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A MACROECONOMIC THEORY OF THE OPEN ECONOMY

LEARNING OBJECTIVES:

By the end of this chapter, students should understand:

- how to build a model to explain an open economy's trade balance and exchange rate.
- how to use the model to analyze the effects of government budget deficits.
- how to use the model to analyze the macroeconomic effects of trade policies.
- how to use the model to analyze political instability and capital flight.

KEY POINTS:

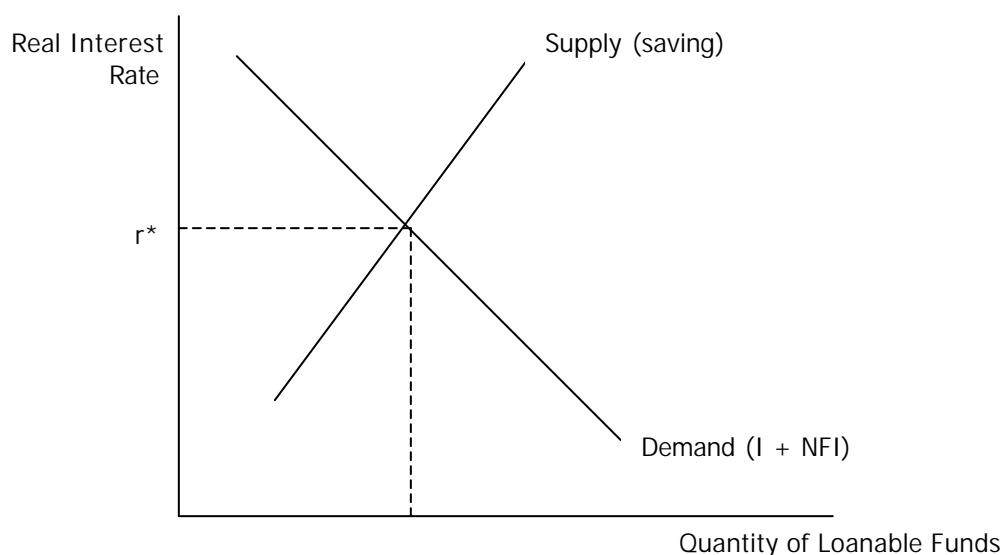
1. To analyze the macroeconomics of open economies, two markets are central? the market for loanable funds and the market for foreign-currency exchange. In the market for loanable funds, the interest rate adjusts to balance the supply of loanable funds (from national saving) and the demand for loanable funds (from domestic investment and net foreign investment). In the market for foreign-currency exchange, the real exchange rate adjusts to balance the supply of dollars (for net foreign investment) and the demand for dollars (for net exports). Because net foreign investment is part of the demand for loanable funds and provides the supply of dollars for foreign-currency exchange, it is the variable that connects these two markets.
2. A policy that reduces national saving, such as a government budget deficit, reduces the supply of loanable funds and drives up the interest rate. The higher interest rate reduces net foreign investment, which reduces the supply of dollars in the market for foreign-currency exchange. The dollar appreciates, and net exports fall.
3. Although restrictive trade policies, such as a tariff or quota on imports, are sometimes advocated as a way to alter the trade balance, they do not necessarily have that effect. A trade restriction increases net exports for a given exchange rate and, therefore, increases the demand for dollars in the market for foreign-currency exchange. As a result, the dollar appreciates in value, making domestic goods more expensive relative to foreign goods. This appreciation offsets the initial impact of the trade restriction on net exports.
4. When investors change their attitudes about holding assets of a country, the ramifications for the country's economy can be profound. In particular, political instability can lead to capital flight, which tends to increase interest rates and cause the currency to depreciate.

