Profit margins were also enhanced by the 27 percent appreciation of the dollar against the yen from December 1980 to February 1985, because the VERs made it impossible to sell additional cars even if prices were lowered.

As the dollar depreciated after February 1985, Japanese auto producers and their U.S. dealers were willing to reduce their wide profit margins to limit their price increases. The producers sought to avoid both a reduction in their share of the large U.S. market and deterioration in their marketing network. This action would be sensible, particularly if the producers expected the dollar’s decline to be temporary. Dealers could reduce their markup to offset part of the increases in the wholesale price they pay to producers. Dealers would thus seek to adjust their retail transaction price to what they consider the profit-maximizing level.

The Japanese automotive industry was apparently not the only foreign producer to acquire super-normal profits in the U.S. market during the most recent dollar appreciation. A recent study indicates that profit margins in several U.S. import industries have been substantial enough over the past decade to absorb a considerable amount of exchange-rate change. It would appear that such a pattern is recurring, as dollar import prices are rising more slowly in response to dollar depreciation than might be expected considering the historical record.

Conclusions

We have seen that how Japanese automotive producers cope with fluctuating exchange rates affects both the timing and ultimate degree of pass-through to prices of automobile imports. Currency hedging tends to delay the response on prices, while diversification of costs can reduce long-run pass-through. Also, wide profit margins attained with dollar depreciation and VERs provided firms and their retail dealers with an especially thick cushion against dollar depreciation.

Currency hedging and outsourcing in global markets are not unique to Japanese automobile producers. The rapidly increasing volume of financial transactions associated with currency hedging by nonfinancial businesses would suggest that increasing numbers of exporters are finding the currency hedge a useful device for coping with the vagaries of fluctuating exchange rates. Moreover, the trend of U.S. and foreign multinational corporations toward buying worldwide is pervasive across industries.

Without more specific data on financial transactions and production processes, however, it is difficult to assess the precise effect of these growing practices on pass-through. Nevertheless, the trends toward increased hedging and worldwide buying are consistent with more sluggish response in import prices and smaller long-run pass-through.11

11. For a discussion of how changing profit margins might affect the changing relationship between exchange rates and import prices, see Mann, "Prices, Profit Margins, and Exchange Rates."

In April 1987, the value of the U.S. dollar fell substantially, continuing a slide that began in February 1985 when the dollar peaked in relation to most currencies. Then worth more than 262 Japanese yen, the dollar is currently trading at about 140 yen. This means that it now takes 85 percent more dollars than it did in February 1985 to buy the same amount of yen. The dollar has demonstrated similar movements relative to currencies of some other major trading partners (see chart 1).

On the surface, it would seem that the dollar price of Japanese exports to the United States would need to rise by 85 percent as the dollar depreciated relative to the yen. More generally, it would seem that prices of most imports should be rising sharply, thus reducing the volume of imports demanded. In fact, while prices of many U.S. imports have accelerated somewhat, the rate of increase has been relatively moderate—much less than one might expect from observing exchange-rate changes alone (see chart 2). Furthermore, despite these price increases, the volume of imports has not fallen significantly. In fact, until the first quarter of 1987, the volume of nonpetroleum merchandise imports had risen in every quarter since the dollar began to depreciate. In the eight quarters since the dollar’s decline began, nonpetroleum merchandise import volume has risen 17 percent.

The effects of exchange-rate changes typically occur with a lag. However, recent studies indicate that pass-through—the extent to which a change in the exchange rate leads to a change in import prices—may have been altered significantly in the 1980s. Historically, estimates of long-run pass-through typically range between 60 and 80 percent, and most estimates indicate that pass-through is essentially completed in a two-year period. The current experience suggests that import prices are now moving more sluggishly to exchange-rate changes than that less of the exchange-rate changes will ultimately be passed through.

