Has the Dollar Fallen Enough?

By Craig S. Hakkio and Richard Roberts

The exchange value of the dollar has declined substantially since the first quarter of 1985. But the U.S. trade balance did not begin turning around until late 1986, and the improvement has not been as large as predicted. Some analysts have argued that this belated and meager reduction in the trade deficit proves that the dollar has not fallen enough.

Whether the decline in the exchange rate is sufficient to reduce the trade balance to acceptable levels is an open question. Some people argue that the exchange rate has fallen far enough and that the trade deficit will eventually decline to an acceptable level, while others argue that the exchange rate must decline further for the trade deficit to improve sufficiently.

This article argues that the drop in the value of the dollar thus far will not by itself eliminate the trade deficit and so, unless other factors contributing to the trade deficit also improve, the dollar will probably have to decline further. The article is divided into three sections. The first discusses the deterioration in the trade balance, and the second discusses the expected improvement. Since understanding why the U.S. trade balance deteriorated will help to understand why it is expected to improve, the first section briefly discusses how much the trade balance deteriorated and why. The analysis shows that the past appreciation of the dollar accounts for about two-thirds of the deterioration in the trade balance. The second section shows that the recent decline in the dollar will result in a significant further improvement in the overall trade balance. The third section shows, however, that unless recent efforts to achieve international coordination of economic policies succeed in achieving more rapid economic growth in the countries that buy U.S. exports, the dollar may need to decline further to eliminate the trade deficit altogether.

The deterioration in the U.S. trade deficit

Understanding why the trade deficit worsened suggests reasons why the trade deficit will

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improve. Therefore, as a prelude to discussing the expected improvement in the trade deficit, this section discusses the deterioration in the U.S. trade balance in the first half of the 1980s. The evidence on the deterioration of the trade deficit is reviewed first, followed by a discussion of reasons for the deterioration. It will be shown that although the rise in the value of the dollar was the main reason for the deterioration in the trade deficit, other factors also contributed.

How much the U.S. trade balance deteriorated

The deterioration in the trade balance in the early 1980s was dramatic. The real trade balance as well as real exports and real imports from 1975 to 1987 are shown in Chart 1. After small trade deficits throughout the second half of the 1970s, the trade balance reached a surplus in the beginning of 1980. After that, the trade balance deteriorated steadily, reaching a deficit of $163 billion in the third quarter of 1986 before improving moderately in recent quarters. Since the trade deficit began to turn around in 1986, this section focuses on the period between 1980 and 1986. Most of the deterioration during this period was due to a rise in imports, which grew 45 percent, while exports fell 5 percent.

By definition, the overall trade balance includes merchandise trade and services trade. Merchandise trade is primarily trade in goods. Since most of the deterioration was in merchandise trade, most of the improvement is expected to be in this category. Agricultural exports and petroleum imports require special analysis because they are heavily affected by government programs and OPEC.[1] As a result, the concept of "exports"

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[1] For further information about agricultural exports, see David Henneberry, Mark Drabenstott, and Shida Henneberry, "A Weaker Dollar and U.S. Farm Exports," *Economic Review*, Federal Reserve Bank of Kansas City, May 1987.

in this article will refer to nonagricultural merchandise exports, "imports" will refer to non-petroleum merchandise imports, and the term "trade balance" will refer to the difference between the two.

The general trends in the nonagricultural/non-petroleum trade balance are the same as in the overall trade balance. Nonagricultural merchandise exports, nonpetroleum merchandise imports, and the nonagricultural/nonpetroleum merchandise trade balance are plotted in Chart 2. A comparison of Charts 1 and 2 shows similar trends in both trade balances. For example, both trade balances reached surpluses in 1980 and then declined until the third quarter of 1986, before turning around modestly in the past few quarters. Of the $205 billion deterioration in the overall trade balance between 1980 and 1986, $168 billion was due to trade in nonagricultural/nonpetroleum merchandise.

Reasons for the deterioration

Several factors contributed to the deterioration in the (nonagricultural/nonpetroleum) trade balance. The two most important determinants of the trade balance are thought to be exchange rates, which affect the relative price of imports and exports, and real income growth at home and abroad, which affects total spending. Other factors were also important, however, in explaining the U.S. trade deficit in the 1980s.

This article focuses on the "proximate determinants" of the deterioration in the trade balance. The effect of exchange rates and real income on the trade balance is discussed, but not why the exchange value of the dollar rose 40 percent between 1980 and the first quarter of 1985 or why U.S. real income rose 11 percent during this period. The reasons the exchange rate rose so much and income increased are the more fundamental reasons for the deterioration in the trade balance. Macroeconomic policies are generally

CHART 1
U.S. trade balance

Billions of 1982 dollars
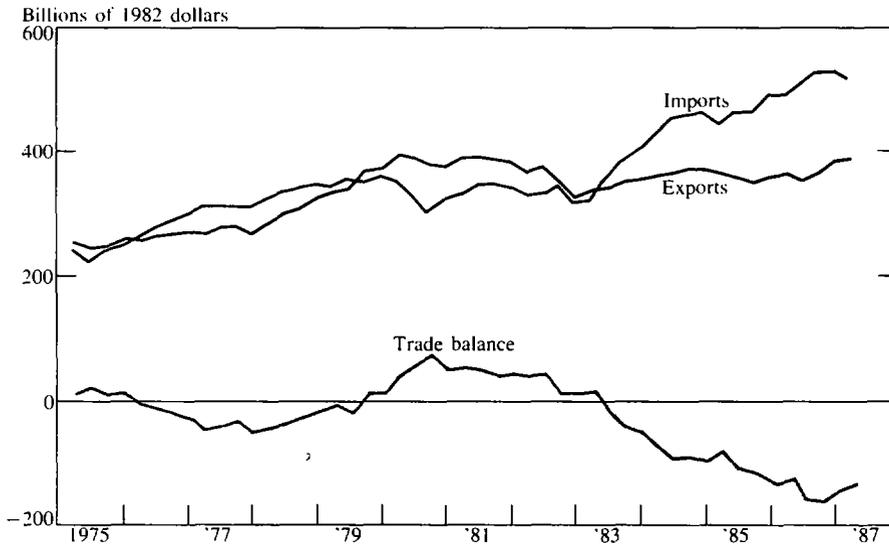
CHART 2
U.S. trade balance excluding agriculture and petroleum products

