Econ 455

Lapan

Spring 2001

FINAL EXAM

Answer a total of three questions. Answer at most one question from Part II.

(answer three questions from Part I or answer 2 questions from Part I and one question from Part II).

Part I.

1. Answer all parts.

   a) Answer parts (i)-(iii) assuming the following exchange rates hold:

<table>
<thead>
<tr>
<th>Currency</th>
<th>Exchange Rate (as US$ per foreign currency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro</td>
<td>$0.90/Euro</td>
</tr>
<tr>
<td>Swiss franc (SF)</td>
<td>$0.600/SF</td>
</tr>
<tr>
<td>180-day forward rate</td>
<td>$0.606/SF</td>
</tr>
</tbody>
</table>

   i. What is the spot exchange rate between the Euro and the Swiss franc? (6 points)

   ii. If US 6 month interest rates are 2.5% (annual interest rates are 5%), what is the 6 month interest rate on Swiss franc securities? Show how you got your answer. (7 points)

   iii. Given the prices of goods produced in each country, what is the likely effect of an appreciation of the dollar against the Euro on US exports to, and US imports from, Euro countries (i.e., countries whose currency is the Euro)? Explain. (7 points)

   b) Under the gold standard each country set the price of gold in terms of its own currency. To illustrate how the system worked, assume Britain sets the price of gold at: £130/ounce of gold, and the US sets the price at: $260/ounce of gold. Thus, in London you can buy or sell gold with the British Central Bank at the stated price of £130/ounce, whereas in New York you can buy or sell gold with the US Central Bank at the stated price of $260/ounce. Neither Central Bank fixes the exchange rate between the dollar and the British pound. However, there are foreign exchange markets at which private citizens can exchange dollars for pounds (or vice versa), but neither government intervenes in those markets.

   i. Assume gold can be shipped, with no transportation cost, between London and New York. What will the exchange rate between the US dollar and the British pound be? Explain how you got your answer. (6 points)

   ii. Suppose there is a 5% cost for shipping gold between New York and London (in either direction). Under these circumstances, what is the range of possible exchange rates between the dollar and the pound? (To help answer the question, think about when arbitrage profits can be made by shipping gold between the two countries). What happens when the exchange rate reaches one of the end points of this range? (7 points)

2. Consider a small economy, such as Mexico, which is on a flexible exchange rate system. Assume that the US price level (in dollars) and US interest rates are independent of any Mexican policy.
Under these circumstances answer all of the following parts. Your answer should be supported either with equations, or a clearly explained graph.

a) How will an increase in Mexican real income affect Mexican interest rates, and the (spot and forward) Mexican exchange rate (in terms of $/peso) in the short run (when Mexican prices are assumed fixed)? Will the impact on the exchange rate and interest rates be larger if the increase in income is thought to be permanent or thought to be temporary? Explain. {Assume the Mexican money supply is fixed.} (10 points)

b) Given Mexican income levels, how does a permanent increase in the Mexican money supply affect Mexican interest rates, and the spot and forward exchange rates in the short run? (By definition, the peso price of Mexican goods is fixed in the short run). (7 points)

c) How does the permanent increase in the Mexican money supply affect Mexican interest rates, prices, and the exchange rate in the long run? Compare your answer to part (b) above (compare not only the direction, but also the magnitude, of the changes). (7 points)

d) Using your answer to parts (b) and (c) explain what is meant by exchange rate overshooting, and explain why overshooting occurs. How does this money supply increase affect the real exchange rate in the short run and the long run? Draw a graph that shows how the Mexican price level, interest rates and exchange rate respond over time to this permanent increase in the money supply. (9 points)

3. Answer all parts. In answering this question, assume that prices adjust immediately.

a) Consider two countries, the US and Britain. Suppose real income in both countries is stationary (there is no income growth), but that the British money supply (pounds) has been growing at a steady 5% per year, while the US money supply has been growing at 6% per year. Furthermore, assume everybody expects both Central Banks to maintain these monetary growth rates into the indefinite future. Using the above information, and the fact that there is a flexible exchange rate between the US dollar and the British pound:

i. What prediction would you make about the inflation rate in each country, the nominal interest rate in each country, and the annual rate of depreciation (or appreciation) of the dollar against the pound? Be precise and justify your answer. (7 points)

