Macroeconomics: an Introduction

Chapter 12

The International Economy

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Preview

Imagine that you could stand at the border between the U.S. and Canada and observe the transactions that take place across it. Natural gas flows southward through pipelines to utilities in the U.S. Personal computers made in California are trucked northward to be sold in Canadian stores. Tourists from each country head for destinations in the other. Some transactions take place over the telephone, without the movement of any physical goods. For example, a mutual fund in Chicago buys 1,000 shares of a mining company traded on the Toronto Stock Exchange, or a Canadian real estate developer gives the go-ahead to construct a new shopping mall in Atlanta.

In each of these transactions, a payment is made to a party in the other country and that payment must be converted to the currency of the other country. The Canadian supplier of natural gas pays wages, taxes, and dividends in Canadian dollars. When it receives payment from a customer in the U.S., it takes those U.S. dollars to its bank and exchanges them for Canadian dollars so that it can pay its bills.

In this chapter we will learn how the rate of exchange is determined and what might cause it to change. We will also find out what is meant by the balance of payments between countries. The U.S. has a very large trade deficit, and we will discuss why that is the case and whether it is cause for concern. Finally, we will explore what motivates countries to trade with one another in the first place.

12.1 Exchange Rates

The cost of one currency in terms of another is called the exchange rate. What makes an exchange rate different from most prices is that it is "two-sided."

The U.S./Canada exchange rate is expressed both in Canadian dollars per U.S. dollar, and as U.S. dollars per Canadian dollar. If you went to your bank in the U.S. to buy Canadian dollars for a trip in October 1999, it was offering to sell you Canadian dollars for about US$0.68 each. If, instead, you waited to exchange dollars until you arrived in Canada, you would have found that the bank there was offering to buy your U.S. dollars for about C$1.47. These two prices, US$0.68 and C$1.47 are equivalent prices since the first states that

$$C\$1 = US\$0.68.$$

Dividing both sides of this equations by .68 we solve for the price of a US$:

$$US\$ = C\$1/.68 = C\$1.47$$

The exchange rate is expressed interchangeably as the price of a Canadian dollar in U.S. dollars, or the price of a U.S. dollar in Canadian dollar. Notice that the one is just the reciprocal (recall that 1/x is the reciprocal of x) of the other.

Determined by Supply and Demand

The exchange rate is like any other price in that it is determined by the forces of supply and demand. What is novel and sometimes confusing in the case of the foreign exchange market is that instead of the price of a good like compact disks being quoted in dollars, we have the prices of two kinds of dollars being quoted in terms of each other. It is equally correct to think of the U.S dollar as the good being traded with its price quoted in Canadian dollars, or the Canadian dollar as the good being traded with its price quoted in U.S. dollars. It is important, though, to remember which side of the market you are looking at or it is easy to become very confused as any experienced traveler abroad can attest.

Because of the two-sided nature of the foreign exchange market, a shift in the demand for one currency is equivalent to a shift in the supply of the other. For example, if we think of the Canadian dollar as the good traded, then a U.S. utility buying Canadian dollars to pay for more Canadian gas this winter is increasing the *demand* for Canadian dollars in the foreign exchange market. That will tend to push up the price of Canadian dollars in terms of U.S. dollars. We could equally well have thought of this as a situation in which the U.S. dollar is the goods being traded, so the U.S. utility is increasing the *supply* of U.S. dollars in the foreign exchange market. That pushes down the value of the U.S. dollar in terms of Canadian dollars, but the effect on the exchange rate is the same whichever way we think of it.

Similarly, the Canadian retailer increasing its purchasing of U.S. personal computers for sale in Canada will need to sell Canadian dollars for US dollars in order to pay the manufacturer in California. That transaction increases the supply of Canadian dollars in the foreign exchange market and therefore tends to push down the price of Canadian dollars in terms of U.S. dollars. But we could have thought of that transaction as one that increases the demand for U.S. dollars, thereby pushing up the value of the U.S. dollar in terms of the Canadian dollar. Again, we reach the same conclusion about the transaction affects the relative values of the two currencies. It is changes such as these in the demand and supply of the two currencies that causes the exchange rate to change.

Exercises 12.1

A. If the exchange rate between the U.S. and Japan is quoted in the newspaper at 125 Japanese yen to the US dollar, how many dollars will one yen buy? What is the price, then, of a yen in dollars?

B. Locate the Foreign Exchange table on the business page of your newspaper. What is the quote for British pounds? What is the value of a U.S. dollar in terms of British pounds?

C. Suppose that there is an unusually mild winter that reduces the demand for natural gas in the U.S. How does this affect supply and demand in the foreign exchange market? What will be the effect of the mild winter on the price of U.S. dollars in Canadian dollars? on the price of Canadian dollars in U.S. dollars?

12.2 The Balance of Payments

A remarkable fact about the international transactions between residents of any country and the Rest-Of-the-World (ROW) is that the total of all payments made to the ROW will equal, or balance, the total of all payments received from the ROW! Let's see why this must be so.

Consider the simplified case of a world consisting of two countries, say the US and Canada. We will imagine that all foreign exchange transactions between U.S. and Canada are handled by one firm, so that we can see the quantities of currencies traded. Further, imagine that this dealer is on the US side of the boarder. It holds an inventory of Canadian dollars, standing ready to buy more C$ or sell C$ from its inventory. The exchange rate is posted by the dealer for all to see, and it is free to change that posted rate as it sees fit. Canadians making payments to the US come to the dealer and sell their dollars for US dollars. These transactions cause the dealer's inventory of Canadian dollars to increase.

Meanwhile, Americans making payments to Canadians go to the same dealer to buy Canadian dollars, causing the dealer's inventory of Canadian dollars to shrink. The dealer wishes to hold only enough Canadian dollars in inventory to accommodate its customers, since they serve no other purpose for the dealer. The dealer's inventory of Canadian dollars will remain stable as long as it is buying about the same quantity of them as it is selling. The dealer makes a profit by charging a small commission on each transaction.

How Do the Payments Get Balanced?

Now suppose that a warm winter causes the demand for Canadian gas, and therefore for Canadian dollars, to plummet. The dealer suddenly finds that its inventory of Canadian dollars is growing rapidly. What should the dealer do? The appropriate response is to reduce the quoted price for Canadian dollars to encourage their purchase and discourage their sale. This makes it less expensive for Americans to buy goods and services in Canada and more expensive for Canadians to buy in the U.S. The dealer will continue to reduce the price of Canadian dollars until its inventory of Canadian dollars is again stable, the sale of Canadian dollars again balanced by purchases. At this new equilibrium in the

foreign exchange market, the sales of Canadian dollars is just balanced by purchases.

We can see from this simple example that the total of all payments to the U.S. from Canada is equal to, or balances, the total of all the payments from Canada to the U.S. The balance is maintained because an imbalance means that the dealer's inventory of foreign exchange either increases or decreases and the exchange rate is then adjusted until the balance is restored.

In the real world there are transactions among many countries through many dealers, but still the total payments received from each country by the ROW balances the total of payments made by each country to the ROW. The basic mechanism is the same as in our simple example: the currency of each country is useful to foreigners only to make payments in that country. Non-Canadians have no desire to accumulate Canadian dollars beyond the inventory held by foreign exchange dealers. Each Canadian dollar that goes abroad finds its way back home. The only way this can happen is if payments to Canada by non-Canadians balances payments made by Canadians to non-Canadians.