Billions of 1982 dollars
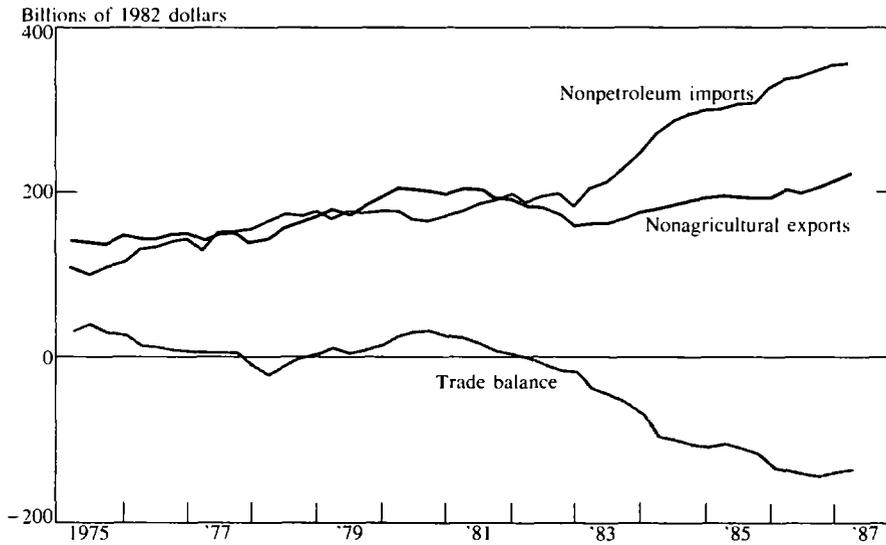
thought to account for most of the rise in the dollar.[2]

Real income. Increases in real income affect the trade balance by increasing demand for imports by U.S. residents and demand for exports by foreigners. The demand for imports—like the demand for any commodity—depends on real income. As U.S. real income rises, some of the additional income will be spent for imported goods. Similarly, as real income rises abroad, foreigners will increase their purchases of American goods. If U.S. growth is greater than foreign growth, imports will tend to grow faster than exports, causing the U.S. trade balance to worsen. But if U.S. and foreign income rise the same amount, imports and exports will also rise by about the same amount and the trade balance will not be much affected.

Empirical evidence suggests that real income growth at home and abroad had only a small effect on the U.S. trade balance in the 1980s. Real income is generally measured in one of two ways: real GNP or real domestic demand. While both measures have advantages, this article uses real GNP as its measure of real income.[3] Real GNP growth rates were similar in the United States and its trading partners between 1980 and 1986. The

U.S. economy grew 14.2 percent, while the economies of its trading partners grew 12.5 percent. The similarity of growth at home and abroad probably left the U.S. trade balance affected very little by this factor.

The small effect of relative income growth is confirmed by the breakdown of the deterioration in the U.S. trade balance between 1980 and 1986 shown in Table 1. The third line in Panel A shows that the deterioration totaled $168 billion, as exports rose only $5 billion while imports rose $173 billion. The first line in Panel B shows that the 12.5 percent growth in foreign GNP during this period is estimated to have increased U.S. exports by $61 billion.[4] The 14.2 percent growth in U.S. real GNP is estimated to have increased U.S. imports by $59 billion. Even though U.S. income growth was slightly greater than foreign income growth, imports increased by less than exports because imports were $32 billion less than exports in 1980. The estimated effect of relative income growth, therefore, is a slight improvement in the trade balance. Thus, relative income growth does not account for the deterioration in the U.S. trade balance.

[2] The more fundamental reasons would include restrictive monetary policy in 1980 and 1981, the large government budget deficit, the reputation of the United States as a safe haven for foreign investment, liberalization of Japanese financial markets, and the tax cut that improved the investment climate. For more details on the fundamental reasons for the appreciation of the dollar, see William Branson, "Causes of Appreciation and Volatility of the Dollar," *The U.S. Dollar—Recent Developments, Outlook, and Policy Options,* a symposium sponsored by the Federal Reserve Bank of Kansas City, August 1985.

[3] Real GNP measures production and real domestic demand represents total spending by U.S. residents. Real GNP was chosen as the measure of income because much of U.S. trade is in intermediate products. To the extent that imports represent the demand for intermediate goods, real GNP is a good measure of income. To the extent that imports represent the demand for final goods, domestic demand is preferable. For further discussion of the dif-

ference between GNP and domestic demand, see William Helkie and Peter Hooper, "The U.S. External Deficit in the 1980s: An Empirical Analysis," International Finance Discussion Paper No. 304, Board of Governors of the Federal Reserve System, February 1987, p. 22 and p. 46.

[4] The notes at the end of the table describe how these and other estimates in this section were calculated. Foreign real GNP is a composite index. Real GNP of 17 industrialized countries, excluding the United States, enter the composite. These countries are Canada, France, Germany, Italy, Japan, the United Kingdom, Australia, Austria, Belgium, Denmark, Finland, Greece, Netherlands, Norway, Spain, Sweden, and Switzerland. William Helkie and Peter Hooper argue that for every 1 percent increase in foreign income, exports should increase 2.1 percent and that for every 1 percent increase in U.S. income, imports should increase 2.1 percent. It should be noted that their definition of foreign real GNP differs from the definition used in this article. The definition of relative import and export prices also differ. Consequently, their elasticities should be viewed with caution when applied to the data in this article.

TABLE 1

Deterioration of the U.S. trade balance, 1980-86

(billions of 1982 dollars)

Panel A: Magnitude of the Deterioration

	Exports	−	Imports	=	Trade Balance[1]
Levels in 1980	$203		$171		$ 32
Levels in 1986	208		344		−136
CHANGES: 1980-86	5		173		−168

Panel B: Causes of the Deterioration

	Changes in Exports	−	Changes in Imports	=	Changes in the Trade Balance
Due to income[2]	$ 61		$ 59		$ 2
Due to relative prices[3]	−49		46		−95
Due to other factors[4]	−7		68		−75
TOTAL CHANGES	5		173		−168

NOTES: [1] Exports refer to nonagricultural merchandise exports, imports refer to nonpetroleum merchandise imports, and the trade balance refers to the difference between the two.

All calculations in the table are done in the same way. For example, the percentage change in exports due to a change in relative prices equals the percentage change in relative prices times the elasticity of exports with respect to relative prices. Then, since exports in 1980 are known, one can calculate the change in exports due to relative prices. The change is based on percentage changes calculated as the difference in logarithms.

[2] Foreign income rose 12.5 percent. Assuming the elasticity of exports with respect to foreign income is 2.1, exports would rise 26.3 percent, or $61 billion. U.S. income rose 14.2 percent. Assuming the elasticity of imports with respect to U.S. income is 2.1, imports would rise 29.8 percent, or $59 billion.