CHAPTER OUTLINE:

- I. Supply and Demand for Loanable Funds and for Foreign-Currency Exchange
 - A. The Market for Loanable Funds
 1. Whenever a nation saves a dollar of income, it can use that dollar to finance the purchase of domestic capital or to finance the purchase of an asset abroad.

$$S = I + NFI$$
 2. The supply of loanable funds comes from national saving.
 3. The demand for loanable funds comes from domestic investment and net foreign investment.
 4. The quantity of loanable funds demanded and the quantity of loanable funds supplied depend on the real interest rate.
 - a. A higher real interest rate encourages people to save and thus raises the quantity of loanable funds supplied.
 - b. A higher interest rate makes borrowing to finance capital projects more costly, discouraging investment and lowering the quantity of loanable funds demanded.
 - c. A higher real interest rate in a country will also lower net foreign investment. All else equal, a higher domestic interest rate implies that purchases of foreign assets by domestic residents will fall and purchases of domestic assets by foreigners will rise.
 5. The supply and demand for loanable funds can be shown graphically.
 - a. The real interest rate is the price of borrowing funds and is therefore on the vertical axis; the quantity of loanable funds is on the horizontal axis.
 - b. The supply of loanable funds is upward-sloping because of the positive relationship between the real interest rate and the quantity of loanable funds supplied.
 - c. The demand for loanable funds is downward-sloping because of the inverse relationship between the real interest rate and the quantity of loanable funds demanded.

Figure 30-1



6. The interest rate adjusts to bring the supply and demand for loanable funds into balance.
 - a. If the interest rate was below r^* , the quantity of loanable funds demanded would be greater than the quantity of loanable funds supplied. This would lead to upward pressure on the interest rate.
 - b. If the interest rate was above r^* , the quantity of loanable funds demanded would be less than the quantity of loanable funds supplied. This would lead to downward pressure on the interest rate.
7. At the equilibrium interest rate, the amount that people want to save is exactly equal to the desired quantities of domestic investment and net foreign investment.

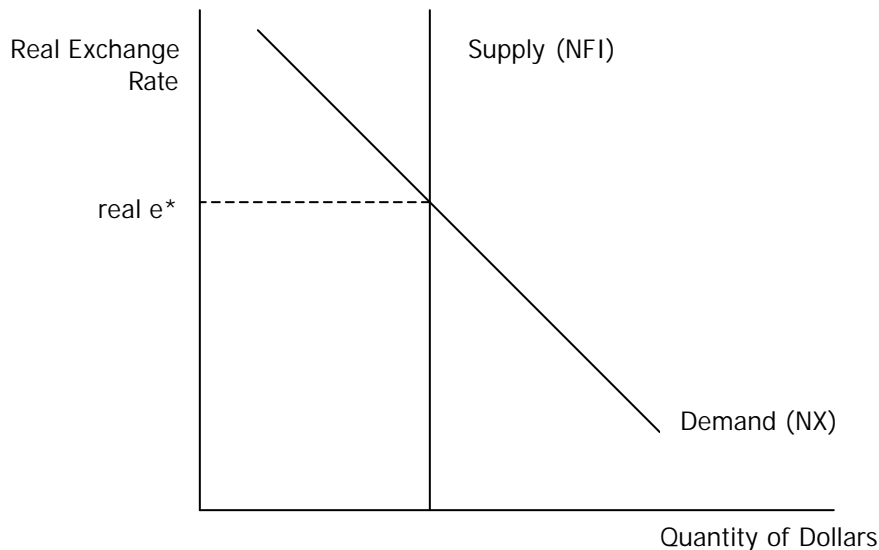
B. The Market for Foreign-Currency Exchange

1. The imbalance between the purchase and sale of capital assets abroad must be equal to the imbalance between exports and imports of goods and services.

$$NFI = NX$$
2. Net foreign investment represents the quantity of dollars supplied for the purpose of buying assets abroad.
3. Net exports represent the quantity of dollars demanded for the purpose of buying U.S. net exports of goods and services.
4. The real exchange rate is the price that balances the supply and demand in the market for foreign-currency exchange.

