Working Paper

INTERNATIONAL MONETARY FUND

IMF WORKING PAPER

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WP/94/113

INTERNATIONAL MONETARY FUND

Research Department

Measures of External Competitiveness for Germany

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September 1994

Abstract

This paper assesses Germany's external competitive position from several angles. It first examines movements in several real exchange rate indices. The analysis of competitiveness is then supplemented by using the so-called constant market share approach, and finally by examining briefly both pressures on profit margins in the tradable goods sector as well as export prospects. A key conclusion of the analysis is that the deterioration of Germany's external competitiveness suggested by some commonly used indicators of the real appreciation of the deutsche mark, such as those based on relative unit labor costs in manufacturing, is generally exaggerated.

JEL Classification Numbers:

F10, F14, F17

1/ I would like to thank Jacques Artus, Robert Corker, Mohsin Khan, Manmohan Kumar, Tessa van der Willigen, and Harilaos Vittas for helpful discussion and suggestions. Aarne Dimanlig, Toh Kuan and Rosa Vera-Bunge provided valuable research assistance. Any errors, however, are my own.

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Summary

This paper assesses Germany's external competitive position. This issue is particularly interesting in light of the substantial real appreciation of the deutsche mark in recent years, as indicated by several conventional measures of the real exchange rate, and the key role that exports have played in past economic recoveries.

Competitiveness is assessed from different angles. The paper first examines movements in several real exchange rate indices for Germany and reviews briefly their relationship to observed changes in trade flows. Against this background, the analysis seeks to shed further light on Germany's competitive position by using the so-called constant market share approach. Finally, the paper briefly investigates the extent to which international competition may have narrowed German profit margins in tradable goods industries and offers a brief assessment of trade prospects based on recent developments in export order statistics.

The analysis demonstrates the differing picture of Germany's external competitiveness painted by various indicators. A number of them have shown a deterioration in competitiveness, some by sizable margins. However, it also appears likely that Germany's external competitive position is stronger than suggested by standard measures based on the manufacturing sector alone. An analysis of broader-based real exchange rate indices supports this conclusion. Moreover, the results of constant market share analysis suggest some positive competitiveness effects. These results are particularly significant for the period up to 1990 insofar as an absolute squeeze on profits at home was not readily apparent in the available data. They also suggest the need to take into account product mix, quality factors, and market orientation in evaluating the international competitiveness of individual countries.

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I. Introduction

This paper provides an assessment of Germany's external competitive position. This issue is particularly interesting in light of the substantial real appreciation of the deutsche mark in recent years suggested by several conventional indicators of the real exchange rate and the key role that exports have played in past economic recoveries. It is worth noting at the outset that the concept of external competitiveness is a multidimensional one, which, at the macroeconomic level, cannot be adequately captured in a single measure. Whereas indices of the real exchange rate provide a useful guide, an array of other factors that do not lend themselves to direct quantification also affect competitiveness, including reliability, quality, after-sales service, delivery times, financing arrangements, technological innovation, and the like.

It is also worth emphasizing that an observed change in an index of the real exchange rate may simply represent an equilibrium response to changed economic circumstances, in which case any resulting deterioration in net exports would not necessarily be a cause for concern. As a relevant and recent German example, some real appreciation of the deutsche mark in the wake of unification was to be expected as an endogenous equilibrating response to the capital needs and demands of the former east Germany. This response served to divert west German exports from foreign markets to a buoyant east German market and to encourage higher imports in order to meet increased domestic demand, and thus by itself did not represent a competitiveness problem. ^{1/}

A key conclusion of the analysis is that the deterioration of Germany's external competitiveness suggested by some commonly used indicators of the real appreciation of the deutsche mark, such as those based on relative unit labor costs in manufacturing, is almost certainly exaggerated. By implication, the concern sometimes expressed that Germany's ability to compete internationally may have been impaired by an appreciating real exchange rate to such an extent as to undermine prospects for sustainable recovery can be viewed as largely unfounded.

The assessment of competitiveness is carried out from several angles. The next section discusses movements in several real exchange rate indices for Germany and reviews briefly their relationship to observed changes in trade flows. With this as background, Section III attempts to assess developments in competitiveness using the so-called constant market share approach. This approach essentially entails a decomposition of German export growth into four components: a global market growth effect; a commodity composition effect; a market distribution effect; and a residual "competitiveness" effect. The latter can be interpreted as an indication of

^{1/} See Masson and Meredith (1990), and Adams and others (1992). It might be noted that the analysis in both of these papers suggested that some real depreciation of the deutsche mark would later be prompted by the withdrawal of stimulus related to the earlier unification shock.

Germany's ability, for any number of reasons, to compete effectively with other sources of supply. In this section, the extent to which international competition may have narrowed German profit margins in tradable goods industries is also investigated. Section IV provides an assessment of trade prospects based in part on recent developments in export order statistics. Concluding remarks are contained in Section V. 1/

II. Developments in Real Exchange Rate Indices

In this section, various conventional measures of Germany's real exchange rate based on data for the manufacturing sector are first presented and discussed. They point, on balance, to a sizable loss of external competitiveness in the 1980s and early 1990s. More broadly-based measures are then reviewed. These suggest that Germany's external competitiveness has actually been stronger than the manufacturing-based indices alone would indicate.