[3] The relative price of exports rose 27 percent. Assuming the elasticity of exports with respect to relative price is −1.0, exports would fall 27 percent, or $49 billion. The relative price of imports fell 24 percent. Assuming the elasticity of imports with respect to relative prices is −1.0, imports would rise 24 percent, or $46 billion.

[4] Since exports rose $5 billion, and since relative price changes and foreign income changes explain an $18 billion increase in exports, other factors must explain the rest—a $13 billion decrease in exports. Since imports rose $174 billion, and since relative price changes and U.S. income changes explain a $105 billion increase in imports, other factors must explain the rest—a $68 billion increase in imports.

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If income growth at home and abroad does not explain the deterioration in the trade balance, what does? The obvious choice is the value of the dollar.

The value of the dollar. The rise in the value of the dollar caused a substantial portion of the deterioration in the trade balance. Between 1980 and its peak in the first quarter of 1985, the value of the dollar rose 40 percent, as measured by the Morgan Guaranty index.[5] The exchange value of the dollar affects imports and exports by affecting the prices of U.S. imports and exports. An increase in the value of the dollar, for example, makes U.S. exports more expensive and U.S. imports cheaper. As exports become more expensive, fewer goods are exported, and as imports become cheaper, more goods are imported.

The amount by which the appreciation of the dollar affects imports and exports depends on the answer to two questions. First, how much did import prices fall and export prices rise as a result of the stronger dollar? Second, how much did imports rise and exports fall as a result of the price changes?

The effect of the exchange rate on the prices of imports and exports is shown in Charts 3 and 4. Chart 3 shows that import prices, measured relative to prices of domestically produced goods, fell as the exchange rate rose. Between 1980 and their low point in the fourth quarter of 1985, relative import prices fell 24 percent. The rise in export prices, measured relative to the price of foreign goods, associated with the higher dollar is evident in Chart 4, which shows that relative export prices rose 27 percent between 1980 and their high point in the first quarter of 1985.

Two things in Charts 3 and 4 are noteworthy. First, the rise in the exchange rate was not fully passed-through to import prices and export prices. That is, import prices fell and export prices rose less than the dollar, so that the exchange rate "pass-through" was only partial.[6] Second, the timing and extent of pass-through was different for export prices and import prices. Export prices rose quicker and more substantially than import prices fell. This tendency for import prices to react less to changes in the value of the dollar is consistent with the view that foreign producers may be more willing to absorb part of exchange rate changes in their profit margins than are their U.S. counterparts.

An example provides some insight into why the pass-through may be relatively slow and meager for U.S. imports. Suppose that a Toyota costs $10,000 before the dollar rises 10 percent against the yen. In choosing the price to charge after the exchange rate change, Toyota must consider the effect of its decision on its profit margin and its market share. It could pass through the entire increase in the exchange rate, lowering prices 10 percent to $9,000. In that case, Toyota's market share could rise substantially. And since the dollar has risen 10 percent against the yen while dollar prices have fallen 10 percent, Toyota's profit margin on U.S. car sales would be unchanged in terms of yen. Alternatively, Toyota could keep the dollar price of its cars sold in the United States constant, a pricing decision that would raise its profit margins 10 percent but have no effect on its market share. Finally, Toyota could choose to increase both profit margins and market share by passing through part of the increase in the dollar. If Toyota cuts prices 5 percent, it could gain market share in the United States while increasing its profit margins 5 percent. This trade-off between profit margins and market share

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[5] The Morgan Guaranty index is a composite index of the values of currencies of 15 industrialized countries. The countries are the same ones that enter the foreign GNP index, except that Finland and Greece are excluded.

[6] Since the real and nominal exchange rate behaved similarly, the same basic results would hold if the real exchange rate were used instead of the nominal exchange rate.

CHART 3
Import prices and the exchange rate
(1980-82 average = 1.0)
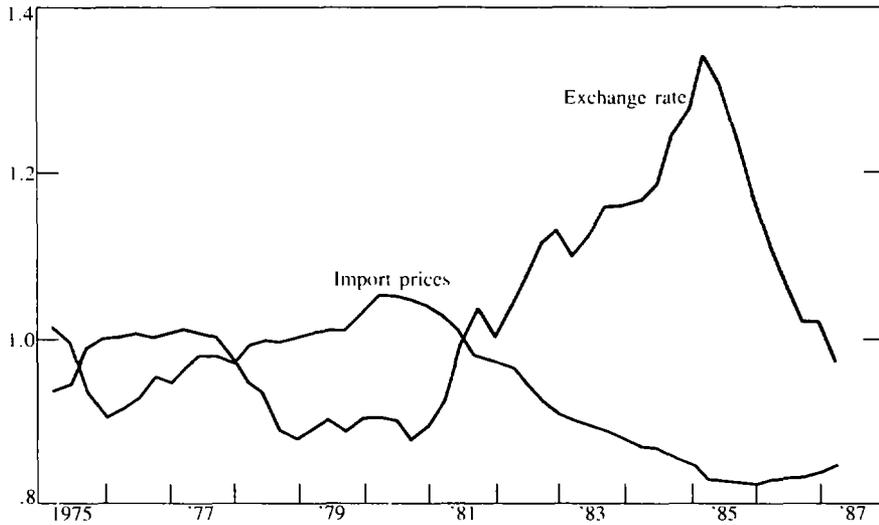
CHART 4
Export prices and the exchange rate
(1980-82 average = 1.0)

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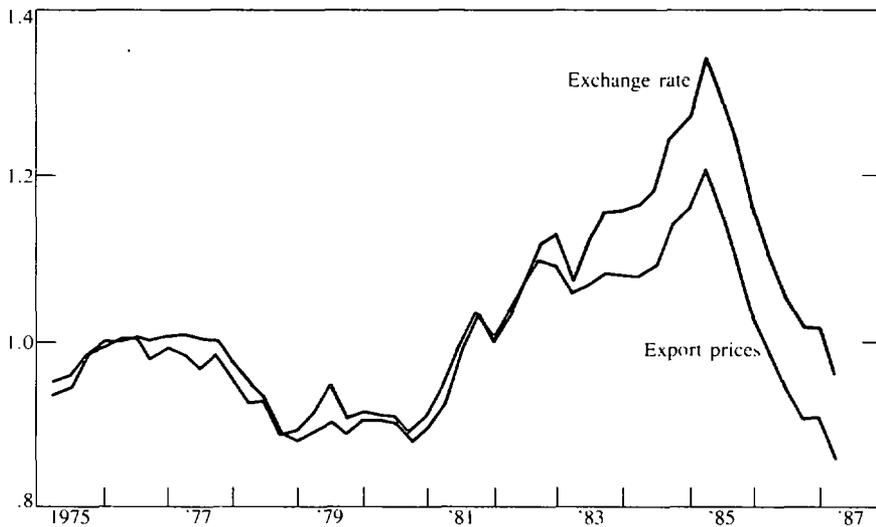
explains why the pass-through of exchange rate changes to import prices is only partial.[7]

