

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:

Currency	Exchange Rate
Japanese Yen (¥)	120 ¥/\$
180 day forward rate	119 ¥/\$
Swiss franc (SF)	\$.7500/SF
180-day forward rate	\$.7425/SF

- i. What is the spot exchange rate between the Yen and the Swiss franc? **(5 points)**
- ii. Given the forward rates, in which of the 3 countries are interest rates highest? In which country are interest rates lowest? **(4 points)**
- iii. If US 6 month interest rates are 1.5% (annual interest rates are 3%), what is the 6 month interest rate on Swiss franc securities? Show how you got your answer. **(5 points)**
- b) While the current international monetary arrangement is generally one of flexible exchange rates, some countries do attempt to fix the exchange rate of their currency against that of some major country. Suppose the current Brazilian government attempts to fix its exchange rate at **3 real (its currency unit) to the US dollar**.
- i. How can Brazil “fix” its exchange rate and what must it do to make sure that this official exchange rate is also the actual exchange rate (i.e., that there are not illegal markets in which people trade the Brazilian currency for the dollar at a different price)? **(6 points)**
- ii. Suppose Brazil is holding an election this weekend and polls show that each of the two major candidates is equally likely to win. One candidate, the incumbent, pledges to maintain the exchange rate at **3 real/\$**. The other major candidate (the challenger) released an economic plan this morning that calls for devaluing the currency to **6 real/\$** in order to stimulate the economy. How would this announcement affect the forward rate of the real, and what must the current government do to maintain the spot rate at **3 real/\$**? Be specific. **(5 points)**
- iii. Why does the challenger think that this devaluation will stimulate the Brazilian economy? Is he correct about this belief? Explain. **(4 points)**
- iv. Finally, suppose the Brazilian government is having difficulty maintaining the current exchange rate and announces the following policy. Exporters will be required to sell the dollars they earn (via exports) to the Central Bank at the fixed rate of **3 real/\$** while Brazilian citizens who want to buy dollars (sell *reals*) to pay for imports (or foreign travel) will be charged **4 real/\$**. Explain why this policy is similar to imposing tariffs. **(4 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 would an increase in the Mexican money supply affect Mexican interest rates and the spot and forward Mexican exchange rate (in \$/peso) in the **short run** (when Mexican prices and real income are fixed)? Will the impact on the exchange rate and interest rates be larger if the increase in the money supply is thought to be permanent or thought to be temporary? Explain. **(10 points)**
- b) What is the **long run** impact of a permanent increase in the Mexican money supply on Mexican prices, the exchange rate and the Mexican interest rate (assume real income does not change)? Explain. **(6 points)**
- i. Use your answers to parts (a) and (b) to explain what is meant by exchange rate overshooting and to explain why this overshooting occurs. Does the overshooting imply speculators can make excess profits in the foreign exchange market? Illustrate your answer with a graph that shows how the Mexican price level, interest rates and the exchange rate respond over time to this permanent increase in the money supply. **(7 points)**
- c) Suppose the Mexican government announces the discovery of a major oil field that will double Mexican oil exports within two years and that will significantly increase Mexican income within two years (but will have no immediate impact on Mexican income). Explain what the likely consequences of this oil find (and announcement) are on the spot and forward exchange rates, on Mexican interest rates and on this year's Current Account Balance. **(10 points)**

(question 3 on next page)

3. Answer all parts. In answering this question, assume that **prices adjust immediately and that real income is always at its full employment level.**
- a) Consider two countries, the US and Japan. Suppose analysts expect no real income growth in either country, but the consensus forecast is that the money supply will grow at 4% per year in the US and only 2% per year in Japan. Furthermore, all analysts expects these monetary growth rates to be maintained forever. Using the above information, and the fact that there is a flexible exchange rate between the US dollar and the Japanese yen:
- i. What prediction would you make about: (1)the inflation rate in each country, (2)the nominal interest rate in each country, (3)the annual rate of depreciation (or appreciation) of the dollar against the yen; and (4)how the real exchange rate will change over time. Be precise and justify your answer. **(8 points)**
 - ii. How would your answer to the previous part be altered if US real income were growing at 5% per year, while Japanese income remained stable? How would you expect this income growth in the US to affect the *real* exchange rate? Explain. **(8 points)**
- b) Return to the assumptions of part (ai), in which there is no income growth in either country, the Japanese money supply has been growing at 2% per year, while the US money supply is growing at 4% per year. Suppose that, suddenly and unexpectedly, the head of the Japanese central bank announces that, starting tomorrow, the Japanese Central Bank will pursue a more expansionary monetary policy, with a target monetary growth rate (for the foreseeable future) of 6% per year.
- i. Discuss the **immediate** impact of this announced change in monetary policy on Japanese interest rates, Japanese prices, and the exchange rate (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. As mentioned in class, monetary and fiscal policy work differently under a fixed exchange rate system than they do under a flexible exchange rate system. Foreign economic disturbances also affect the domestic economy differently under fixed and flexible exchange rates. To illustrate this, 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:

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

where: M^s 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; $CA(\cdot)$ 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 (ρ) and foreign income (Y^*). The domestic interest rate is determined through covered interest arbitrage.