What Kinds of International Payments Are There?

The balance of payments for the U.S. is broken down into its various components in the table on the facing page.

The payments which the U.S. receives from the ROW are listed in the first column. These include receipts for merchandise exported, interest and dividends from US-owned assets abroad, payment for services sold to the ROW, and transfers from the ROW. Interest and dividends can be thought of as payment for the exports of services of factors of production. Services in international trade are often called "invisibles" because they are not seen crossing the border. These include insurance and other financial services; and tourism. Transfers are gifts from the foreigners to Americans. Together, these receipts make up the current account.

The capital account includes private purchases by foreigners of U.S. assets, such as the purchase of 10,000 shares of Blue Skies Airlines by a pension fund in Paris. It also includes purchases of U.S. assets by foreign governments, such as the sale of $1 billion of U.S. Treasury bills to the German central bank (the Bundesbank). Receipts on capital account can be thought of as payments received for the export of capital assets.

The total of current account receipts is called "exports of goods and services" and the total of capital account receipts is called "exports of capital." Together, they make up the total of all U.S. receipts from the ROW.

Similarly, the second column lists all payments made by the U.S. to the ROW in the same categories. The sum of "imports of goods and

services" plus "imports of capital" is the total of payments received by the US from the ROW.

The third column shows the balance between receipts and payments. The difference between merchandise exports and merchandise imports is called the merchandise trade balance The merchandise trade balance has been negative for the U.S. during the past decade and is one of those discouraging sounding statistics often reported in the press.

The difference between exports and imports of goods and services is called the balance on current account which has also been negative. The difference between exports of capital and imports of capital is the balance on capital account.

Finally the balance of payments is, equivalently, the sum of the balances on current and capital account or the difference between total receipts and total payments. In either case it is equal to zero!

The U.S. Balance of Payments

Receipts from ROW		Payments to ROW		Balance
		Current Account		
Merchandise Exports	-	Merchandise Imports	=	Merchandise Trade Balance
Income on US Assets Abroad		Income on Foreign Investment		
Services Exports		Services Imports		
Transfers		Transfers		
Exports of Goods and Services	-	Imports of Goods and Services	=	Balance on Current Account
		Capital Account		
Change in Foreign Assets in US		Change in US Assets Abroad		
Change in Foreign Official Assets		Change in US Official Assets		
Exports of Capital	-	Imports of Capital	=	Balance on Capital Account
Total Receipts from the ROW	-	Total Payments to the ROW	=	Balance of Payments (= zero)

Rest-of-World Savings, the Flip Side of the Trade Deficit

In Chapter 2 we saw how the trade deficit of the U.S. has helped to finance the federal budget deficit that emerged during the past decade since it is a source of savings for the U.S. economy. The balance of payments gives us another perspective on this important relationship.

The balance of payments table tells us that

Balance on Current Account + Balance on Capital Account
= Balance of Payments.

But since the balance of payments must equal zero, we have,

The Balance on Current Account = - The Balance on Capital Account

Note that this says the balance on current account is the *negative* of the balance on capital account. Now, each of these is, in turn, the difference between exports and imports, so we have,

{Exports of G&S - Imports of G&S}=- {Exports of Capital- Imports of Capital}

which we can rearrange as,

Net Exports of Goods and Services = - Net Exports of Capital

Finally, since the trade deficit is the negative of Net Exports of Goods and Services, we have

Trade Deficit = Net Export of Capital.

This says that a deficit in the net export of goods and services must be accompanied by a surplus in the net export of capital assets. It is guaranteed since total international payments must balance. The U.S. has been exchanging U.S. Treasury bonds, ownership of film studios in Hollywood, and other capital assets for foreign-made cars and imported crude oil. It is the trade deficit that gives the Rest-of-the-World the U.S. dollars to purchase those capital assets, and the ROW sector has been a major source of savings as we saw in Chapter 2.

Exercises 12.2

A. Suppose that investors around the world decide in 2002 that Russia's economy is one that offers many attractive investment opportunities. What effect would you expect this development to have on Russia's exchange rate? balance of trade? balance on current account? balance on capital account? balance of payments?

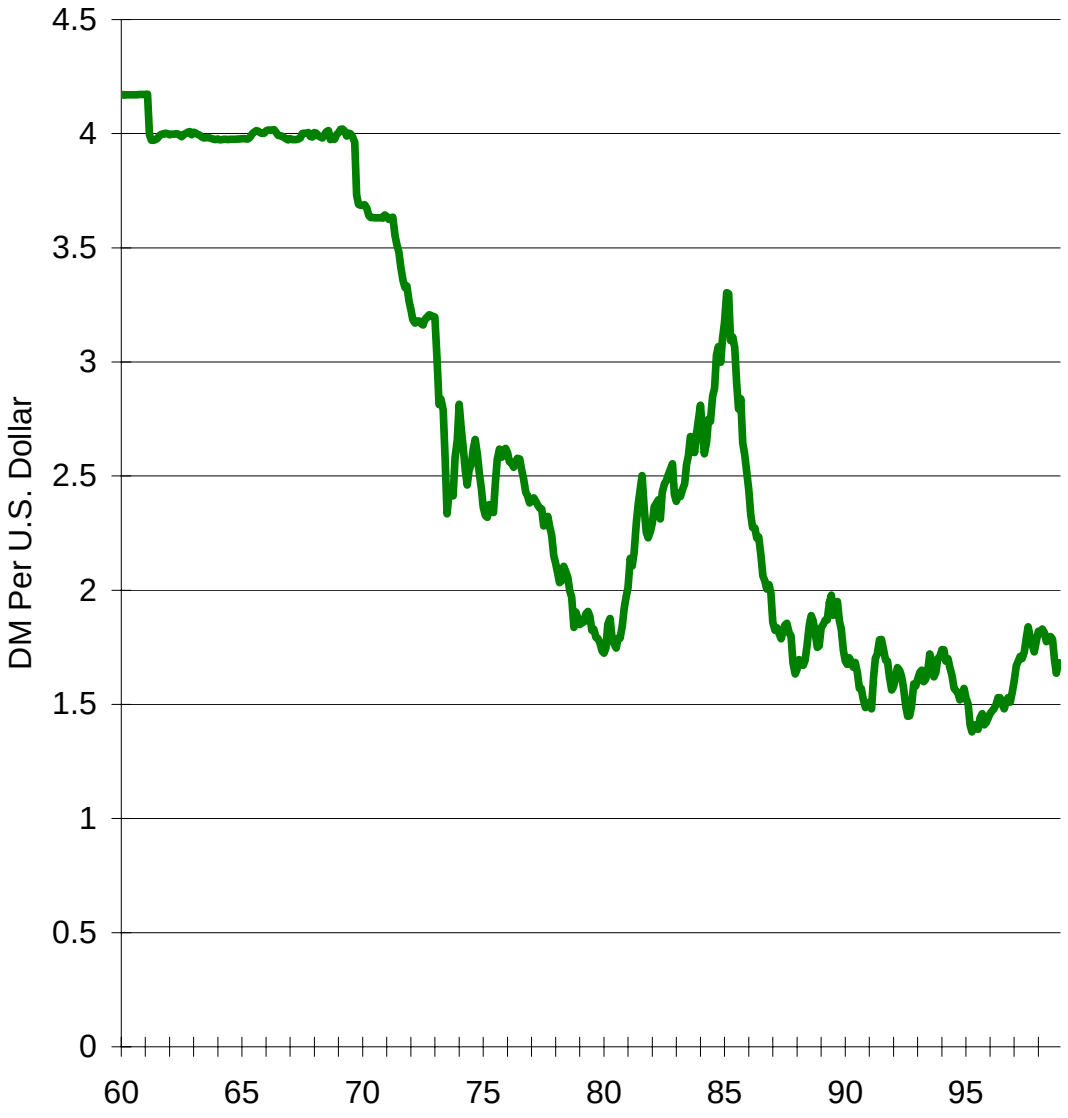
12.3 Why Do Exchange Rates Fluctuate?