- a. When the U.S. real exchange rate appreciates, U.S. goods become more expensive relative to foreign goods, lowering U.S. exports and raising imports. Thus, an increase in the real exchange rate will reduce the quantity of dollars demanded.
 - b. The key determinant of net foreign investment is the real interest rate. Thus, as the real exchange rate changes, there will be no change in net foreign investment.
5. We can show the market for foreign-currency exchange graphically.
- a. The real exchange rate is on the vertical axis; the quantity of dollars exchanged is on the horizontal axis.
 - b. The demand for dollars will be downward-sloping because of the inverse relationship between the real exchange rate and the quantity of dollars demanded.
 - c. The supply of dollars will be a vertical line because of the fact that changes in the real exchange rate have no influence on the quantity of dollars supplied.

Figure 30-2

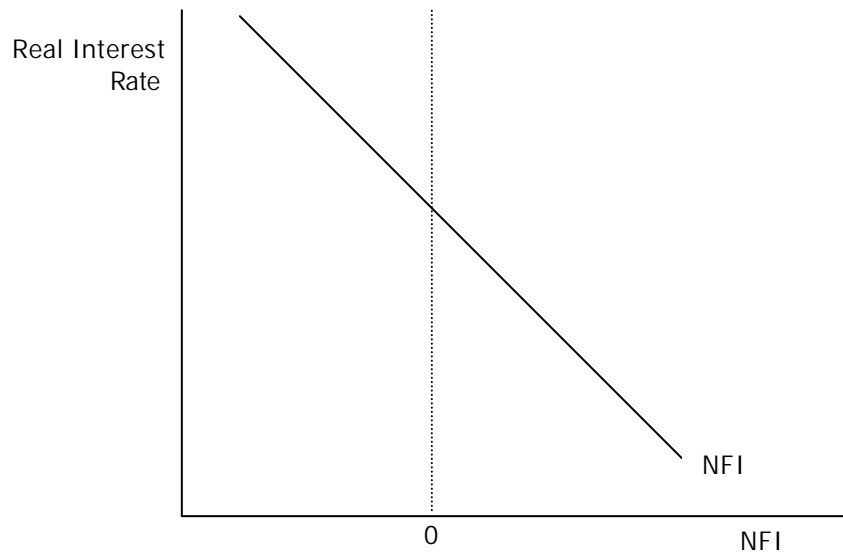


6. The real exchange rate adjusts to balance the supply and demand for dollars.
- a. If the real exchange rate was lower than $real\ e^*$, the quantity of dollars demanded would be greater than the quantity of dollars supplied and there would be upward pressure on the real exchange rate.

- b. If the real exchange rate was higher than real e^* , the quantity of dollars demanded would be less than the quantity of dollars supplied and there would be downward pressure on the real exchange rate.
 - 7. At the equilibrium real exchange rate, the demand for dollars to buy net exports exactly balances the supply of dollars to be exchanged into foreign currency to buy assets abroad.
- C. *FYI: Purchasing-Power Parity as a Special Case*
 - 1. Purchasing-power parity suggests that a dollar must buy the same quantity of goods and services in every country. As a result, the real exchange rate is fixed and the nominal exchange rate is determined by the price levels in the two countries.
 - 2. Purchasing-power parity assumes that international trade responds quickly to international price differences.
 - a. If goods were cheaper in one country than another, they would be exported from the country where they are cheaper and imported into the second country where the prices are higher.
 - b. This would continue until the price differential disappears.
 - c. Because net exports are so responsive to small changes in the real exchange rate, purchasing-power parity implies that the demand for dollars would be horizontal. Thus, purchasing-power parity is simply a special case of the model of the foreign-currency exchange market.
 - d. However, it is more realistic to draw the demand curve downward-sloping.