- a) Assuming domestic prices, the foreign interest rate and foreign real income are all fixed, determine the short run effects of a *temporary* increase in foreign prices 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 price 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 in the short run? 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 short run impact under fixed or flexible exchange rates? Explain carefully. **(8 points)**

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

5. Answer all parts.

- a) Consider the specific factor model for a small country (Honduras) in which there are two goods (clothing, electronics). Each good is produced, under constant returns to scale, using capital and labor. Since the current capital (machines) in each sector is the result of previous investment decisions, capital is not mobile between the two sectors (i.e., capital is sector specific). However, labor is mobile between the sectors and thus, in equilibrium, it earns the same return in each sector. Under free trade, the country exports clothing and imports electronics.
- i. Given the amount of capital in each sector, show how an import tariff on electronics affects the real return to each factor in Honduras and the output of each good. Who gains and who loses as a result of this tariff? Be specific. **(7 points)**
 - ii. Suppose that, over time, capital can be shifted from one sector to the other (due to depreciation, etc.) but the **total** capital stock stays fixed. Assuming that production of electronics is *capital-intensive* (as compared to clothing), discuss the *long-run* effects on output and factor prices of this import tariff on electronics. **(7 points)**
 - iii. Compare your results from parts (i) and (ii). Are the output changes larger in the short run or long run? Is there a difference between which interest groups gain in the long run than in the short run? Be specific. **(6 points)**
- b) Consider a world with two large countries (the US, Asia) and five goods. All goods are produced using only labor, and the assumptions of the Ricardian model hold so that the amount of labor required per unit output is independent of the level of output. These labor requirements are given in the following table:

Amount of labor required per unit output

	Food	Textiles	Electronics	Autos	Chemicals
US	2	6	4	8	3
Asia	8	3	10	12	9

- i. What can you conclude about the pattern of trade between the two countries? Be as specific as possible. **(6 points)**
- ii. Suppose initially Asia exports two goods and imports the other three. How will a doubling of productivity in Asia (halving the labor requirements) affect the pattern of trade between the two countries, the relative prices of goods and the real wage rate in each country? Who gains and who loses from this productivity increase in Asia? Explain. **(7 points)**

6. Under the *Multifibre Agreement* (MFA), international trade in textiles was regulated by a series of bilateral agreements that restricted the volume of textile exports from each developing country to each “developed” country. To illustrate the effect of this agreement, consider a partial equilibrium model of *three* countries, the US, Thailand and Singapore. Demand and supply for textiles in each country are given by:

$$\text{US:} \quad S^{us} = 2P^{us}; \quad D^{us} = 400 - 2P^{us}$$

$$\text{Thailand:} \quad S^t = 2P^t; \quad D^t = 90 - P^t$$

$$\text{Singapore:} \quad S^s = 2P^s; \quad D^s = 60 - P^s$$

where the superscripts {us, t, s} refer to the country.

In answering the following questions, **assume that Thailand and Singapore cannot trade with each other – they can only trade with the US.**

- a) Assume the US has no import restrictions on textiles. Find the equilibrium world price, US imports and the exports of Thailand and Singapore. **(5 points)**
- b) Assume that, to help domestic producers, the US negotiates export restrictions with Thailand and Singapore. Under the agreements, *each* country agrees to limit their own exports to the US to **45** (for each country, for a total of **90**). Remembering that Thailand and Singapore do not trade with each other, find the impact of these agreements on *price* in each country. **(5 points)**
- i. **Calculate** how this agreement affects welfare in each country (**as compared to free trade**). In answering, assume all of the quota rents accrue to the exporting nation (which is what actually happens under the agreement). **(7 points)**
- ii. Suppose that the agreement is modified to allow Singapore and Thailand to trade export quotas with each other (for example, Singapore could buy from Thailand the right to export an additional 5 units to the US, making Singapore’s total exports 50 and Thailand’s total exports 40). From the US perspective, total *imports* remain at 90, though the source of the imports may change. Under these conditions, find the price and the level of exports from each country, and the price of the quotas. Compared to part (bi), who gains and who loses from this trade in quotas? What is the overall gain (or loss) in welfare due to this trade in quotas (a numerical answer is required). **(7 points)**
- c) Given the limit on US imports of 90 (and the tradable quotas, as in part bii), how does an import tariff of **20** affect price in each country, the price of quotas, the volume of trade and each country’s welfare? **(4 points)**
- d) Return to the case in which there are no tariffs, but each country’s exports to the US are limited to 45. Suppose the US signs a separate agreement with Thailand that allows Thailand to export all it wants to the US. How is this agreement likely to affect welfare in the US, Thailand and Singapore? Explain (no calculations are required). **(5 points)**