FINAL EXAMINATION (Spring 2002)

Note: The comprehensive final essay was distributed on the last day of class. Students had the option of turning the essay in a week before the final exam, or writing it during the final itself. About 90 percent of students turned in the essay in advance.

PART I. QUESTIONS FROM THE LAST SECTION OF THE COURSE

Question 1 (20 points total; 15 minutes)
Suppose the economy is initially in equilibrium with the MPRF and PC intersecting at the NRU and $\pi_e$.
Assume the Fed sets the real interest rate in reaction to the inflation rate.
A) (3 points) Draw the relevant graph. Label your curves MPRF1 and PC1.
B) (2 points) Now suppose that consumer confidence rises, leading to increases in consumption spending. Assume the public holds rational expectations about the inflation rate. Draw the relevant curve(s) in the axes above, labeling your new curve(s) with subscripts “2.”
C) (15 points) Describe what happens to the unemployment rate and the inflation rate. Explain the process by which the economy adjusts to the new unemployment and inflation rates.

Question 2 (15 points total; 11 minutes total)
Suppose the Fed follows the Taylor Rule, setting monetary policy in reaction to the inflation rate. What are the effects on unemployment and on inflation of an increase in government spending under
A) (5 points) static expectations?
B) (5 points) adaptive expectations?
C) (5 points) rational expectations?
Briefly explain your answers. Supplement each of your answers with a graph.

Question 3 (15 points total; 11 minutes total)
The “Taylor Rule” gives rise to the “Monetary Policy Reaction Function”: a relationship between the inflation rate ($\pi$) and the unemployment rate ($u$) that is based upon the IS/LM, AS/AD relationship supplemented with an assumption about what factors the Fed considers when it targets the real interest rate.

$$r = r^* + \phi' \cdot (\pi - \pi')$$

A) (3 points) If the Fed dislikes inflation a great deal, will $\phi$ be large or small? Explain.
B) (7 points) When the actual inflation rate rises above the Fed’s target inflation rate and the Fed reacts, what happens to output and employment? Why? What then happens to the inflation rate? Why?
C) (5 points) We could construct an alternative MPRF that assumes the Fed responds to expected (not actual) deviations of inflation from their target rate. If the Fed is reacting to expected increases in inflation by adjusting the real interest rate, and if the public knows the Fed is doing so, and if the public believes the Fed will always do so, will there ever be an increase in the inflation rate? Explain.

Question 4 (10 points total; 7 minutes total)
Based on the Economic Report of the President, describe one reason for government provision of retirement security. Based on the Economic Report, describe one reason the financial sustainability of Social Security is in question. Suppose the federal government implements a program that reduces federal expenditures for retirement security. If the public has rational expectations, will the government’s program affect output in the short run? Will it affect inflation? Will it affect the growth rate of the standard of living? Briefly explain.

PART II. QUESTIONS FROM THE WHOLE COURSE (80 points total; about 60 minutes)

Question 5 (10 points total; 7 minutes total)
Is it real or nominal interest rates that affect investment spending? Explain.
Question 6  (15 points total; 11 minutes total)
In response to the steel tariffs implemented two months ago by the Bush Administration, Japan announced this week that it will implement retaliatory tariffs against the United States, placing a 100 percent tariff (tax) on steel imported from the United States into Japan. What effect should the Japanese tariff have on gross exports from the United States? What effect should the Japanese tariff have on the growth rate of standards of living in the United States? Explain your answers. Be complete.

Question 7  (15 points total; 11 minutes total)
When the Fed increases the money supply, output and income increase in the short run but not in the long run. Explain why the increase in the money supply has no effect on output in the long run. What, if anything, does the increase in money supply affect in the long run? Explain.

Question 8  (10 points total; 7 minutes total)
We have discussed the formation of expectations – static, adaptive, or rational – primarily in the context of inflationary expectations. But a discussion of whether our expectations are static, adaptive, or rational can apply to any setting in which we form expectations (or, hunches about the future). Consider the investment decision of firms. After September 11, many firms decreased their investment spending in reaction to expected drops in revenue. Were their expectations static, adaptive, or rational? Explain.

For the next question, you may want to have these equations available:
\[ \frac{X_{t+1}}{K_t} = \frac{Y_{t+1}}{L_{t+1}} = \left( \frac{K}{L} \right)^* (G)^{-\phi} \]
\[ g \left( \frac{K}{L} \right) = \frac{g}{g} - \delta - \eta \]
\[ g \left( \frac{Y}{L} \right) = \alpha \left( \frac{g}{g} - \delta - \eta - g \right) + g \]
\[ g \left( \frac{Y}{Y} \right) = (1 - \alpha) \left( \frac{g}{g} - \delta - \eta - g \right) \]

Question 9  (30 points total; 22 minutes total)
Suppose that output, Y, is produced with private capital, K, and labor-efficiency units, L E, according to a Cobb-Douglas production function with parameter \( \alpha \).

A)  (8 points) Suppose the saving rate is 22 percent, the depreciation rate is 8 percent, the labor force is growing by 1 percent annually, and efficiency is increasing by 2 percent a year. What is the value of the capital-output ratio when the economy is in steady-state balanced-growth equilibrium? If the capital stock is $5,000 billion and total output is $10,000 billion, is the economy in steady-state balanced-growth equilibrium? Show all of your work, simplifying as far as possible without a calculator, or no points.

B)  (10 points) Suppose the economy is initially in steady-state balanced-growth equilibrium. Now suppose there is an increase in the saving rate. Will the growth rate of output per worker rise, fall, or stay the same? Explain fully.
C) (12 points) Some economists say that policy to encourage growth in standard of living should focus entirely on increases in efficiency, E. Others argue that policy can also focus on increasing saving. Who, if anyone, is right: those who want to focus only on efficiency, or those who want to focus on saving as well? Discuss.

PART III. THE COMPREHENSIVE ESSAY QUESTION (60 points; 48 minutes)

Congratulations! You have a job! Well, sort of. You decided to try your hand at being a freelance economics writer – writing in-depth articles about the economy that you then try to sell to news outlets.

You’ve decided that your first essay should explain why an economics education is necessary for all. As an example, you want to explain how the effects of macroeconomic policy depend upon peoples’ expectations of the effect of that policy and, in turn, how expectations depend in part on what we know about how the economy functions. You decide to illustrate your point by discussing the possible short-run and long-run effects of a federal income tax cut.

You’ve made a preliminary outline (though you’re not sure yet if you’re completely happy with it):

- Introduction: Brief statement of why economics education is vital
- Expectations: Discussion of how our expectations are formed, and how expectations can depend upon peoples’ knowledge of the economy
- Example: Illustration of the effect of expectations with an example of a tax cut.
  - . . . Short-Run: the role of expectations in determining the short-run effect(s) of a tax cut
  - . . . Long-Run: long-run effect(s) of a tax cut
- Conclusion: Why economics education is vital