The pass-through for export prices was larger and quicker than for import prices. Export prices rose 27 percent, while import prices fell 24 percent.[8] Some evidence on the speed of pass-through can be seen by looking at when import and export prices changed direction after the dollar began declining in the first quarter of 1985. Since export prices stopped rising in the first quarter of 1985 and import prices stopped falling in the fourth quarter of 1985, the pass-through was quicker for export prices than for import prices. The difference in turnaround times is still another example of the lags between cause and effect.

The fall in import prices and the rise in export prices caused imports to rise and exports to fall. Charts 5 and 6 document these changes. Since imports and exports depend on income as well as prices, the income effect was removed before plotting the course of imports and exports.[9] To the extent that variables other than income and relative price affect imports and exports, however, the charts give an exaggerated impression of the price effect. Nevertheless, relative prices are the most important effect captured in the charts, as is documented below. Chart 5 shows, for example, that imports rose as their prices fell between 1980 and 1986, except for a slight dip in imports in 1982 caused by the recession. Similarly, Chart 6 shows that exports fell as their prices rose.

The evidence presented in Charts 3 through 6 suggests that the rise in the exchange rate between 1980 and the first quarter of 1985 accounts for a large part of the deterioration in the U.S. trade balance. Econometric evidence also confirms this impression. Such evidence suggests that imports and exports change proportionately to their prices.[10] The rise in the exchange rate caused import prices to fall 24 percent, which led to an estimated $46 billion increase in imports. In addition, the 27 percent increase in export prices is estimated to have caused exports to decline $49 billion. These estimates, shown in Table 1, imply that the rise in the value of the dollar accounts for $95 billion of the deterioration in the U.S. trade balance.[11]

These results imply that the stronger dollar explains about two-thirds of the deterioration in the trade balance. The estimates are not precise because the total amount of the deterioration depends on the year chosen for comparison. Between 1980 and 1985, the trade balance deteriorated $144 billion. But between 1980 and 1986, the trade balance deteriorated $169 billion. If the deterioration is taken as $144 billion, the exchange rate explains 66 percent of the deterioration in the trade balance. If, however, the deterioration is taken to be the larger amount, the exchange rate explains only 56 percent of the deterioration. For ease of exposition, it is assumed that the exchange rate accounts for two-thirds of the deterioration in the trade balance.[12]

[7] For further information on the pass-through, see Catherine L. Mann, "Prices, Profit Margins, and Exchange Rates," *Federal Reserve Bulletin*, Board of Governors of the Federal Reserve System, June 1986, pp. 366-379.

[8] The pass-through for import prices was 60 percent and the pass-through for export prices was 68 percent.

[9] Since the long-run income elasticities are assumed to equal 2.1 for imports and exports, imports purged of income equals $IM/(Y^{2.1})$ and exports purged of income equals $EX/(Y^{2.1})$.

[10] According to Helkie and Hooper, the import price elasticity equals -1.05 and the export price elasticity equals -0.83. They state: "The long-run price elasticities are both roughly in the neighborhood of -1.0" (p. 19).

[11] Helkie and Hooper find that changes in relative prices explain a $123 billion deterioration (p. 45).

[12] Robert Solomon, in "Effects of the Strong Dollar," *The U.S. Dollar—Recent Developments, Outlook, and Policy Options*, a symposium sponsored by the Federal Reserve Bank of Kansas

CHART 5
Imports and import prices
(1980-82 average = 1.0)
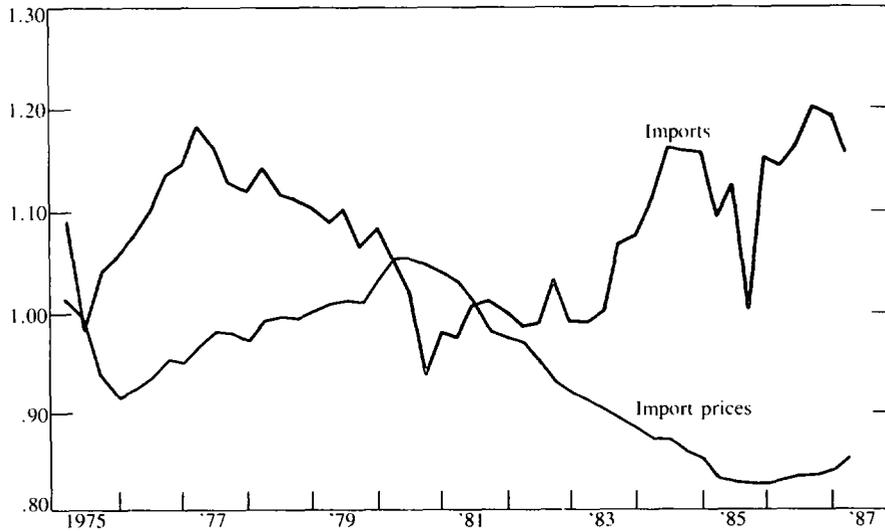
CHART 6
Exports and export prices
(1980-82 average = 1.0)

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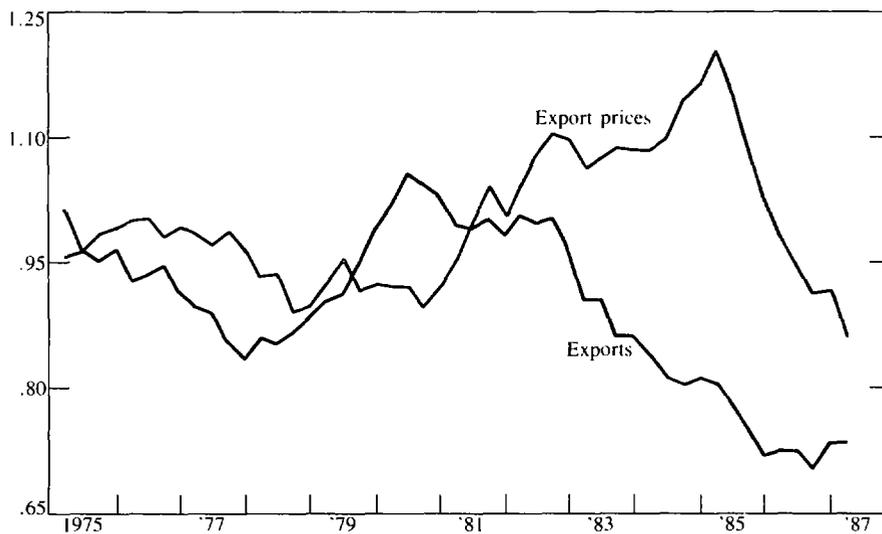
If the exchange rate explains two-thirds of the deterioration, what factors explain the other one-third? Several other factors can explain the deterioration.