ii. How would your answer to the previous part be altered if US real income were growing at 5% per year, while British income remained stable? How would you expect this income growth in the US to affect the real exchange rate? Explain. (9 points)

b) Return to the assumptions of part (ai), in which there is no income growth in either country, the British money supply is growing at 5% per year, while the US money supply is growing at 6% per year. Suppose that, unexpectedly, Alan Greenspan (chairman of the Board of Governors of the US Federal Reserve System) suddenly, and unexpectedly, announces that, starting next month, the US will pursue (indefinitely) a tighter monetary policy, and that hereafter the US money supply will grow by only 2% per year.
i. Explain the **immediate** impact of this new monetary policy on interest rates, prices, and the exchange rate in the US (by immediate, I mean even before the change in the rate of monetary growth has taken effect). Carefully explain the reasoning behind your answer.  

(9 points)

ii. Show how this policy affects prices, the interest rate and the exchange rate over time. Demonstrate your results by drawing graphs showing both the immediate impact (part i), and the long run consequences of this new policy.  

(8 points)

4. Answer all parts.

a) While the US allows the exchange rate of the dollar to float against other currencies, some countries fix their exchange rate to the dollar (or to another currency, like the Euro). Suppose, for example, that Brazil decides to fix the exchange rate between its currency (the **real**) and the dollar at the rate of: $0.44/real.

i. Suppose that – in the absence of government action – the **real** would depreciate to $0.40/real. What actions must Brazil take to maintain the exchange rate at $0.44/real? Be specific.  

(5 points)

ii. Given its commitment to a fixed exchange rate, can Brazil follow a monetary policy that is independent of US monetary policy? What would happen if the US money supply grew by 4% per year, real incomes in both countries were stable, and Brazil tried to pursue 9% annual money supply growth?  

(7 points)

iii. Finally, suppose speculators become convinced Brazil cannot maintain this exchange rate, and thus believe there will be a depreciation of the **real** within 6 months. Acting on these beliefs, the speculators sell the **real** forward, causing the forward price of the **real** to decline. What actions can Brazil take to maintain the **spot** exchange rate at $0.44/real? If Brazil has no foreign exchange reserves, what can it do?  

(7 points)

b) As above, suppose Brazil fixes its exchange rate at $0.44/real, and suppose that it is having difficulty maintaining this exchange rate. Some ministers in the government suggest increasing import tariffs as a method of combating the pressure in the exchange market.

i. How would import tariffs affect real resource allocation in Brazil (**i.e.**, goods produced, imports, exports, etc.) and how – if at all – would this help Brazil maintain the fixed exchange rate? Explain.  

(7 points)

ii. Instead of just import tariffs, suppose Brazil imposes across-the-board import tariffs of 10% and export subsidies of 10%. How will this policy affect production within Brazil, and what impact will this policy have in the foreign exchange market? If the exchange rate were flexible, and if it had originally been in equilibrium, how would the import tariff-export subsidy affect the equilibrium exchange rate? Explain.  

(7 points)

5. In comparing exchange rate systems, it is important to understand that government policy may work differently under a fixed exchange rate system than it would under a flexible exchange rate system. Similarly, foreign economic disturbances will affect the domestic economy differently.
under fixed and flexible exchange rates. To illustrate these points, consider the macroeconomic model for a small economy developed in Chapter 16. Let $DD$ represent the aggregate demand-aggregate supply equilibrium relation, and let $AA$ represent the money market equilibrium condition. The $DD$ locus is determined by setting the supply of goods ($Y$) equal to the demand for goods ($C+I+G+CA$), whereas money market equilibrium ($AA$) is obtained by setting money supply equal to money demand. These relationships are summarized by the following equations:

$$Y = C(Y - T) + I + G + CA\left(Y^*, \rho, Y^*\right)$$
$$\rho \equiv \left(EP^*/P\right)$$
$$M^* = PL(Y, R)$$

where: $M^*$ is the domestic money supply; $L(Y, R)$ is the demand for real money balances; $Y$ is real domestic income (output); $T$ is taxes; $G$ is government purchases; $CA(.)$ denotes the current account balance; $Y^*$ is real foreign income; and $R$ is the domestic interest rate. $CA$ is decreasing in domestic income ($Y$), but increasing in the real exchange rate $r$ and foreign income ($Y^*$).

