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ECON 202
MACROECONOMIC THEORY **3 May 2013**
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Midterm Exam II

1. (**25 Points**) Suppose that the following information is given for an economy:

$C=20+0.25YD$ $I=15+0.25Y-10i$ $G=25$ $T=40$ $M^d=200Y-1000i$
$M^s=2000/P$

a) (**10 pts**) Derive the aggregate (AD) equation.

b) (**10 pts**) Now consider the following short run aggregate supply (SRAS) equation: P=2Y Using AD and AS equations, find the equilibrium values of Y and P.

c) (**5 pts**) Now suppose that the natural level of output is $Y_n=15$. Explain what happens to output and the price level in the long run.

2. (**25 Points**) Suppose the Philips curve is given by $\pi_t = \pi_t^e + 0.18 - 3u_t$, where $\pi_t^e = \theta \pi_{t-1}$, for some $\theta \geq 0$.

a) (**5 pts**) What is the natural level of unemployment?
b) (**5 pts**) Suppose now that θ is equal to 0. Suppose that the rate of unemployment is initially equal to the natural rate. In year t, the authorities decide to bring the unemployment rate down to 4% and hold it there forever. Determine the rate of inflation in years t, t + 1, t + 2, and t+3.
c) (**3 pts**) Do you believe the answer given in (b)? Why or why not?

Now suppose that in year t+4, θ increases from 0 to 1. Suppose that the government is still determined to keep u at 4% forever.

d) (**3 pts**) Why might θ increase in this way?
e) (**5 pts**) What will the inflation rate be in years t + 4, t + 5, t+6?
f) (**4 pts**) Consider the inflation rates you calculated above for years *t + 4*, *t + 5*, *t+6*. Does the change in the inflation rate increase, decrease or stay constant over time? What is the relationship between the change in the inflation rate and the natural rate of unemployment? Interpret your answer.

3. (**15 Points**) Graphically illustrate (using the WS and PS relations) and explain the effects of an increase in unemployment benefits on the **equilibrium real wage**, **the natural rate of unemployment**, **the natural level of employment**, and **the natural level of output**.

4. (**25 Points**) Assume that the economy starts at the natural level of output. Now suppose that there is an increase in price of oil.
a) **(10 pts**) In an AS-AD diagram, show what happens to output and the price level in the short run and the long run.
b) (**3 pts**) What happens to the unemployment rate in the short run? In the long run? **Hint**: You may use wage-setting and price-setting equations

Suppose that the Central Bank decides to respond immediately to the increase in the price of oil. In particular suppose that the Central Bank wants to prevent the unemployment rate from changing in the short run, after the change in the price of oil. Assume that the Central Bank changes the money supply once –immediately after the increase in the price of oil- and then does not change the money supply again.

c) (**10 pts**) What should the Central Bank do? **Show** and **discuss** how the Central Bank's action (after the increase in the price of oil) affects the AS-AD diagram in the short run and in the long run.
d) (**2 pts**) How do short run and the long run unemployment rates compare to your answers from part (b)?

5. (**15 Points**) Consider the following Philips equation:

$$\pi_t - \pi_t^e = -\alpha(u_t - u_n)$$

Suppose that a proportion, λ, of labor contracts is indexed: Nominal wages in those contracts move one-for-one with variations in actual price level. A proportion, 1- λ, is not indexed: nominal wages for these labor contracts are set on the basis of expected inflation, which is the same as last year's inflation.

a) (**10 pts**) Derive the new Phillips equation, which shows the relationship between the actual unemployment rate, u_t, natural unemployment rate, un, and the change in the inflation rate, $\pi_t - \pi_{t-1}$.

b) (**5 pts**) Explain how a reduction in the proportion of contracts that are indexed affects the relationship between changes in the unemployment rate and inflation.