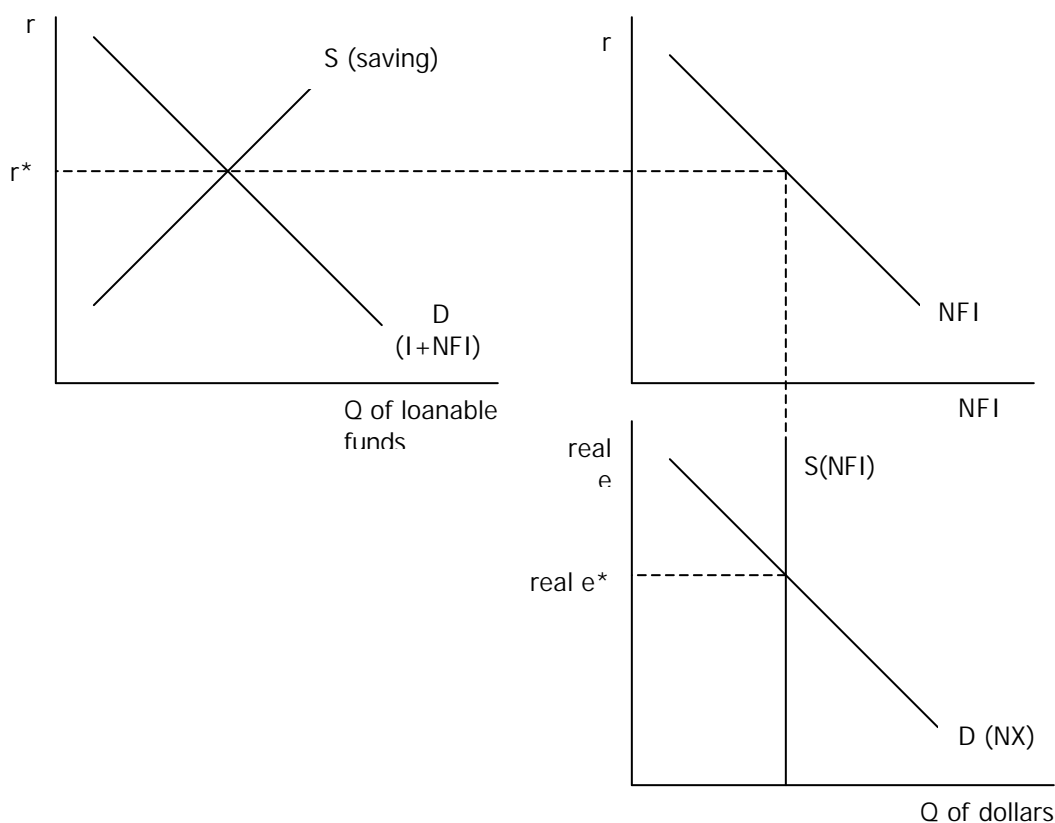
II. Equilibrium in the Open Economy

- A. Net Foreign Investment: the Link between the Two Markets
 - 1. In the market for loanable funds, net foreign investment is a part of the demand.
 - 2. In the foreign-currency exchange market, net foreign investment is the supply of dollars.
 - 3. This means that net foreign investment is the variable that links the two markets.

Figure 30-3

4. The key determinant of net foreign investment is the real interest rate.
5. We can show the relationship between net foreign investment and the real interest rate graphically.
 - a. When the real interest rate is high, owning domestic assets is more attractive and thus, net foreign investment is low.
 - b. This inverse relationship implies that net foreign investment will be downward-sloping.
 - c. Note that net foreign investment can be positive or negative.

