Professor Christiano
C-06, Fall 1999

Final Exam

IMPORTANT: read the following notes

- You may not use calculators, notes, or aids of any kind.

- Note the points each question is worth and plan your time accordingly. The total number of points possible is 100, and the number of points per question is indicated in parentheses.

- Explain your answers carefully in clear English. We are particularly interested in whether you understand the underlying economic intuition. Supplement what you say with liberal use of diagrams. Typically, the phrase, 'explain carefully', sprinkled throughout the exam, means prove or illustrate what you say with diagrams.

- Write neatly and label all diagrams. We cannot give you credit if we cannot read your answer.

Following are the equations of the model we developed in class:

$$\text{Money Market Clearing} \;:\quad \frac{M}{P} = L(R,Y)$$

$$\text{Uncovered Interest Parity} \;:\quad R = R^* + \frac{E^e - E}{E} + \rho\left(\frac{B^d}{B^f}\right)$$

$$\text{Goods Market Clearing} \;:\quad Y = C(Y - T) + I + G + CA(q, Y - T)$$

Here, L ('money demand') is decreasing in its first argument and increasing in its second argument. Also, ρ is a risk premium which is increasing in its argument, B^f is the foreign assets held by the public and B^d is the stock of domestic held by the public. Finally, assume that CA (the current account) is increasing in its first argument and decreasing in its second argument. Also, q is the real exchange rate, with $q = EP^*/P$, where E is the nominal exchange rate, P^* is the foreign price level and P is the domestic price level.

1. (15) Some questions about the current account:

   (a) Explain why the response of CA to q reflects the impact of several effects, not all of which move CA in the same direction. What are we assuming about the relative strength of these effects when we assume that CA is increasing in q?

   (b) Defend the assumption that CA is increasing in its second argument.

   (c) What is the $J-$curve?

   (d) Give an example of a country running a current account deficit where that deficit is a good thing. Give an example of a country running a current account deficit where that deficit is a bad thing.

2. (10) Some questions about money demand:

   (a) Why is L decreasing in its first argument and increasing in its second argument?

   (b) Explain the sense in which the specification above implies that money demand is increasing in P. What is the justification for specifying money demand in this way?

2

(c) Suppose you are given data on velocity, $V = P \times Y/M$, and the interest rate. Suppose too, that you specify money demand to have this form, $L(R,Y) = f(R)Y^\gamma$. Suppose that, over a long period of time, the interest rate did not show much movement up or down, but velocity grew 2 percent and output grew 10 percent.

    i. Show that this implies an income elasticity of money demand that is less than one.

    ii. Describe an argument based on technological progress in the payments technology that would allow you to reconcile the notion that the income elasticity of money demand is one, with the above data.

3. (5) The above specification of aggregate demand does not include the rate of interest. Some people think it makes more sense to assume that aggregate demand is a decreasing function of the interest rate. Explain.

4. (20) Following are some questions about the risk premium in the UIP relation:

    (a) Why is the risk premium increasing in its argument?

    (b) What set of open market operations can a central bank do so that B^d/B^f changes, but the stock of money does not?

    (c) Explain what would happen over time to E, P, Y, R, q, CA if the central bank were to temporarily increase B^d/B^f, holding M fixed.

    (d) For real-world analysis it is best to think of ρ as being equal to zero. Why?

5. (5) Explain the rationale for our assumption that in the short run, prices are fixed, while in the long run they are flexible.

6. (20) Consider the version of the model in which $\rho = 0$. Suppose there is an increase in the money supply. Suppose the economy starts in an equilibrium with full employment. Work out the implications, over time, for E, P, Y, R, q, CA under the following two sets of circumstances:

(a) The increase in M is temporary.

(b) The increase in M is permanent.

7. (25) Suppose there is a temporary increase in R^* and that the central banker is committed to a fixed exchange rate. Imagine that before the shock to R^*, the economy is at a full employment level of output.

(a) Use the above model to explain carefully explain what happens, over the short and long run, to E, P, Y, R, M, q, CA . For this, consider the version of the model with $\rho = 0$.

(b) Repeat the previous analysis, but under the assumption that aggregate demand is a decreasing function of the interest rate.

(c) Continue to suppose that aggregate demand is a decreasing function of the rate of interest. Suppose too that ρ is not zero.

  i. What can the central banker do, to maintain full employment *and* defend the fixed exchange rate? Explain the strategy in detail and carefully.

  ii. Explain in detail what happens to the assets and liabilities of the central bank. What happens to the central bank's foreign reserves as a result of its strategy?

  iii. Suppose that in fact $\rho = 0$, but the central banker behaves as though ρ were not zero. What would the central banker see pursuing the strategy described in (i)?

(d) Suppose the market, for no particular reason, raises E^e when the central bank is officially committed to a fixed exchange rate. Consider the version of the model with $\rho = 0$.

Consider two scenarios. In one, aggregate demand is a negative function of the rate of interest, and in the other aggregate demand is not a function of the interest rate. Explain why the increase in E^e is unlikely to be self-fulfilling in the second scenario (where agg. demand is not a function of R) and might very well be self-fulfilling in the first.