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Currency Appreciation and Deindustrialization:  
A European Perspective

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Working Paper 1992-006B  
<http://research.stlouisfed.org/wp/1992/92-006.pdf>

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# **CURRENCY APPRECIATION AND "DEINDUSTRIALIZATION": A EUROPEAN PERSPECTIVE**

**June 1994**

## **ABSTRACT**

During the 1980s, policy advisers were successful in promoting the view that movements in the value of the dollar have an inverse relationship to U.S. international competitiveness. This article explains their hypothesis, as well as the counterargument that exchange rates positively reflect a country's competitiveness. Economic policies that boost competitiveness also raise the value of the domestic currency.

The mirror image of these hypotheses apply to U.S. trading partners, including Europe. The evidence indicates that European countries were not "deindustrialized" from 1985 to 1990, when the ECU rose in value by more than the dollar had risen in 1980-1985. Instead, European competitiveness rebounded strongly in the late-1980s, reversing the stagnant performance of the early-1980s. Similarly, during the early-1980s, when the United States was, on one unsupported view, deindustrializing, European nations generally did not enjoy a surge in their share of output or capital formation. Instead, they suffered from "Eurosclerosis."

**KEYWORDS:** Exchange rates, Currency appreciation, productivity, international competitiveness

**JEL CLASSIFICATION:** F21, F31, F41, F43

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This paper was written while the author was a visiting scholar at the Austrian National Bank. An earlier version was presented at the Bank and at the University of Munich. Comments by the participants, especially Professors Bernhard Pieper, Hans-Werner Sinn and Dieter Proske are gratefully acknowledged.

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Currency Appreciation and "Deindustrialization": A European Perspective

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The rise in the value of the U.S. dollar in the early 1980's and its subsequent fall were surrounded by arguments that a currency appreciation depresses a country's industrial and traded goods sectors and that a depreciation would boost these sectors. In the U.S. case, the argument was made that the 1980-85 appreciation of the dollar "deindustrialized" the country, or that America lost its international competitiveness. The antidote, according to this argument, was to engineer a decline in the dollar to boost U.S. competitiveness.<sup>1</sup> The international counterpart to this argument was that foreign nations, including Europe, gained competitiveness in the early 1980's, only to lose it after 1985 when their currencies appreciated.

This article examines the arguments surrounding this view and some evidence on whether there is such an inverse link between a country's exchange rate and its international competitiveness. It first reviews an alternative hypothesis that movements in the value of a country's currency, to the contrary, reflect a positive relationship to the country's competitiveness. Earlier discussions of this hypothesis have focused more heavily on the U.S. experience, especially

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<sup>1</sup>These arguments are legend. Some influential examples of proponents of this view, however, include: Branson (1986), Branson and Love (1988), Brinner (1985), Cline (1986), Krugman and Baldwin (1987), Marris (1985), Meyer (1986), Peterson (1987) and Solomon (1985).

during the period of the rise in the dollar.<sup>2</sup> While less widely discussed, this alternative hypothesis recently has been put forward by former Federal Reserve Chairman Paul Volcker in his book with Toyoo Gyohten: "I may be old-fashioned about this, but I have never been able to shake the feeling that a strong currency is generally a good thing and that it is typically a sign of vigor and strength and competitiveness" (1992 p. xv).

This article focuses on some European evidence, especially from the period when the dollar fell (1985 to 1990), or when non-U.S. currencies appreciated. Specifically it addresses whether European industries were "deindustrialized" when the dollar fell and European currencies appreciated. It concludes that the European evidence is also consistent with the view that a rise in the external value of a country's currency reflects an improvement in the performance of the country's industry or in its competitiveness. Thus European countries gained competitiveness vis-a-vis the United States when the U.S. dollar fell and European currencies appreciated, and they had lost it earlier when the dollar rose.

#### I. The Rise and Fall in the U.S. Dollar: Is the European Experience Comparable?

Since the initiating factor giving rise to the "deindustrialization" hypothesis was the rise in the value of the dollar, a review of this experience is necessary for determining whether the experience in Europe is comparable. Chart 1 shows the movements in the trade-weighted nominal and real exchange rates

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<sup>2</sup>The hypothesis is developed in several papers, including Tatom (1985, 1986a, 1986b, 1987, and 1988). Lawrence (1983 and 1984) was among the first to cast doubt on the U.S. deindustrialization hypothesis. Glick and Hutchinson (1990) argue that the rise in the value of the dollar in 1980-85 was linked to fiscal stimulus that could have raised the value of the dollar and stimulated output and employment in the U.S. traded-goods sector.

for the United States from 1973 to 1991. The dollar rose on both bases from 1980 to 1985, then fell to 1988.<sup>3</sup> By 1990, the nominal exchange rate had fallen 35 percent, nearly reversing the 46.3 percent rise from 1980 to 1985; the real exchange rate (based on consumer prices) also retraced its earlier rise over the same period.

Movements in the value of the dollar imply opposite movements in non-dollar currencies. Thus, if a rise in the dollar deindustrializes the United States, the reversal of this movement should deindustrialize U.S. trading partners. Whether this hypothesis is relevant for Europe depends on the extent to which movements in the value of the dollar are mirrored in European currencies.

Since there is no single European currency and, in fact, there have been several realignments in the European Monetary System (EMS), it is not a simple task to determine movements in the value of European currencies. One indicator, however, is the value of the European Currency Unit (ECU). From 1980 to 1985, the dollar value of the ECU fell 45.2 percent, paralleling the 45.3 percent rise in the dollar; subsequently, from 1985 to 1990, the ECU rose 67 percent. Thus, while the dollar almost exactly retraced its earlier movement, the ECU rose from \$0.7622 to \$1.2730 per ECU from 1985 to 1990, putting the ECU 8.5 percent below its \$1.391 per ECU average in 1980. Nevertheless, it should be noted that the rise in the ECU (and its earlier fall) exceeded the comparable U.S. movements. Thus, if a 45.3 percent rise in the dollar can deindustrialize the United States, a 67 percent rise in the ECU might equally well be expected to reduce European competitiveness.

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<sup>3</sup>The trade-weighted value of the dollar actually peaked in the first quarter of 1985, but the analysis here is unaffected by this difference.

Table 1 offers a broader view of exchange rate movements, however. On a trade-weighted basis, no European country had an appreciation in 1985 to 1990 as large as the previous appreciation of the dollar, on a nominal or real (using export unit values) basis. Nonetheless, six countries (Germany, Netherlands, Belgium, Denmark, Switzerland and Austria) showed nominal appreciations of about 10 to 19 percent.<sup>4</sup> Six others showed smaller appreciations and 6 depreciated. Eleven of the 13 countries shown had real appreciations from 1985-90. Over the earlier period (1980-85), similar numbers of European countries depreciated and to a similar relative extent compared with the U.S.'s subsequent depreciation. In particular, 13 of 18 countries had nominal declines and 10 of 13 had real depreciations. While the changes in the trade-weighted European exchange rates do not move as dramatically as those for the United States or the value of the ECU, they still generally conform to the ECU pattern. How should such movements in exchange rates be interpreted?

## II. Two Views of The Link Between The Exchange Rate and Traded Goods Sector's Performance

The hypothesis that there is an inverse linkage between a country's exchange rate and its industrial performance treats exchange rate movements as exogenous. When a country's currency rises (falls) in value, or the exchange rate rises (falls), domestic prices of imported goods fall and foreign prices of domestic exports rise. As a result, domestic consumers switch from local, import-competing goods to foreign suppliers, and foreigners switch from imports

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<sup>4</sup>The relatively larger rise in the value of the German mark against the other 11 appreciating European nations has been referred to as the German dominance hypothesis. In this view, a major shift against or in favor of the dollar vis a vis EMS countries affects the mark most of all. The focus on the dollar in accounting for EMS country movements is especially important in the 1980s according to one of the hypotheses explained below. The German dominance hypothesis is explained by Giavassi and Giovannini (1989).

to their own import-competing sector. The appreciating-currency country loses production for export and its import-competing sector shrinks, so the traded goods sector contracts. At the same time, the traded goods sector abroad will expand; the demand for its import-competing sector rises, as well as for its exports. This reflects the symmetry of the argument, of course, because these countries have depreciating currencies. According to this hypothesis, referred to as the "deindustrialization" hypothesis below, European nations and other competitors with the United States should have benefited from expanding trade in the early 1980s and should have lost competitiveness when the U.S. dollar fell from 1985 to 1990.

