FRBSF Weekly Letter

December 12, 1986

The Pass-Through Effect on U.S. Imports

Despite the 35 percent depreciation of the dollar since its peak in February 1985, the volume of United States imports has remained high. In fact, net exports of goods and services — total exports minus total imports — worsened in the second quarter of 1986 to a deficit level of around $150 billion in 1982 dollars.

A previous *Letter* (September 26, 1986) discussed how much of an improvement in the trade balance could have been expected by now on the basis of the historical relationship between the trade balance and its traditional determinants — the exchange rate and U.S. and world GNP. It concluded that predictions based on historical relationships, which fit recent experience reasonably well through the first quarter of 1986, increasingly overstated the improvement in the trade deficit in the last few quarters. Much of this prediction error was due to underestimates of the level of imports.

A number of reasons have been proposed for the apparent delay in the anticipated decline in U.S. imports and turnaround in the current U.S. trade picture. Among them is the possibility that foreign exporters, having benefitted from high profits when the dollar was strong, are now choosing to limit price increases and to sacrifice profit margins on exports to the U.S. to preserve their share of the huge U.S. market.

This *Letter* explores the extent to which the relationship between changes in the exchange rate and changes in import prices, known as the *pass-through* relationship, may have changed significantly in recent years. If foreign exporters of products into the United States are indeed passing changes in the value of the dollar through to U.S. import prices more slowly than in the past, then the anticipated turnaround in the U.S. trade balance may take longer than history would suggest.

The pass-through effect

U.S. import prices reflect the costs in dollars of purchasing goods produced abroad. These costs, in turn, depend on the costs of foreign producers, the exchange rate, and on the profit margins desired by foreign exporters. For example, one would expect import prices to rise if costs in Japan increase. Similarly, one would expect higher import prices if the dollar depreciates against the yen (making the yen more expensive), or if foreign exporters increase their profit margins.

The extent to which import prices adjust to reflect changes in the cost of foreign goods resulting from a dollar depreciation or appreciation is known as the "pass-through". In very competitive markets, foreign exporters have small profit margins and are forced to pass through changes in the value of the dollar to U.S. import prices very quickly. However, in markets that are not very competitive, profit margins are large and foreign exporters may prefer to absorb changes in the value of the dollar by altering their profit margins. The pass-through to import prices is then quite small. A small pass-through would therefore tend to reduce the effect of exchange rate changes on U.S. consumers' demand for foreign goods.

A popular current explanation for the seemingly slow turnaround in the U.S. trade balance is that foreign exporters were able to increase profit margins substantially during the period (up to 1985) in which the dollar was sharply appreciating, and that they cushioned the impact of the subsequent dollar depreciation by reducing their profit margins rather than by raising their export prices proportionately. They preferred to reduce their profit margins presumably to protect their market shares. Although changing profit margins have in the past caused delays in the pass-through, the unusually sharp rise in the dollar's value in the 1980s may have resulted in a slower pass-through in recent quarters than would be suggested by historical experience.

The data appear to confirm this hypothesis. In the 18 months up to August 1986, the dollar depreciated 41 percent against the yen, 38 percent against the German mark, and 26 percent against the British pound. (At the same time,

inflation in these countries was comparable to that in the United States.) But the (unit value) prices of non-oil imports increased only 4 percent over this period — a much smaller percentage change than the dollar depreciation.

A better picture of the pass-through and implications for the competitiveness of U.S. goods comes from comparing changes in the real trade-weighted value of the dollar to a measure of the relative import price. A strong pass-through effect would imply that increases (decreases) in the real value of the dollar should show up closely in decreases (increases) in relative import prices.

The real value of the dollar is the nominal value of the dollar adjusted for inflation in the U.S. and abroad. It can be interpreted as a measure of the relative cost of foreign and U.S. goods. The lower the real value of the dollar, the more costly are foreign goods compared to U.S. goods. The relative import price is the ratio of U.S. non-oil import prices to the U.S. price level. It reflects the actual price charged for imported goods in the U.S. market in comparison to domestic prices. The higher the relative import price, the less competitive are foreign imports.