B. Simultaneous Equilibrium in Two Markets

Figure 30-4

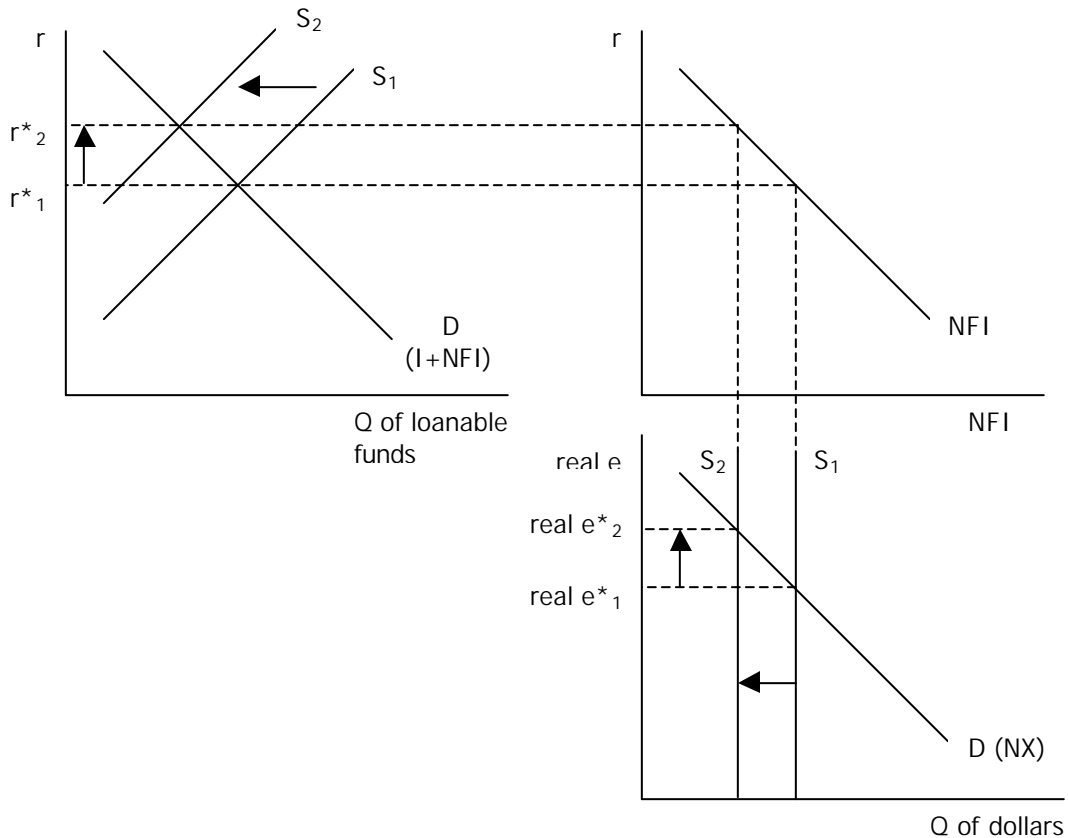
1. The real interest rate is determined in the market for loanable funds.
2. This real interest rate determines the level of net foreign investment.
3. Because net foreign investment must be paid for with foreign currency, the quantity of net foreign investment determines the supply of dollars.
4. The equilibrium real exchange rate brings into balance the quantity of dollars supplied and the quantity of dollars demanded.
5. Thus, the real interest rate and the real exchange rate adjust simultaneously to balance supply and demand in the two markets. As they do so, they determine the levels of national saving, domestic investment, net foreign investment, and net exports.