Other factors

Two factors often discussed as contributing to the worsening of the trade balance—a decline in U.S. competitiveness and foreign trade barriers—do not explain the dramatic deterioration in the U.S. trade balance. Productivity growth in the manufacturing sector since the third quarter of 1981 has exceeded the postwar average and the slow growth in the 1970s. Consequently, there is little evidence to suggest that declining productivity caused the deterioration.[13] And, while foreigners have erected trade barriers against U.S. products, the United States has also erected trade barriers against foreign products.[14] In any event, to the extent that these factors might lead to a worsening in the trade balance, the effects are not large enough to explain the dramatic deterioration.

At least two other factors, however, contributed to the deterioration in the trade balance. They are the LDC debt crisis and the increased importance of South Korea, Taiwan, Hong Kong, and Singapore—the so-called Newly Industrializing Countries or NIC's.

The LDC debt crisis was one factor contributing to the deterioration in the U.S. trade balance. The LDC debt crisis forced many Latin American countries to run large trade surpluses to pay their debt service costs. Since the United States was an important trading partner of these countries, the United States bore a large part of the necessary reduction in Latin American imports and increase in Latin American exports. Whereas Latin American countries had trade deficits before 1982, they have had trade surpluses since then. In 1981, for example, the United States had a trade surplus of $1.3 billion with Latin America. Subsequently, the United States has had trade deficits averaging $15 billion.[15]

Another factor contributing to the U.S. trade deficit was the emergence of the Newly Industrializing Countries. As their name suggests, the NIC's have recently become industrialized. And these countries have emerged as important trading partners with the United States. Whereas these countries accounted for only 11 percent of U.S. trade in 1975, they accounted for 16 percent by 1985. Moreover, the increased trade with the NIC's has been due primarily to an increase in exports to the United States. Between 1980 and 1986, the NIC's increased their exports by $55 billion, of which $30 billion went to the United States. Partly as a result of their export-oriented policies, these countries increased their trade surplus with the United States from $3 billion in 1980 to $30 billion in 1986.[16] Some of the deterioration is due to the increase in the dollar, which rose 30 percent against the Asian NIC's.

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City, August 1985, states "we have reason to accept the Federal Reserve estimate that something like two-thirds of the increase in the U.S. current account deficit is attributable to the appreciation of the dollar" (p. 68).

[13] For example, the *Economic Report of the President*, 1987, states (p. 118): "In sum, the deterioration of international cost competitiveness in U.S. manufacturing during the first half of this decade was the result of the real appreciation of the dollar, not sagging productivity growth or excessive wage increases."

[14] See, for example, C. Fred Bergsten and William Cline, *The United States-Japan Economic Problem*, Institute for International Economics, Vol. 13, October 1985, for evidence.

[15] Of course, some of the deterioration in the U.S. trade balance with Latin America is due to the rise in the exchange rate and faster growth in the United States than in Latin America.

[16] For additional information on the NIC's, see "The Asian NIC's and U.S. Trade," *World Financial Markets*, Morgan Guaranty Trust Company of New York, January 1987.

Some of the deterioration, however, is also due to the emergence of the NIC's as important competitors to U.S. firms selling in the United States.

The effect of these other factors is shown in Table 1. The entries are the part of exports and imports that are not explained by relative prices or income. As a result, they actually reflect the combined effect of the two factors discussed above, plus any other influences not previously discussed.[17] According to the table, other factors explain $7 billion of the decline in exports and $68 billion of the increase in imports.

In summary, several factors contributed to the deterioration in the trade balance. By itself, income growth at home and abroad would have led to a slight improvement in the trade balance. But, the strong dollar caused the trade balance to worsen by about $95 billion, and all other factors caused the trade balance to deteriorate by $75 billion. Since the rising dollar was the primary reason for the deterioration, the falling dollar should be the primary reason for the expected improvement in the U.S. trade deficit.

An improvement
in the U.S. trade deficit

After worsening between 1980 and 1986, the trade deficit began improving in late 1986. Between the third quarter of last year and the first quarter of this year, the nonagricultural/nonpetroleum merchandise trade deficit declined $8 billion, from $140 billion to $132 billion. This section argues that the improvement will continue.

The decline in the exchange rate since early 1985 will lead to a significant further improvement in the trade balance. But by itself, the decline in the exchange rate will not eliminate the trade deficit altogether.

The reasons the trade deficit is expected to improve over the next three years are discussed in this section. Rough estimates of the expected improvement are discussed, based on certain simplifying assumptions.[18] The decline in the exchange rate is the main reason for expecting improvement. However, increases in U.S. and foreign real income and the "other factors" will also influence the improvement in the trade balance.

Real income

Recent and prospective changes in income will tend to cause the trade deficit to worsen. From the third quarter of 1986 to the first quarter of this year, both U.S. and foreign real GNP grew about 1 percent. And according to projections by one forecasting service, Data Resources Inc. (DRI), U.S. real GNP will grow 7.3 percent between 1986 and 1989 and foreign real GNP will grow 7.7 percent. Since U.S. and foreign incomes are expected to grow at about the same rates, imports and exports should also grow at about the same rates. The trade balance will still deteriorate, however, even though imports and

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[17] There is another reason why the full effect of the LDC debt crisis and the emergence of the NIC's on the trade deficit is not captured in Table 1. The foreign income variable and exchange rate index do not include any of the Latin American countries or the NIC's. Therefore, if these countries are different from the countries included in these two variables, the effect of the debt crisis and the NIC's may not be adequately captured in the estimated elasticities.