#### What Is Competitiveness?

This argument clarifies the meaning of competitiveness as used here. Competitiveness, to a first approximation, refers to a country's market share in world output. This definition ignores the influences of differing natural growth rates and of distortions arising from domestic subsidies, taxes or regulations; the former consideration is especially important at an aggregate level because a country with a declining population and labor force is unlikely to appear competitive on a market share basis, even if its productivity performance is superior. Thus, while the latter is a more meaningful measure of a nation's relative performance in securing a high or rising standard of living, changes in competitiveness reflected in relative output are unlikely to yield a different indicator of competitiveness changes. More importantly, such a definition avoids the more frequent reliance on movements in trade balances or on real exchange rates as indicators of movements in a country's competitiveness. These

indicators provide a seriously erroneous view of a country's, or an industry's, competitive position.<sup>5</sup>

For example, a country's net exports of a product will fall, despite an increase in domestic production, if its own consumption rises more. A simple redistribution of world income can result in consumption changes that reduce world trade, and which reduce trade most in a country that is gaining income. The latter's consumption of traded goods could rise relatively more than its production, so that its net exports fall or its net imports rise. Similarly, a redistribution of world resources and production can result in a decline in a country's net exports, perhaps even in its share of trade, despite an increase in the country's absolute output and its share of world production.

Real exchange rate measures are also unreliable indicators of competitiveness. Such measures frequently rely on consumer price measures, which are not representative of traded goods. Belassa (1961, 1964) notes the effect of economic growth in raising consumer price measures relative to traded goods prices, biasing upward such real exchange rate measures, and giving the false impression of lost competitiveness in more rapidly growing countries. Lipschitz and McDonald (1992) provide a recent discussion, following Marston (1986), and indicate the shortcomings of other real exchange rate measures as indicators of international competitiveness. They share the view taken here that a measure of a gain (loss) in competitiveness should reflect a gain (loss) in producers' share of both domestic and foreign markets.

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<sup>5</sup>Krugman (1994) raises similar concerns over the concept of international competitiveness and arrives at similar conclusions. In his case, however, since productivity or real GDP per capita are not distinctly different concepts from competitiveness, he rejects any usefulness of a concept of a nation's competitiveness.



## Movements in The Exchange Rate Can Reflect A Positive Relationship to Competitiveness

The alternative view of the exchange rate- competitiveness linkage focuses on influences that lower (raise) the relative cost of a country's traded goods output, raising (lowering) the rate of return to capital in this sector, and attracting a net capital inflow into the country. In this case, the rise in the country's exchange rate reflects its increased competitiveness.<sup>6</sup> A sufficient condition for this result is the operation of purchasing power parity, so that a decline in cost in one country (due to a positive productivity or negative resource price shock, for example) requires that foreign producers' currency decline in value to maintain international competitiveness.<sup>7</sup>

In the context of the monetary approach to exchange rate determination, policies that boost productivity or capacity output in a country raise the value of its currency. Such changes in productivity also are associated with changes in relative rates of return to investment, so that capital flows reinforce the appreciation of the currency of the country which initially boosted the rate of return to capital. In this view, movements in the exchange rate reflect

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<sup>6</sup>Since, in this view and generally in economic theory, both the exchange rate and competitiveness are jointly determined endogenous variables, any correlation is conceivable depending upon the internal and external shocks affecting the economy. See Frenkel and Razin (1992), for example. This is the simplest refutation of the deindustrialization hypothesis. Piggott, Rutledge and Willett (1985) provide a discussion of a related problem involving the treatment of the exchange rate as an exogenous variable. Their analysis concerns the link between the exchange rate and the prices where the currency's value is inversely related to future domestic inflation, but the exchange rate might also be viewed as the cause of a rise in domestic prices.

<sup>7</sup>Frenkel and Mussa (1985) provide a summary of the state of research on the validity of purchasing power parity (PPP). At least in the short run, it does not hold usually. Note that the PPP assumption above is a sufficient condition used for exposition only. The focus below is on real shocks for which naive tests of PPP would be expected to fail, especially in the short run.

movements in competitiveness in the same direction, instead of acting as the agent for an inverse movement in competitiveness.

Economic policy has a major influence on competitiveness and the exchange rate. Attempts to boost productivity through increased investment, for example, typically involve new incentives to invest or anti-inflationary monetary policies aimed at reducing the cost of capital and raising the private rate of return to saving. To the extent that such efforts are expected to be successful, the value of the country's currency will rise.

This positive linkage is also central to exchange rate policy in countries that manage their exchange rate. Currency depreciation typically reflects a willingness to ratify a monetary policy that has been and/or is expected to be more inflationary than a country's trading partners. Similarly, a credible appreciation requires an economic policy that is consistent with lower expected future domestic prices. Austrian economic policy offers one of the clearest examples of this relationship; in the mid-1970s and again in 1979, Austria appreciated the schilling against the Deutsche Mark and a basket of currencies to signal their intention to adhere to their hard currency policy. To be credible, policy actions had to support the expectations of slower inflation.<sup>8</sup>

In the specific example of U.S. developments in the 1980's, tax law changes in 1981 reduced the cost of capital in the United States, boosting the rate of return to capital in the U.S. and raising the cost of capital abroad. These tax changes included extending the investment tax credit and broadening its coverage

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<sup>8</sup>See Gluck, Proske and Tatom (1992) for a recent discussion of Austrian exchange rate policy. Winckler (1991) develops the case for signaling policy changes using exchange rate changes. See also Hochreiter and Winckler (1991) for an application to Austria. The emphasis in such discussions is typically on monetary policy, but the analysis can also apply to fiscal policy, where supply-side effects on productivity can be more direct.

to shorter-lived assets, allowing expensing for some short-lived capital goods and substantially shortening the depreciation lives of most capital goods.<sup>9</sup> As a result of such changes, one would expect that U.S. investment would rise, boosting U.S. labor productivity and output. At the same time, the higher cost of capital abroad would be expected to retard foreign investment and productivity and output growth. World investment would be channeled by both U.S. and foreign investors toward the U.S. and away from foreign markets.

Dissatisfaction with the excesses of U.S. investment, especially in long-lived structures and very short-lived assets, as well as with the rise in the value of the dollar itself and with the trade deficit, led U.S. policymakers, in the first instance, to reverse these fiscal incentives and also to accelerate monetary growth. Monetary growth accelerated in early 1985, just after policy discussions of proposed fiscal actions also had begun. The fiscal actions adopted in the 1986 tax reform act included repeal of the investment tax credit and substantial lengthening in depreciation lives. Despite a reduction in the marginal income tax rates, taxes on capital income rose, boosting the cost of capital sharply.<sup>10</sup> For example, corporate tax accruals, net of the Federal

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<sup>9</sup>These tax changes are discussed in Ott (1984). The 1981 and 1986 tax changes and their effects on international capital flows are also discussed in Sinn (1988) and Mutti and Grubert (1988). Koester and Kormendi (1989) provide evidence from 63 countries supporting the hypothesis that marginal tax rates on income have a negative influence on economic growth. Their marginal tax rate measures do not include adjustments for some tax changes that affect the marginal cost of capital and, therefore, investment, like changing depreciation and tax credit rules.

<sup>10</sup>The maximum combined marginal tax rate on corporate income realized through reinvested earnings rose from 56.8 percent under the 1981 tax law to 59.1 percent under the 1986 tax reform; the former consisted of a 20 percent capital gains tax rate and a 46 percent corporate tax rate, and the latter consisted of a 39 percent corporate rate and a 33 percent personal income or capital gains tax rate. For corporate capital income realized through dividends, the maximum tax rate fell from 73 percent in 1981 to 59.1 percent in 1986. The weighted average maximum marginal tax rate (assuming 50 percent of corporate earnings are

Reserve, rose 47.3 percent from \$58.5 billion in 1985 to \$86.1 billion in 1987, despite only little cyclical improvement in the U.S. economy and nominal GDP growth of 12.4 percent over the same period.

