

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)-(ii) assuming the following exchange rates hold:

Currency	Exchange Rate (as US\$ per foreign currency)
Euro	\$1.20/Euro
British pound (£)	\$1.800/£
180-day forward rate	\$1.782/£

- i. What is the spot exchange rate between the Euro and the British pound? **(6 points)**
 - ii. If US 6 month interest rates are 1.5% (annual interest rates are 3%), what is the 6 month interest rate on British pound securities? Show how you got your answer. **(6 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, for example, Mexico wishes to fix the exchange rate of its currency (the peso) to the US dollar, at the rate of 11 pesos/\$.
- i. What actions must the Mexican Central Bank undertake to maintain this exchange rate? Suppose speculators expect a future devaluation of the peso (to 15pesos/\$) and act on these expectations. How does the speculator's behavior affect the forward exchange rate, and what must Mexico do to maintain the spot exchange rate at 11pesos/\$? **(5 points)**
 - ii. How would these actions by the Mexican Central Bank affect domestic interest rates, the domestic money supply and foreign exchange reserves? Be specific. **(6 points)**
 - iii. Sometimes developing countries will set two exchange rates, one at which they buy foreign exchange and the other at which they sell it. To illustrate, suppose the Mexican Central Bank **requires** all exporters - who are paid in US dollars - to sell their dollar earnings to the Central Bank at the rate of **10 pesos/\$**, while Mexican importers (who need dollars) must purchase the US currency from the Central Bank at the rate of **15 pesos/\$**. How will this policy affect trade flows and is the policy like any trade policy? (To answer, assume US \$ prices of all goods are given. How does this dual exchange rate affect relative prices of goods in Mexico?) **(6 points)**
 - iv. Given the arrangement described in part (iii) above, do exporters have an incentive to underreport their dollar earnings to the government? If so, what are they likely to do with these excess dollars? Explain. **(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 will an increase in Mexican *real income* (due, for example, to an increase in productivity): (1) 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 assumption, 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 and that real income is exogenous** (*i.e., the economy is always at full employment*).
- a) Consider two countries, the US and Japan. Assume that real income (GDP) in both countries is constant. Further, assume the exchange rate between the two countries is flexible, and can be explained by the exchange rate model discussed in class and developed in Chapter 15 (which assumes flexible prices and full employment).
 - i. Suppose the US implements a policy of taxing imports and subsidizing exports. How will these import tariffs and export subsidies affect the US price level and the US-Japanese exchange rate (\$/yen) (for simplicity, assume the US and Japan are the only two countries in the world)? Will the policy have any real effects? **(8 points)**
 - ii. Assume there are no import tariffs nor export subsidies. Assume the US money supply is increasing at 7% per year, and that the Japanese money supply is growing at 10% per year. 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 yen? Be precise and justify your answer. **(8 points)**

(question 3, continued)

- b) Assume that income levels in both the US and Japan are constant, that the US money supply is growing at 7% per year and the Japanese money supply is growing at 10% per year. Further, suppose that people have expected these economic conditions to continue into the future. However, suppose that at a press conference this morning the head of the (US) Federal Reserve announces that, starting in one week, the Federal Reserve will move to a less expansionary monetary policy, with money supply growth reduced to 4% per year.
- i. Explain the **immediate** impact of this announcement concerning U.S. monetary policy on interest rates and prices in the U.S., and the exchange rate between the dollar and yen (by immediate, I mean even before there is any change in national money supplies). 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 which show: (i) how each of these variables (prices, interest rates, and the exchange rate) was changing over time before the announcement; (ii) what the immediate impact of the announcement is; and (iii) the long run consequences of this new policy for each of the variables. **(8 points)**
4. In comparing fixed and flexible exchange rates, it is important to understand that fiscal and monetary policy have different impacts under each exchange regime. Similarly, foreign disturbances (such as a recession) have a different impact on an economy under flexible exchange rates than under fixed exchange rates. To illustrate these points, consider the macroeconomic model for a small economy developed in Chapter 16. Let AD represent the aggregate demand-aggregate supply equilibrium relation, and let LM represent the money market equilibrium condition. The AD locus is determined by setting the supply of goods (Y) equal to the demand for goods ($C+I+G+CA$), whereas money market equilibrium (LM) is obtained by setting money supply equal to money demand. These relationships are summarized by the following equations:

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

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; $CA(\dots)$ denotes the current account balance; Y^* is real foreign income; and R is the domestic interest rate. CA is decreasing in domestic disposable income ($Y - T$), but increasing in the real exchange rate (q) and foreign income (Y^*). The domestic interest rate is determined through covered interest arbitrage.