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[18] A three-year horizon was chosen to reflect the time it takes for the full effects of the decrease in the dollar to be felt. The dollar began falling in the first quarter of 1985. The latest available data are for the first quarter of 1987. It is assumed, therefore, that the effect of the dollar depreciation will be complete by 1989. To the extent the effects take longer, the three-year horizon is too short. In addition, it is assumed that the elasticities estimated over the period 1969:Q1-1984:Q4 are applicable for the period 1985-89. If these elasticities have changed, as some economists think, then the forecasts may be biased. For all of these reasons, the estimates of the expected improvement in the trade balance should be viewed as being suggestive.

exports grow at the same rate, because the value of imports greatly exceeds the value of exports. Hence, imports will change more than exports and the effect of income growth will be a worsening in the trade balance.

If imports and exports increase 2.1 times as much as income, in percentage terms, U.S. real GNP will cause imports to increase about 15 percent between now and 1989, and foreign real GNP will cause exports to increase about 16 percent.[19] As shown in the first line of Panel B in Table 2, foreign income growth should increase exports $37 billion from the $208 billion in 1986, and U.S. income growth should increase imports $57 billion from the $344 billion in 1986. These and other estimates in Table 2 explain the reasons for expecting an improvement in the trade balance. The terms "pessimistic" and "optimistic" in Table 2 refer to different assumptions about changes in import prices; the effect of income on imports is the same for both forecasts. Although income growth has the same percentage impact on exports and imports over the next three years, the trade deficit is nonetheless likely to worsen by $20 billion because of growth in foreign income and U.S. income.

The value of the dollar

The decline in the dollar since the first quarter of 1985 tended to reduce export prices and increase import prices. The exchange value of the dollar, as measured by the Morgan Guaranty index, has declined 33 percent since the first quarter of 1985. Export prices have fallen 33 percent since their high point in the first quarter of 1985, and import prices have risen 3 percent since their low point in the fourth quarter that year.

Lower export prices imply an increase in exports of $82 billion. The decline in relative export prices has completely offset their previous rise, with the result that export industries have regained the price competitiveness they lost in the early 1980s. These industries should be able to recapture the sales they lost as a result of the high dollar. The decline in export prices could then be expected to cause exports to increase $82 billion by 1989.

The magnitude of the decline in imports is less certain though. Import prices have risen less than might have been expected. More than 60 percent of the increase in the exchange rate in the early 1980s was passed through to import prices. Import prices would be expected, therefore, eventually to rise 20 percent in response to the 33 percent decline in the dollar. But import prices have risen only 3 percent so far, for reasons that are not well understood.[20] The two forecasts in Table 2 reflect this uncertainty. The "pessimistic" forecast assumes that import prices rise 10 percent and imports fall 10 percent. Although 10 percent is more than import prices have risen so far, it is only half the increase predicted on the basis of the previous extent of pass-through. If imports decline proportionately to their prices, this 10 percent increase in import prices would lead to a 10 percent reduction in imports. The implied $33 billion decline in imports is indicated in the second line of Panel B of Table 2, under the "pessimistic" forecast.

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[19] The notes at the end of Table 2 describe how these and other estimates in this section were calculated.

[20] One explanation is that while foreign producers could increase their profit margins when the dollar rose, they chose to reduce their profit margins rather than increase their export prices when the dollar fell. For more information on this subject, see Reuven Glick and Ramon Moreno, "The Pass-Through Effect on U.S. Imports," *Federal Reserve Bank of San Francisco Weekly Letter*, December 12, 1986, and Gerald Anderson and John Carlson, "Does Dollar Depreciation Matter: The Case of Auto Imports from Japan," *Economic Commentary*, Federal Reserve Bank of Cleveland, May 1, 1987.

TABLE 2

Expected improvement in the U.S. trade balance—1986-1989
(billions of 1982 dollars)

Panel A: Magnitude of the Improvement

	"Pessimistic" Forecast			"Optimistic" Forecast[1]		
	Exports	– Imports	= Trade Balance	Exports	– Imports	= Trade Balance
Levels in 1986	$208	$344	–$136	$208	$344	–$136
Levels in 1989	327	348	–21	327	319	8
CHANGES: 1986-89	119	4	115	119	–25	144

Panel B: Causes of the Improvement

	"Pessimistic" Forecast			"Optimistic" Forecast		
	Changes in Exports	– Changes in Imports	= Changes in the Trade Balance	Changes in Exports	– Changes in Imports	= Changes in the Trade Balance
Due to income[2]	$ 37	$ 57	–$ 20	$ 37	$ 57	–$ 20
Due to relative prices[3]	82	–33	115	82	–62	144
Due to other factors[4]	0	–20	20	0	–20	20
TOTAL CHANGE	119	4	115	119	–25	144

NOTES: [1] Exports refer to nonagricultural merchandise exports, imports refer to nonpetroleum merchandise imports, and the trade balance refers to the difference between the two.

All calculations in the table are done in the same way. For example, the percentage change in exports due to a change in relative price equals the percentage change in relative price times the elasticity of exports with respect to relative price. Then, since exports in 1986 are known, one can calculate the change in exports due to relative price. The change is calculated based on percentage changes calculated as the difference in logarithms.

[2] Foreign income rises 7.7 percent. Assuming the elasticity of exports with respect to foreign income is 2.1, exports would rise 16 percent, or $37 billion. U.S. income rises 7.3 percent. Assuming the elasticity of imports with respect to U.S. income is 2.1, imports would rise 15 percent, or $57 billion.

[3] The relative price of exports has fallen 33 percent. Assuming the elasticity of exports with respect to relative prices is –1.0, exports would rise 33 percent, or $82 billion. In the pessimistic forecast, the relative price of imports rises 10 percent. Assuming the elasticity of imports with respect to relative price is –1.0, imports would fall 10 percent, or $33 billion. In the optimistic forecast, the relative price of imports rises 20 percent. Assuming the same elasticity of imports, imports would fall 20 percent, or $62 billion.

[4] As discussed in the text, other factors are assumed not to change exports and to decrease imports by $20 billion.

In contrast, the "optimistic" forecast shown in Panel B of Table 2 implies a larger decline in imports and a larger improvement in the trade balance. Reflecting the assumption that the full 60 percent of the decline in the exchange rate that would be predicted on the basis of past relationships is passed through to import prices, this forecast assumes that import prices rise 20 percent. Imports would then decline $62 billion. Imports decline more and the trade balance improves more in the optimistic forecast because import prices are assumed to rise by more.