Why haven’t the expected effects of dollar depreciation become more manifest? Were profit margins of foreign exporting firms so large that they could absorb a larger share of the exchange-rate changes? Or are these firms now losing money? To be sure, profit margins have been reduced. However, firms competing in export markets have developed ways to limit their exposure to exchange-rate changes. Some of these techniques affect only the timing of pass-through, suggesting that much of the impact of dollar depreciation is still in the pipeline. On the other hand, other developments could limit the ultimate impact of exchange-rate changes on prices of imports, suggesting that lesser terms of the real trade-weighted value of the dollar in relation to a measure of the relative import price.
developments affect the timing and exchange-rate changes and how these competing in export markets cope with some of the ways in which firms denominated in dollars. In the absence of hedging, the firm would normally sell its dollar receipts for yen in spot markets when the revenues were received. It would use the yen to pay its production costs and to pay profits to its Japanese owners. If the dollar then rose against the yen, a given amount of sales-revenue dollars would exchange for fewer yen than previously expected, leaving the firm accepting smaller yen profits, or possibly losses, on its existing sales. Moreover, the yen price of its imports could go up, raising the dollar cost of imports.

Developments such as these have encouraged companies to consider a firm manufacturing products denominated in yen and sales revenue denominated in dollars. In the absence of hedging, the firm would normally sell its dollar receipts for yen in spot markets when the revenues were received. It would use the yen to pay its production costs and to pay profits to its Japanese owners. If the dollar then rose against the yen, a given amount of sales-revenue dollars would exchange for fewer yen than previously expected, leaving the firm accepting smaller yen profits, or possibly losses, on its existing sales. Moreover, the yen price of its imports could go up, raising the dollar cost of imports.

Currency Hedging

One important option available to firms competing in international markets is the currency hedge—a financial tool that can be used to reduce the impact of exchange-rate changes on a firm’s revenues and profits. To illustrate, consider a firm manufacturing products in Japan and selling them in the United States. Suppose the firm’s sales are denominated in yen, and its costs are denominated in dollars. The firm’s yen sales revenue in October were more or less than the yen price of its dollar costs. If the firm’s costs remained constant, a one-time exchange-rate change would affect the firm’s profits only if it did not hedge. But if the firm chose to hedge, it would be able to lock in a desirable exchange rate, regardless of the subsequent exchange-rate movements. The firm would then be able to protect itself against the risk of adverse currency movements and would be able to budget its costs more accurately.

Hedging contracts are agreements between a company and a bank or other financial institution to sell or buy forward contracts for the exchange of specified amounts of two currencies at a future date. The exchange rate in the contract (the forward exchange rate) will usually differ from the spot rate (the exchange rate in agreements to exchange currency at a future date). The difference between the spot and future prices of the two currencies is known as the premium or discount, depending on the expected change in currency valuation.

On February 25, 1985, the yen-dollar spot rate was 262 yen and the 24-month forward rate was 126 yen. Thus, on that date, the company could have agreed with a bank to sell a certain number of dollars for yen at the forward rate of 126 yen on February 25, 1987. Having done this, the firm could price its cars in February 1985 at the exchange rate of 240 yen per dollar, even though in February 1987 the spot exchange rate fluctuated between 152 yen and 154 yen.

Because such contracts are often confidential, it is difficult to determine exactly how many firms have used forward exchange rates. However, anecdotal evidence suggests that many firms have used forward exchange rates. One way to measure the extent of such activity is to examine the forward contracts of a firm manufacturing products in Japan, selling them in the United States, and using the yen to pay its costs.

For example, the Japanese auto industry represents an excellent example of firms that have used forward exchange rates. In 1985, the yen rose by 20 percent against the dollar, but Japanese auto producers were able to limit their exposure to the impact of exchange-rate changes. They were able to do this by using forward exchange contracts to lock in a fixed exchange rate for any yen-based transactions that would occur in the future.

Forward exchange contracts are agreements between a company and a bank or other financial institution to sell or buy forward contracts for the exchange of specified amounts of two currencies at a future date. The exchange rate in the contract (the forward exchange rate) will usually differ from the spot rate (the exchange rate in agreements to exchange currency at a future date). The difference between the spot and future prices of the two currencies is known as the premium or discount, depending on the expected change in currency valuation.

The difference between the spot and future prices of the two currencies is known as the premium or discount, depending on the expected change in currency valuation.


4. Import costs of new passenger automobiles rose by an average of 22 percent between March 1985 and March 1987. The yen appreciated against the dollar by about 85 percent in the same period. Unit car imports from Japan rose approximately 1 percent from the first quarter of 1985 to the first quarter of 1986.


7. Some import contracts may provide for changes in prices if exchange rates change.
of the recent exchange-rate change will be passed through to import prices or export revenues. Therefore, it was not surprising to hear one CEO say, "This Economic Commentary examines some of the ways in which firms compete internationally. Today, with exchange-rate changes and how these developments affect the timing and extent of the pass-through of the changes to the prices of import goods. The Japanese automotive industry is used as an illustrative case in point.