1. The manufacturing sector

Chart 1 plots various real effective exchange rate indices for the manufacturing sector, all of which point to a significant loss of competitiveness in the period from 1985 to mid-1990, i.e., the eve of unification (July 1990). Part of this loss of competitiveness can be viewed as the counterpart of the correction of the exchange rate of the U.S. dollar which, as is widely recognized, was significantly overvalued in the mid-1980s. However, even if the period surrounding the dollar's overvaluation is taken to be somewhat abnormal, the indicators still show a sizable deterioration in German competitiveness, and this is true whether one compares exchange rate indices in mid-1990 with the late 1970s and 1980, or with 1987.

Developments in the various indicators in the later part of the 1980s suggest at first sight that exporters may have responded to the appreciating deutsche mark and rising unit labor costs by reducing their profit margins (at least relative to those in competitor countries) in an effort to hold on

1/ It is evident that measures of international competitiveness by themselves cannot be taken as measures of economic well-being and that the goal of economic policy is not to achieve a particular target for performance in the traded goods sector. Rather, policies should be aimed directly at promoting appropriately high and sustainable rates of savings and investment, correspondingly high productivity and economic growth, and thereby, an improved standard of living; factors that may also have a positive impact on a country's ability to compete in international markets. Several articles by Paul Krugman discuss the misuse of the notion of international competitiveness as an underlying reason for economic difficulties that are primarily domestic in origin. Just three examples are Krugman (March/April 1994, February 1994, and November 1991).

Chart 1
Germany

Real Effective Exchange Rates for Manufacturing 1/
First Quarter 1975 to First Quarter 1994
(1985=100)

Source: IMF, Research Department.

1/ Against the currencies of 16 industrial countries as described in International Financial Statistics.

to market share. 1/ The indices shown in Chart 1 do indeed start to diverge considerably in 1987 and show significant cumulative differences by mid-1990. By then, the relative unit labor costs index was roughly 10 percent higher than the nominal effective exchange rate index. By contrast, the relative export price index actually declined from its end-1986 level, after having broadly kept pace with the other indices. 2/ 3/

However, it would be erroneous to interpret the apparent decline in Germany's relative export profit margins as indicative of a genuine profit squeeze. During most of the period preceding unification there was a tendency in many industrial countries, particularly in Europe, for income distribution to shift from labor to capital. Data on the rate of return on capital and the capital income share in the business sector indicate that both were at an historically high level at the beginning of the 1990s in Germany, after rising steadily during the 1980s. Data on profit margins for the German enterprise sector, particularly for the manufacturing sector, indicate that profits fell perceptibly in 1991 for the first time since the beginning of the upswing at the end of 1982. 4/

Since unification, there has been a further real appreciation of the deutsche mark in terms of relative unit labor costs of around 10 percent by mid-1993, with virtually all of this appreciation being accounted for in the last year of this period. An appreciation of the nominal effective exchange rate was important, but more rapid growth of unit labor costs in Germany than in her competitor countries also contributed. Since mid-1993, there has been some easing back of the real effective deutsche mark (in terms of relative unit labor costs) from its earlier peak (Chart 1).

2. Broader-based indices 5/

While measures of unit labor costs in manufacturing reveal important information on a significant component of production costs for a sector

1/ The strategy of defending market share through squeezing profits is not one that can be sustained in the long run--thus the argument that indicators based on relative costs, whether unit labor costs or more comprehensive measures of costs discussed later, are particularly relevant for assessing external competitiveness from a longer-term perspective.

2/ Lipschitz and McDonald (1991) offer evidence that profit margins in the ERM countries increased relative to those in Germany up to 1988.

3/ It is important to note that the later part of the 1980s witnessed a large fall in the price of oil. While this would have been of benefit to both domestic and foreign exporters' profit margins, the benefit to Germany was probably more pronounced because of greater reliance on imported oil than many other industrial countries. Nevertheless, comparing the index based on unit labor costs to one based on value-added deflators in manufacturing instead of export unit values still indicates declining relative profit margins, particularly later in the 1980s (Chart 2).

4/ Section III.2 contains more discussion of profit margins in Germany.

5/ Much of this section draws on Bundesbank, Monthly Report (May 1994), pp. 45-57.

whose products account for a large proportion of merchandise exports and imports (for example, manufactured goods accounted for almost 97 percent of west German exports and almost 88 percent of its imports in 1992), caution needs to be exercised when interpreting unit labor costs as a measure of competitiveness. In particular, there are significant problems with available data on unit labor costs in manufacturing. These data encompass only the costs of labor services that are incurred directly in manufacturing, and therefore exclude the costs of other important labor inputs that are used in producing manufactured goods. These excluded costs may be in the form of labor from the services sector--for example, legal or marketing services, if these are not performed in-house--as well as other indirect labor costs embodied in the intermediate inputs needed for producing manufactures. Such labor costs can have an important effect on the cost of manufactured goods produced in Germany relative to competitor countries, and therefore need to be recognized in the analysis. Labor costs in manufacturing account directly for a much smaller fraction of total production costs. 1/ In addition, there may be problems of international comparability in the definitions of the manufacturing sector that lead to differences in the extent to which certain suppliers and service areas are included in the manufacturing sector across countries. Such comparability problems may be reflected in measured unit labor costs in German manufacturing having recorded larger increases than unit labor costs in other areas of the business sector, whereas in most other competitor countries sectoral differences in the evolution of unit labor costs have been the reverse. 2/

1/ To emphasize this point, the Bundesbank notes: "Although labor costs--in terms of the value added--constitute by far the most significant cost factor in the manufacturing sector, with a share of 70 percent, in relation to the total value of the finished product (in other words, including the intermediate work undertaken by other domestic sectors and by sectors abroad) the labor costs incurred directly in manufacturing account for only about one-quarter of the total." See Bundesbank, Monthly Report, (May 1994), p. 51.

