

Lectures in Macroeconomics

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Chapter 7

Foreign Exchange Rates

We turn now to a more detailed look at exchange rates, with the simple message that real exchange rates are highly variable. Examples include Mexico in 1981-82, when the peso collapsed, the real appreciation of US\$ in the 1980s and the Japanese autos in early 1993, when the yen rose sharply.

Classical Theory of Exchange Rates

The Classical theory of exchange rates is basically the quantity theory of money and the theory of purchasing power parity, or PPP, which we looked at in Chapter 3 of these lectures. The first ingredient is the quantity theory, which tells us that prices of goods reflect stocks of money:

$$P = MV/Y$$

$$P^f = M^f V^f / Y^f .$$

With V's fixed (the premise of the quantity theory) and ignoring Y's (just to make things easier), we see that price increases are caused by increases in money M. We saw in Chapter 6 that this is a reasonable approximation over periods of several years or more.

The second ingredient of our theory is PPP, which I'll review quickly. Let us say that the price of US goods, measured in dollars, is P, and the price of foreign goods, measured in foreign currency units, is P^f (f for foreign), and the spot exchange rate, measured as the dollar price of one unit of foreign currency, is S. Then the dollar price of foreign goods is SP. The logic behind PPP is that prices of comparable goods should not be different in two locations, so we should see (at least approximately)

$$P = S P^f .$$

or

$$S = P / P^f \tag{1}$$

A minor variant of this is

$$RER = S P^f / P = 1$$

i.e, the real exchange rate is constant if the PPP holds. Equation (1) in growth rates is

$$(S_t - S_{t-1})/S_{t-1} = (P_t - P_{t-1})/P_{t-1} - (P_t^f - P_{t-1}^f)/P_{t-1}^f$$

so that the rate of depreciation of the currency is equal to the difference between the two countries inflation rates. We'll look at this relation in the data shortly.

Putting the two ingredients together, we get

$$S = (M/M^f) (V/V^f) (Y^f/Y) \quad (2)$$

Roughly speaking, we see that our currency weakens (S rises) if we issue more money than the other country (M rises more than M^f).

There's no question that both ingredients are poor descriptions of reality over short time periods of time. What may surprise you is that they do considerably better over longer periods. Figure 1 illustrates the first ingredient, the relation between exchange rate changes and differences in inflation rates. The figure reports average annual growth rates for several countries for the period 1970-90. The theory says they should be the same, and in fact they're pretty close: countries with high inflation rates also experienced the greatest depreciation of their currencies. In Figure 2 we turn to the relation between depreciation and money growth. Applying our old trick with logarithms to (2), we see that changes in the exchange rate are approximately equal to differences in money growth rates:

$$(S_t - S_{t-1})/S_{t-1} = (M_t - M_{t-1})/M_{t-1} - (M_t^f - M_{t-1}^f)/M_{t-1}^f$$

The approximation is based on two things: that velocities are constant, and that differences in output growth across countries are small (so we don't miss much by ignoring them, even though in principle they should be there). We see in Figure 2 that this is pretty good, too, for averages over the same twenty-year period.

Fixed Exchange Rate Regimes: Mexico 1982

The story behind PPP is that exchange rates should eventually lead to comparable prices of goods in different countries. If goods are more expensive in Germany than the US, a fall in the value of the DM will bring them back into line. The evidence is that this tendency asserts itself eventually.

When the exchange rate is fixed by government decree, as it is in many countries around the world, this mechanism operates a little differently. We're going to look at the collapse of the Mexican peso in 1982 as an example of what can happen. The short story is that the peso collapsed in 1982. Between early 1977 and early 1980, the peso traded in the neighborhood of 23 pesos per dollar, a level enforced by the Banco de Mexico, the Mexican central bank. We'll return shortly to how they did this. Through January of 1982, the rate crept up, hitting 26.6 the end of the month. On February 5, President Lopez-Portillo announced that the central bank would defend the peso "like a dog,"

presumably to assure financial markets that the government would not let the peso collapse. On February 19 this effort was abandoned, and the peso immediately fell 29 percent against the dollar, reaching 45 pesos to the dollar by the end of the month. The peso continued to fall throughout the decade, and now trades at about 3000 to the dollar. The complete history of the peso for this period is illustrated in Figure 3.

So what happened?