Currency Hedges

One important option available to firms competing in international markets is the currency hedge—a financial tool that can be used to reduce the impact of exchange-rate changes on a firm’s revenues and profits. To illustrate, consider a firm manufacturing products in Japan and selling them in the United States. The dollar is used as the currency for the sales, and the yen is used as the currency for the costs. The dollar price of the product, therefore, depends on the exchange rate between the yen and the dollar. If the dollar appreciates relative to the yen, the yen sales revenue will decline. Firms must consider a number of factors when deciding how to hedge exchange-rate risk.

Techniques for hedging exchange-rate risk include forward contracts, spot transactions, currency swaps, and currency options. Forward contracts allow a firm to lock in the exchange rate for a future transaction. Spot transactions involve buying or selling a currency on the current open market. Currency swaps involve the exchange of two currencies for a specified period of time, typically one year. Currency options give the holder the right, but not the obligation, to buy or sell a currency at a specified exchange rate on or before a specified date. Each of these techniques has its own advantages and disadvantages. For example, forward contracts provide certainty but lock in a lower exchange rate. Spot transactions provide flexibility but offer no assurance of a favorable exchange rate. Currency swaps provide flexibility but require the exchange of interest payments. Currency options provide a balance between the certainty of forward contracts and the flexibility of spot transactions.

One important technique for hedging exchange-rate risk is the use of currency options. A currency option gives the holder the right, but not the obligation, to buy or sell a specified amount of a foreign currency at a specified exchange rate on or before a specified date. Currency options are typically used to protect against the risk of an adverse change in the exchange rate. For example, a Japanese firm that exports to the United States may use currency options to lock in the exchange rate for future sales. If the dollar appreciates against the yen, the firm will be able to sell its products at a lower price in the United States, thereby increasing its sales revenue.

Forward Contracts

One of the most popular techniques for hedging exchange-rate risk is the use of forward contracts. A forward contract is an agreement between two parties to exchange a specified amount of a foreign currency at a specified exchange rate on or before a specified date. Forward contracts can be used to lock in the exchange rate for future sales or purchases. For example, a Japanese firm that exports to the United States may use a forward contract to lock in the exchange rate for its future sales. If the dollar appreciates against the yen, the firm will be able to sell its products at a lower price in the United States, thereby increasing its sales revenue.

Forward contracts can be used to lock in the exchange rate for future sales or purchases. For example, a Japanese firm that exports to the United States may use a forward contract to lock in the exchange rate for its future sales. If the dollar appreciates against the yen, the firm will be able to sell its products at a lower price in the United States, thereby increasing its sales revenue.

Currency Options

Another popular technique for hedging exchange-rate risk is the use of currency options. A currency option gives the holder the right, but not the obligation, to buy or sell a specified amount of a foreign currency at a specified exchange rate on or before a specified date. Currency options can be used to lock in the exchange rate for future sales or purchases. For example, a Japanese firm that exports to the United States may use a currency option to lock in the exchange rate for its future sales. If the dollar appreciates against the yen, the firm will be able to sell its products at a lower price in the United States, thereby increasing its sales revenue.

Currency options can be used to lock in the exchange rate for future sales or purchases. For example, a Japanese firm that exports to the United States may use a currency option to lock in the exchange rate for its future sales. If the dollar appreciates against the yen, the firm will be able to sell its products at a lower price in the United States, thereby increasing its sales revenue.

Profit Margins

Profit margins in international markets are an important consideration for firms. The profit margin is the difference between the selling price and the cost of goods sold. In some cases, profit margins are very high. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower. For example, Japanese car makers enjoy profit margins of 15% on their sales in the United States. However, in other cases, profit margins are lower.
Profit margins were also enhanced by the 27 percent appreciation of the dollar against the yen from December 1980 to February 1985, because the VERs made it impossible to sell additional cars even if prices were lowered. As the dollar depreciated after February 1985, Japanese auto producers and their U.S. dealers were willing to reduce their wide profit margins to limit their price increases. The producers sought to avoid both a reduction in their share of the large U.S. market and deterioration in their marketing network. This action would be sensible, particularly if the producers expected the dollar’s decline to be temporary. Dealers could reduce their markup to offset part of the increases in the wholesale price they pay to producers. Dealers would thus seek to adjust their retail transaction price to what they consider the profit-maximizing level. The Japanese automotive industry was apparently not the only foreign producer to acquire super-normal profits in the U.S. market during the most recent dollar appreciation. A recent study indicates that profit margins in several U.S. import industries have been substantial enough over the past decade to absorb a considerable amount of exchange-rate change. It would appear that such a pattern is recurring, as dollar import prices are rising more slowly in response to dollar depreciation than might be expected considering the historical record.