As a result, the pattern of exchange rates, investment, productivity and output were expected to reverse, according to this view. In particular, these changes were expected to raise the U.S. cost of capital and reduce the U.S. rate of return to capital, lower U.S. investment by domestic and foreign investors, and lower the cost of capital abroad. The changing pattern of investment could be expected to lower U.S. productivity and output growth and to raise these measures abroad, while lowering the value of the dollar or raising the value of foreign currencies. Thus, a decline in the value of the dollar was expected to boost European competitiveness, rather than deindustrializing Europe, as the conventional view might suggest.

### III. The U.S. Evidence

Developments in the United States were strongly at odds with the deindustrialization hypothesis, despite its popularity. Proponents of the importance of the hypothesis for the United States focus on trade balance developments. When the dollar rose sharply, the U.S. balance of trade deteriorated sharply; subsequently it improved as the dollar fell. The merchandise trade deficit rose from \$25.5 billion in 1980 to \$122.2 billion in 1985 and to \$159.6 billion in 1987; by 1990, it had declined to \$108.8 billion.

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distributed as dividends) fell from 64.9 percent in 1981 to 59.1 percent. Thus, the corporate income tax base would have had to effectively rise by only 9 percent for the maximum tax on corporate capital income to have been raised. This base rose substantially more than this, however, due to the end of the investment tax credit and lengthened depreciation allowances.

Virtually all of these changes were concentrated in 5 manufacturing industries: electrical and transportation equipment, nonelectrical machinery, primary metals and apparel, according to Tatom (1988). Of the \$124.1 billion overall rise in the merchandise trade deficit, 91.9 percent was concentrated in these five industries. These industries did not deindustrialize. In fact, productivity growth in these industries boomed in 1980-85, raising the growth of overall manufacturing productivity and of real GNP per worker. While this growth slowed in 1985-87, these industries still registered faster productivity growth than the rest of manufacturing or real GNP per worker.

This unusual productivity performance was reflected in strong production gains. Output in these deficit-related industries also boomed in 1980-85, growing more than twice as fast as the rest of manufacturing and nearly double real GNP growth. These industries produced an unusually strong overall rise in overall U.S. manufacturing productivity, capacity and output. The cyclically-adjusted share of U.S. manufacturing output rose to its highest post-World War II levels from mid-1981 to 1985.<sup>11</sup>

The deindustrialization hypothesis also incorrectly interpreted the source of the dollar's strength. Proponents of the hypothesis typically cite the rise in the U.S. budget deficit as the source of interest rate increases which induced the rise in the dollar, rather than incentives to reallocate world capital.<sup>12</sup>

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<sup>11</sup>See Tatom (1986a, 1986b, 1987, 1988). Tatom (1986a and 1988) show that there is a positive and statistically significant leading relationship between an increase (decrease) in the trade-weighted value of the U.S. dollar and subsequent (3 quarters) increases (decreases) in U.S. manufacturing output, given cyclical influences on such output. This leading relationship is consistent with forward-looking foreign exchange markets which anticipate movements in productivity or competitiveness.

<sup>12</sup>The hypothesis that a rise in foreign demand for dollars to buy assets in the United States was the source of the dollar rise is not easily supported. While foreigners may have increased their U.S. investment, they would have done

Such arguments have been unimpeded by the poor fit of the facts and the argument. For example, the surge in U.S. interest rates occurred well before the emergence of the U.S. budget deficit. In fact, by mid-1981 interest rates had peaked, but the total government budget deficit for the year ending in III/1981 had risen only to \$36.2 billion (from a surplus of \$15.8 billion two years earlier). Table 2 summarizes subsequent movements in the budget deficit and the movements up or down in the value of the dollar and in interest rates over each interval.

The budget deficit climbed to \$179 billion in 1983, while interest rates generally fell. The budget deficit then fell until early 1985 (to \$132.2 billion), without halting the rise in the dollar. Next the budget deficit rose to \$185.3 billion in the year ending in I/1987, while the dollar fell. Finally, from its recent low point of \$99.6 billion in the year ending in III/1989, the total government budget deficit surged to \$215.4 billion in 1991, without resurrecting a rise in interest rates or the exchange rate. Moreover, over these two years, when the budget deficit more than doubled, the merchandise trade deficit fell from \$115.7 billion to \$73.4 billion.

Contrary to the deindustrialization hypothesis, there are only two periods in Table 2 when the budget deficit and the value of the dollar moved in the same direction. Moreover, in each of these instances, U.S. interest rates moved in the opposite direction, contrary to the transmission mechanism hypothesized in their view. The movements in the table are for the three-month Treasury bill rate, but other short-term rates, and a real rate constructed by computing the

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so in domestic currency. Since this currency bought substantially fewer dollars, foreign investment in the U.S. did not grow much faster than U.S. income from 1980 to 1985. The source of the dollar appreciation in international transactions is discussed below.

quarterly average of the three-month Treasury bill rate less the annualized rate of increase of the CPI over the next three months, show the same pattern. The links between budget deficits and interest rates, interest rates and the value of the dollar, and the value of the dollar and U.S. trade are nearly as poorly understood, or at least as poorly argued by U.S. deindustrialization proponents, as that between exchange rates and competitiveness.

Some insight into the changing pattern of international competitiveness can be obtained from Chart 2 which shows sources of supplies of dollars in international exchange, measured relative to U.S. GDP. The two principal sources are U.S. demands for spending on imports and on foreign assets, or U.S. investment abroad. U.S. assets abroad generally fell from 1980 to 1985, despite a slight rise during 1982. This reduction in U.S. investment abroad was the source of a decline in the supply of dollars in international exchange equal to nearly 2.5 percent of U.S. GDP between 1980 and 1985.

The next major swing in Chart 2 was again in U.S. investment abroad, which increased sharply, pushing up the overall supply of dollars in international exchange just as the exchange value of the dollar began to fall. Thus, at least from a U.S. standpoint, shifts of U.S. demand for foreign assets are consistent with changing incentives to invest in the United States and with movements in the exchange rate.

Finally, the pattern of U.S. domestic investment is consistent with this view and not with the deindustrialization hypothesis. Chart 3 show U.S. business fixed investment as a share of GDP since 1948; periods of recession are indicated. Both actual and cyclically-adjusted shares are shown. The actual

share is strongly cyclical, so the cyclically-adjusted share is more representative of non-cyclical shifts in demand for business capital.<sup>13</sup>

The cyclically-adjusted share shows that investment surged up in mid-1981 to its highest post-World War II level and remained more than a full percentage point higher than its early-1981 level until early in 1986 when tax reform became effective. The cyclically-adjusted investment share has remained relatively low since the onset of tax reform and the decline in the dollar.

These changes in the relative strength of business investment have also been reflected in U.S. productivity performance. Chart 4 shows U.S. productivity, measured by output per hour in the business sector, since 1959. Productivity growth was much stronger in 1980-85 than it had been in the 1970s, but it has stagnated since 1986. This pattern is consistent with the U.S. investment pattern, but it is precisely the opposite of the productivity performance suggested by the deindustrialization hypothesis. The rise in the dollar was supposed to destroy U.S. productivity, according to this hypothesis, while its subsequent fall was supposed to restore U.S. productivity; exactly the opposite has occurred.

#### IV. The European Evidence

Did European competitiveness deteriorate in the late-1980s, when, on average, the ECU rose as much as the dollar had earlier? Chart 5 shows the share of European and U.S. trade (imports plus exports) in world trade from 1959 to 1991. The chart shows that Europe's share of world trade rose sharply in

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<sup>13</sup>The cyclical adjustment is based on an estimate of the effect of movements in the manufacturing capacity utilization rate on the share of investment. The adjusted series is based on an average utilization rate of about 82 percent, about the post-World War II average. See Tatom (1989) for a discussion of this adjustment and of controversies surrounding business investment in the 1980s.



1986-91, but that it had been temporarily depressed in 1981-85. The European share rose from 41.1 percent in 1985 to 47.8 percent in 1990, following its earlier decline from 44.1 percent in 1980. This pattern is precisely opposite that suggested by the deindustrialization hypothesis. Similarly, the U.S. share fell from 15.5 percent in 1985 to 13.5 percent in 1990, following its previous rise from 12.4 percent in 1980.