Fundamentals. There are several dimensions to this question, but the most obvious one is that Mexico's fixed exchange rate was inconsistent with its other policies. You can see in Figure 4 that while Mexico attempted to fix its currency, its monetary policy led to much more rapid growth in its stock of money than in the US. This is illustrated by the "dash-dot" line in the figure, denoting the ratio of the money stock in Mexico to that in the US. As a result, prices in Mexico rose more rapidly than those in the US, with Mexico averaging between 20 and 30 percent inflation between 1979 and 1981. The dashed line in Figure 4 depicts the sharp rise in the ratio of Mexican prices to American. By the end of 1981, prices had risen substantially more in Mexico than the US, leading many Mexicans to shift their spending and investments outside the country. By February 1982, the discrepancy in prices proved to be indefensible, and the peso imploded. In short, the enormous departure from PPP was too much for the system to withstand, so the exchange rate collapsed. You can see in the figure that the decline in the peso brought prices back into line with PPP (for a while).

Fixing the Exchange Rate. Another dimension to our question is the central bank's behavior. You might think that the central bank can simply announce an exchange rate, but a little thought will tell you it's not so easy. To take a slightly frivolous example, I could claim that my apartment is worth 2 million dollars, but if no one is willing to buy it for that price it's not clear that the statement means anything. For related reasons, the central bank must back up its claim to fix the exchange rate.

In the simplest version of a fixed exchange rate, the central bank supports the price by buying and selling as much foreign currency as people want at the set price. If people want dollars, the bank supplies dollars, if they want pesos, the bank supplies pesos. As with monetary policy, the central bank does this by changing the composition of its balance sheet. The Banco de Mexico might have had a balance sheet something like this in late 1981:

<u>Assets</u>		<u>Liabilities</u>	
FX Reserves	5	Monetary Base	100
Other	115	Bonds	20

We could do this in any units we like, but let's say the units are billions of US dollars. The numbers (which I made up) reflect the fact that there is not much of a government bond market in Mexico--it's primarily a captive market of banks, who are required to hold government securities. The 5 under "FX Reserves" is holdings of dollar-denominated assets (largely US government securities). If people want to buy, say, 2 billion more US dollars, this would show up as a decline of 2 billion

in FX reserves and a corresponding decline in the monetary base (Mexican currency), as people trade in their pesos for dollars.

The Banco had some trouble backing up the exchange rate policy in February 1982, when a run on the peso depleted almost half of its reserves (see Figure 5). If they ran out of reserves, of course, they would be unable to deliver on their pledge to meet market demand at the current price. They compromised by letting the peso fall, which relieved some of the pressure for a time. In August of 1982, renewed pressure on the peso lowered reserves further. This time the bank outlawed many fx transactions, thereby taking the exchange rate out of the hands of the market. As the jargon would have it, the peso was no longer "convertible" into foreign currency without explicit permission from the central bank. In that sense, the official price was like the 2m claim for my apartment: virtually meaningless, since you could not generally buy or sell at that price. Those with permission were able to buy dollars cheaply, while others paid a much higher prices in the parallel or black market. These exchange controls caused serious problems for both Mexican business and foreign businesses operating in Mexico, since without foreign currency they could not import foreign goods. And since foreign investors could not be assured of repatriating their earnings, many avoided investing in the first place. Many Mexicans, in fact, got their own assets out of the country ahead of time, sparked by their fear (subsequently borne out) that currency controls would make it impossible to do later.

To summarize: el Banco tried to set the exchange rate at a level that was wildly inconsistent with its fundamental PPP value. When this didn't work, they let the peso fall and limited FX transactions.

Lessons. This series of events is (perhaps surprisingly) relatively common, and suggests some lessons for businesses operating in foreign countries.

1. Fixed exchange rates aren't fixed forever. They simply substitute infrequent large movements for more frequent smaller movements. If you get caught, they can kill you. Anyone holding pesos on February 19, 1982, lost 29 percent of their dollar-equivalent value in a day, and more after that.
2. Operate in hard currencies when you can. One strategy for dealing with such risk is to do business in dollars, or some other hard currency. US banks, for example, denominated their loans in dollars, so the collapse in the peso did not hurt them on its own. But the collapse of the economy that went with the fall in the peso did hurt them, with the result that most loans were repaid only in part. Mexicans, too, tried to switch to dollars, but government restrictions made this difficult to do on a large scale.
3. Enter after the fall. A colleague of George Soros's said once that the best opportunities come when situations change from "disaster" to "bad". Anyone entering the Mexican market in 1982 or 1983 had, at least, the advantage of buying low. With Spring break coming up, you might use the corollary: the cheapest vacations are right after the currency collapses.

Exchange Rates in the Short Run

Although the theory of PPP works moderately well for long periods of time (decades?), it is a relatively poor description of shorter term movements. An example of such evidence, similar to that for Mexico, is Figure 6, where we see real exchange rates for the US vs Germany, Japan, and Mexico. In the theory of PPP [equation (1)] this should be constant. In the data, it is not.