Exchange rates are a staple of the news media these days: "the dollar rose against the Yen in heavy trading," "the Euro hit a new low today," "the British pound rebounded in New York," and "the dollar falls below 100 yen," are typical evening news items. Why do exchange rates fluctuate? Does a country gain an advantage by having a "strong" currency as opposed to a "weak" one? Can governments control exchange rates? Should they control them? Can we anticipate how monetary and fiscal policies will affect foreign exchange rates? These are increasingly important questions as our economy becomes more international and Americans often find themselves involved in international transactions.

The currency of Europe today is the Euro, the national currencies having been completely replaced in 2001. So to study the behavior of exchange rates over time we have to study one of the old national currencies. We will use the former currency of Germany, the Deutsche Mark abbreviated DM. That history ends as the 1990s end since by that time the Euro block currencies were all linked together. Let's see if we can understand some of the factors underlying the changing relationship between the DM and the U.S. dollar, the two most important currencies in the world today.

The exchange rate between DM and US$ over the last three decades is plotted in Figure 12.1. It is expressed as the value of the US$ in terms of DM, or, in other words, the number of DM that one US$ could buy. Three features of the chart are worth noting. First, there was almost no fluctuation in the exchange rate until 1969, when the dollar dropped sharply. Second, by the early 1990s, the U.S. dollar was worth less than half as many DM as it was in the 1960s. Third, the continuing decline of the dollar was interrupted by a surge in its value in the mid-1980s.

Figure 12.1: The Exchange Rate Between German Marks (DM) and U.S. Dollars



Bretton Woods

The exchange rate did not fluctuate before 1969 because it was fixed under a system agreed upon in 1944 by the major industrial nations at a meeting in Bretton Woods, New Hampshire. The Bretton Woods System made the U.S. dollar the benchmark currency and it established rates of exchange between the dollar and other currencies which were to remain fixed. The value of the dollar was, in turn, anchored by the promise of the U.S. Treasury to sell unlimited quantities of gold to other governments (but not to individuals) upon demand, at $35 per ounce. Fixed exchange rates were enforced by government intervention in the foreign exchange markets whenever the rates started to deviate from agreed upon levels.

One sign that the Bretton Woods System was in trouble was the "revaluation" of the DM in 1969, seen in Figure 12.1 as a sharp drop in the US$. The problem was that inflation in the U.S. had rendered $35 an unrealistically low price for gold. President Nixon ordered gold sales halted in 1971 to avoid a run on U.S. gold reserves. The US$ fell sharply again and the Bretton Woods System was in ruins.

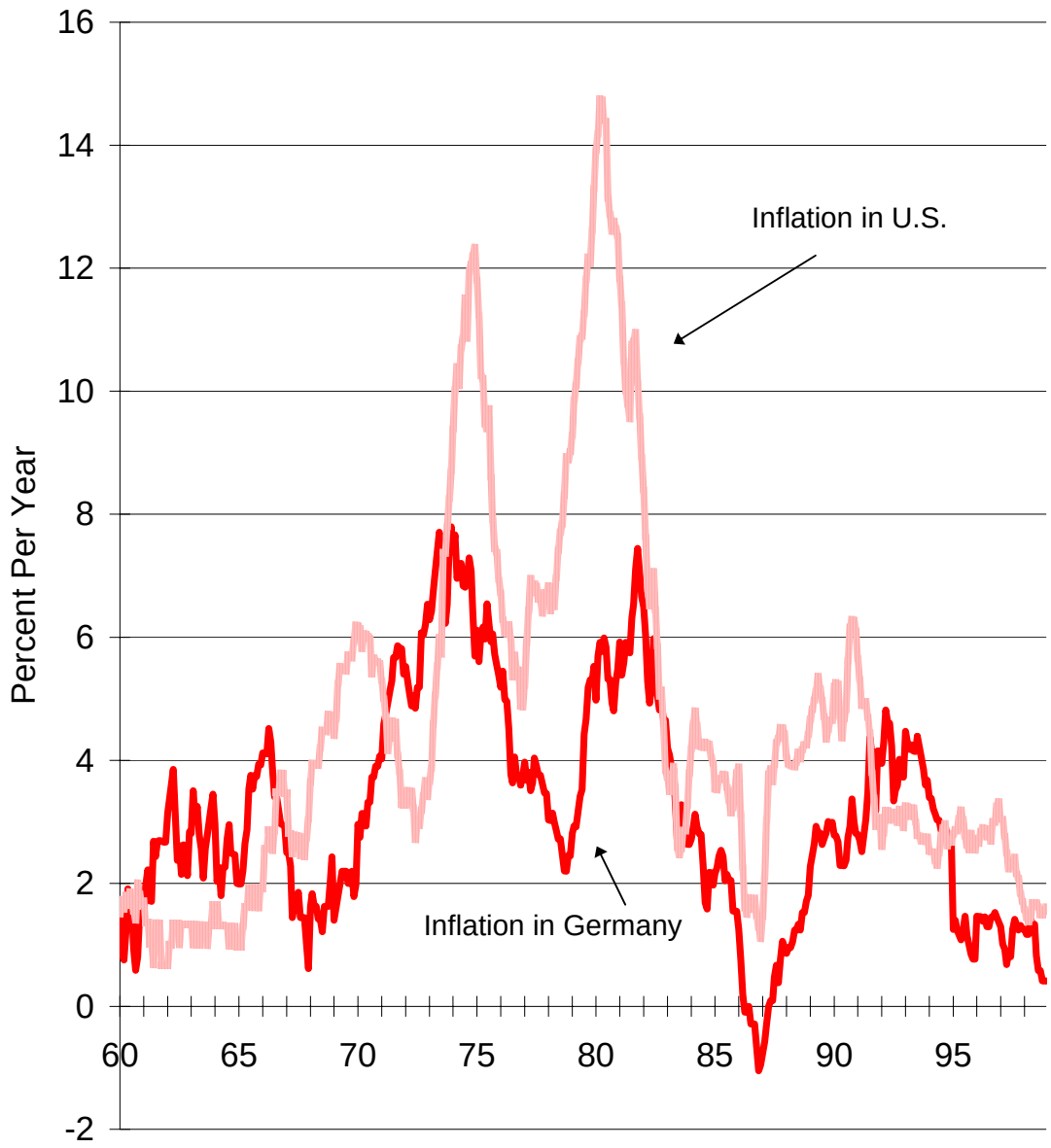
The Bretton Woods System had been established in the belief that fixed exchange rates would encourage world trade by taking the uncertainly out of dealing in foreign currencies. It was undone by the failure of the U.S. to maintain the purchasing power of the dollar when its inflation rate sped up at the end of the 1960s.