The more relevant measure of competitiveness is the share of world output. Table 3 shows the growth rates of manufacturing output in the period of depreciating European currencies (1980-85) and when they generally rose (1985-90). The data are from the Organization for Economic Cooperation and Development (OECD) and include all the European countries used above except Iceland. In the 1980-85 period, European output growth generally did not exceed that in the United States; only Luxembourg, Ireland and Portugal showed faster growth.

In the latest period, there is no evidence of lost European competitiveness. Four European countries had manufacturing growth that outstripped that in the United States. More importantly, only 4 of the 16 European countries showed a slowing in output growth in 1985-90 and 11 showed sharper accelerations than the United States. The six largest European industrial nations (Belgium, France, Germany, Italy, Switzerland and the United Kingdom) showed faster growth than the United States and accelerations in growth exceeding 2.5 percent per year.<sup>14</sup>

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<sup>14</sup>It might be argued that the results reported in this paper are strongly influenced by business cycle movements. For the United States, however, the unemployment rate in 1980, 1985 and 1990 was 7.1, 7.2, and 5.5 percent, respectively. Thus, the 1980-85 period comparison exhibits little cyclical influence at its end points and the second period shows some cyclical improvement which should bias the results in favor of the United States. The OECD's standardized unemployment rate for Europe fell from 10.4 percent in 1985 to 8.1

The positive link between the exchange rate and competitiveness suggests that there should be differences in domestic price performance surrounding the major changes in exchange rates and competitiveness in the 1980s. In particular, when domestic economic policies boost capital formation, productivity and the exchange rate, the country, like the United States in the early 1980s, should have a lower rate of price increase than its competitors. Alternatively, when foreign economic policies raise domestic capital formation, productivity growth and the exchange rate, as occurred for Europe from 1985 to 1990, the domestic inflation rate in the beneficiary country should be smaller, or show a more favorable development.<sup>15</sup>

Table 4 shows the five-year rate of price increase, based on the export price deflator, for the 18 European countries and the United States. While there are many other factors that are important for influencing the level and pace of change of inflation, the data are consistent with the positive competitiveness-exchange rate linkage. In particular, from 1980-85 the United States had the lowest rate of price increase shown. In the 1980-85 period, inflation improved in all of the countries shown, but it improved least in the United States. As a result, the U.S. rate of export price increase ranked seventh in 1985-90, rather than first, as in 1980-85. The smaller decline in

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percent in 1990, which is a slightly larger improvement than in the United States. Interpreting movements in European unemployment rates as purely cyclical is questionable, however. For example, the 1980-85 rise in the unemployment rate from 6.1 percent in 1980 has been interpreted as largely a rise in the natural rate. Thus, cyclical movements from 1980 to 1985 and from 1985 to 1990 are likely to be quite similar in the U.S. and in Europe.

<sup>15</sup>With fixed exchange rates, a positive productivity shock would be expected to lower domestic and world prices with money growth rising where the productivity shock originated and falling elsewhere. With flexible exchange rates, these price pressures are allowed to show through to the exchange rates and less to foreign prices and relative money stocks.

U.S. inflation in the late 1980s, or larger decline in Europe, is consistent with the relative improvement in competitiveness in Europe; both of these changes reflect, presumably, the alterations in monetary and tax policies noted above.

While inflation (Table 4) and manufacturing growth rate comparisons (Table 3) suggest that European competitiveness improved while European currencies appreciated, a better summary measure supporting this conclusion is the OECD index of European manufacturing output. European members of the OECD account for 39.5 percent of OECD manufacturing (in 1980), slightly more than the weight for the United States (36.8 percent).

Chart 6 shows the OECD indexes for European and U.S manufacturing (1980 = 100 in each case). The chart shows that the relative position of the United States improved sharply from 1980 to 1985 and that this advantage narrowed later, particularly when U.S. output stagnated after 1988. In contrast, European output staged a notable rebound in 1985-90 from its stagnate performance in 1980-85, or in 1973-85. During the 1980-85 period, European performance was referred to as "Eurosclerosis." From 1985 to 1990, European output rose at a 3.1 percent rate, up from a 0.2 percent rate from 1980 to 1985. Not only did European output growth not slow, its relatively rapid pace almost caught up with the U.S. growth rate. The U.S. manufacturing index rose at a 3.7 percent rate in 1985-90, nearly unchanged from its 1980-85 rate of 3.8 percent.

#### Some Statistical Evidence

A more systematic test of the deindustrialization hypothesis for Europe can be conducted using the European manufacturing index shown in Chart 6. While a comparable measure for the European exchange rate is more problematic, the hypothesis above relates to the symmetry of effects of movements in the value of the dollar. Thus, it is possible to test whether there is a systematic positive

relationship between the nominal trade-weighted value of the U.S. dollar (Chart 1) and European manufacturing output (Chart 6), as the deindustrialization hypothesis suggests (or whether there is a significant negative relation as the classical monetary or supply-side hypothesis suggests).<sup>16</sup>

A strong test of the hypothesis is to examine the existence of a long-run relationship between the value of the dollar ( $\ln \text{TWEX}$ ) and European manufacturing output ( $\ln M$ ). An Engle-Granger cointegration test for this relationship was conducted for the period I/1960 to I/1991, including alternative scale measures for demand. The alternative scale measures include the logarithm of OECD real GDP ( $\ln \text{XT}$ ) and the OECD unemployment rate ( $\text{UNT}$ ), U.S. real GDP ( $\ln X$ ) and its unemployment rate ( $\text{UN}_t$ ), and the OECD measures of European real GDP and unemployment.

Only U.S. scale measures yielded a statistically significant cointegrating vector estimate according to the Engle-Granger cointegration test that relies on an augmented-Dickey-Fuller test. The estimates all include a time trend ( $t$ ) because the levels of some measures ( $\ln \text{LM}$  and the logarithm of U.S. manufacturing output) have significant trends even though they are not trend stationary, while others ( $\ln \text{LXT}$  and  $\ln \text{LXF}$ ) have mixed results with the tests suggesting that they are either characterized as having trend stationary growth rates,  $I(2)$ , or that they are stationary,  $I(0)$ ; unit roots are rejected for each of the latter specifications, but the trend is statistically significant in the growth rate test equations.<sup>17</sup> Finally, adding OECD measures or European measures was

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<sup>16</sup>The test below was not conducted using the real exchange rate because the sample period is much shorter (beginning in 1972) for this series. The two exchange rate measures are highly correlated, however, at least for the period since 1971.

<sup>17</sup>According to standard Dickey-Fuller tests, all the other variables are  $I(1)$  except for the European unemployment rate which is  $I(2)$ .

examined; only the addition of the logarithm of OECD output maintains the significant cointegrating vector. The estimate is:

$$(1) \ln M = -7.156 - 0.023 \ln TWEX_t - 0.005 t + 2.696 \ln XT_t - 1.489 \ln X$$

$$\quad \quad \quad (-20.66) \quad (-2.20) \quad \quad \quad (-15.59) \quad (34.71) \quad \quad \quad (-12.91)$$

$$- 0.011 UN_t + R_t$$

$$\quad \quad \quad (-7.53)$$

$$\bar{R}^2 = 0.998 \quad \quad \quad S.E. = 0.0124 \quad \quad \quad D.W. = 0.66$$

$$\Delta R_t = -0.421 R_{t-1} + 0.102 \Delta R_{t-1} + 0.207 \Delta R_{t-2}$$

$$\quad \quad \quad (-5.39) \quad \quad \quad (1.10) \quad \quad \quad (2.34)$$

$$\bar{R}^2 = 0.197 \quad \quad \quad S.E. = 0.009 \quad \quad \quad D.W. = 2.05$$

where  $R_t$  is the residual in the cointegrating vector and t-statistics are indicated in parentheses. The Dickey-Fuller statistic for the critical parameter, the lagged residual, in the test with two significant lagged dependent variables is -5.39, which is below the critical value at a 5 percent significance level of -4.86. Most importantly, the trade-weighted value of the dollar has a long-run, negative relationship with European manufacturing output, contrary to the deindustrialization hypothesis, but consistent with the supply-side hypothesis.<sup>18</sup>

Since the latter hypothesis relates to international changes in investment, it is useful to look at this pattern as well. Table 5 shows simple percentage changes in gross fixed capital formation for the U.S. and 11 European countries

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<sup>18</sup>The same test was performed for U.S. manufacturing output. In this case, only the U.S. real GDP and unemployment rate (in addition to the trend and  $\ln TWEX$ ) enter a statistically significant (5 percent level) cointegrating vector. In this case,  $\ln TWEX$  has a significant positive coefficient, again supporting the supply-side hypothesis and decisively rejecting the deindustrialization hypothesis. The coefficient is 0.043 ( $t = 3.65$ ) and output and the unemployment rate have their expected positive and negative coefficients, respectively.

for the two periods. The pattern is again inconsistent with the deindustrialization hypothesis. In 1985-90, European countries generally showed a sharp acceleration in investment and their investment pace exceeded that in the United States, where investment growth slowed sharply. In the earlier period, U.S. investment grew much faster than in most European countries; this is also inconsistent with the widespread view of declining U.S. competitiveness in the early 1980s.