2/ As is well known, there are other difficulties associated with using data on unit labor costs. Changes in the prices of inputs other than labor affect competitiveness, but are not captured by examining only unit labor costs. For example, the substitution of capital for labor may result in a lower unit labor cost index but higher capital costs, so the decline in unit labor costs overstates any improvement in cost competitiveness. In the process, labor may be reduced, and more importantly some marginal activities, typically where productivity is relatively low, would cease altogether. It may in fact be a lack of competitiveness that causes the output of tradables to fall but that also results in a rise in average productivity. More detailed discussion of these difficulties, as well as of more general difficulties with measures of real exchange rates, is found in Lipschitz and McDonald (1991), Turner and Van't dack (1993), Wickham (1993), and Marsh and Tokarick (1994).

Chart 2
Germany
Effective Exchange Rates and Relative Profits 1/
First Quarter 1975 to First Quarter 1994
(1985=100)

Source: IMF, Research Department.

1/ In manufacturing. Profits defined as ratio of effective exchange rates based, respectively, on implicit value-added deflators over unit labor costs.

2/ Against the currencies of 16 industrial countries as described in International Financial Statistics.

In light of the above discussion, it seems sensible to examine relative unit labor costs from the broader perspective of the overall business sector instead of manufacturing alone. Of course, this does not solve all problems: as with unit labor costs in manufacturing, the costs of other important inputs that affect relative cost competitiveness, such as the costs of various capital inputs, are not taken into account. Moreover, the business sector covers not only the tradables sector but also parts of the economy that are sheltered from foreign competition. Nevertheless, the broader indicators add another dimension to the analysis by trying to account for the fact that competitiveness in German manufacturing also depends on labor inputs provided by other parts of the German economy. Moreover, the above-mentioned definitional problems for the manufacturing sector should not be as important.

As with indicators based on the manufacturing sector alone, more broadly-based indicators show an appreciation of the real effective exchange rate (Chart 3). The various indices peak in 1993 and then reverse to some degree in the more recent quarters, reflecting increases in labor productivity, moderate wage settlements, and some modest depreciation of the deutsche mark. What is striking, however, is that the levels of the broader-based indicators suggest a much smaller cumulative real appreciation of the deutsche mark since the mid-1980s than those for the manufacturing sector alone. In fact, relative unit labor costs for the business sector as a whole are estimated to have recently been a bit below their 1987 peak, in sharp contrast to the continued steep rise during this period suggested by the index of relative unit labor costs in manufacturing alone. This implies that the growth in relative unit labor costs in the non-manufacturing sectors has been much more subdued than in manufacturing itself; and, to the extent that inputs from the former are used in producing manufactured goods, German competitiveness would be stronger than suggested by relative unit labor costs in the manufacturing sector alone.

There is, furthermore, evidence that relative unit labor costs for the business sector as a whole are more closely correlated empirically with the observed behavior of exports. For example, in its study, the Bundesbank uses a simple regression framework and obtains an estimated elasticity of exports with respect to unit labor costs in the business sector of -0.22 in the short run and -0.36 in the long run; both are statistically significant. By contrast, similar elasticities for unit labor costs in manufacturing are not significant (and equal -0.14 and -0.21 in the short and long runs, respectively).

The other indicators based on total expenditure deflators and consumer prices, respectively, have tended to move fairly closely over the last 20 years or so with relative unit labor costs for the business sector; thus, they also stand well below the manufacturing indices. However, while these variables are also statistically significant in export equations, they do

not explain exports as well as relative unit labor costs. 1/ Like unit labor costs, the index based on expenditure deflators can be interpreted as an indicator of costs per unit of output; but in this case it covers total costs, which include the prices of all factors of production and, therefore, supplement and extend the information based on unit labor costs. Such broad-based indices can also be seen as reflecting the ratio of the relative prices of nontradable goods to tradable goods at home and abroad: an increase in this index would reflect either a loss of competitiveness in the traded goods market, or a greater incentive to allocate resources to the nontradable goods sector at home than abroad. 2/

To extend the analysis, it is instructive to consider directly the relative price of nontradables to tradables, another measure of international competitiveness, which is often referred to in the literature as "the" real (or internal real) exchange rate. This measure also recognizes the important fact that a country's international performance depends on developments in the nontradable sector. If the real exchange rate appreciates--that is, the price of nontradables rises relative to the price of tradables--resources will tend to be reallocated away from the tradable goods sector with the trade balance deteriorating accordingly and in this sense competitiveness is said to worsen. 3/ However, one problem is that this measure may not entail a loss of competitiveness (or may overstate such a loss), even when rising over time, if the growth in labor (or total factor) productivity differs across sectors of the economy.

The internal real exchange rate shows much less of an appreciation than the indices based on the manufacturing sector (Chart 4). And even here, the internal real exchange rate overstates the deterioration in actual competitiveness insofar as labor productivity (and total factor productivity) in the tradable goods sector has been rising more rapidly than

1/ Marsh and Tokarick (1994) suggest that export volume equations using competitiveness indicators based on unit labor costs (normalized) can explain trade flows for exports of goods overall, and for manufactured goods alone, somewhat better than indicators based on consumer prices or export unit values.

2/ If prices of traded goods in different countries are closely related through international competition, then a real appreciation of the currency as measured by aggregate price indices would suggest that developments in the internal terms of trade are more favorable to nontraded goods in the appreciating country.

3/ Underlying this adjustment is the idea that the internal real exchange rate represents the domestic cost of consuming and producing tradable goods, and is a summary measure of the incentives guiding resource allocation between the two major sectors of the economy.