For Germany we see that the exchange rate is flat until the early 1970s, as a result of the Bretton Woods fixed exchange rate system in place at the time and the small differences in inflation between Germany and the US in the 1960s. But with the collapse of the Bretton Woods system, the DM rose and prices of German goods rose with them. The log scale of the figure tells us that German goods rose about 40 percent relative to American goods between the beginning of 1971 and the end of 1973. The 1973-93 period is remarkable for enormous fluctuations in both directions, with a sharp fall in the DM in 1980 and a sharp rise in 1985 as highlights.

The graph for Japan tells us that Japanese goods have gotten progressively more expensive than US goods over the last thirty years, although again there have been significant ups and downs along the way (and note that the scale is larger than that for Germany). One issue that comes to mind is the Japanese trade surplus. Although this has some connection with the exchange rate, the graph tells us that the rising surplus has occurred while prices of Japanese goods have risen, on average, when most people think the connection should go the other way. The Clinton Administration, for example, talked up the yen in 1993 and again in early 1995 in the hope that it would bring the Japanese surplus down and reduce the US trade deficit.

Mexico exhibits a boom/bust pattern common among developing countries, with gradual rises in the real exchange rate reversed periodically by sudden collapses in the peso---note the sharp drop in 1976, as well as the collapse in 1982 that we've already examined.

Academics love to quibble about these things (and, to be fair, our quibbling is useful for separating useful statistics from misleading ones), and some of them have suggested that the problem may be that the goods in the CPI's are not comparable. You'll recall that the basis of the theory is arbitrage: if a good is cheaper in one place than another, people will buy more of it and drive its price up until the difference disappears. In fact, we see just that with gold: there is very little difference between the prices of gold in the US, Japan, or Germany. The same is true for some agricultural commodities, but barriers to trade that inhibit arbitrage allow higher prices of sugar in the US and rice in Japan. In general, prices even of comparable goods vary widely internationally. In short, the theory of PPP is a poor theory for the short run. We see enormous fluctuations in real exchange rates, meaning that prices of goods vary widely across countries. Anyone who has visited Japan in the recent past can vouch for that.

What are the reasons for the breakdown of the PPP in the short-run? There are a number of reasons for the failure of PPP:

1. The CPI of different countries are not comparable since they include very different goods.

2. The CPI includes many goods that are not traded (such as services); the PPP will not hold for these goods. For example, a haircut in Bombay might be cheaper than in New York but few New Yorkers would fly to Bombay just to get a haircut.

3. PPP (or the Law of One Price, LOP) holds better for homogenous commodities that are traded internationally (gold, oil, agricultural commodities, raw materials). In these well-developed commodity markets, the goods arbitrage implied by the PPP holds very fast.

4. Even for homogenous goods, the PPP might hold very well: by and large, prices even of comparable goods vary widely internationally. *The Economist* (see the article "McCurrencies: where is the beef?") runs a feature on the prices of Big Macs around the world that makes the same point. The Big Mac is a good example, because McDonald's makes sure that the product is the same everywhere. Yet we see that its price is not the same. [In this reading, the last column, labeled over/under valuation, is the percent deviation of the German real exchange rate from one, with the sign reversed. Thus the +37 for Germany means that Big Macs are 37 percent more expensive in Germany than the US.]

5. If firms can "price discriminate" between domestic and foreign markets, PPP (or Law of One Price) will not hold for homogenous goods. The price of German (Japanese) cars is very different in the US relative to Germany (Japan). Price discrimination is feasible only under some conditions.

6. Finally, if goods are not homogenous (Japanese cars are not the same cars as US cars), the US price in dollars of Japanese cars does not have to be equal to the price in dollars of US cars. Moreover, changes in the nominal exchange rates will affect the relative price of Japanese versus US cars in complex ways that we discuss in the next section.

US - Japanese Auto Makers Competition and the Dollar in the 1980s

We will discuss the role of exchange rate in the competition between US and Japanese car makers in the 1980s. To understand the importance of exchange rate note that the dollar had a dramatic appreciation between 1980 and 1985 and a major depreciation from 1985 to 1989. Specifically:

Exchange Rates:

1980:

$$S_{Y/\$} = \text{Yen/Dollars} = 200$$

$$S_{\$/Y} = \text{Dollars/Yen} = 0.005$$

1984:

$$S_{Y/\$} = \text{Yen/Dollars} = 250$$

$$S_{\$/Y} = \text{Dollars/Yen} = 0.004$$

1989:

$$S_{Y/\$} = \text{Yen/Dollars} = 139$$

$$S_{\$/Y} = \text{Dollars/Yen} = 0.0072$$

The data above show that the \$ appreciated relative to the Yen by 20% between 1980 and 1984; and depreciated relative to the Yen by 44% between 1984 and 1989.