III. How Policies and Events Affect an Open Economy

A. Government Budget Deficits

Figure 30-5

1. A government budget deficit occurs when the government spending exceeds government revenue.

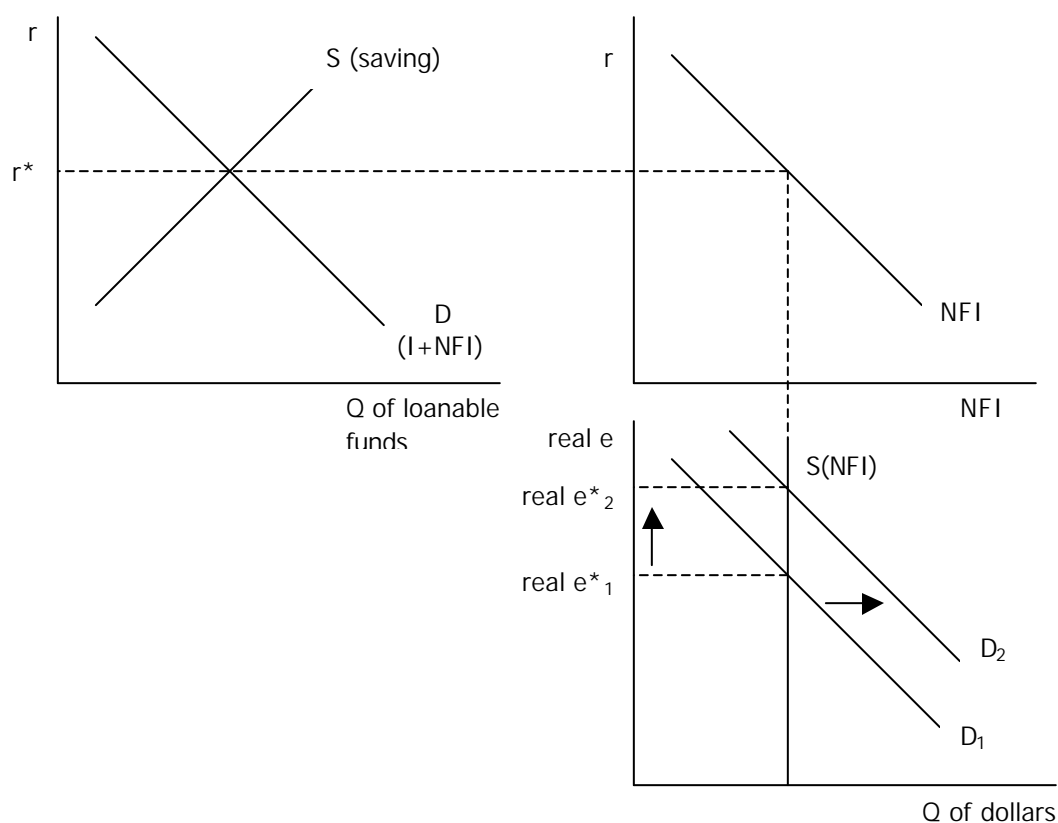


2. Because a government deficit represents negative public saving, it lowers national saving. This leads to a decline in the supply of loanable funds.
3. The real interest rate rises, leading to a decline in both domestic investment and net foreign investment.
4. Because net foreign investment falls, people need less foreign currency to buy foreign assets so the supply of dollars declines.
5. The real exchange rate rises, making U.S. goods more expensive relative to foreign goods. Exports will fall, imports will rise, and net exports will fall.
6. In an open economy, government budget deficits raise real interest rates, crowd out domestic investment, cause the dollar to appreciate, and push the trade balance toward deficit.
7. Because they are so closely related, the budget deficit and the trade deficit are often called the *twin deficits*. Note that, because many other factors affect the trade deficit, these "twins" are not identical.

B. Trade Policy

Figure 30-6

1. Definition of **Trade Policy**: a government policy that directly influences the quantity of goods and services that a country imports or exports.
2. Two common types of trade policies are tariffs (taxes on imported goods) and quotas (limits on the quantity of imported goods).
3. Example: the U.S. government imposes a quota on the number of cars imported from Japan.
4. Note that the quota will have no effect on the market for loanable funds. Thus, the real interest rate will be unaffected.
5. The quota will lower imports and thus increase net exports. Since net exports are the source of demand for dollars in the market for foreign-currency exchange, the demand for dollars will increase.
6. The real exchange rate will rise making U.S. goods relatively more expensive than foreign goods. Exports will fall, imports will rise, and net exports will fall.
7. In the end, the quota reduces both imports and exports but net exports remain the same.



8. Thus, trade policies do not affect the trade balance.

9. Recall that $NX = NFI$. Also remember that $S = I + NFI$.

Rewriting, we get:

$$NFI = S - I.$$

Substituting for NFI , we get:

$$NX = S - I.$$

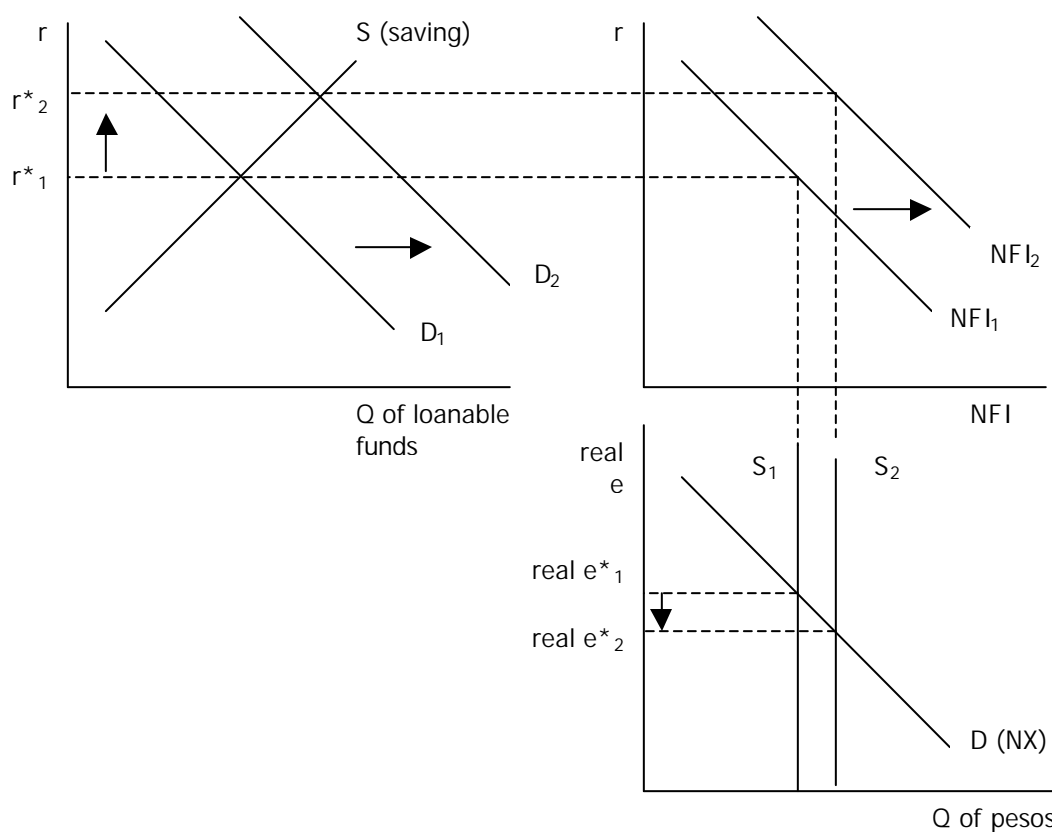
10. Since trade policies do not affect national saving or domestic investment, they cannot affect net exports.
11. Trade policies do have effects on firms, industries, and countries. But these effects are more microeconomic than macroeconomic.

C. Political Instability and Capital Flight

1. Definition of **Capital Flight**: a large and sudden reduction in the demand for assets located in a country.
2. Capital flight often occurs because investors feel that the country is unstable, due to either economic or political problems.
3. Example: Investors around the world observe political problems in Mexico and begin selling Mexican assets and buying U.S. assets.

Figure 30-7

4. Mexican net foreign investment will rise because investors are selling Mexican assets and purchasing assets from another country.
 - a. Since net foreign investment determines the supply of pesos, the supply of pesos increases.
 - b. Since net foreign investment is also a part of the demand for loanable funds, the demand for loanable funds rises.
5. The increased demand for loanable funds causes the equilibrium real interest rate to rise.
6. The increased supply of pesos lowers the equilibrium real exchange rate.
7. Thus, capital flight from Mexico increases Mexican interest rates and lowers the value of the Mexican peso in the market for foreign-currency exchange.



8. Capital flight in Mexico will also affect other countries. If the capital flows out of Mexico and into the United States, it has the opposite effect on the U.S. economy.
9. In 1997, several Asian countries experienced capital flight. The same thing occurred in Russia in 1998.

D. *In the News: How the Chinese Help American Home Buyers*

1. China is using funds from its large trade surpluses to purchase U.S. securities.
2. This is an article from *The Wall Street Journal* covering the effects of this influx of capital on U.S. interest rates.