It is evident that the US$ had been overvalued, and the DM undervalued, during the later years of Bretton Woods. The growing value of the DM reflected in part the recovery of the German economy after World War II. But why did the dollar then continue to fall against the DM over the next two decades? Could relatively rapid inflation in the U.S. have been the major factor?

Figure 12.2 compares the rate of inflation in the two countries, measured by the CPI of each. Neither country had much inflation before 1966, but since then inflation has been more rapid in the U.S. than in Germany.

Since inflation diminishes the purchasing power of a currency, it is intuitive that more rapid inflation in the U.S. would diminish the purchasing power of the US$ in terms of DM. Now we will find out if that is the whole explanation, or just a partial explanation for the strength of the DM.

Figure 12.2: Inflation Rates In Germany and the U.S.



The Law of One Price and Purchasing Power Parity

The law of one price states that a good should sell for the same price everywhere, allowing for transportation costs. For example, a hamburger should sell for about the same price in Chicago as in Hamburg, Germany. If hamburgers sell for less in Chicago than in Hamburg, entrepreneurs will ship frozen beef, catsup, and wheat flour from Chicago to Hamburg and reap the price difference as a profit. This will cause the price of a hamburger in Hamburg to fall and the price in Chicago to rise until finally a hamburger sells for the same price in both cities.

Exploiting a difference in price for the same good in different locations is called arbitrage. When price differences occur, arbitrage will tend to eliminate them, enforcing the law of one price. If a hamburger sells for $1.50 in Chicago, it should sell for the DM equivalent in Hamburg, which is $1.50 times the exchange rate expressed as DM per US$, which we will denote by "DM/$." Thus, at an exchange rate of two DM per dollar, a Hamburger (a resident of Hamburg) should be paying about DM3.00 for a hamburger.

In practice, transportation costs, differences in taxes, and the fact that some goods cannot be transported means that the law of one price does not hold exactly. For example, the land that the hamburger store occupies may be much more expensive to rent in Hamburg than in Chicago, so the difference in land rental cost will be reflected in a higher price for hamburgers in Hamburg.

Similarly, the difference between the cost of an apartment in Tokyo and in St. Louis is not readily arbitraged since we cannot ship land from Missouri, where it is plentiful, to Tokyo, where it is very scarce. However, world travelers can attest that the law of one price holds remarkably well for hamburgers.

If the law of one price held exactly for all goods, then the cost of a given consumer's market basket should be the same in the U.S. as it is in Germany. Thus, if we took the cost of the basket of goods priced in the U.S. and converted that dollar cost to the equivalent number of DM at the exchange rate, the result should be the same as the actual cost of the same market basket purchased in Germany. If that were true, then we would have the equality:

$$\textit{Cost of Basket in U.S.} \bullet \textit{Exchange rate in DM/\$} = \textit{Cost of Basket in Germany}$$

For example, suppose that the weekly supermarket purchases of a family in Chicago are $250 at a time when the exchange rate is 4 DM/$. Under the law of one price, the cost of the same goods in Germany would be

$$\$250 \bullet 4 \text{ DM}/\$ = \text{DM}1{,}000.$$

Now, suppose that the U.S. experiences a doubling of the price level over the next decade so the same weekly purchases then cost $500 in the U.S. while in Germany the cost is still DM1,000. What must happen to the exchange rate to keep the costs of the two market baskets equal? Clearly, the dollar will have to fall to 2 DM per US$, and then we will have the equality,

$$\$500 \bullet 2 \text{ DM}/\$ = \text{DM } 1{,}000.$$

If the exchange rate adjusts to equate the costs of equivalent market baskets across countries, then there is said to be purchasing power parity, often abbreviated PPP. If PPP held *exactly*, then differences in inflation rates would account for *all* of the movement in exchange rates.

The Real Exchange Rate

To what extent do the differing inflation rates in the U.S. and Germany actually account for the decline and fluctuation of the DM/$ exchange rate that we saw in Figure 12.1? We answer this question by adjusting the DM/$ exchange rate for the differing rates of inflation in the U.S. and Germany and see how much variation is left. The inflation-adjusted exchange rate is called the real exchange rate and we can think of the unadjusted exchange rate as the nominal exchange rate. We use the CPIs of the two countries, denoted CPI^{US} and CPI^{G}, in the formula,

$$\textit{Real DM/\$ Exchange Rate} = \textit{Nominal DM/\$ Exchange Rate} \bullet (CPI^{US}/CPI^{G}).$$

Suppose again that the cost of living in the U.S. doubles but that in Germany stays the same. As we saw above, PPP implies that the *doubling of the* CPI^{US} should be accompanied by a *halving of the DM/$* exchange rate. If that happens, the *real* DM/$ exchange rate will be unchanged as we see here:

$$\textbf{\textit{New}}\ \textit{Real DM/\$} = \textbf{\textit{New}}\ \textit{DM/\$} \bullet (\textbf{\textit{New}}\ CPI^{US}/CPI^{G}$$

$$= (\textbf{(1/2)} \bullet \textbf{\textit{Old}}\ \textit{DM/\$}) \bullet (\textbf{2} \bullet \textbf{\textit{Old}}\ CPI^{US}/CPI^{G})$$

$$= (\textbf{\textit{Old}}\ \textit{DM/\$}) \bullet (\textbf{\textit{Old}}\ CPI^{US}/CPI^{G})$$