To summarize, the decline in the exchange rate should lead to a significant improvement in the trade balance. The amount of improvement in the trade balance due to the exchange rate depends on how much import prices eventually rise. Under the pessimistic assumption that they rise only 10 percent, the trade balance could be expected to improve $115 billion. But under the more optimistic assumption of a 20 percent increase in import prices, the trade balance could be expected to improve $144 billion.

In addition to changes in income and the exchange rate, other factors could lead to either greater improvement or less improvement.

Other factors

Factors other than real income and the exchange rate are likely to contribute to a slight improvement in the trade balance. The previous section argued that the LDC debt crisis and the emergence of the NIC's as important international competitors of U.S. firms contributed to the deterioration in the trade balance. Although these two factors will likely contribute somewhat to the improvement in the U.S. trade balance, they will not contribute enough to reverse the entire amount of the worsening of the trade balance they caused earlier in the decade.

The U.S. trade deficit with Latin America should improve somewhat. The improvement should occur because of faster income growth in Latin America and because of the decline in the value of the dollar. For the traditional reasons, these factors imply that exports to Latin America should pick up and imports from Latin America should recede. Although the LDC debt crisis appears to have stabilized, it is likely to continue in some form.[21] As a result, the U.S. trade deficit with Latin America is not likely to disappear entirely. As long as Latin American countries are required to run trade surpluses to service their debt, the United States will likely run trade deficits with Latin America.

For similar reasons, the U.S. trade balance with the NIC's is likely to retrace only part of the earlier deterioration. The recent decline in the dollar against the NIC currencies should tend to improve the U.S. trade deficit. Also, many of the NIC's are taking actions to reduce their surpluses with the United States by encouraging more imports from the United States.[22] The NIC's will remain formidable competitors for U.S. firms, however, partly because U.S. consumers have become accustomed to buying products from them and because their firms have developed marketing networks in this country. As a result, U.S. deficits with the NIC's will probably not be eliminated altogether.

On balance, the special factors that worsened the trade balance in the early 1980s are likely to

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[21] For example, in a letter to Senator William Proxmire on May 5, 1987, Chairman Paul Volcker stated: "In my judgment, a great deal has been accomplished over that period [the past four years], and we are on a broad track that provides better chances for success over time than others . . .."

[22] Between the first quarter of 1985 and the first quarter of 1987, the dollar fell 12 percent against the Taiwan dollar and rose 2 percent against the Korean won. In addition, since the first quarter of 1987, the dollar has fallen an additional 11 percent against the Taiwan dollar. Furthermore, the Taiwan cabinet approved in late May a proposal to cut in half a harbor tax on imports and to impose a tax on exports.

contribute to its improvement in the late 1980s. These factors are not likely to contribute enough to eliminate the U.S. trade deficit entirely. Table 1 shows that the effects of these other factors led to a $75 billion deterioration in the trade deficit. Assuming only 25 percent of these effects are reversed, these other factors will contribute approximately $20 billion to the overall improvement in the trade balance.[23] For ease of exposition, it is assumed that these improvements take the form of a $20 billion decrease in imports, as shown in Table 2.

To summarize the discussion so far, changes in real income at home and abroad, the exchange rate, and other factors suggest that the trade balance could improve by as much as $144 billion or as little as $115 billion. These estimates are shown in the final lines of both Panels A and B of Table 2, and simply reflect the changes in exports and imports due to their determinants. Changes in relative prices could cause the trade balance to improve by as much as $144 billion or as little as $115 billion. Changes in income at home and abroad should cause the trade balance to deteriorate by $20 billion. Finally, other factors can be expected to offset the income effect, contributing $20 billion to deterioration in the trade balance. As a result of these changes, the nonagricultural/nonpetroleum merchandise trade balance could decline sufficiently to lead to an $8 billion surplus by 1989, or a $21 billion deficit, as is shown in the second line of Panel A.

Has the dollar fallen enough?

Whether the dollar has fallen enough depends on whether the decline in the trade balance shown

in Table 2 is large enough. There are both political and economic criteria for judging how much of an improvement is enough. The political criteria depend on whether the decline in the trade deficit is sufficient to stave the pressures for protectionist legislation. As long as the trade deficit is perceived as large or as not declining fast enough, political pressures for protectionist measures to limit imports will persist. But if declines in the trade deficit come soon enough, and are large enough, these pressures would diminish. Because resistance to protectionist sentiment is essential for continued worldwide growth and open trading, perceptions of whether the trade deficit is too large should be taken into account in judging whether the improvement in the U.S. trade balance is sufficient.

There are also economic criteria for judging whether the dollar must fall further. An equilibrium level of the dollar implies that the associated trade balance can be sustained. For example, if the decline in the dollar would eventually lead to a $100 billion trade deficit, most analysts would say the dollar has not fallen enough because such a large deficit is not likely to be sustainable.

Economic criteria suggest that the dollar will probably have to decline further. The logic and evidence for this conclusion will be laid out in this section. The first element of the argument is that the lasting effect of past trade deficits requires that the United States run a surplus in merchandise trade in the future. And according to projections of oil imports and agricultural exports, this surplus must be in the nonagricultural/nonpetroleum component of merchandise trade. Although there are several ways this surplus can be obtained, the most likely is a further decline in the value of the dollar.

Surplus in merchandise trade is needed

There are two components of the overall trade balance: merchandise trade and services trade.

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[23] To prevent double-counting, the $20 billion improvement represents the improvement in the trade balance associated with these two factors not captured by the income and exchange rate effects. A somewhat arbitrary 25 percent is used for illustrative purposes.

A major component of the service account is income earned on overseas investments, often called factor income. The United States has traditionally run a surplus in this category because of its net creditor status. The surplus has been declining sharply in recent years, however, as the long string of trade deficits has turned the United States into a net debtor nation. And as the United States goes deeper into debt due to continuing deficits in overall trade, the factor income component of the overall trade balance will turn from surplus to deficit. The larger the trade deficit and the longer it continues, the greater will be the factor income deficit. With the factor income component of the overall trade deficit in deficit because of the debt service burden associated with the recent and prospective trade deficits, merchandise trade, which is the largest component of the nonfactor income trade balance, must eventually be in surplus.