Finally, the evidence in Table 3 can be used to more systematically assess the exchange rate-competitiveness linkage. Table 6 provides evidence on the correlation coefficients for the growth rates of manufacturing output shown in Table 3 and the movements in the nominal and real exchange rates in Table 1 for two groups of countries: Europe only and Europe excluding Portugal. Both time periods are used and the number of observations are given in parentheses.

The most noteworthy feature in Table 6 is that the correlations are positive, not negative. The distinction between the nominal and real exchange rate movements in the table makes little difference. Portugal had the second largest manufacturing growth rate in 1985-90 and fourth largest in 1980-85, while its exchange rate fell by the greatest amount in 1980-85 and nearly the most in 1985-90. When Portugal is excluded from the European countries, the positive correlation for the nominal exchange rate gains in statistical significance. The results in the table reject the conventional view both for Europe and for the whole data set. They also fail to reject the hypothesized positive relationship between the exchange rate and manufacturing output.

## V. Conclusion

One of the greatest misconceptions about international economic policy and developments during the past decade has been the view that a country's exchange

rate and its economic competitiveness bear a negative relationship to each other. This hypothesis fostered the view that the rise in the dollar early in the 1980s deindustrialized the United States (and, by inference, boosted European or non-U.S. competitiveness). It also fostered the view that policy actions to lower a country's currency value could boost the country's competitiveness (and, by inference, lower foreign competitiveness).

This article presents an alternative hypothesis based on classical monetary and supply-side considerations. Under this hypothesis, exchange rate changes are expected to reflect similar movements in competitiveness, so that policies that boost the dollar do so, at least in part, because these same policies boost U.S. competitiveness. Similarly, policies that can lower the dollar tend to do so because they also lower U.S. competitiveness, or raise competitiveness abroad.

Changes in U.S. tax policy in the early 1980s raised incentives to invest in the U.S. and not abroad. Such changes could be expected to raise investment, productivity and output growth in the United States and lower these measures abroad while raising the value of the dollar. Thus, the implied depreciation of foreign currencies, including European ones, should have reflected the reduced competitiveness of these countries. Similarly, the reversal of these tax incentives in 1986 reversed these patterns and, therefore, contributed to a decline in the dollar and rise in European competitiveness.

The empirical evidence reviewed here is strongly supportive of the tax arguments and so rejects the deindustrialization hypothesis. In particular, European countries apparently enjoyed a renaissance in competitiveness, as their currencies generally appreciated from 1985 to 1990, following relatively stagnate performance in the early 1980s when their currencies generally depreciated. Output and investment both accelerated sharply in Europe in the late-1980s, while

slowing in the United States. Similarly, in the early-1980s, European output and investment were unusually weak and this was reflected in the weakness in their currencies. Finally, some systematic statistical evidence is presented here which shows that the value of the U.S. dollar has a statistically significant and negative long-run influence on European manufacturing output, which is again inconsistent with the deindustrialization view.



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Table 1  
Exchange Rate Changes

	Nominal		Real <sup>1/</sup>	
	1985-90	1980-85	1985-90	1980-85
United States	-35.0%	46.3%	-25.5%	45.3%
<u>Europe</u>				
Austria	9.9	3.7	-2.2	-9.4
Belgium	11.2	-17.3	3.1	13.6
Luxembourg	4.5	11.6	---	---
Denmark	10.4	11.4	5.7 <sup>2/</sup>	1.6
Finland	5.5	1.4	13.5	1.2
France	4.8	-23.0	5.1	3.1
Germany	19.1	3.0	14.4	12.5
Italy	0.6	-27.0	6.7	-3.3
Ireland	7.1	-15.7	---	---
Netherlands	14.8	0.2	-6.3	-4.8
Spain	8.0	-30.4	9.9	-8.9
Switzerland	13.0	12.2	10.4	4.9
<u>Nominally Depreciating European Countries (1985-90)</u>				
Greece	-40.9	-48.1	---	---
Iceland	-33.3	-82.1	---	---
Norway	-10.4	-4.8	6.1	-7.2
Portugal	-23.9	-49.9	---	---
Sweden	-6.3	-21.3	7.6	-9.0
United Kingdom	-8.8	-15.0	7.1	-9.6
<sup>1/</sup> Based on Export Unit Values; blanks indicate data are not available. <sup>2/</sup> The latest year available in 1988. Source: IMF, <u>International Financial Statistics</u>				

Table 2  
The U.S. Budget Deficit and the Dollar

Year ending	Budget deficit	Change	Change in the value of the dollar	Change in interest rates
III/1981	\$ 36.2 billion	N.A.	N.A.	N.A.
IV/1983	179.0	+	+	-
I/1985	132.2	-	+	-
I/1987	185.3	+	-	-
III/1989	99.6	-	-	+
IV/1991	215.4	+	-	-



Table 3  
Manufacturing Output Growth (Compound Annual Rates)

	1980-85	1985-90	Change
United States	3.1%	3.7%	0.6%
<u>Europe</u>			
Austria	1.4	2.5	1.1
Belgium	0.9	3.8	2.7
Luxembourg	4.2	3.2	-1.0
Denmark	2.5	-0.2	-2.7
Finland	2.9	2.6	-0.3
France	-1.0	2.8	3.8
Germany	0.1	3.4	3.3
Greece	0.3	0.4	0.1
Ireland	5.5	8.4	2.9
Italy	-0.8	3.2	4.0
Netherlands	1.8	3.3	1.5
Norway	0.8	0.6	-0.2
Portugal	3.2	4.9	1.7
Spain	0.3	3.3	3.0
Sweden	2.0	1.2	-0.8
Switzerland	0.5	3.8	3.3
United Kingdom	0.7	3.4	2.7

Sources: Organization for Economic Cooperation and Development and U.S. Bureau of Labor Statistics

Table 4  
The Increase of Export Prices: 1985-90 and 1980-85 (Implicit Price Deflator)