$$= \textbf{\textit{Old}}\ \textit{Real DM/\$}$$

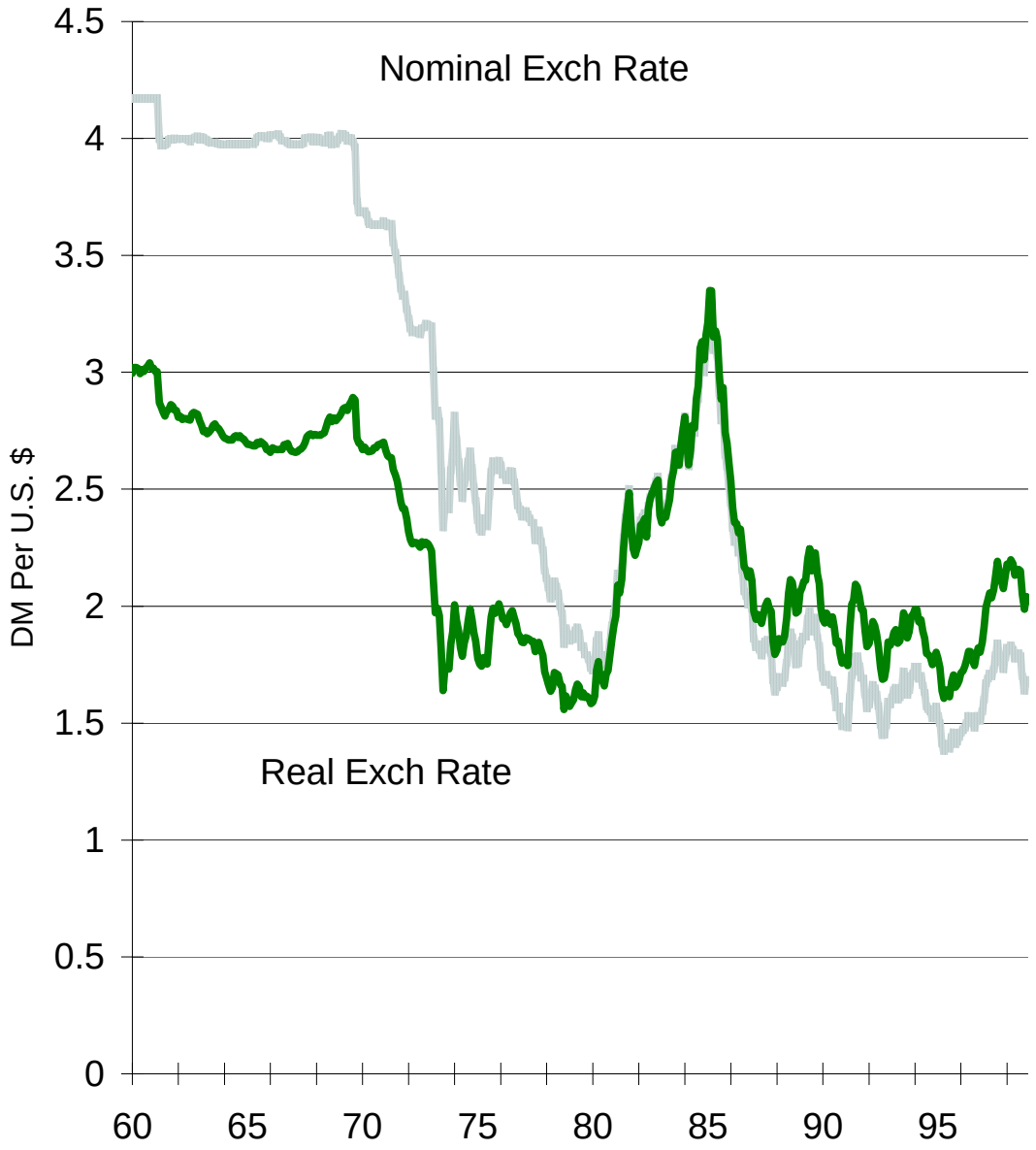
This example illustrates the following general result: if PPP holds exactly, then the real exchange rate remains constant through time. Any variation in the real exchange rate reflects a departure from PPP and therefore reflects the influence on the exchange rate of factors other than differing inflation rates.

Figure 12.3 plots the real and nominal DM/$ exchange rates. The two CPIs share the same base period, 1982-84, in which they are both equal to 100 by definition. Like the CPI, the real exchange rate is a relative rather than absolute measure that is anchored to its nominal counterpart in the base period. That explains why the real exchange rate and nominal exchange rates come together in 1983.

We see in Figure 12.3 that the real exchange rate is not constant, implying that PPP does not hold *exactly*. Evidently, many items in the CPI market basket are more like apartments than hamburgers; they cannot be readily transported from one country to another. But we also see that the real exchange rate has moved much less than the nominal rate, implying that differing inflation rates do account for much of the weakness of the dollar over this period.

We are still left with the puzzling surge in the real value of the dollar relative to the DM that occurred in the mid 1980s. That is what we will try to explain in the next section.

Figure 12.3: Nominal and Real DM/$ Exchange Rates



Insights from the Real DM/$ Rate

To help us understand and apply the real exchange rate, it is useful to think of it as the relative cost of the consumer's market basket in the U.S. as compared to Germany. Note that the real exchange rate can be rearranged as,

$$\textit{Real DM/\$} = \textit{DM/\$} \bullet (CPI^{US}/CPI^{G}) = [CPI^{US}] \,/\, [CPI^{G}/(\textit{DM/\$})]$$

The numerator in the last expression, CPI^{US}, can be thought of as the cost of the market basket when purchased in the U.S. in dollars. The denominator, CPI^{G}/(DM/$), can be thought of as the cost of the market basket in Germany in terms of U.S. dollars that have been converted to DM. Therefore, when the real DM/$ rate falls, it means that goods have become less expensive in the U.S. relative to Germany.

Now we see why the low level of the *real* DM/$ rate in the late 1990s lead many economists to believe that the U.S. is more competitive with Germany in world markets. Potential customers in Brazil or Singapore will find that goods are cheaper to buy in the U.S. than in Germany, and indeed U.S.-made cars have made rapid inroads in both U.S. and foreign markets at the expense of German car-makers. Recognizing this shift in costs, BMW built a plant in South Carolina and Mercedes Benz is producing its new SUV in Alabama. And, the parent company of Mercedes, Daimler Benz bought the Chrysler Corp. in 1999.

With another simple rearrangement of the formula for the real exchange rate, we can show that the real DM/$ rate is also equivalent to the *relative* purchasing power of the US$ in Germany compared to its purchasing power in the U.S. We can write:

$$\textit{Real DM/\$} = \textit{DM/\$} \bullet (CPI^{US}/CPI^{G}) = [(\textit{DM/\$})/CPI^{G}] \,/\, [1/CPI^{US}]$$

$$=$$

Purchasing power of US$ in Germany/Purchasing power of US$ in U.S.

To see why this makes sense, recall from Chapter 4 that $1/CPI^{US}$ is the purchasing power of the dollar in the U.S, and the higher the CPI, the less will one dollar buy. Now let's convert that dollar into DMs at the exchange rate and see what the purchasing power of that dollar is in Germany. That will be $(DM/\$)/CPI^{G}$. The ratio of the latter to the former gives us the relative purchasing power of the U.S. dollar in Germany as opposed to its purchasing power in the U.S.

Thus, the decline in the real DM/$ exchange rate that we have seen since 1985 means that the U.S. dollar has lost purchasing power in Germany even more rapidly than it has in the U.S. This is consistent

with the observation that German cars and other consumer goods have become much less competitive in the U.S. market since 1985, with the sales of some formerly strong sellers, such as Porsche cars, falling to a fraction of their 1980s level.

Exercises 12.3

A. An American family that had visited Germany in 1984 returned in 1988. They were surprised at how the cost of a vacation in Germany relative to the U.S. had changed in those eight years. Were they pleasantly or unpleasantly surprised? How does the change in the real exchange rate over that period give you a basis for answering the question?

B. In what direction have real exchange rates for the U.S. dollar moved against major currencies? How do you think that is likely to show up in patterns of tourism internationally? Does your observation of the nationality of tourists here and abroad support that prediction?

12.4 Why Do Real Exchange Rates Fluctuate?

The value of the U.S. dollar rose sharply in the period 1981-1985 against all major currencies, the DM/$ rate doubling in real as well as nominal terms. What could explain such dramatic changes?

Let's think about why foreigners buy U.S. dollars. They buy U.S. dollars in order to buy U.S. goods and also in order to buy U.S. assets. It seems clear that dollars were not in demand by foreigners buying U.S. goods in the mid 1980's since that was a time of rapidly widening US trade deficits. Looking back at Figure 5.10 we see that U.S. exports were stagnating while imports were soaring during that period.

Could dollars have been in demand by foreigners wanting to buy U.S. assets? Recall that the real rate of interest on U.S. Treasury bills, plotted in Figure 4.5, jumped in 1981 and remained very high. In Chapter 4 we attributed that increase in real interest rates to the burgeoning federal budget deficit. The U.S. Treasury was obliged to pay higher real interest rates on its bonds and bills to induce people to buy more of them. Foreigners were attracted by these higher real interest rates too, and purchased large quantities of U.S. dollars to buy U.S. Treasury securities.