Chart 3
Germany
Comparing Real Effective Exchange Rate
Indices for Manufacturing with Broader-based Indices, 1975-94 1/
(1975=100)

Source: Deutsche Bundesbank, Monthly Report (May 1994); and chart 1 for normalized unit labor costs.

1/ Against the currencies of 18 industrial countries (without Greece and Ireland for unit labor costs in the manufacturing sector). Annual data, except for 1994, which shows the first quarter.

CHART 4
Germany

Internal Terms of Trade

(1985 = 100)

Sources: Calculations from OECD data; IMF, Research Department.

in the nontradable goods sector (Chart 4). ^{1/} In addition, the effects of an appreciation of the internal real exchange rate on the trade balance could be lessened if similar trends occur in competitor countries. ^{2/}

III. Trade Performance and Related Developments

This section begins with an analysis of export market shares to see if further light can be shed on the German competitiveness issue. This analysis suggests that a competitiveness problem has not been particularly evident in the actual performance of German exports. The section goes on to review the available data on developments in sectoral profits as another channel through which competitive pressures may have had an impact.

1. Constant market share analysis

Constant market share analysis has the advantage of taking into account the composition of a country's exports both in terms of the types of goods it exports and the markets to which it exports in analyzing export performance. ^{3/} Applying this approach basically entails decomposing the change in German exports between any two periods into four effects: the effect from the expansion of overall trade by competitor countries (the global market growth effect); the effect from Germany exporting goods for which demand is growing at a different pace than the overall average for competitor countries (the commodity composition effect); the effect from Germany exporting to markets for which demand is growing at a different pace than the overall average for competitor countries (the market distribution effect); and a "competitiveness" residual.

More formally, the change in German exports (ΔX) between any two periods can be written as:

$$\Delta X = \sum_i r_i X_i \quad (1)$$

^{1/} The data used to construct these variables are available through 1991 and are from the OECD international sectoral database, comprising 14 countries and 20 sectors. Tradables are defined to include those sectors in which more than 10 percent of total production is exported for all 14 countries combined. For details on this database and classification, see De Gregorio and others, WP/94/33 (March 1994). The data used here update their calculations for 1970-85 up to 1991.

^{2/} De Gregorio et al. (1994) provide evidence of the increase in the relative price of nontradables for 14 OECD countries, using the OECD international sectoral database.

^{3/} More discussion of constant market share analysis is contained in Leamer and Stern (1970), pp. 171-183, and Richardson (1971), pp. 227-239.

$$+ \sum_i r_i X_i - \sum_i r X_i \quad (2)$$

$$+ \sum_i \sum_j r_{ij} X_{ij} - \sum_i r_i X_i \quad (3)$$

$$+ \Delta X - \sum_i \sum_j r_{ij} X_{ij} \quad (4)$$

where:

- r = the proportional change in the overall exports of competitor countries;
- r_i = the proportional change in competitors' exports of good i ;
- r_{ij} = the proportional change in competitors' exports of good i in market j ;
- X_i = German exports of good i ;
- X_{ij} = German exports of good i to market j .

The expression (1) of the decomposition is the "market growth effect"; (2) is the "commodity composition effect"; (3) is the "market distribution effect"; and (4) is the residual "competitiveness effect." Expressions (2) and (3) take into account whether exports are concentrated in commodities and markets that can be considered to be slowly or rapidly expanding relative to the average for competitors. 1/

The competitor group--that is, the standard with which to judge export performance--is taken to be the OECD as a group (excluding Germany). 2/ This facilitates meeting the large data requirements, as detailed data are available on the value of exports across the 10, broad one-digit SITC categories and across various country markets that are aggregated up to the OECD total (OECD series C foreign trade statistics); 3/ the analysis

1/ Reversing the order of calculating effects (2) and (3) would give a different decomposition, but not change the calculations of their combined effects.

2/ A considerable bias might have been introduced in the interpretation of the competitiveness residual had the German economy been growing at a significantly different rate than the OECD average. In fact, real growth in west Germany, and for the OECD overall, averaged around 2 1/2 percent from 1980 to 1992.

3/ While it would have been desirable to also perform the analyses on volume data to try to control for valuation effects, such data are not available.

considers 11 market groupings. ^{1/} Similar data are also available for Germany alone. Thus, "r", the "r_i"s, and the "r_{ij}"s are derived from data on OECD exports (excluding Germany) by SITC category and by market.

The results of this exercise are reported in Table 1; they extend to 1992, but do not go further because of data limitations. Also, starting in 1991, the data encompass unified Germany. As a result, the data for that year and 1992 are not strictly comparable with earlier data, and, for this reason, such comparisons are generally not made; however, the table does include for reference calculations that compare 1992 to 1990. Table 2 summarizes the results for those goods and markets that are responsible for most of the observed change in overall market shares.

Looking over the whole sweep from 1984 to 1990, a negative competitiveness effect might have been expected on the basis of the deterioration in competitiveness suggested by several of the indicators discussed earlier. In actual fact, the calculations yield a small, but positive effect--that is, German exports increased by a somewhat greater amount than would have been expected if they had grown by the same proportion as did competitors' exports in each good and each market (this is expression (4) in the earlier-explained decomposition). It can be seen from Table 1 that about 5 percent of the increase in exports over the entire period was attributable to competitiveness effects, which resulted in an annual average boost to export growth of 1 percent. Table 2 indicates that machinery and transportation equipment, which in 1990 accounted for about one-half of Germany's exports, was the sector driving the positive competitiveness calculations, particularly in regard to exports to Japan, North America, and Asia; the competitiveness effect was negative for exports to other European countries. The category of manufactured goods (classified chiefly by material) was also important, with the calculated gains in this sector not concentrated in particular markets.