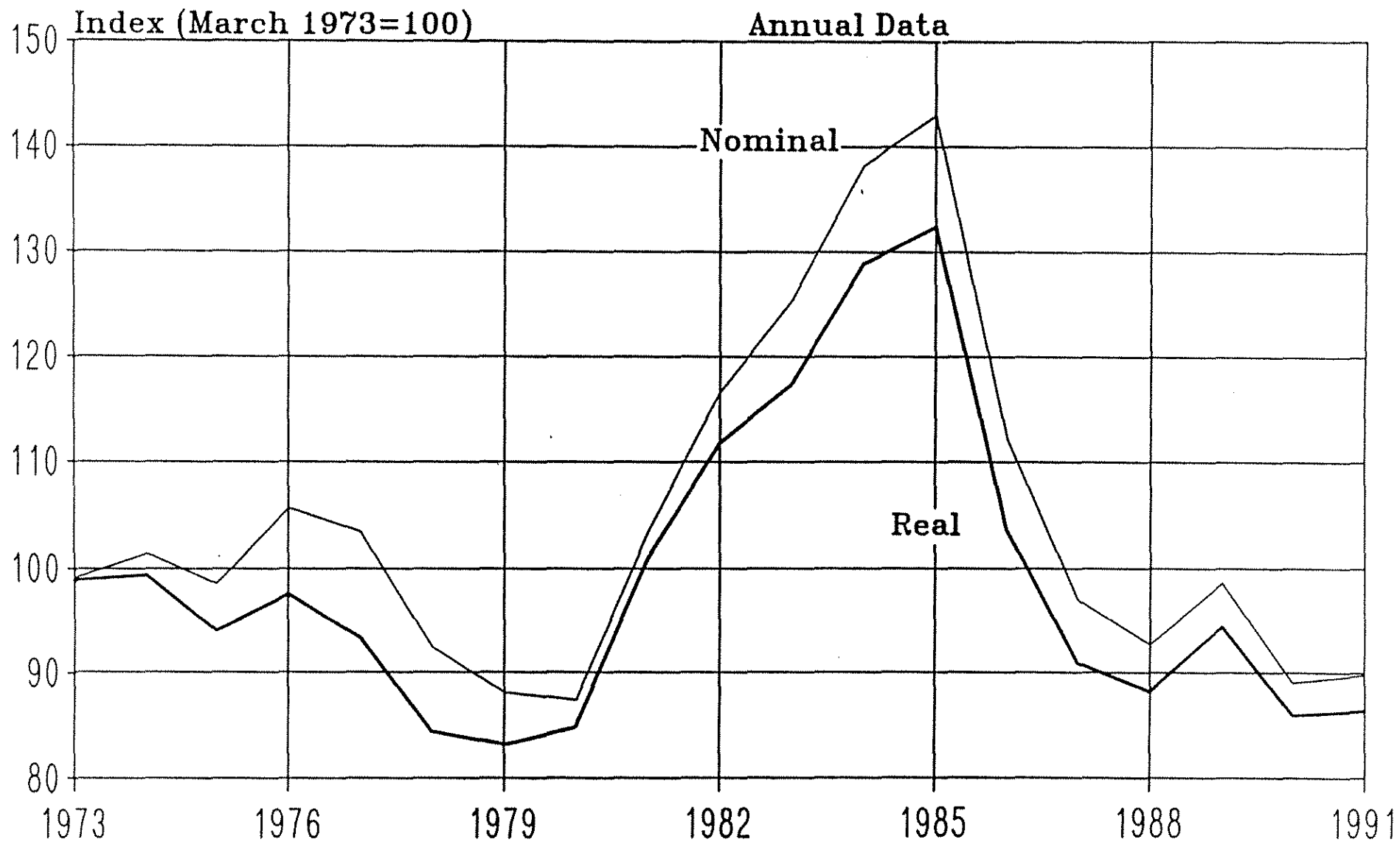
	1985-90	1980-85	Change
United States	1.9%	4.9%	-3.0%
<u>Europe</u>			
Austria	2.0	19.0	-17.0
Belgium	-4.6	47.8	-43.2
Luxembourg	0.0	46.7	-46.7
Denmark	-3.4	46.1	-42.7
Finland	8.9	36.3	-27.4
France	2.7	62.0	-59.3
Germany	2.6	18.6	-16.0
Greece	58.2	144.8	-86.6
Iceland	135.5	651.3	-515.8
Ireland	-2.2	56.8	-59.0
Italy	12.5	82.3	-69.8
Netherlands	-15.3	26.5	-41.8
Norway	-4.3	38.8	-43.1
Portugal	48.8	182.6	-133.8
Spain	10.7	88.4	-77.7
Sweden	15.1	52.5	-37.4
Switzerland	10.8	20.0	-9.2
United Kingdom	8.4	41.4	-33.0

Source: OECD Annual National Accounts

Table 5			
Gross Fixed Capital Formation Increases in Selected Countries*			
	1985-90	1980-85	Change
United States	2.8%	20.0%	-17.2%
<u>Europe</u>			
Austria	27.3	-3.5	30.8
Belgium	57.5	-19.2	76.8
Luxembourg	73.6	-26.3	99.9
Denmark	4.1	12.0	-7.9
Finland	26.4	11.9	14.5
France	32.9	-6.2	39.1
Germany	28.8	-6.3	35.1
Greece	11.8	-10.3	22.1
Ireland	24.1	-13.7	37.8
Italy	22.7	-3.7	26.4
Netherlands	29.1	-1.7	30.8
Norway	-16.1	6.0	-22.1
Portugal	64.1	-20.2	84.3
Spain	74.2	-7.0	81.2
Sweden	27.0	8.8	18.2
Switzerland	34.0	14.3	19.7
United Kingdom	32.6	13.0	19.6
*Volume indices, 1985 = 100			

Table 6 Correlations of Manufacturing Growth and Exchange Rate Changes		
Manufacturing growth in:	Nominal exchange rates	Real exchange rates
European countries	0.298 (34)**	0.549 (25)*
European countries excluding Portugal	0.439 (32)*	0.549 (25)*
*Significant at a 5 percent level **Significant at a 10 percent level		