As this increased demand for U.S. dollars pushed up the real exchange rate, U.S. goods became relatively expensive on world markets. Foreign goods, on the other hand, were relatively cheap for Americans to buy with their more valuable dollars. The effect of the high real exchange rate in the mid 1980s was therefore a decline in U.S. exports and a rise in imports to the US. This is how the trade deficit was caused by the

federal budget deficit, and it is the real exchange rate that links those twin deficits together.

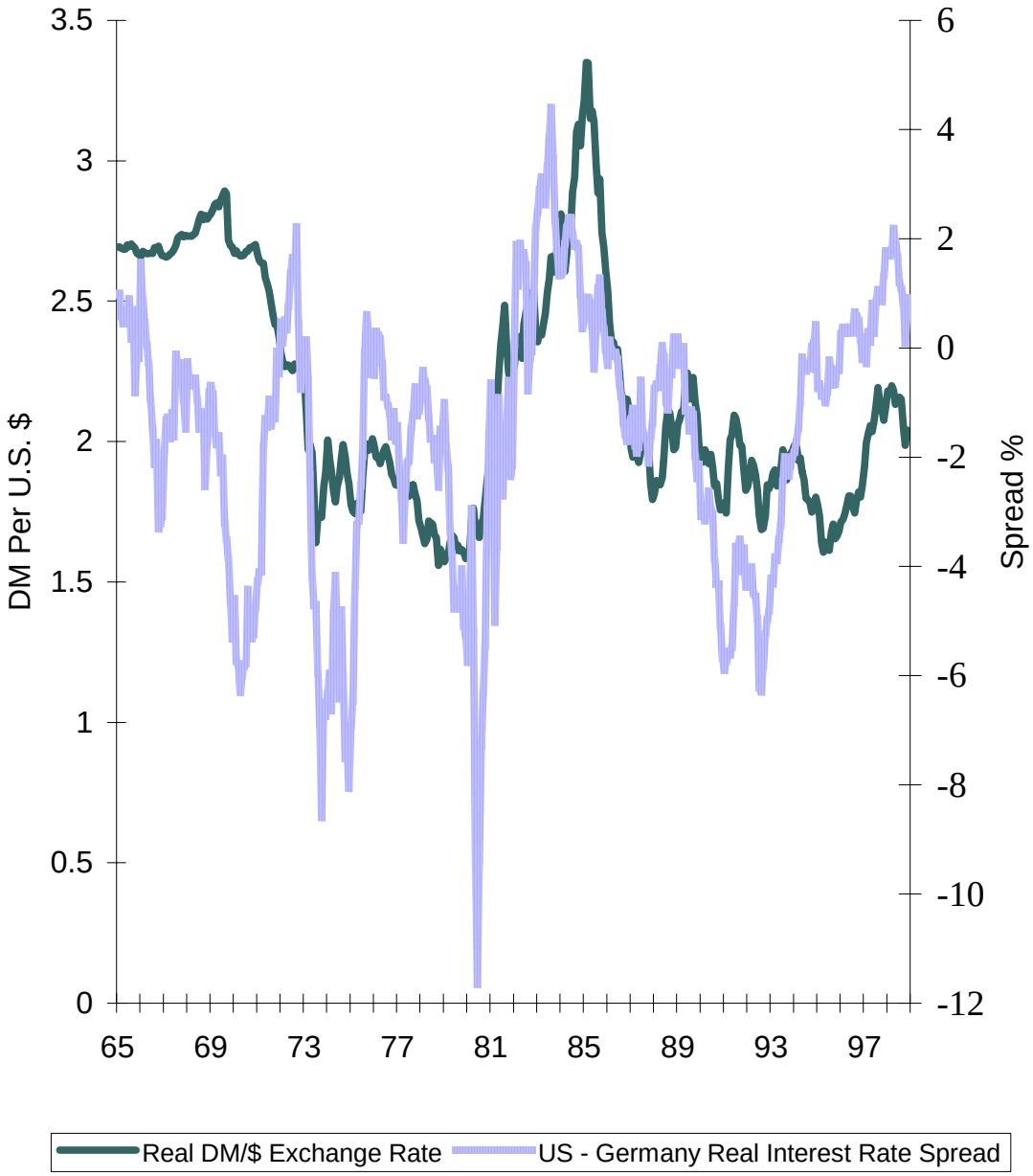
Let's check if we can see the relationship between the real interest rate and the real exchange rate in the data. Since investors are constantly *comparing* real rates of interest across countries, it is the *difference* between real rates in the U.S. and Germany that is important. Figure 12.4 plots the real DM/$ exchange rate along with the difference between ex ante real short term interest rates in the two countries.

Notice that during the Bretton Woods System of fixed exchange rates, there is little relation between the two variables, but that a closer relationship emerges in the 1970s, as governments abandoned their attempts to fix exchange rates. An unusually large spread between U.S. and German real interest rates did emerge in the early 1980s and that coincided with the sharp rise in the dollar. As the spread between real interest rates then declined, the U.S. dollar declined too.

The early 1990s were a period when real interest rates were relatively high in Germany. That reflected efforts by the Bundesbank, the German central bank, to stop inflation that developed after reunification caused a temporary increase in Germany's money supply. Notice that the resulting negative differential between U.S. and German real interest rates is associated with a further decline in the U.S. dollar against the DM as we would expect.

The behavior of the DM/$ rate in the 1990s was not fully explained by real short term interest rates. The dollar was weak in 1993-94 in spite of a shift in the real interest rate spread in its favor. The dollar finally strengthened in 1997, but was not as buoyant as we would expect on the basis of the real interest rate differential alone.

Figure 12.4: The Real DM/$ Exchange Rate and U.S. & Germany Real Interest Rate Spread



Should Countries "Defend" Their Currency?

The fact that real interest rates affect exchange rates means that monetary and fiscal policies are important factors in the foreign exchange markets. Sometimes policies are adopted with the specific intent of influencing the exchange rate.

In the early 1990s exchange rates among European currencies were fixed in preparation for adoption of a single currency within the European Community. When the German Bundesbank raised interest rates sharply in 1992, putting upward pressure on the DM, other European countries were obliged to followed suit to maintain their fixed exchange rate with the DM. At one point, the Bank of Sweden raised its overnight rate to 500% to "defend" the Krona! Britain and Italy chose to devalue their currencies rather than push interest rates higher and risk serious damage to their economies. Indeed, Sweden became mired in a protracted recession. The move towards a common European currency did not get back on track until 1999 when the Euro was launched.

This episode illustrates the principle that it is impossible to have simultaneously 1) free international movement of capital, 2) fixed exchange rates, and 3) independent monetary policy. The European countries had 1) and 2) until the Bundesbank's actions made them acutely aware that they had lost the third. Given the choice, they abandoned 2) to regain 3). The U.S. today has 1) and 3), but at the cost of having to let the market determine the exchange rate. Under the Bretton Woods System, many countries found that they had to impose controls on the movement of capital to preserve an independent monetary policy. No wonder this mutually exclusive trio is often called the "unholy trinity" of monetary policy.

