Optional Quiz: 14.02
Spring 1999

Please check one of the following to denote your section

_____ Irons F 9 am  ____ Neut MWF 11 am  ____ Gonzalez MWF 1 pm
_____ Irons F 11 am  ____ Neut MWF 3 pm  ____ Gonzalez MWF 2 pm
_____ Irons F 1 pm  ____ Aportela MWF 9 am

STOP! Failure to follow these instructions could be detrimental to your grade.

Please both questions completely in the space provided below, and show all of your work to improve your chance for partial credit. Be sure to LEGIBLY write your full name and check your section on the top of this document. When finished with the exam, you must return this exam to your TA. Each question is worth 50 points.

Question 1.

Let \( u_t \) denote the unemployment rate, \( u_n \) denote the natural rate of unemployment, and \( \Pi_t \) denote the rate of inflation. Thinking about labor market equilibrium, when will the rate of unemployment be equal to the natural rate? (8 points)

What can you say about real wages if \( u_t < u_n \)? (8 points)

Consider the following results from OLS estimation of the modified Phillips curve \( \Delta \Pi_t = -\alpha (u_t-u_n) \). T-ratios are reported beneath coefficient estimates.

\[
\Delta \Pi_t = 0.057 - 0.950^*u_t \\
0.146 \quad 4.023
\]

Test the hypothesis that \( \alpha \) is statistically different from zero. (8 points)

What is your best estimate for the natural rate of unemployment? (8 points)

If the central bank wants to reduce inflation by 10 percent this year, what will be the rate of unemployment? (8 points)

Briefly explain why there is a tradeoff between unemployment and the change in inflation. (10 points)
Question 2.

Assume the following behavior of agents in a fictional economy. C denotes consumption, I represents investment, r represents the real interest rate G describes government spending, NX refers to net exports and Y is simply real output.

\[
\begin{align*}
    C &= 10 + 0.6 \times Y \\
    I &= 5 - 100 \times r + 0.2 \times Y \\
    G &= \text{fixed} \\
    NX &= 0 \text{ always}
\end{align*}
\]

Solve for equilibrium output as a function of G and r. (8 points)

Assume initially G = 6 and r = 7 percent. What is equilibrium output, consumption, and investment? (3 points)

What happens to equilibrium output, consumption, and investment if G doubles? (5 points)

Assume there is now an additional restriction that \( r = Y/1000 \). Why might this be true? (8 points)

Solve for equilibrium output as a function of G. (8 points)

Assume again that G = 6 percent. What is equilibrium output, consumption, investment, and the interest rate? (4 points)

What happens to equilibrium output, consumption, investment, and the interest rate if G doubles? (4 points)

Why is this different from your the previous answer? Explain in words. (10 points)