How large the merchandise trade surplus must be depends on the answers to several questions. How large will the overall trade deficit be in the coming years? How long before the overall trade deficit is in balance? And what interest rate should be used to calculate the debt service on the U.S. international debt? According to Paul Krugman and George Hatsopoulos, the factor income deficit will be $21 billion (current dollars) in 1991. So for overall balance in the trade accounts by 1991, the nonfactor income surplus would have to be $21 billion (current dollars).[24] Since the nonfac-

tor income deficit was $181 billion in 1986, this implies close to a $200 billion turnaround in this category by 1991. And since merchandise trade is the major component, it is reasonable to assume that the merchandise trade deficit must decline by about $175 billion between 1986 and 1989. A turnaround of this magnitude implies that merchandise trade would be in surplus by 1989.[25]

Surplus must be in nonagricultural/ nonpetroleum merchandise trade

There are two ways the merchandise trade account could be in surplus. The nonagricultural/ nonpetroleum component of merchandise trade could be in surplus, or the agricultural/petroleum component could be in surplus. Unless agricultural exports rise a great deal or oil imports decline, the only way to achieve a surplus in merchandise trade is to have a surplus in non-agricultural/nonpetroleum merchandise trade.

Evidence suggests that trade in agricultural and petroleum products will remain in deficit for the next several years. Although the exchange value of the dollar is an important factor in determining farm exports, it may not be the most important. According to one study, "U.S. agriculture

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[24] See Paul Krugman and George Hatsopoulos, "The Problem of U.S. Competitiveness in Manufacturing," *The New England Economic Review*, Federal Reserve Bank of Boston, January/February 1987, pp. 18-29, for further details. The authors construct a simple model of international trade that allows them to estimate the improvement in the nonfactor income current account that is needed to give current account balance in 1991. They assume gross domestic product (GDP) grows 2.5 percent per year, inflation equals 3 percent, and the real interest rate is 4 percent. They estimate that the nonfactor income current account surplus, in current dollars, must be $21.6 billion

in 1991; if the inflation rate is 3 percent, this means the real value is about $16 billion. If the current account declines linearly from 1986, then U.S. international debt would equal $532 billion in 1991. As a result, the factor income deficit is 4 percent of the level of international debt in 1991.

[25] By bringing the target date up to 1989, the improvement was reduced to $175 billion from $200 billion. If current account balance occurs later than 1991, the improvement in merchandise trade would need to be larger since the total debt would be larger. Of course, the (larger) improvement would come at a later date. However, if the merchandise trade balance is in deficit in 1989, and if the effect of past declines in the dollar is completed by 1989—as assumed in this article—then the merchandise trade deficit will grow after 1989. The reason is that equal growth rates in U.S. and foreign real income mean equal growth rates in imports and exports. But as long as imports exceed exports, the equal growth rates would lead to deterioration in the trade balance.

can hope to find significant growth in exports only through improving economies in the developing world."[26] Forecasts by DRI confirm this expectation of slow growth in farm exports. These forecasts imply that farm exports will average $37 billion in 1988-90, up only modestly from the $27 billion average in 1984-86. DRI also predicts that oil imports will average $84 billion in 1988-90, up significantly from the $66 billion average in 1984-86. As a result, the trade deficit for agricultural and petroleum products will rise from $39 billion in 1986 to about $47 billion in 1989.

Since a surplus in merchandise trade will not come from a rise in farm exports or a decline in oil imports, it must come from an improvement in nonagricultural/nonpetroleum trade. The previous subsection argued that the merchandise trade deficit must decline by $175 billion by 1989. Adding the projected $8 billion worsening of the agricultural/petroleum trade deficit yields a projection that the nonagricultural/nonpetroleum trade surplus must improve by $183 billion.

With no further declines in the dollar, the nonagricultural/nonpetroleum trade balance must, therefore, decline even more than in the optimistic forecast in Table 2. According to that forecast, the nonagricultural/nonpetroleum component of the trade balance would improve only $144 billion even if most of the exchange rate changes that have occurred so far are eventually reflected in import and export prices. Yet the nonagricultural/nonpetroleum component of merchandise trade must decline by substantially more than this to achieve the required decline of $183 billion.

How to achieve the necessary surplus

There are at least four ways to get such an additional improvement in the trade balance. U.S. real GNP could grow more slowly, reducing the growth of imports, or foreign real GNP could grow faster, increasing the growth of exports. Alternatively, such other factors as solution of the LDC debt problem could lead to a larger turnaround in the nonagricultural/nonpetroleum trade balance than is generally thought likely. Or finally, the exchange value of the dollar could fall further, causing further increases in import prices and further declines in export prices, which would lead to more exports and fewer imports. Any combination of these possibilities could lead to the additional reduction in the nonagricultural/nonpetroleum merchandise trade deficit that is projected to be necessary for overall balance of trade equilibrium.

Conclusions

The deterioration in the trade balance between 1980 and 1986 was a macroeconomic phenomenon. Several macroeconomic factors that account for the deterioration were identified in the first section. Chief among them was the loss of U.S. price competitiveness associated with the rise in the value of the dollar. Other factors include the debt servicing problems of Latin America and the increased competitiveness of the Asian NIC's. Underlying these developments were several macroeconomic imbalances, including the saving-investment imbalance due to large government budget deficits.

Although the trade deficit is expected to decline significantly, further macroeconomic efforts are needed to reduce the trade deficit further. While increased productivity would improve living standards in the United States, it would not significantly affect the trade deficit over the next few years. Macroeconomic coordination was successful in reducing the value of the dollar from its high in early 1985. The second section showed that with no further declines in the dollar, the nonagricultural/nonpetroleum merchandise trade deficit could optimistically decline by $144 billion.

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[26] See Henneberry, Drabenstott, and Henneberry, p. 34.

However, the lasting effects of past trade deficits implies that this measure of the trade deficit needs to decline substantially more to pay the interest on the buildup of international debt.

Therefore, further efforts are needed to reduce the trade imbalance. The overall strategy is to reduce the U.S. trade deficit while avoiding protectionism and maintaining noninflationary growth at home and abroad. In furtherance of this strategy, the Federal Reserve and the Administration have urged foreign industrial countries to stimulate their economies, as a way to reduce the trade imbalance. But the outlook for foreign economic growth remains uncertain. Unless macroeconomic policies to stimulate faster growth abroad are adopted, either the U.S. economy will have to grow slower or the dollar will have to fall further to eliminate the U.S. trade deficit. Since few would recommend slower U.S. growth, the most likely way to achieve an additional reduction in the merchandise trade deficit is through a lower value of the dollar, which would stimulate exports and retard imports.

More fundamentally, a reduction in the trade balance may require a reduction in the federal government budget deficit. The rise in the dollar during the early 1980s is thought by many to be due in large part to the burgeoning federal budget deficits. And without improvement in this area, significant and sustainable reductions in the trade deficit will be hard to come by without disruption in the U.S. capital market.