Exercises 12.4

A. During 1992 the Bundesbank pursued a vigorous anti-inflation policy which raised the level of real interest rates in Germany. At the same time the US Federal Reserve was pursuing a policy of trying to stimulate the US economy as it struggled to recover from recession. Explain how the Fed's policy influenced the differential between the real interest rates of the two countries and, consequently, the real exchange rate.

B. The major continental countries of Europe have joined in a currency union and all agreed to adopt the Euro as their common currency. What are some of the potential advantages of their doing so? What do individual countries give up in terms of policy flexibility by doing so?

12.5 International Trade

Trade between groups of peoples, whether tribes or nations, is as old as the human race. Archeologists have found stone tools in pre-historic sites made of materials quarried many hundreds of miles distant. Why has trade been such an enduring feature of human activity? Should we today encourage trade and welcome its growth, or does it threaten our well-being?

Nations trade for the same reason that we don't all make our own shoes: specialization makes possible a much higher standard of living. To see why trade makes the traders better off, recall Robinson Crusoe and Friday on their island and imagine that they live on fish and coconuts. They can each spend some time gathering coconuts and some time fishing, or they can each specialize in one of the two activities and meet at the end of the day to trade fish for coconuts. Would they find it advantageous to specialize, and if so, which should each specialize in?

If Crusoe is a superb fisherman and a lousy tree climber while Friday is the opposite, then it is easy to see that Crusoe should stick to fishing and Friday to coconut gathering. That way they would each make best use of their absolute advantage in each activity. What is perhaps surprising is that the benefits of specialization and trade are still there if Friday is much better at both activities! According to the principle of comparative advantage, each should specialize in the activity in which he has the *lowest opportunity cost*.

To see how comparative advantage works, imagine that Friday can catch four fish per day or gather eight coconuts per day. Evidently, it takes him twice as long to catch a fish as it does to harvest a coconut. Friday can mix his activities so that he can also produce three fish and two coconuts, or two fish and four coconuts, or one fish and six coconuts. Notice that Friday's opportunity cost of producing one fish is two coconuts, since to produce one more fish his output of coconuts drops by two. Similarly, his opportunity cost of producing one coconut is half a fish.

The production possibilities open to Friday are portrayed in Figure 12.5 as the gray line.

Crusoe is an Englishman educated at Oxford University where he received the equivalent of our MBA, so he has almost no practical skills. He can catch only three fish per day if that is all he does or instead can gather three coconuts. His production possibilities are illustrated by the dashed line in Figure 12.5.

We see that Crusoe's opportunity cost of producing one fish is one coconut, since to produce one more fish he must sacrifice the production of one coconut. Similarly, his opportunity cost of producing one coconut is one fish.

The Principle of Comparative Advantage

The principle of comparative advantage says that each agent in the economy should specialize in the activity in which they have the lowest opportunity cost. This means that Crusoe should specialize in fishing because his opportunity cost is only one coconut while Friday's is two, and Friday should specialize in gathering coconuts because his opportunity cost only half a fish while Crusoe's is one fish.

They will need to agree on a price for fish in terms of coconuts, or vice versa, at which Crusoe will trade his fish for Friday's coconuts at the end of the day. That price must be higher than one coconut per fish, or else Crusoe would be better off producing coconuts for himself. The price must be lower than two coconuts per fish, or else Friday would be better off producing his own fish. The price must be between their opportunity costs for both to find trade attractive, say 1.5 coconuts per fish. At that price, Friday can then get a fish by giving up only 1.5 coconuts in trade instead of 2 by catching it himself. Crusoe can get 1.5 coconuts for a fish in trade instead of only 1 by gathering it himself.

That situation is illustrated in Figure 12.6 where the dark gray line shows Friday's trading opportunities ranging from keeping all the coconuts he produces to trading away all but two of them. At every point corresponding to trade, Friday has more of both fish and coconuts to consume. Similarly, Crusoe's trading opportunities are the solid black line, and trade also allows him to increase his consumption of both goods. Both people are made better off by specializing and then trading; these are the gains from trade.

As simple as it seems, the principle of comparative advantage is one of the most powerful ideas in economics. It was first articulated by the English economist David Ricardo in 1817 and is still the primary basis for the advocacy of free trade between nations. There is perhaps no position that enjoys broader support among economists than that international trade should be free and open. Why not spread the gains from trade as widely as possible? Economists since Ricardo have found the case for free trade compelling.

Figure 12.5: Without Trade, Crusoe's and Friday's Choices Are Limited To Their Own Production Possibilities