Conclusions

We have seen that how Japanese automobile producers cope with fluctuating exchange rates affects both the timing and ultimate degree of pass-through to prices of automobile imports. Currency hedging tends to delay the response on prices, while diversification of costs can reduce long-run pass-through. Also, wide profit margins attained with dollar depreciation and VERs provided these firms and their retail dealers with an especially thick cushion against dollar depreciation.

Currency hedging and outsourcing in global markets are not unique to Japanese automobile producers. The rapidly increasing volume of financial transactions associated with currency hedging by nonfinancial businesses would suggest that increasing numbers of exporters are finding the currency hedge a useful device for coping with the vagaries of fluctuating exchange rates. Moreover, the trend of U.S. and foreign multinational corporations toward buying worldwide is pervasive across industries.

Without more specific data on financial transactions and production processes, however, it is difficult to assess the precise effect of these growing practices on pass-through. Nevertheless, the trends toward increased hedging and worldwide buying are consistent with more sluggish response in import prices and smaller long-run pass-through.11

In April 1987, the value of the U.S. dollar fell substantially, continuing a slide that began in February 1985 when the dollar peaked in relation to most currencies. Then worth more than 262 Japanese yen, the dollar is currently trading at about 140 yen. This means that it now takes 85 percent more dollars than it did in February 1985 to buy the same amount of yen. The dollar has demonstrated similar movements relative to currencies of some other major trading partners (see chart 1).

On the surface, it would seem that the dollar price of Japanese exports to the United States would need to rise by 85 percent as the dollar depreciated relative to the yen. More generally, it would seem that prices of most imports should be rising sharply, thus reducing the volume of imports demanded. In fact, while prices of many U.S. imports have accelerated somewhat, the rate of increase has been relatively moderate—much less than one might expect from observing exchange-rate changes alone (see chart 2). Furthermore, despite these price increases, the volume of imports has not fallen significantly. In fact, until the first quarter of 1987, the volume of nonpetroleum merchandise imports had risen in every quarter since the dollar began to depreciate. In the eight quarters since the dollar’s decline began, nonpetroleum merchandise import volume has risen 17 percent. The effects of exchange-rate changes typically occur with a lag. However, recent studies indicate that pass-through—the extent to which a change in the exchange rate leads to a change in import prices—may have been altered significantly in the 1980s.1 Historically, estimates of long-run pass-through typically range between 60 and 80 percent, and most estimates indicate that pass-through is essentially completed in a two-year period. The current experience suggests that import prices are now remodelling more sluggishly to exchange-rate changes or that less of the exchange-rate changes will ultimately be passed through.

Why haven’t the expected effects of dollar depreciation become more manifest? Were profit margins of foreign exporting firms so large that they could absorb a larger share of the exchange-rate changes? Or are these firms now losing money? To be sure, profit margins have been reduced. However, firms competing in export markets have developed ways to limit their exposure to exchange-rate changes. Some of these techniques affect only the timing of pass-through, suggesting that much of the impact of dollar depreciation is still in the pipeline. On the other hand, other developments could limit the ultimate impact of exchange-rate changes on prices of imports, suggesting that less

---

8. Most analysts agree that the Japanese government imposed VERs to avoid having the U.S. Congress impose even stricter restraints. In this sense, the export restraints were not voluntary.


10. See Mann, "Prices, Profit Margins, and Exchange Rates."

11. For a discussion of how changing profit margins might affect the changing relationship between exchange rates and import prices, see Mann, "Prices, Profit Margins, and Exchange Rates."  

---

Chart 1

<table>
<thead>
<tr>
<th>Percentage change</th>
<th>1985</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>85.1</td>
<td>82.8</td>
<td></td>
</tr>
</tbody>
</table>

SOURCES: Board of Governors of the Federal Reserve System.