Let us consider now the effects of exchange rate on the pricing policies of domestic (US) and foreign (Japanese) car makers.

Consider the competition in the car industry in 1980. Let us suppose that the prices of American and Japanese cars in 1980s were:

Price of a U.S. car in the U.S. in Dollars ($P_{\$}$): \$10,000.

Price of a Japanese car in Japan in Yen (P_{Y^J}): 2 million Yen

These numbers are not exact but are used here for the sake of the exercise.

Since the price of a good is equal to the cost of production times the gross profit margin (mark-up rate, m)

$$\begin{aligned} 2\text{m Yen} &= (1 + \text{profit margin}) \times (\text{production cost}) = (1 + m) \times C = \\ &= (1 + 0.2) \times 1.66 \end{aligned}$$

where

$$m = 0.2 (= 2/1.66 - 1) = 20\%$$

$C = 1.66\text{m Yen}$ (production costs, mostly wages)

The price of a Japanese car exported to the U.S. in Dollars ($P_{\J), given the exchange rate of 1980 was then:

$$P_{\$^J} = P_{Y^J} \times S_{\$/Y} = P_{Y^J} / S_{Y/\$}$$

$$\$ 10,000 = 2\text{m Yen} \times 0.005 = 2\text{m Yen} / 200$$

Suppose that the dollar appreciates by 20%, as it did between 1980 and 1984. Japanese exporters have now two options:

1. Since the dollar has appreciated, they can maintain their Yen prices (2m Yen) and sell the car at a much lower price in the U.S. in this case:

$$P_{\$}^J = P_Y^J \times S_{\$/Y} = P_Y^J / S_{Y/\$}$$

$$\text{\$ } 8,000 = 2\text{m Yen} \times 0.004 = 2\text{m Yen} / 250$$

In this case, the appreciation of the dollar reduces the competitiveness of US cars since now you can import the Japanese cars at a much lower price (20% lower). This loss of competitiveness is the typical effect of a domestic currency appreciation: imported goods become cheaper than domestic goods and the trade balance will worsen as we buy more foreign goods.

So, in this case a 20% appreciation makes foreign good 20% cheaper in the US: there is a full pass-through of the exchange rate to the domestic (US) price of imported goods.

From the Japanese point of view, selling cars in the US at \$8,000 (with the exchange rate at 250) means that they receive in Yen a revenue of 2m Yen so that their profit margins remain the same as before ($m = 20\%$). While their profit margin are not increasing, the benefit of reducing the \$ price of cars in the US is that Japanese cars become cheaper, their demand is higher and the market share of the Japanese in the US market becomes larger.

So, in this case profit margins are constant but market shares are larger for the Japanese car makers.

Note that this is a case where the PPP does not hold since the price of US cars (\$10,000) is different from the price of Japanese cars (\$8,000). Such a failure of PPP is not surprising since the two goods, American and Japanese cars, are not homogenous so that the consumers do not consider the two goods as being perfectly substitutable in demand. If the two goods were homogenous (as in the case of raw materials, oil, gold, agricultural goods) then we would expect that the PPP would hold for them.

2. The second option for the Japanese following the appreciation of the dollar would have been to maintain the \$ dollar price of the cars sold in the US at \$10,000 in spite of the appreciation of the \$. This option implied that the Japanese cars would not become cheaper than US cars and therefore the Japanese would not gain market shares in the US; however the benefit of the strategy was that by selling at \$ 10,000, the profit margin of the Japanese car makers would increase a lot. In fact in this case the revenue in Yen of the sale of a car in the US would be:

$$P_Y^{JUS} = P_{\$}^J / S_{\$/Y} = P_{\$}^J \times S_{Y/\$}$$

$$2.5\text{m Yen} = \$10,000 / 0.004 = \$ 10,000 \times 250$$

Since Japanese cars sold in Japan would still be priced at 2m Yen (P_Y^J) while Japanese cars sold in the US would have a value in Yen equal to 2.5m Yen (P_Y^{JUS}), the Japanese would have much larger profit margins on their US sales. Such a profit margin is equal to the Yen revenue of a US sale divided by the cost of production (C):

Profit margin on the sale of a Japanese car in the US:

$$2.5/1.66 - 1 = 0.51 \text{ (51 \%)}$$

Profit margin on the sale of a Japanese car in Japan:

$$2.0/1.66 - 1 = 0.2 \text{ (20 \%)}$$

Note that this second strategy implied that the Law of One Price would not hold since the price of a Japanese car in the US (\$10,000 = 2.5m Yen) would be much larger than the price of a Japanese car in Japan (2.0m Yen). So, for the second scheme to work it is necessary that the conditions for price discrimination would be satisfied (exclusive dealership, national warranty policy). Otherwise, it would have been optimal for someone to buy Japanese cars in Japan and sell them for less than \$10,000 in the US.