It is tempting to conclude that exporters were able to hold on to, and even increase somewhat, market share but at some cost to profit margins. It is also plausible, given the results, that some of the nonquantifiable elements of competitiveness had a significant positive impact on exports, offsetting (or even resulting in) real exchange rate appreciation. Another

^{1/} The 11 market groupings are: North America; Japan; Australia, New Zealand, and South Africa; the 12 EU countries; EFTA; Asia; Africa; Latin America and the Caribbean; the Middle East; the economies in transition; and others not classified elsewhere, or a residual market. The one-digit SITC classification is: section 0 for food and live animals; section 1 for beverages and tobacco; section 2 for crude materials, inedible, except fuels; section 3 for mineral fuels, lubricants and related materials; section 4 for animal and vegetable oils, fats and waxes; section 5 for chemicals and related products; section 6 for manufactured goods classified chiefly by material; section 7 for machinery and transport equipment; section 8 for miscellaneous manufactured articles; and section 9 for commodities and transactions not classified elsewhere.

Table 1. Constant Market Share
Decomposition of Export Growth 1/

(In percent)

	1984- 1990	1984- 1987	1987- 1988	1987- 1990	1991- 1992	Memorandum item 1990-1992
Proportion of change due to:						
Market growth effect	71.4	51.8	156.4	118.1	89.5	116.3
Commodity composition effect	7.5	8.0	8.7	3.4	6.9	11.3
Market distribution effect	16.4	16.2	-9.3	8.2	-59.9	-58.6
Competitiveness effect	4.7	23.9	-55.7	-29.8	63.5	31.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum items:						
Yearly average growth in exports (percent per year)	15.1	19.7	9.8	10.6	6.9	3.9
Yearly average growth in exports due to competitiveness effects (percent per year)	1.0	5.4	-5.5	-3.6	4.4	1.2

1/ Data for Germany are on a unified basis starting in 1991. Thus, calculations are generally not made that use data from 1991 on, against data for 1990 or earlier as a base; the calculations for 1990-92 are an exception and only for reference.

Table 2. Main Forces Behind Decomposition of Export Growth

(In U.S. dollars)	1984-90	1984-87	1987-88	1987-90	1991-92
Commodity Composition Effect	Total = 17.0 of which: Mach & Trans = 14.5 Misc Manu = 7.6 Min Fuels = -4.9 Food = -2.2 Crude Mat = -1.6	Total = 9.8 of which: Mach & Trans = 7.9 Misc Manu = 4.1 Chemicals = 2.1 Min Fuels = -3.3 Food = -1.1	Total = 2.5	Total = 3.5 of which: Mach & Trans = 1.2 Misc Manu = 2.2 Chemicals = -1.7 Min Fuels = -1.1	Total = 1.9 of which: Mach & Trans = 1.5 Misc Manu = 1.3 Chemicals = 1.5 Manu Goods = -2.0
Market Distribution Effect	Total = 37.2 of which: EEC (Mach & Trans) = 33.3 EEC (Manu Goods) = 10.2 EEC (Chemicals) = 3.6 EEC (Misc Manu) = 3.4 NAF (Mach & Trans) = -5.5 ME (Mach & Trans) = -5.3	Total = 19.9 of which: EEC (Mach & Trans) = 15.0 EEC (Manu Goods) = 5.1 EFTA (Mach & Trans) = 4.1 EEC (Misc Manu) = 2.0 EEC (Chemicals) = 2.1 EEC (Food) = 1.9 ME (Mach & Trans) = -3.1 AFR (Mach & Trans) = -1.6 NAF (Mach & Trans) = -1.5 ANSA (Mach & Trans) = -1.0	Total = -2.7	Total = 8.5 of which: EEC (Mach & Trans) = 12.2 Japan (" " ") = 1.9 Asia (" " ") = 1.2 NAF (" " ") = -4.7 EFTA (" " ") = -2.3 EEC (Manu Goods) = 3.1 Transition Economies (Manu Goods) = -1.7	Total = -16.6 of which: Transition Economies Mach & Trans = -6.1 Manu Goods = -2.2 Misc Manu = -1.0 Chemicals = -1.7 Food = -1.6 EEC (Mach & Trans) = -3.4 EFTA (" " ") = -2.1
Competitiveness Effect	Total = 10.6 of which: Mach & Trans = 8.6 (Japan) = (3.6) (NAF) = (2.6) (Asia) = (3.1) (EFTA) = (2.3) (Res) = (1.1) (EEC) = (-5.6) Manu Goods = 4.2	Total = 29.3 of which: Mach & Trans = 17.6 (NAF) = (6.3) (EEC) = (3.6) (EFTA) = (2.4) (Asia) = (2.0) (Japan) = (1.6) Manu Goods = 4.9 Misc. Manu = 3.5 Chemicals = 2.8	Total = -16.1 of which: Mach & Trans = -11.8 (NAF) = (-4.8) (EEC) = (-3.2) (EFTA) = (-1.1) (Asia) = (-1.0) (Res) = (-1.0) NIE = -4.0	Total = -31.0 of which: Mach & Trans = -17.0 (EEC) = (-11.4) (NAF) = (-5.2) NIE = -7.2 (EEC) = (-2.8) (EFTA) = (-1.7) Chemicals = -3.0 (EEC) = (-1.7) Manu Goods = -2.4 (EEC) = (-3.1)	Total = 17.6 of which: Mach & Trans = 12.0 (EEC) = (5.7) (EFTA) = (1.2) (ME) = (1.1) (Res) = (4.9) Transition Economies = (-1.0) Manu Goods = 2.7 Misc Goods = 1.4

