

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 (as US\$ per foreign currency)
Euro	\$.9000/Euro
British pound (£)	\$1.4400/£
180-day forward rate	\$1.4112/£

- i. What is the spot exchange rate between the Euro and the British pound? **(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 British pound securities? Show how you got your answer. **(6 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. **(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, for example, New Zealand wishes to fix the exchange rate of its currency (also called the dollar) to the US dollar, at the rate of 1 NZ dollar = \$.50 US.
- i. What actions must New Zealand undertake to maintain this exchange rate? Suppose, for example, that speculators expect a future devaluation of the New Zealand currency (to 1 NZ dollar = \$.40 US), and act on these expectations. How would the behavior of the speculators affect the forward exchange rate, and what must New Zealand do to maintain the spot exchange rate at the level of 1 NZ dollar = \$.50 US? **(6 points)**
 - ii. How do the actions taken by the New Zealand government affect domestic interest rates and the domestic money supply? Be specific. **(6 points)**
 - iii. Under what conditions is it likely that New Zealand will **not** be able to maintain the exchange rate of 1 NZ dollar = \$.50 US? Be specific. **(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.
- How will a decrease in Mexican *real income* (due, for example, to a decline in Mexican oil production as oil reserves fall) 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 decrease in income is thought to be *permanent* or thought to be *temporary*? Explain.
{Assume the Mexican money supply is fixed.} **(10 points)**
 - 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)**
 - 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)**
 - 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**.
- Consider two countries, the US and Japan. Assume that real income (GDP) in both countries is stable, that the US money supply is increasing at 5% per year, and that the Japanese money supply is growing at 3% per year. 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).
 - Under these circumstances, what predictions would you make concerning: (i) the inflation rate in each country; (ii) the difference in nominal interest rates between the two countries; and (iii) how the exchange rate changes over time? Explain. **(9 points)**
 - How would your answer to part (i) above change if the US economy were growing at 4% per year, while there was no real income growth in Japan? Explain. **(7 points)**
 - Assume that income levels in both the US and Japan are stable, that the US money supply is growing at 5% per year and the Japanese money supply is growing at 3% 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 Japanese Central Bank unexpectedly announces that, starting in one week, the Japanese Central Bank will move to a more expansionary monetary policy, with money supply growth of 5% per year.

(question 2b continued on next page)

- i. Explain the **immediate** impact of this announcement concerning Japanese monetary policy on interest rates and prices in Japan, 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. **(7 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. **(10 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:

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

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; $CA(\cdot)$ 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 (q) 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, 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. **(9 points)**
- b) If the domestic government wants to maintain a fixed exchange rate, what additional policy must it use to accompany this fiscal expansion? Under which exchange rate system does the fiscal expansion have a greater impact on the domestic economy? **(8 points)**
- c) How would your answer to part (a) change if people expected the increase in government spending to be permanent? Will the impact on domestic income and the spot exchange rate be larger (under flexible exchange rates) when the fiscal expansion is temporary or permanent? Explain your answers. **(8 points)**
- d) Use your answers to parts (a) and (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. **(8 points)**

5. Answer all parts

- a) It used to be common for developing countries to use multiple fixed exchange rates. For example, a country (say, Thailand) would require its citizens to sell their dollars to the government in exchange for the local currency (baht) at one exchange rate, while the Thai Central Bank would resell these dollars to importers at different exchange rates. To illustrate, suppose Thailand requires exporters (and all citizens who acquire dollars) to sell these dollars to the Central Bank at the rate of 40 baht/\$, while the Central Bank sells dollars to food importers at the rate of 60 baht/\$, and to car importers at the rate of 80 baht/\$.
- i. Why might a government **require** its citizens to sell their foreign exchange (dollars) to the Central Bank at one rate and to buy from the Central Bank at a different rate? Why isn't the Central Bank willing to buy and sell foreign currency at the "fixed" exchange rate of **40baht/\$** to all individuals? **(5 points)**
 - ii. What are the economic consequences of these multiple exchange rates? How do they affect exports, imports and the composition of imports? Discuss how a system of multiple exchange rates is similar to trade policies discussed earlier in the course. {Hint: It might help your discussion to assume given world prices for each good and to calculate how the exchange rate policy affected domestic relative prices}. **(7 points)**
 - iii. Illegal markets, in which private citizens (illegally) trade foreign currencies directly with each other (at rates different from those set by the Central Bank) are a common feature of countries that maintain multiple exchange rates, as in this example. Why would these illegal markets develop? Explain. **(4 points)**
- b) Consider a flexible exchange rate model for Thailand in which prices adjust instantaneously and full employment prevails (i.e., a "long run" equilibrium). Suppose world (nominal and relative) prices are given, as is the Thai money supply.
- i. How would a constant percent tariff on all imports affect relative prices and real resource allocation in Thailand (i.e., goods produced, imports, exports, etc.)? How will this tariff affect nominal prices and the equilibrium exchange rate (in terms of baht/dollar)? Explain. **(7 points)**
 - ii. Instead of just import tariffs, suppose Thailand imposes across-the-board import tariffs of 10% **and** export subsidies of 10%. How will this policy effect relative prices and production within Thailand, and what impact will this policy have on the exchange rate? Explain. **(6 points)**
 - iii. Use these results to explain why a county on a "fixed" exchange rate system might use trade policy to "support" its exchange rate. In what way are these trade policies (in part b) similar to the system of multiple exchange rates discussed in part (a)? **(4 points)**

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

6. Consider a small country that produces and consumes two goods, shirts and rice. Domestic supply and demand for rice are:

$$Q^d = 120 - 3P^c; \quad Q^s = 5P^f$$

where P^c is the price domestic consumers pay for rice and P^f is the price domestic producers receive for rice output. Assume the world price of rice is: $P^w = 25$. Suppose that, for political reasons, the government wants to increase the income of domestic rice producers.

- a) Show how a production subsidy of 10 (per unit output) affects domestic production, consumption and exports. Calculate the welfare impact of this subsidy on each group, and the overall deadweight loss due to this policy. **(8 points)**
- b) Suppose the production subsidy is replaced by an export subsidy of 10 (per unit output). Find the effects of this policy (on production, consumption, exports, and welfare of each group), and contrast it to a production subsidy. Which policy is better, given the stated objective of helping rice producers? **(8 points)**
- c) How does the production subsidy to rice producers affect the domestic output of shirts? Give a specific numerical answer. **(6 points)**
- d) Suppose that the government decides to use the production subsidy of 10 to help rice producers. However, suppose that – in addition to this subsidy – it places production limits on rice output. In particular, suppose it restricts total rice output to 125. How does this production restriction affect welfare (as compared to the case of a subsidy with no production limit) and what is the overall deadweight loss of the combined policy of production subsidies and production limits (compared to no policy)? Explain. **(6 points)**
- e) Suppose the country were large enough so that its exports affected world price. How would this affect the ranking of production subsidies and export subsidies? How would it affect the deadweight loss due to each policy? (A discussion, rather than a numerical answer, is expected). **(5 points)**

(question 7, next page)

7. 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 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 workers? Explain. **(6 points)**
 - iii. Given world wages for skilled and unskilled workers, and given the Swiss import tariff, what would happen if Switzerland allowed unrestricted immigration. Who within Switzerland would gain, and who would lose, from this policy? What would be the impact of the import tariff, given unrestricted immigration? 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	8	6	10	3
Developing Countries	4	4	2	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 standard of living in the developing countries? Explain. **(7 points)**