .
- (a) Draw the labor market and show the equilibrium wage.
  - (b) Let firms reduce hiring, shifting labor demand to  $L^r(w) = 800 - 20w$ . If the labor market clears, show what happens to wages and employment.
  - (c) Now suppose that wages are completely sticky and do not adjust. Show what happens to wages and employment.
  - (d) If the Ministry of Labor of this economy did a telephone survey to find the unemployment rate, which would be the most realistic unemployment rate under the conditions of part (c): 30%, 25%, or 20%? Explain.
4. *Okuns Law*. 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?