Food = Food and Live Animals

Crude Mat = Crude Materials, inedible, except fuels

Min Fuels = Mineral Fuels, Lubricants, and Related Materials

Chemicals = Chemicals and Related Products

Manu Goods = Manufactured Goods Classified Chiefly by Material

Mach & Trans = Machinery and Transport Equipment

Misc Manu = Miscellaneous Manufactured Articles

Res = Residual market

ME = Middle East

ANSA = Australia, New Zealand, and South Africa

NIE = Goods not included elsewhere

EEC see text

EFTA see text

explanation is that German exports are relatively price-inelastic, income-elastic goods. 1/

It is worth emphasizing that the commodity composition and market distribution effects were also positive and larger than the competitiveness residual. This was the case over the 1984-90 period as a whole, and also in the two sub-periods of 1984-87 and 1987-90. 2/ This result provides some evidence consistent with the notion that Germany has benefitted from a "favorable" composition of exports. Especially strong effects were calculated for machinery and transportation equipment, with strong effects also calculated for other categories of manufacturing; the European market figured in prominently.

The gains from a positive competitiveness effect over the 1984-90 period did not take place in a steady fashion, as demonstrated by performing separate calculations for the first and second halves of the period. The first half of the period, 1984-87, experienced significant, and broadly-based positive competitiveness effects, attributable most strongly to the machinery and transportation equipment sector, but also to two categories of manufactured goods and to the chemicals sector. The calculations indicate that competitiveness effects added about 5 1/2 percent per year to export growth. By comparison, negative competitiveness effects retarded export growth in the second half of the period by some 3 1/2 percent per year; these negative effects were concentrated mainly in the machinery and transport equipment sector and were particularly strong in 1987-88. Negative competitiveness effects were also calculated for the categories of chemicals and manufactured goods (classified chiefly by sector), but their size was relatively small compared to the positive gains recorded in the first half of the period.

Because the calculations can be sensitive to the choice of base year, different combinations of base and comparator years were tried within the 1984-90 period, but the results did not change in a substantive way. Germany's share in world trade peaked at the beginning of the 1980s. Calculations using 1980 as a base--which is also a year that precedes the beginning of the U.S. dollar's sharp upward move--show positive competitiveness effects for the periods 1980-1987 and 1980-1990.

1/ The elasticities estimated by the Bundesbank (May 1994) for various measures of the real exchange rate are all (in absolute value) at 0.3 or lower in the short-run, and below 0.5 in the long-run. Golub (1994) finds comparatively little responsiveness of German exports to changes in relative unit labor costs. These two studies do not report income elasticities.

2/ The combined effect for the 1987-88 period alone was virtually zero.

While the effects of an appreciating real exchange rate operate only with a lag, ^{1/} it is striking that the calculations for more recent periods, such as 1991-92, again show positive competitiveness effects, concentrated once more around the machinery and transportation equipment sector. Interestingly, the market distribution effect was substantially negative, which reflects Germany having exported goods to particular markets for which demand was comparatively weak. As shown in Table 2, this was especially the case because of exports to the economies in transition, across a range of goods (machinery and transport equipment, manufactured goods, chemicals, and food).

On balance, from the above analysis, a competitiveness problem has not been particularly evident in the export flows, despite the deterioration in competitiveness suggested by several conventional cost indicators.

2. Sectoral pressures on profits

While not a sustainable strategy in the long-run, exporters may have tried to defend their market share by "pricing to market" and squeezing profits in the short-run. Empirical work by Knetter (1989) provides supporting evidence of this kind of behavior. He finds that for a selected group of 10 products across several market destinations that German export prices denominated in deutsche mark are sensitive to exchange rate changes and that adjustments in these prices have tended to stabilize the local currency prices in the destination market. Amid the appreciation of the deutsche mark, this would imply a squeeze on profit margins. Unfortunately, because of data problems, it is difficult to garner other direct, and more general evidence on the extent to which profits may have been squeezed in firms--or the various sectors that comprise tradable goods--as a result of their export activities or their efforts to compete with imported goods. The sectoral data that are available encompass both domestic and foreign sales and therefore need to be interpreted with great caution; also, many difficulties are encountered in trying to discern which sectors faced import competition more intensively, by constructing, say, import penetration ratios. That being said, the available data tend to lend only limited support to the notion that profits in the tradable goods sector (or more precisely in manufacturing) were squeezed in 1991 in some subsectors of

^{1/} Estimates from MULTIMOD, the IMF's multicountry macroeconometric model would suggest that most of the effects take place in one year. But even allowing for longer lags, say up to three years, would fail to explain the positive competitiveness residuals that the calculations suggest for the 1991-92 period.

manufacturing, but no clear pattern emerges in earlier years. 1/ These data are reported in Table 3. 2/

IV. Prospects for Export Growth

Judgments about external competitiveness can be based not only on past performance but also on the prospects for international trade. In addition to recent evidence pointing to a favorable performance (and prospects) of German exports in some regional markets, 3/ concerns over external competitiveness have also been mitigated by recent labor market adjustments to competitive pressures. The Bundesbank has noted that the efforts of German producers to export have been assisted by accelerated measures to reduce costs that were widely introduced in industry in the light of sluggish sales trends and that also improved international competitiveness. 4/ Recent wage settlements imply moderate wage growth, which, along with productivity gains (reflecting labor shedding), point to unit labor costs that should actually decline this year. Moreover, the ongoing restructuring effort of the business sector should also be helped by the increased flexibility in the hiring and usage of labor inputs, which in turn contributes to improving the financial position and external competitiveness of enterprises. 5/