The above is a case where the Law of One Price does not hold (since the price of the same good is different in two different markets); this can happen only if you can price discriminate across different markets.

So, while in the first option following a \$ appreciation (reduce your \$ price to \$8,000) profit margins are constant but market shares are larger for the Japanese car makers, in the second option (maintain your \$ price at \$10,000) market shares would remain constant (as Japanese cars do not become cheaper in the US) but the profit margins from car exports to the US become very large.

Of course a third option that is in between the first two is possible as well: cut somewhat the \$ price of Japanese cars in the US below \$10,000 but not by the full 20% \$ appreciation. In this middle case, profit margin would increase somewhat (but not as much as in option 2) and market share will increase as well (but not as much as in option 1).

In the 1980-1984, Japanese car makers followed mostly the second option (that significantly increased their profit margins). In fact, the quotas on Japanese car exports to the US introduced in 1981 (VER = Voluntary Export Restrictions) implied that the first strategy was not optimal since the quotas did not allow Japanese car makers to increase their market share in the US. Actually, given the presence of numerical quotas on the number of cars to be exported to the US, Japanese car makers moved to upgrade the quality of their car exports to the US. (sell higher value added, higher price, higher quality cars).

Response to the devaluation of the Dollar between 1984 and 1989.

While US car makers lost competitiveness in the 1980-84 period of \$ appreciation, they regained it in the 1985-1989 period in which the dollar depreciated by 44% (the Yen/\$ rate went from 250 to 139).

What were the possible strategies to be followed by Japanese car makers given the \$ depreciation? Suppose that in 1985, the \$ price of Japanese cars was still \$10,000 as Japanese car makers

followed option 2 in the 1980-84 period; suppose also that US cars in the US were also sold at \$ 10,000. Again, Japanese had 2 options following the \$ depreciation:

1. Increase the \$ price in the US by the full amount of the \$ depreciation so as to maintain good profit margins on car sales in the US. In this case:

$$P_{\$}^J = P_Y^J \times S_{\$/Y} = P_Y^J / S_{Y/\$}$$

$$\text{\$ } 14,400 = 2\text{m Yen} \times 0.0072 = 2\text{m Yen} / 139$$

In this case the profit margin on US car sales falls from 50% back to 20% ($2.0/1.66 - 1 = 0.2$ versus the previous $2.5/1.66 - 1 = 0.51$).

The disadvantage of this option is that raising \$ prices is helpful in maintaining profit margins in face of a 44% dollar depreciation but it would lead to an erosion of the Japanese market share in the US as Japanese cars become 44% more expensive than US cars ($\text{\$ } 14,400 > \text{\$ } 10,000$).

Note also that this first option would allow US car makers to increase the price of US cars by some amount since the large increase in the \$ price of Japanese cars gives US a great competitive advantage. If Japanese cars are sold at \$14,400 in the US, US car maker could for example increase their price from \$10,000 to \$12,000. While this increase in US car prices would imply that the US would not gain as large a market share as they would if they maintained their \$ price at \$10,000, this increase would fatten the profit margins of US car makers.

2. The second option for the Japanese would have been to maintain the \$ price of their cars in the US at \$10,000 in spite of the 44% Yen appreciation. This choice would have allowed them to maintain their market share in the US (as their prices would not go up) but at the cost of a huge reduction of their profit margins. In fact this strategy would imply that:

Revenue in Yen of a car sale in US =

$$1.39 \text{ m Yen} = \$10,000 \times 139 = \$10,000 / 0.0072$$

Since the cost of production of a car was 1.66m, this second option implied a huge loss on Japanese car sales to the US.

Now, things were not as bad for the Japanese in this second scenario as major growth in labor productivity in the production of cars in the 1980s led to a reduction of unit labor costs in the production of cars. Also, the upgrading of the Japanese car exports in the early 1980s put Japanese cars in a different quality niche relative to the US cars.

Still, in spite of productivity growth, cost reductions and upgrading, the strategy of maintaining constant the dollar price of Japanese cars in the US in spite of a 44% Yen appreciation was not feasible.

So, a third strategy was the following: increase the \$ price of Japanese cars in the US but not by the full (44%) amount of the Yen appreciation; increasing prices by less than 44% meant that the Japanese would lose some market share but not as much as they would have if they increased their prices by the full 44%.