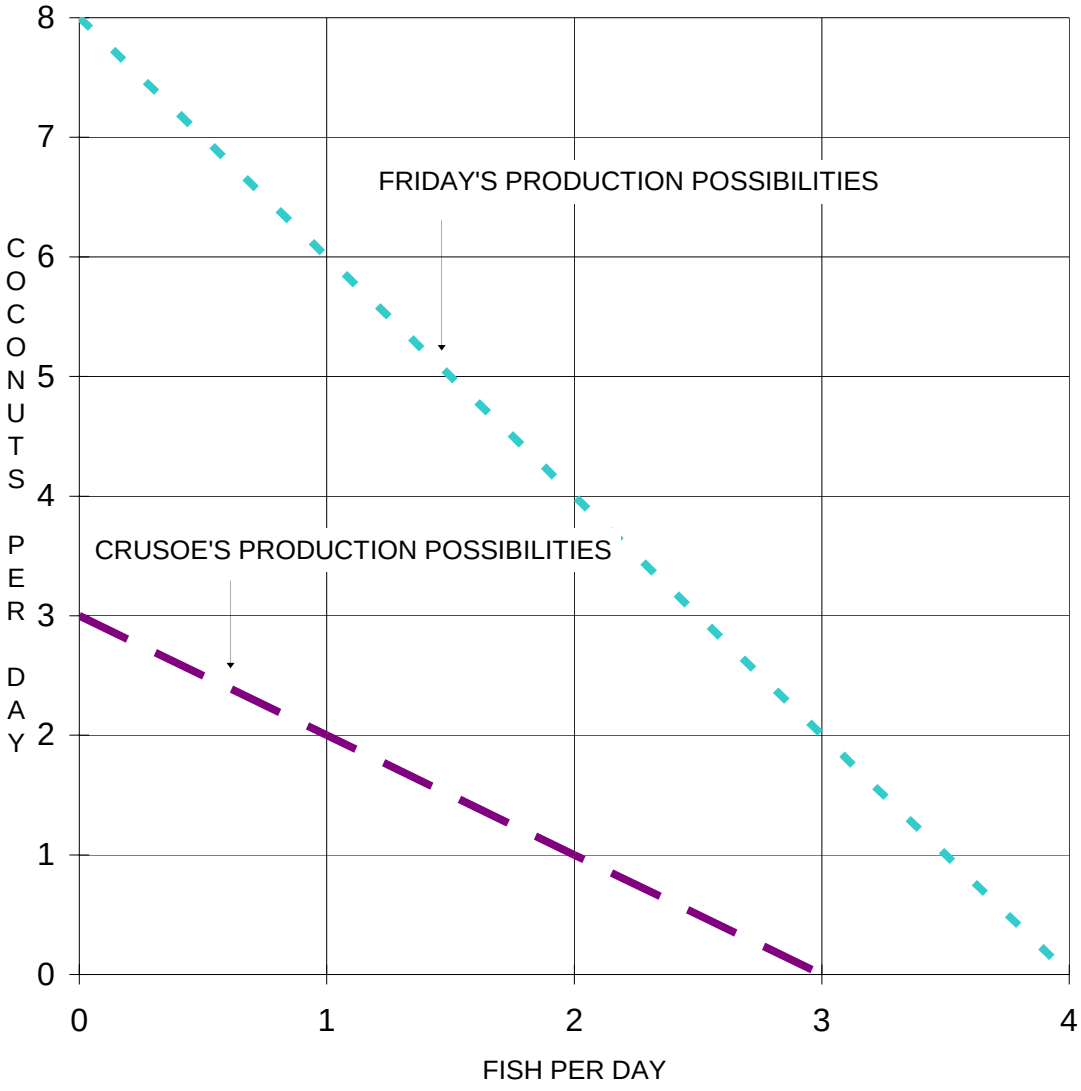
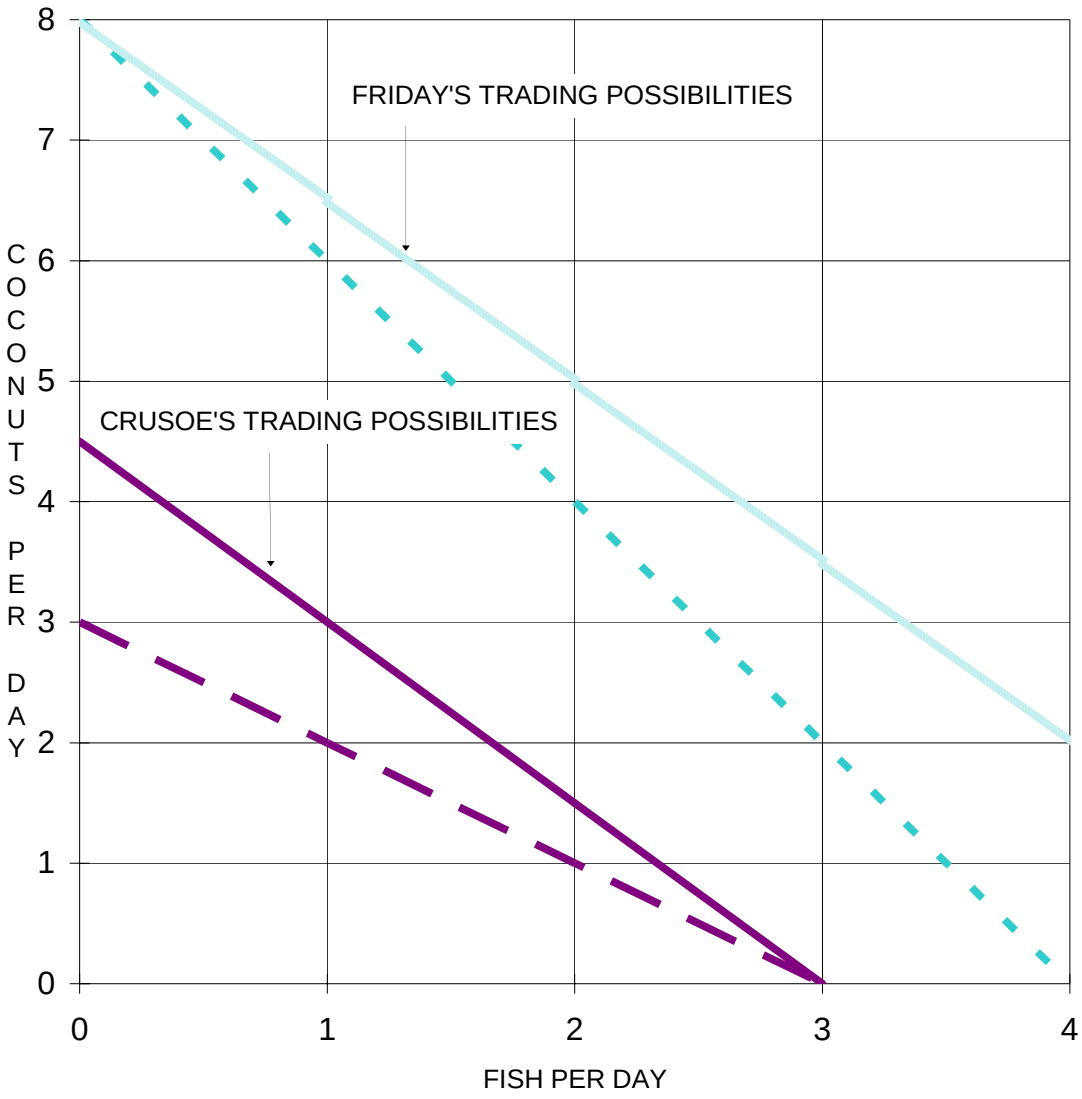


Figure 12.6: Trading Enlarges The Consumption Possibilities For Both Crusoe and Friday



Trade Policy in the Real World

In reality, governments put many obstacles in the way of free international trade, such as tariffs, import quotas on certain goods, and licensing requirements. Economists have usually argued against these trade barriers, but they persist. Why? Tariffs are a source of tax revenue that is relatively easy to collect. More important is that special interest groups lobby governments against allowing imports that harm their private interests. Agricultural lobbies have been particularly successful in getting government to restrict access by foreign producers in order to keep their prices artificially high. U.S. restrictions on sugar imports and the Japanese prohibition on rice imports are current examples. While the domestic producer of the protected good benefits from protection, the consumer is harmed by having to pay more and society is denied the gains from trade.

Arguments against free trade have also been based on national security considerations and the idea that a country can develop new industries only if it protects them from foreign competition during their "infancy." However, the spectacular success of the European Common Market, which eliminated most barriers to free trade within Europe following World War II, has provided a model for negotiating other agreements. These have included GATT (the General Agreement on Tariffs and Trade) and NAFTA (North American Free Trade Agreement) to reduce barriers and encourage freer trade. The latter has lead to explosive growth in trade across the boarders of Canada, the U.S. and Mexico, as well as significant strains as patterns of specialization change in response to new competition and opportunities. The World Trade Organization, or WTO, has major new talks underway to try to resolve points of conflict involving intellectual property rights (critical in the age of computer software and the Internet), agricultural standards, and numerous environmental and labor issues.

Perhaps the argument heard most often against free trade is that it costs American jobs. When we import cars assembled in Mexico, the argument goes, it costs the jobs of US auto-workers. The trap that many fall into here is failing to distinguish between jobs in the whole economy and particular jobs. The emergence of an auto industry in Mexico and the import of some of those autos into the U.S. reduces the demand for workers in the U.S. auto industry. However, the sale of Mexican-made cars in the U.S. puts US dollars into Mexican hands. Those dollars are not used in Mexico; they will be spent in the U.S. The displacement of auto workers by auto imports is easy to see; jobs created by new demand from Mexico as a result of the Mexican auto industry are not so easily seen.

This is not to say that changing patterns of trade do not impose high costs on individuals and firms that have invested in specialized technologies and skills and find their value reduced by new competition.

But when the dollars come back home they also create new opportunities for U.S. industry and workers.

Exercises 12.5

A. Identify several issues of trade policy that are currently being debated in Congress and in the press and summarize the positions and arguments on the two sides.

B. What are some of the issues being debated by the WTO? What are some of the issues being raised by critics of the WTO? Discuss.

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END.