It is also noteworthy that the recent deterioration in several indicators of external competitiveness did not prevent a strong pickup in export orders. Relevant data on these orders are shown in Chart 5, along with survey data on export expectations by enterprises and actual export performance. Following the upward trend in 1993, export orders in the first six months of 1994 were 9 percent higher than in the preceding six months and 12 percent higher than in the same period a year earlier. Survey data have also been very positive on potential export growth. In view of these indicators and their past relationship with actual export performance, it

1/ To be clear, this analysis focuses only on profits in Germany whereas the discussion in Section II.1 is in terms of German profits relative to competitor countries. It would appear from the data in Table 5 that the apparent decline in Germany's relative profit margins up to 1990 did not reflect extensive pressure on absolute profits margins at home.

2/ While detailed data are available only through 1991, the Bundesbank in its Monthly Review (November 1993) reports a loss of profitability in 1992.

3/ German exporters have recently recorded rapid growth in their trade with developing countries, particularly in the Latin American and Asian regions. It appears that Germany has gained a stronger foothold in the Asia region and is increasing its export marketing efforts there, helped by improved competitiveness against Japanese producers because of the strength of the Japanese yen.

4/ Deutsche Bundesbank, Monthly Report (February 1994), p. 66.

5/ The spring wage round produced settlements typically in the 0-2 percent range, in addition to agreements to increase the flexibility of labor utilization.

Chart 5
Germany

Export Indicators

(March 1990 = 100)

Sources: Deutsche Bundesbank; and Ministry of Economics.

Table 3. Profit Margins

(In percent)

Sector	1985	1986	1987	1988	1989	1990	1991	1992
(After-tax profits) 1/								
All enterprises	1.9	2.1	2.1	2.2	2.1	2.2	2.0	1.5
Manufacturing sector	2.3	2.5	2.3	2.6	2.4	2.5	2.1	...
Of which:								
Chemical industry	3.1	3.3	3.6	4.1	3.9	3.4	3.1	...
Manufacture of plastic products	2.7	3.1	2.9	2.7	2.6	2.6	2.6	...
Quarrying, extraction and working-up of stones and earths	1.9	3.7	3.6	4.0	4.5	4.3	4.8	...
Iron and steel industry	2.2	1.7	0.5	2.0	2.3	2.2	1.6	...
Non-ferrous metal industry	1.2	1.3	1.5	2.3	1.5	1.7	1.2	...
Manufacture of structural metal products	1.9	2.3	2.2	2.3	2.9	3.8	3.0	...
Mechanical engineering	3.0	2.8	2.1	2.7	2.7	2.6	1.5	...
Manufacture of road vehicles	1.7	2.1	2.4	2.3	2.1	1.9	1.4	...
Electrical engineering	3.0	3.1	2.7	2.4	2.1	2.5	2.3	...
Manufacture of tools and finished metal goods	3.5	3.5	3.3	3.9	3.3	3.6	3.2	...
Woodworking	1.2	1.9	1.9	1.8	1.5	2.2	1.5	...
Manufacture of wood products	1.3	1.9	2.6	3.1	2.7	2.9	2.7	...
Processing paper and board	3.3	4.0	3.1	2.6	3.2	3.4	2.4	...
Textile industry	2.2	2.2	2.5	2.5	2.2	2.3	2.0	...
Clothing industry	2.5	2.7	2.9	2.6	2.1	2.2	2.6	...
Food and drink industry	1.3	1.7	2.1	2.1	1.5	2.6	2.2	...

Table 3 (concluded). Profit Margins

(In percent)

Sector	1985	1986	1987	1988	1989	1990	1991	1992
(Profits before income taxes) ^{1/}								
All enterprises			3.3	3.5	3.4	3.5	3.2	2.5
Manufacturing sector			4.0	4.4	4.3	4.3	3.6	...
Of which:								
Chemical industry			7.1	8.4	7.7	6.6	5.5	...
Manufacture of plastic products			4.3	4.3	4.1	4.1	4.2	...
Quarrying, extraction and working-up of stones and earths			5.5	6.2	6.8	6.6	6.9	...
Iron and steel industry			1.3	3.3	4.2	4.0	2.8	...
Non-ferrous metal industry			2.5	3.6	3.1	3.2	2.0	...
Manufacture of structural metal products			3.4	3.5	4.3	5.4	4.8	...
Mechanical engineering			3.7	4.2	4.6	4.3	3.1	...
Manufacture of road vehicles			4.6	4.6	4.8	4.2	3.1	...
Electrical engineering			4.6	4.4	4.1	4.2	4.0	...
Manufacture of tools and finished metal goods			4.7	5.4	4.7	5.1	4.7	...
Woodworking			2.4	2.4	2.3	3.1	2.2	...
Manufacture of wood products			3.4	4.0	3.7	3.9	3.8	...
Processing paper and board			4.4	4.0	4.2	4.8	3.8	...
Textile industry			3.9	3.7	3.5	3.4	3.1	...
Clothing industry			4.1	3.8	3.2	3.3	3.8	...
Food and drink industry			2.9	3.0	2.3	3.6	3.1	...

Source: Deutsche Bundesbank.

^{1/} As a percent of turnover.

seems reasonable to expect that exports will perform well for the rest of 1994.