Up to 1983, as shown in Chart 1, there was a strong tendency for relative import prices to fall when the dollar appreciated. (It is also worth noting that between 1980 and 1983, nominal import prices were essentially flat, while relative import prices fell. U.S. inflation was high enough for foreign suppliers to make competitive gains without having to reduce their prices in response to the dollar appreciation.)

Chart 1 also suggests that the pass-through of real exchange rate changes to relative import prices has slowed since 1983. From the third quarter of 1983 to the end of 1984, relative import prices declined 1/8 of one percent for every percent appreciation in the real value of the dollar — down from a 1/2 percent decline for the same appreciation from 1980 to the second quarter of 1983 (marked with a vertical line in Chart 1).

Foreign suppliers apparently did not think it necessary to exploit the improvement in their price competitiveness, afforded by the dollar appreciation, by lowering U.S. import prices more sharply. This supports the view that they were able to increase their profit margins substantially during this period.

The sharp dollar depreciation after the first quarter of 1985 was similarly associated with a comparatively sluggish response in import prices: relative import prices did not increase until the second quarter of 1986. U.S. imports may have remained high partly because this improvement in U.S. competitiveness took so long to appear.

A change in the relationship between the exchange rate and import prices is also indicated by the relationship between the behavior of import prices and the nominal exchange rate and foreign prices, over two periods — from the fourth quarter of 1972 to the second quarter of 1983, and from the fourth quarter of 1972 to the second quarter of 1986. These two periods were chosen because the sharp deterioration in the U.S. trade position began after the second quarter of 1983 and there were no signs of changes in pass-through before then.

For both periods, about 80 percent of the effect of exchange rate changes was passed through after eight quarters. However, the pass-through of exchange rate changes to import prices after four quarters was much less over the longer period when only 40 percent of the exchange rate change took place as compared to 60 percent for the shorter period.

As a result, our predictions of the import price since the second quarter of 1983 (and through the second quarter of 1986), based on the historical relationship between the exchange rate and import prices before then, underestimated the effect of the rising dollar on the actual fall in import prices when the dollar was appreciating, and overpredicted the effect of the depreciating dollar on the actual rise in import prices in the last three quarters. The cumulative pass-through after eight quarters, however, was much closer for the two periods, suggesting that, although the speed of the pass-through has slowed, its total long-run magnitude may not have changed very much.

Implications for U.S. imports

The preceding discussion implies that, in recent

Chart 1
The Pass-Through Effect has Slowed in Recent Years

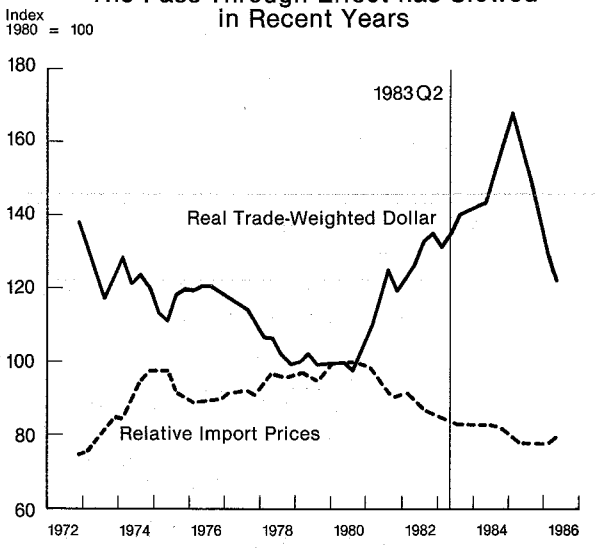
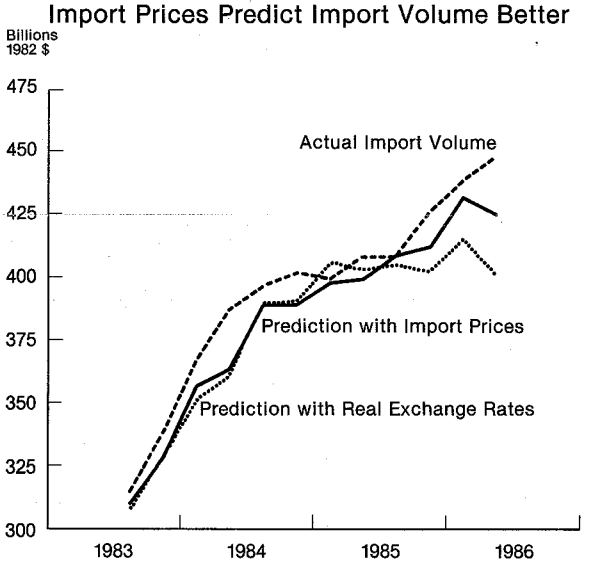