The advantage of increasing prices by some amount was that some market share would be lost but the profit margins would not be squeezed to zero. For example, increasing the \$ prices by 30% rather than 44% implied that the Yen revenues from US export sales would be:

Revenue in Yen of a car sale in US =

$$1.8\text{m Yen} = \$13,000 \times 139 = \$13,000 / 0.0072$$

If the Japanese cost of production of a car was still 1.66m, this strategy would imply a profit margin of:

$$m = 0.084 = 1.8/1.66 - 1 \text{ (8.4\%)}$$

Since actually, production costs in Japan fell somewhat during the 1980s, a profit margin of 8% could be maintained even with a 20% increase in the \$ price of Japanese cars in the US (instead of a 30% increase); conversely, with falling production costs (say from 1.66m to 1.5m), a 30% price increase in the US would have led to a profit margin of 20% ($0.2 = 1.8/1.5 - 1$).

So the strategy of the Japanese was the following:

- Increase \$ price in the US by as little as possible.
- Reduce production costs through productivity growth (costs cutting) as much as possible.
- Cut the profit margins but minimize the effects on such margins through an optimal mix of price increases and cost reductions. Note that, since in strong \$ years of the early 1980s, the profit margins were very large (above 50%), the Japanese had a large buffer of margins to squeeze, i.e. they could afford not to increase their dollar price by too much because in the early 1980s (when the \$ was strong) they had chosen not to decrease their \$ price and they had therefore significantly fattened their profit margins on US sales.
- Note also that, as the Japanese increased their \$ prices in the 1985-89 period, US car makers increased their \$ prices as well. They did not have to do so: they could have kept their prices constant or increased them very little as a way of gaining market shares at the expense of Japan. However, increasing their prices in sync with the increase in the price of Japanese cars allowed the Big Three to increase their profit margins. However, this pricing policy of the Big Three helped the Japanese to maintain market shares in spite of the increase in the \$ price of their exports to US.

Whether the US car makers made a mistake in the late 1980s or not is open to debate. According to one view, they should have maintained the increase in their prices to a minimum so as to gain market shares over the Japanese even if such strategies implied not increasing by a lot the profit

margins in the short-run. According to another view, they did the right thing in raising their dollar prices and boosting short-run profits even if such strategy implied giving up the possibility of increasing their market shares.

This case study also reveals the complex reasons why the PPP might fail and why the relative price of commodities (the real exchange rate) might be significantly affected by the movements of the nominal exchange rate.

Application: Toyota, 1991-93

As discussed in the previous section, whether we can explain them or not, these variations in international prices are a critical factor in international business. When your home currency rises, citizens may view this as a sign of national strength, but businesses know that their costs have just gone up relative to their foreign competition. The car industry in the 1990s is again a good example. Between April of 1990 and July of 1993, the yen "rose" from 158 yen per dollar to 106, a thirty percent rise in three years. Since Japanese wages didn't fall relative to those in the US, this meant that Japanese exporters, like Toyota, faced a comparable increase in their costs. In the North American market, this gave the Big Three a big competitive advantage, a replay of the situation of the late 1980s.

In early 1993, with the yen strengthening, Toyota had two options in pricing its products for the US market. One option was to stay firm on dollar prices, which meant that the margin on US sales would fall (in dollars, hold prices constant while costs rise). The obvious problem with this option is that it squeezes current operating income. The second option was to raise prices, to maintain the yen value of US car sales. The problem with this one is that US carmakers, whose costs hadn't changed, could then fight with lower prices and gain market share. In the end, Toyota and the other Japanese carmakers had little choice. The Big Three threatened to file anti-dumping suits, which you'll remember from your micro course, and forced them to raise their prices, although the price increases were generally smaller than the rise in the yen. Lest this message be missed by consumers, American manufacturers spread the word about high Japanese car prices with extensive price-based advertising.

If you look a little deeper, you see that Japanese exporters had other strategies they could follow, given enough lead time. One of these is to shift production out of Japan, either by outsourcing components to developing countries in Asia (which they have been doing steadily over the last few years) or by increasing production at North American "transplants." US plants of Japanese companies, for example, are reported to be running at capacity, and are used not only for the US market but for exports to Europe. But there's a limit to this. US plants are not currently able to produce complete cars, with engines in particular imported from Japan. Establishing such a capability would take several years, not to mention the cost.

A deeper analysis of how companies manage foreign exchange risk must wait for other courses, but you can see here that it's an issue that cuts across the complete range of business disciplines (market strategy, financial risk management, manufacturing location, the choice of functional currency for accounting purposes and performance evaluation, and so on).