Nevertheless, the export outlook for later years remains more uncertain. First, other European industrial countries are also likely to experience wage moderation and productivity-enhancing restructuring in their tradables sectors; therefore, the ultimate effect of recent adjustments in Germany on Germany's external competitiveness position is not yet clear. Second, recent indicators of stronger export performance may be related to some extent to the weak domestic demand that firms experienced in Germany. In this light, there is a risk that a pick up in domestic demand might dampen future export performance by reducing incentives for firms to penetrate new markets. Furthermore, while it may be reasonable to expect subdued wage growth in the period immediately ahead when Germany would still be emerging from recession, it is unlikely that real wage increases could be held below productivity growth in the medium-term, particularly for those categories in which labor skills are in short supply. In the absence of greater wage differentiation with respect to skill levels, pressures on wages overall could develop that would adversely affect competitiveness in international markets.

V. Concluding Remarks

The analysis in this paper has shown the differing picture of Germany's external competitiveness painted by the various indicators examined. A number of them have shown a deterioration in Germany's external competitiveness, some by sizable margins, but it also appears likely that the standard measures based on the manufacturing sector alone have overstated the weakness of Germany's external competitiveness position. In this regard, the analysis of developments in the broader-based real exchange rate indices, and in the internal real exchange rate, support this conclusion. Moreover, the results of constant market share analysis are revealing and actually suggest positive competitiveness effects. These results are particularly significant for the period up to 1990, insofar as an absolute squeeze on profits at home was not readily apparent. They also suggest the need to take into account product mix, quality factors, and market orientation in evaluating the international competitiveness of individual countries.

Developments in the more recent past have raised understandable concerns over Germany's competitiveness position. Notwithstanding the positive competitiveness effects calculated from the constant market share analysis for 1991-1992, actual export performance, especially during the first half of 1993, worsened significantly on the heels of other indicators of a worsened competitiveness position. ^{1/} Looking ahead, however, there

^{1/} Export data for 1993 are subject to revision as the changeover to a new system of recording trade between EU countries (INTRASTAT) may have resulted in an underestimation of German exports to these countries.

is good cause for optimism that economic recovery will not be thwarted by inadequate competitiveness and a poor export performance. Quite the contrary, recent evidence on sustained growth in export orders and expectations through 1993 and into 1994, as well as actual export performance, are consistent with a solid rebound in exports this year, albeit from a low base. Significant adjustments have been and are taking place in labor markets, while enterprise restructuring efforts continue, all of which are enhancing external competitiveness and export prospects. While the outlook for 1995 is considerably less certain than the prospects for this year, sustaining a strong export performance into 1995 and later years will clearly be helped by a continuation of such restructuring efforts and of labor market reforms and adjustments.

References

- Adams, Gwyn, Lewis Alexander, and Joseph Gagnon, "German Unification and the European Monetary System: A Quantitative Analysis," International Finance Discussion Paper Number 421, Board of Governors of the Federal Reserve System, January 1992.
- De Gregorio, José, Alberto Gionvannini, and Holger C. Wolf, "International Evidence on Tradables and Nontradables Inflation," IMF Working Paper WP/94/33, March 1994 (to be published in the European Economic Review).
- Deutsche Bundesbank, "Real Exchange Rates as an Indicator of International Competitiveness," Monthly Report, Vol. 46, No. 5, May 1994.
- _____, "Trends and Determining Factors of the External Value of the Deutsche Mark," Monthly Report, Vol. 45, No. 11, November 1993.
- Golub, Stephen S., "Comparative Advantage, Exchange Rates, and G-7 Sectoral Trade Balances," IMF Working Paper WP/94/5, January 1994.
- International Monetary Fund, International Financial Statistics, various issues.
- Knetter, Michael M., "Price Discrimination by U.S. and German Exporters," American Economic Review, Vol. 79, No. 1, March 1989, pp. 198-210.
- Krugman, Paul, "Competitiveness: A Dangerous Obsession," Foreign Affairs, Volume 73, No. 2, March/April 1994, pp. 28-44.
- _____, "Home Truths," European Economic Perspectives, Centre for Economic Policy Research, No. 3, February 1994.
- _____, "Myths and Realities of U.S. Competitiveness," Science, Vol. 254, November 1991, pp. 811-815.
- Leamer, Edward E., and Robert M. Stern, Quantitative International Economics, Boston: Allyn and Bacon, Inc., 1970.
- Lipschitz, Leslie and Donough McDonald, "Real Exchange Rates and Competitiveness: A Clarification of Concepts, and Some Measurements for Europe," IMF Working Paper WP/91/25, March 1991.
- Marsh, Ian W., and Stephen P. Tokarick, "Competitiveness Indicators: A Theoretical and Empirical Assessment," IMF Working Paper WP/94/29, March 1994.
- Masson, Paul R., Steven Symansky, and Guy Meredith, "MULTIMOD Mark II: A Revised and Extended Model," Occasional Paper 71, International Monetary Fund, July 1990.

_____, and Guy Meredith, "Domestic and International Macroeconomic Consequences of German Unification," in German Unification: Economic Issues, Occasional Paper 75, International Monetary Fund, December 1990.

Richardson, J. David, "Constant Market Shares Analysis of Export Growth," Journal of International Economics 1, 1971.

Turner, Philip and Jozef Van't dack, "Measuring International Price and Cost Competitiveness," BIS Economic Papers, No. 39, November 1993.

Wickham, Peter, "A Cautionary Note on the Use of Exchange Rate Indicators," IMF Paper on Policy Analysis and Assessment, PPAA/93/5, March 1993.