TABLE 21-3 Unit Labor Costs in Manufacturing
(Dollar index, 1992 = 100)

	UNITED STATES	GERMANY	JAPAN	CANADA
1960	—	11	11	32
1970	—	27	15	35
1985	90	42	50	70
1990	95	88	83	99
1995	97	113	140	85

Source: U.S. Department of Labor, *Monthly Labor Review,* November 1996.

EXTERNAL COMPETITIVENESS

PPP measures are closely related to the behavior of a country's competitiveness in external trade. A decline in a country's relative price level makes the country's goods relatively cheaper and thus more competitive. In Table 21-3 we show unit labor costs in manufacturing measured in U.S. dollars for several countries.

The data make it clear that nominal exchange rates affect unit labor costs in dollars. In 1985, when the dollar peaked, Germany and Japan had very low costs in dollars compared, say, to 1990, by which time the dollar had weakened considerably. Thus *nominal exchange rate movements clearly affect competitiveness.*

21-5

INTEREST DIFFERENTIALS AND EXCHANGE RATE EXPECTATIONS

A cornerstone of our theoretical model of exchange rate determination was international capital mobility. In particular, we argued that with capital markets sufficiently integrated, we would expect interest rates to be equated across countries. How does this assumption stand up to the facts?[17] In Figure 21-9 we show the U.S. federal funds rate and the money market rate in Germany. Obviously, these rates are not equal. How do we square this fact with our theory?

EXCHANGE RATE EXPECTATIONS

Our theoretical analysis was based on the assumption that capital flows internationally in response to nominal interest differentials. For example, if domestic interest rates were 6 percent and foreign rates were 10 percent, we would, according to the earlier sections, expect a capital outflow.

However, such a theory is incomplete in a world in which exchange rates can, do, and are expected to change.[18] For example, consider a situation in which the deutsche mark is expected to depreciate by 5 percent over the next year relative to the dollar. With a 5 percent deutsche mark depreciation, the return *in dollars* of investing in Germany is

[17]On capital mobility, see Jeffrey Frankel, "International Capital Mobility: A Review," *American Economic Review,* May 1991.

[18]You may wish to review the material in Chap. 17, "Financial Markets."

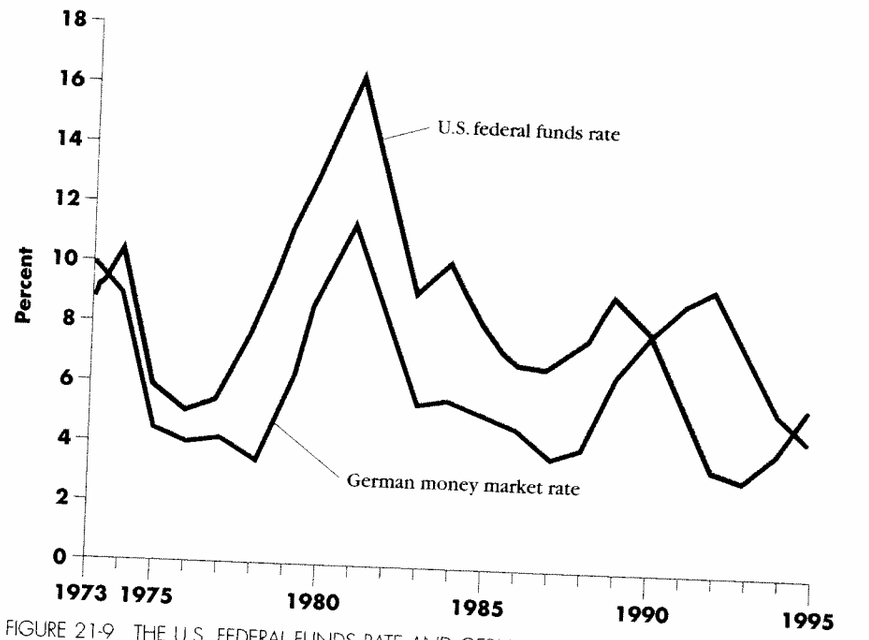

FIGURE 21-9 THE U.S. FEDERAL FUNDS RATE AND GERMAN MONEY MARKET RATE, 1973–1996.
(*Source:* International Financial Statistics Yearbook, *1996, IMF.*)

only 5 percent (= 10 percent − 5 percent). The natural preference is to invest in American bonds, even though the U.S. interest rate is below the German rate.

It is clear, therefore, that we must extend our discussion of interest rate equalization to incorporate expectations of exchange rate changes. Anyone who invests in domestic bonds earns the interest rate i. Alternatively, by investing in foreign bonds, the investor earns the interest rate on foreign bonds, i_f, *plus* whatever she earns from the appreciation of the foreign currency. The total return on foreign bonds, measured in our currency, is then

$$\text{Return on foreign bonds (in terms of domestic currency)} = i_f + \Delta e/e \qquad (5)$$

Of course, since the investor does not know at the time she makes her decision by how much the exchange rate will change, the term $\Delta e/e$ in equation (5) should be interpreted as the *expected* change in the exchange rate.

The introduction of exchange rate expectations modifies our equation for the balance of payments. Now capital flows are governed by the difference between our interest rate and the foreign rate adjusted for expected depreciation: $i - i_f - \Delta e/e$. An increase in foreign interest rates or an expectation of depreciation, given our interest rates, would lead to a capital outflow. Conversely, a rise in our rates or an expectation of appreciation would bring about a capital outflow. We thus write the balance of payments as

$$BP = NX\left(Y, \frac{eP_f}{P}\right) + CF\left(i - i_f - \frac{\Delta e}{e}\right) \qquad (6)$$