Summary

1. In the long run, exchange rates generally reflect prices and monetary policies.
 2. In the short run, though, the only certainty is that exchange rates are uncertain.
 3. Adapting to currency movements is one of the central issues facing an international business, even a small one.
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Figure 1. Exchange Rates and Inflation

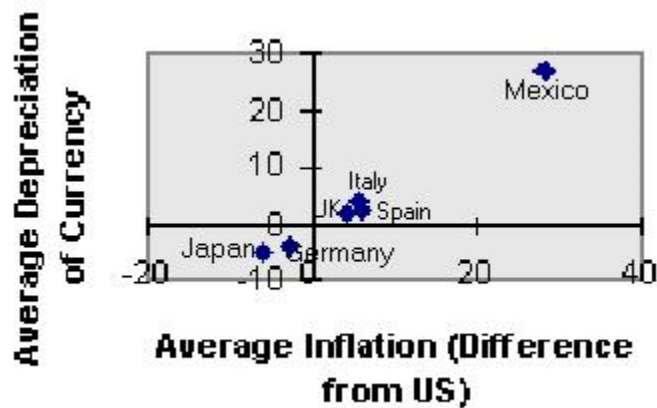


Figure 2. Exchange Rates and Money Growth

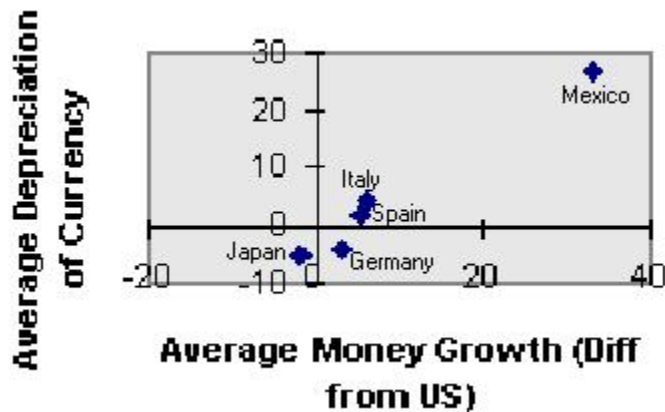


Figure 3
Value of Mexican Peso, 1978-84

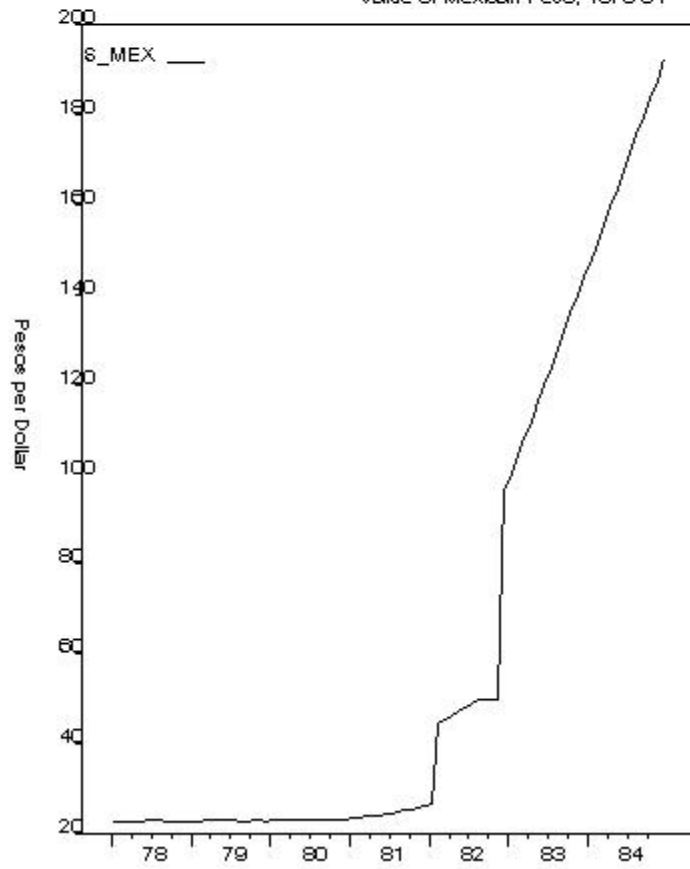


Figure 4
Price Level, Money Supply, and Exchange Rate

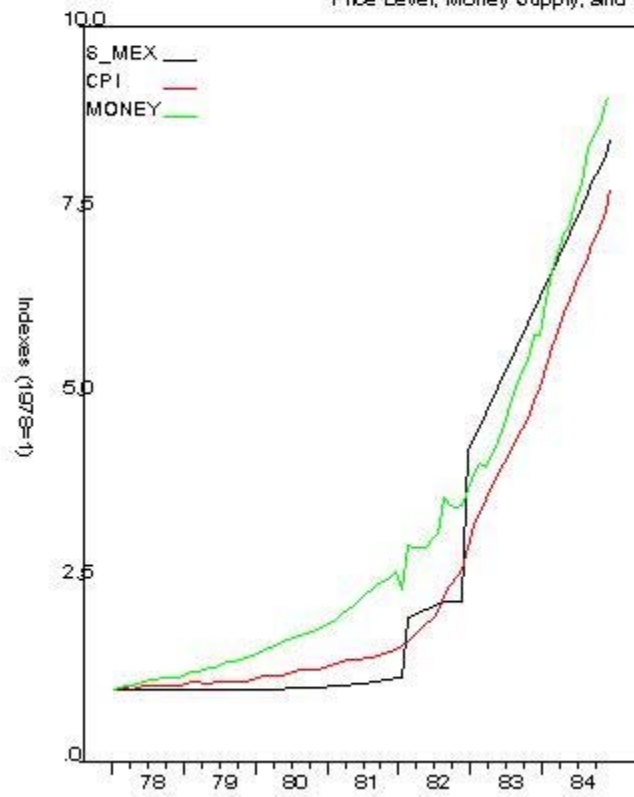


Figure 5
Exchange Rate and FX Reserves

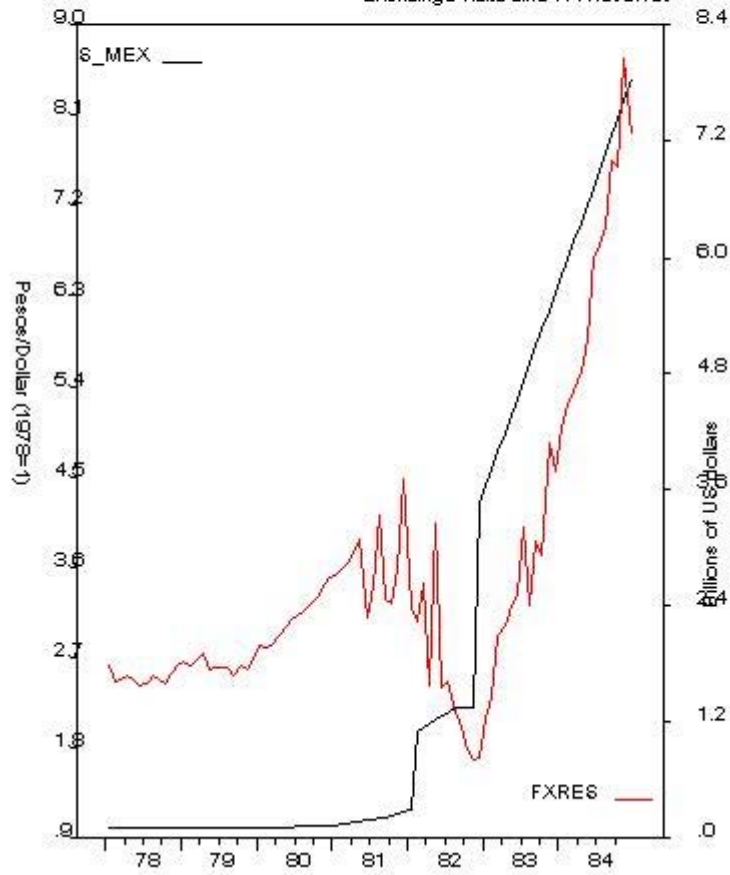
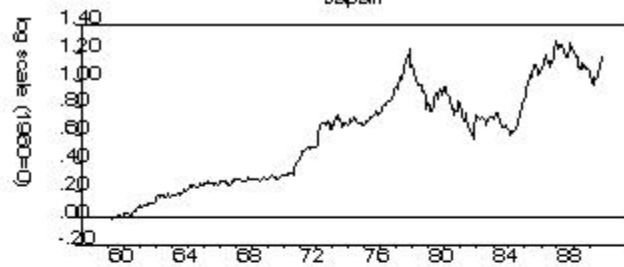


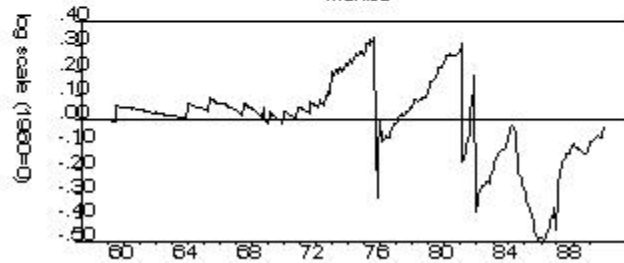
Figure 6. Real Exchange Rates
Germany



Japan



Mexico



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