- b) Assume the U.S. is currently running a large current account (Balance of Trade) deficit. What policy could it use to reduce that deficit and how would that policy affect domestic income levels in the short run? Explain. **(7 points)**
- i. Show how a combination of more than one policy could be used to reduce the deficit while leaving domestic income unchanged. **(4 points)**

(question 4, continued)

- b) Assuming foreign and domestic prices and the foreign interest rate are fixed, find the short run effects of a *temporary* increase in government spending on domestic income, domestic interest rates and the exchange rate under a *flexible* exchange rate system. **(7 points)**
- i. Suppose the government wants the exchange rate to remain constant. Given the increase in government spending, what additional policy does the government have to implement to keep the exchange rate from changing? Would the fiscal expansion be more effective under fixed or flexible exchange rates? Explain. **(6 point)**
- c) Use your answers to part (b) to discuss whether a German recession (a decline in German income) will have a larger effect on the Italian economy under flexible exchange rates or under fixed exchange rates. Explain carefully. **(9 points)**

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

5. Answer all parts.

- a) Assume that Egypt currently produces domestically and exports both clothing and cotton, and that cotton is used in making clothing. Further, assume Egypt is a price taker on world markets for all goods (including cotton and clothing). Finally, assume currently Egypt pursues free trade and that there are no market failures.
- i. Explain, and show graphically, the effect of an Egyptian export subsidy for clothing output on: (1) Egyptian production, consumption and exports of *clothing*; and (2) Egyptian production, consumption and exports of *cotton*. **(7 points)**
- ii. **Given** the export subsidy for clothing, discuss what trade policy, if any, on cotton would be beneficial. Justify your answer and indicate whether there is a policy directed towards the cotton industry that would dominate this trade policy. **(7 points)**
- b) Consider the market for steel in Mexico. The Mexican supply and demand curves are:

$$D = 2000 - 2P^c; \quad S = 4(P^f - 100)$$

where P^c is the price Mexican steel consumers pay to buy steel, and P^f is the price Mexican steel producers receive for their output (if there are no domestic taxes on steel, then $P^c = P^f$). Furthermore, domestic production of steel generates pollution that harms Mexican residents; the damages done by this pollution are **50** per unit steel produced domestically. Finally, assume Mexico is a small country, and that the world price of steel is: $P^w = 500$.

- i. Assuming the Mexican government does not implement any policy to correct the pollution, must the movement from autarky to free trade benefit Mexico? Explain. **(5 points)**
- ii. For the information given, **calculate** the net welfare gain (or loss) to Mexico due to the movement from autarky to free trade (remember to account for the pollution). **(6 points)**

(question 5, continued)

iii. What is the optimal policy for the Mexican government to pursue? Are trade restrictions part of the optimal policy? **(4 points)**

iv. If only trade policy can be used, what should the Mexican government do? **(4 points)**

6. Answer all parts.

a) Consider a small country, such as Switzerland, which produces two goods (watches and textiles), 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 under free trade 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 a **limited** number of unskilled foreign workers to enter the country. If domestic goods prices are unchanged by this inflow of workers, how will this inflow of workers 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 Swiss workers? Explain. **(6 points)**

b) Consider a Ricardian model with four goods (food, clothing, computers and automobiles). The world is divided into two groups of countries, “developed” and “developing”. Countries within each group have the same productivity levels, but the productivity levels in the “developed” countries are higher – for all goods – than in the “developing” countries. The following table gives the **average (marginal) product of labor** for each group:

Output per worker hour				
	Food	Clothing	Computers	Automobiles
Developed Countries	12	6	3	4
Developing Countries	2	4	1	1

i. Given the productivity patterns above, if free trade is allowed, what predictions can you make about the pattern of trade between developing and developed countries? Be as specific as possible. **(7 points)**

ii. If productivity in the developed countries doubles in all sectors, how does this affect: (i) the pattern of trade between countries (be as specific as possible); and (ii) the real wage (the standard of living) in the developing countries? Explain. **(6 points)**

c) There has been much discussion lately about “outsourcing”, where U.S. firms contract to have workers in other countries provide services previously done by U.S. workers (e.g., answering phones, writing computer code, etc.). Use an economic model to discuss whether outsourcing is likely to raise or lower the standard of living in the U.S. Will everybody in the U.S. be affected similarly (i.e., will either all gain or all lose due to outsourcing)? Explain. **(7 points)**