Chart 1  
Index of the Nominal and Real Trade-Weighted  
Dollar Exchange Rate



The real exchange rate measure uses trade-weighted consumer price indices

Chart 2  
The Supply of Dollars in International Trade

Percent  
Quarterly Data

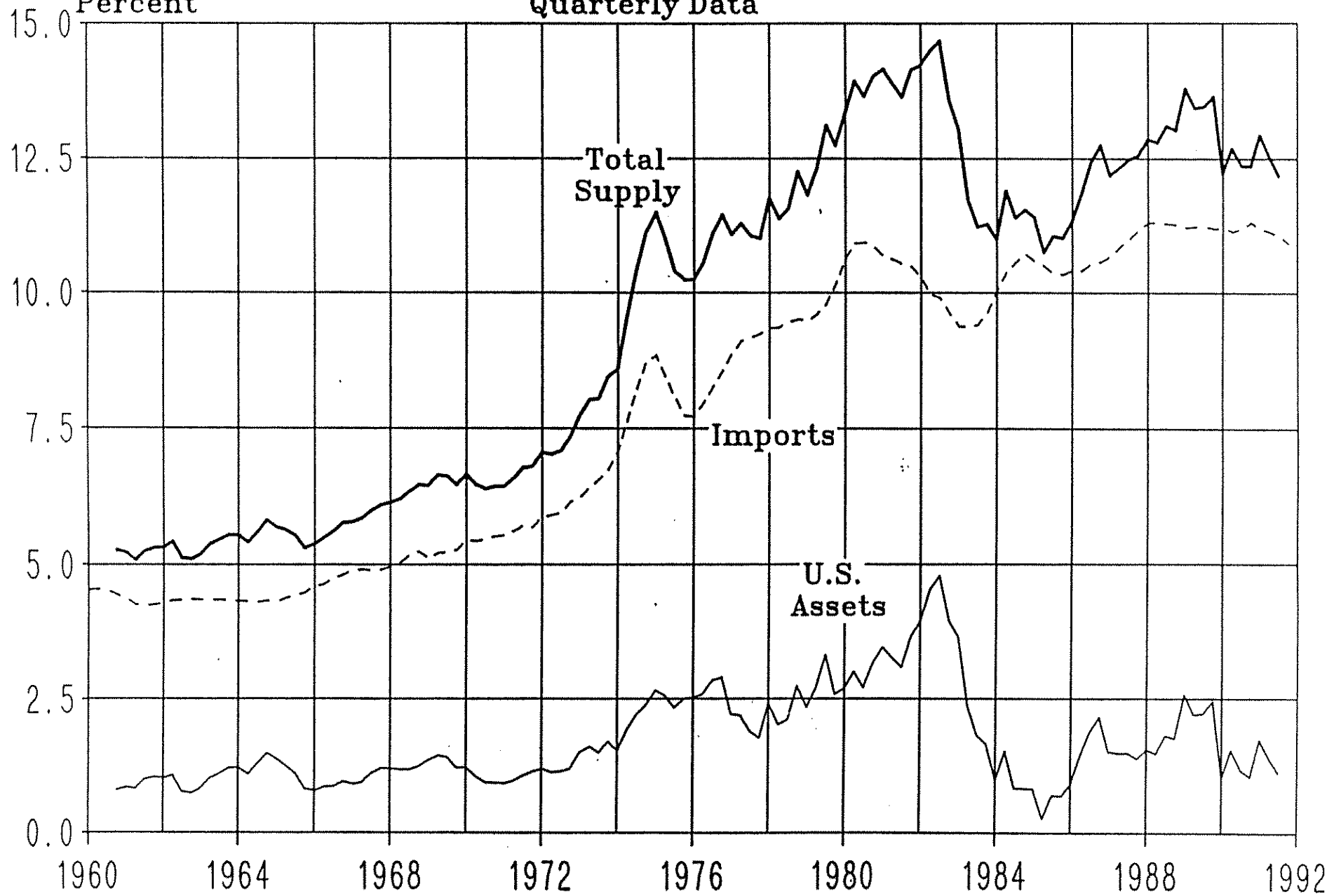


Chart 3

Real Business Fixed Investment as a Share of Real GDP

Percent

Quarterly Data

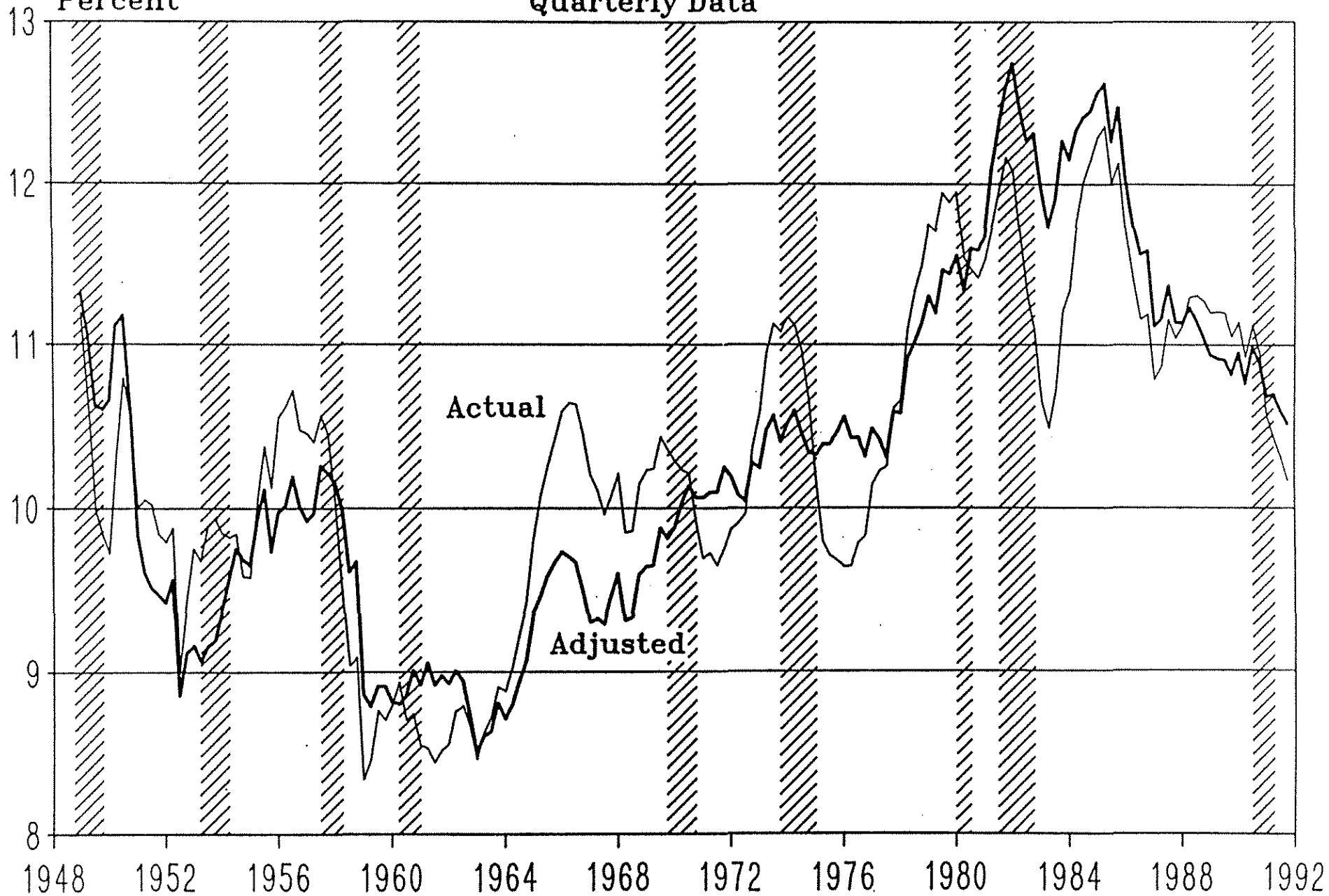
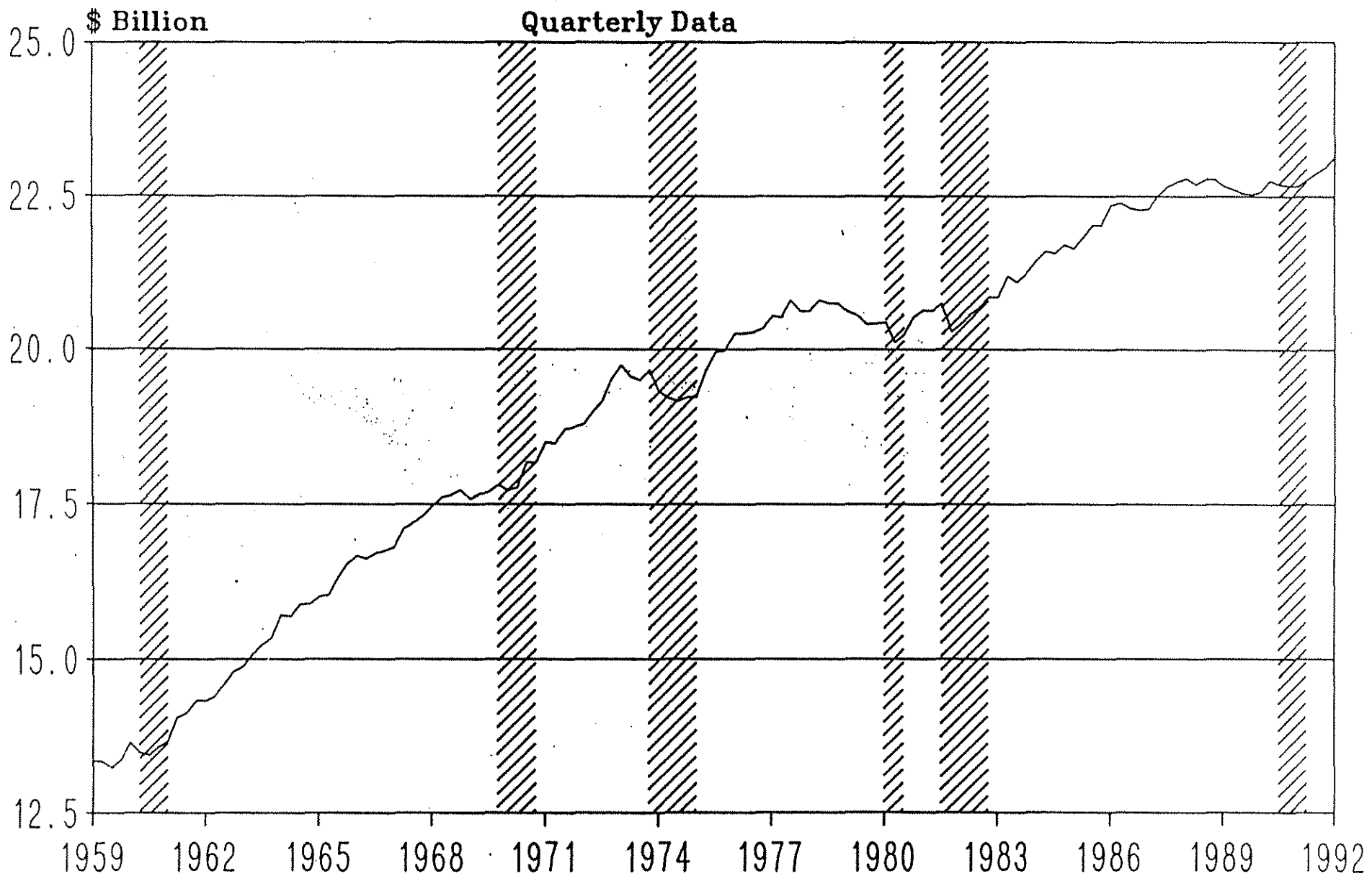