The domestic interest rate is determined through covered interest arbitrage.

a) Assuming foreign and domestic prices and the foreign interest rate are fixed, determine the short run effects of a temporary increase in foreign income on domestic income, domestic interest rates and the exchange rate under a flexible exchange rate system. (8 points)

b) Redo part (a) under a fixed exchange rate system. What must the domestic government do to maintain this fixed exchange rate? Under which exchange rate system does the foreign income change have a greater impact on the domestic economy? (8 points)

c) Next, consider the impact of a temporary increase in domestic government spending ($G$) under a flexible exchange rate system. How will this increase affect domestic income, the exchange rate and the domestic interest rate? How would your answer change if the increase in domestic government spending were thought to be permanent? (9 points)

d) Finally, consider the impact of a temporary increase in $G$ under a fixed exchange rate system. What additional policy would the government have to undertake to maintain the fixed exchange rate? Would this temporary fiscal policy expansion have a greater impact under fixed or flexible exchange rates? Explain carefully. (8 points)

Part II. Answer at most one of the following questions.

6. Answer all parts.

a) Consider a small country that imports steel. Domestic supply and demand are given by:

$$Q^d = 120 - 2P^d; \quad Q^s = P^s$$

where, as is typical in partial equilibrium models, it is assumed that prices of all other goods are held constant. Further, assume the world price of steel is: $P^w = 10$. Finally, assume the country has an import tariff of $t = 15$ on steel imports.

i. Assuming there are no other market failures in this economy, calculate the deadweight loss due to this policy. Under these conditions, can lowering the tariff ever make the
country worse off? Explain. \hspace{1cm} \text{(8 points)}

ii. If the tariff is replaced by a quota (that yields the same level of imports as the tariff), would domestic price and the deadweight loss be the same? If the government auctions off the quota, will this increase domestic prices? Explain. \hspace{1cm} \text{(7 points)}
b) In reality, countries produce, and import (or export) a number of goods. As in part (a), suppose that the country is small. Further, suppose that it pursues free trade in all goods except that it has import tariffs on both steel and automobiles (both of which are imported). Further, assume that steel is used in the production of automobiles.

i. How does the import tariff on cars affect the domestic demand for steel? If you measure the deadweight loss due to the steel tariff in the same way as you did in part (ai), do you think you will overestimate, underestimate, or accurately estimate the actual loss due to this steel tariff? Explain carefully {your reasoning is what matters here}. (6 points)

ii. How will lowering the tariff on steel affect the output of automobiles? Under these circumstances, can lowering the tariff on steel ever make the country worse off? Explain carefully {again, your reasoning is what matters} (6 points)

iii. Suppose, instead of tariffs, there are import quotas on steel and on automobile imports. Could increasing the steel quota ever make the country worse off? Explain. (6 points)

7. Answer all parts.

a) Consider a small country, such as Switzerland. Suppose it produces two goods (watches and textiles), each using two inputs (skilled labor and unskilled labor). Further, suppose the production assumptions of the Heckscher-Ohlin model apply, and that watch production is relatively intensive in skilled labor, while textile production is relatively intensive in unskilled labor. Finally, assume that Switzerland imports textiles and exports watches.

i. How will an import tariff (on textiles) affect output prices, the production of each good, and the real return to each type of labor in Switzerland? Explain. (7 points)

ii. Suppose Switzerland allows limited immigration, leading to an inflow of some unskilled labor. If goods prices are unchanged, how will this immigration affect output levels and factor prices in Switzerland? Can this immigration make Switzerland worse off, assuming immigrants are paid the same wage as other unskilled workers? Explain. (6 points)

b) Consider a Ricardian model with many goods. Suppose we can think of the world as divided into two groups, “developed” and “developing” countries, where the “developed” countries have higher productivity levels. How does generalized technological progress in the “developed countries”, which increases labor productivity (by the same proportion) in every sector affect: (i) the ability of “developing” countries to export goods; and (ii) the standard of living in “developing” countries? Explain your answer. (10 points)

c) Consider a factor specific model, with two goods (food and clothing). Labor is mobile between the two sectors, while capital is specific to clothing production and land is specific to food production. Given world prices, how will increased productivity in food production affect output of each good, and the return to each factor? Explain. (10 points)