Chart 2
Import Prices Predict Import Volume Better



quarters, the import price should be a better predictor of developments in the U.S. trade balance than the real exchange rate because of changes in the pass-through relationship. To confirm this view, we studied two historical relationships through the second quarter of 1983: the first involved real exchange rates, and the second, import prices, to explain the volume of real imports. We then used the two relationships to predict import volume from the third quarter of 1983 to the second quarter of 1986 and compared those predictions to the actual volume of imports.

The results, illustrated in Chart 2, indicate that predictions based on import prices in recent quarters tracked actual import levels more closely than those based on the real exchange rate. The improvement in forecasts of imports using import prices is particularly apparent from early 1985 on.

Conclusions

Our results indicate that the pass-through of exchange rates to import prices over the first four quarters after a change in the exchange rate has become significantly smaller in the last three years than before. Our findings also indicate that the current response of import prices, over the first eight quarters following a change in the dollar, appears to be almost as large as it has been in the past. Although the pass-through may have slowed, the total long-run pass-through is about the same.

This suggests that while a reduction in imports in response to the dollar depreciation may be delayed, a significant improvement can be expected in coming quarters. The reported reduction in the trade deficit in the third quarter of 1986 is consistent with this view.

These conclusions must be tempered by the performance of import prices in predicting import volume. Although import prices have been better predictors than real exchange rates in recent quarters, both have tended to underpredict imports by increasing amounts. If these errors persist, other explanations must be found for the continued growth in U.S. imports.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 11/19/86	Change from 11/12/86	Change from 11/20/85 Dollar	Change from 11/20/85 Percent[7]
Loans, Leases and Investments[1] [2]	204,717	1,359	6,803	3.4
Loans and Leases[1] [6]	184,337	1,649	4,879	2.7
Commercial and Industrial	50,749	673	− 725	− 1.4
Real estate	67,188	127	1,411	2.1
Loans to Individuals	39,581	105	1,753	4.6
Leases	5,575	− 15	161	2.9
U.S. Treasury and Agency Securities[2]	12,513	− 266	1,343	12.0
Other Securities[2]	7,868	− 23	580	7.9
Total Deposits	206,131	−4,193	5,076	2.5
Demand Deposits	53,326	−4,272	4,517	9.2
Demand Deposits Adjusted[3]	36,065	−1,950	− 8,341	−18.7
Other Transaction Balances[4]	18,203	− 155	3,836	26.7
Total Non-Transaction Balances[6]	134,601	233	− 3,277	− 2.3
Money Market Deposit Accounts—Total	46,903	575	1,196	2.6
Time Deposits in Amounts of $100,000 or more	32,663	− 261	− 5,713	−14.8
Other Liabilities for Borrowed Money[5]	27,715	2,211	3,134	12.7

Two Week Averages of Daily Figures	Period ended 11/17/86	Period ended 11/3/86
Reserve Position, All Reporting Banks		
Excess Reserves (+)/Deficiency (−)	66	21
Borrowings	63	64
Net free reserves (+)/Net borrowed(−)	3	− 42

1 Includes loss reserves, unearned income, excludes interbank loans
2 Excludes trading account securities
3 Excludes U.S. government and depository institution deposits and cash items
4 ATS, NOW, Super NOW and savings accounts with telephone transfers
5 Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
6 Includes items not shown separately
7 Annualized percent change