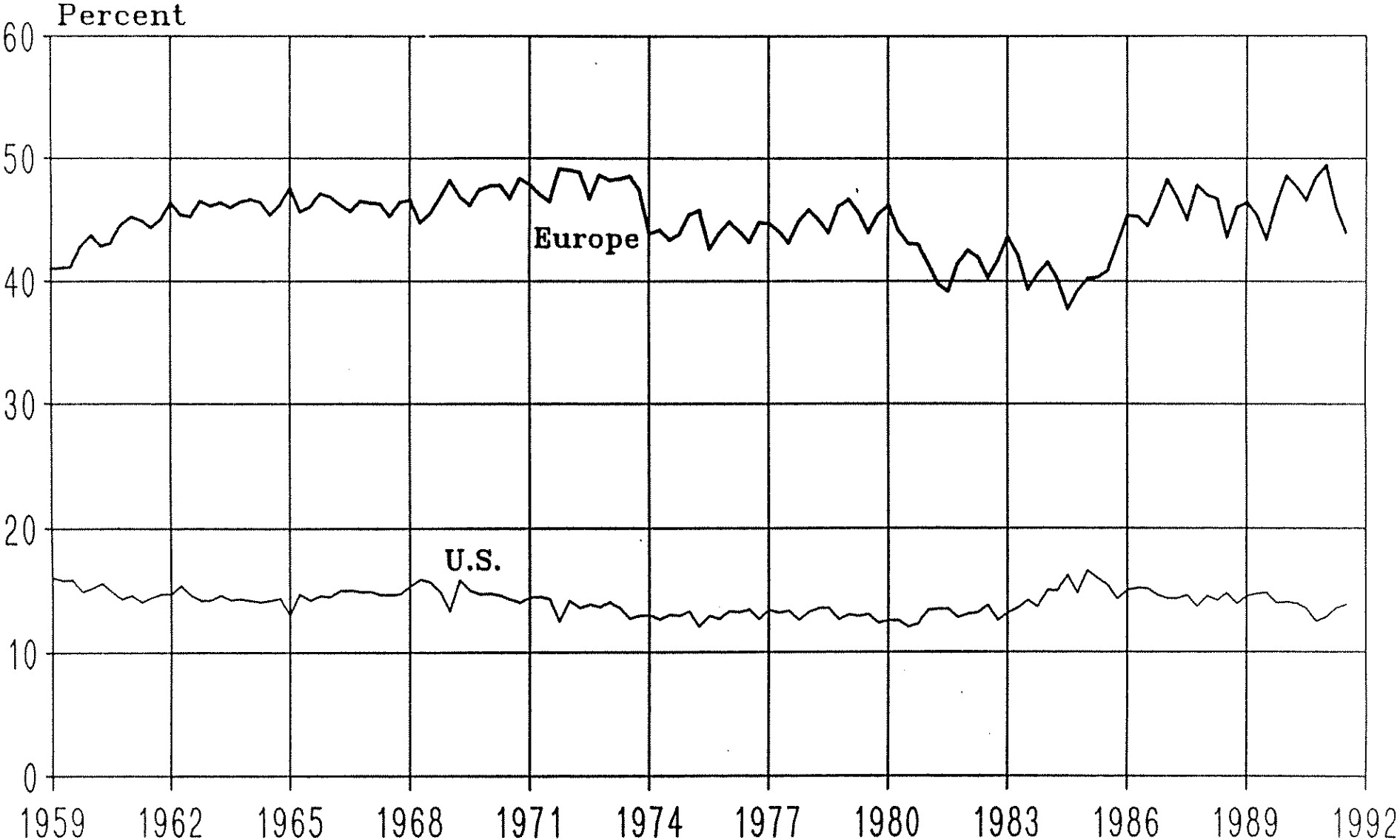
Chart 4  
Business Sector Output per Hour



- Output in 1987 dollars



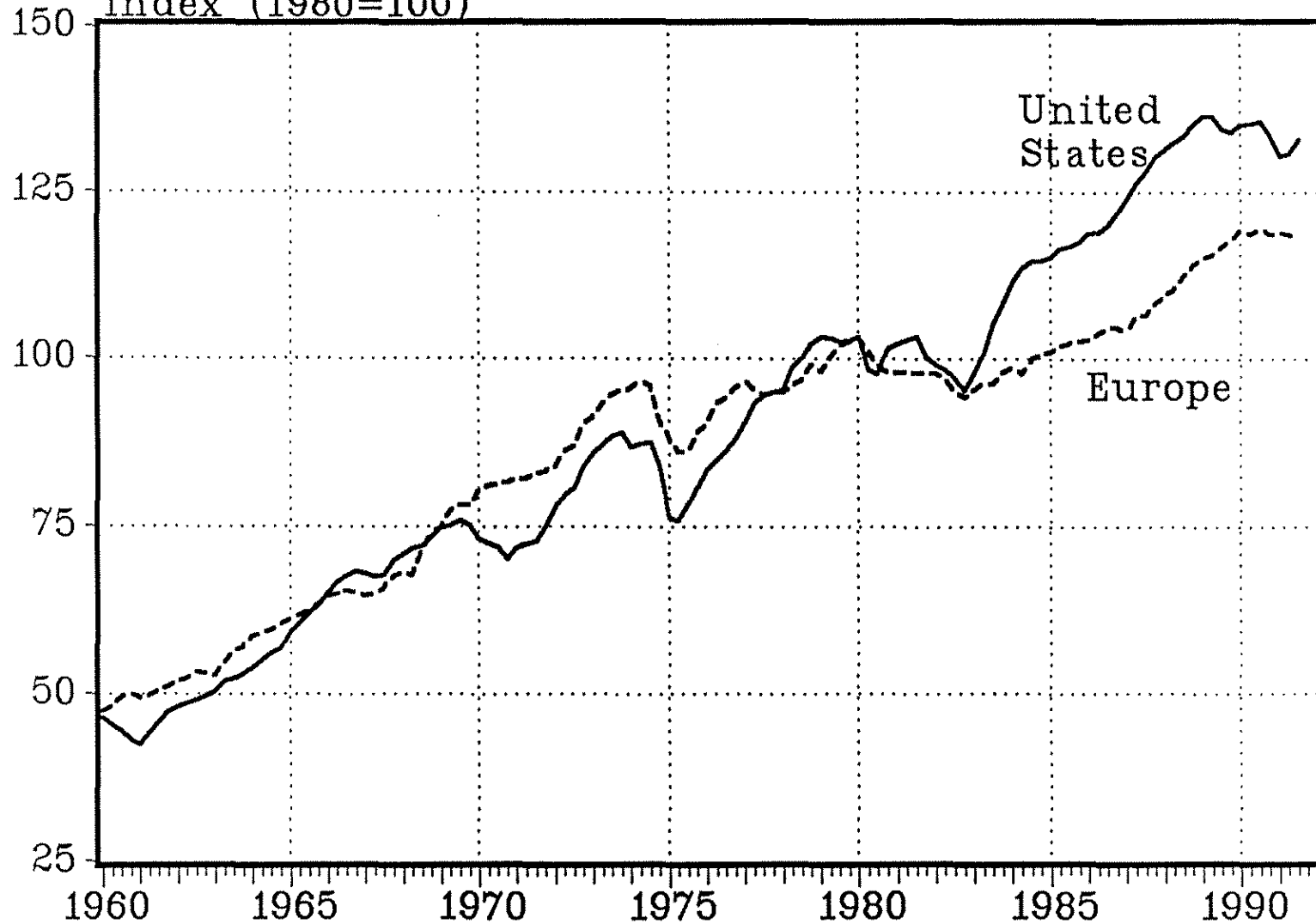
Chart 5  
Total Trade of Europe and the U.S. as a  
Percent of World Trade



Source: International Financial Statistics

Chart 6

European and U.S. Manufacturing Output Index (1980=100)



Source: Organization for Economic Cooperation and Development