Dollar depreciation also worsens the terms of trade, so that the United States must export an increasing volume of goods to pay for a constant volume of imports. Strong productivity growth can affect relative prices sufficiently to allow domestic producers to be competitive in world markets. Moreover, productivity growth is a major source of increase in a nation's real per capita income and standard of living, and hence is of more fundamental importance than changes in exchange rates.

Competition and Trade
The strong comeback in productivity and unit labor costs, along with the benefits from dollar depreciation, have helped to improve the U.S. trade balance since mid-1986. Import prices have been increasing faster than domestic prices, contributing to slower import growth. U.S. exports of manufactured goods have surged because of falling foreign-currency prices of U.S. goods. The deficit in merchandise trade has gradually narrowed from $183 billion in 1986:IIIQ to $120 billion in 1988:IIQ (in 1982 dollars).

The improvement in relative prices of consumer goods, excluding autos, has helped to cut the trade deficit for those goods by nearly $7 billion since 1986:IIIQ. The trade improvement for automobiles has amounted to about $11 billion.

Conclusion
The recent improving trend in the U.S. trade deficit is in part associated with the comeback in manufacturing cost competitiveness. U.S. manufacturing productivity in this expansion has achieved record performance in unit labor costs because of moderation in labor costs coupled with strong productivity growth. As good as the achievement has been in comparison to past performance, the real test is how well domestic producers have performed relative to their major trading partners. Measured against that standard, U.S. manufacturers have managed to outperform their major industrial trading partners.

The major source of the improved cost competitiveness, however, has come from changes in the exchange value of the dollar. This is a veritable source of strength that domestic manufacturers should not depend on. In global markets, a relative price advantage that results from productivity growth and constraint on unit costs is a more lasting foundation for competition than are changes in exchange rates. Consequently, U.S. manufacturers must look ahead to improve productivity and costs relative to our trading partners, independent of developments in exchange markets.

Footnotes
1. A less common but more complete measure is multifactor productivity, which includes labor, capital, and materials used in output. This Economic Commentary is based on labor productivity only.
3. The 11 foreign industrial countries in the index are Belgium, Canada, Denmark, France, Italy, Japan, the Netherlands, Norway, Sweden, the United Kingdom, and West Germany. The weights reflect the relative importance of each country in a U.S. manufacturing trade competitor as of 1980.

ECONOMIC COMMENTARY
Federal Reserve Bank of Cleveland

Productivity, Costs, and International Competitiveness
by John J. Erceg and Theodore G. Bernard

American competitiveness in world markets has greatly improved in the current business expansion. That improvement has contributed to a rising trend in merchandise net exports and a remarkable boom in exports. From mid-1986 to mid-1988, the merchandise trade deficit fell by about $33 billion, adding substantially to the revival in manufacturing production and employment since early 1987.

The improving trend in the trade balance is generally attributed to the dollar's depreciation in foreign exchange markets since early 1985. Often overlooked, however, is the improvement in U.S. manufacturing costs in recent years, stemming from larger productivity gains and from smaller increases in unit labor costs relative to those of our major trading partners. This Economic Commentary reviews the recent performance of the U.S. manufacturing sector relative both to past performance and to our major trading partners. Although the effects of dollar depreciation have been the major factor in increased U.S. cost competitiveness in world markets, record improvement in manufacturing productivity growth and constraint in compensation growth have also been significant.

The Productivity Slowdown
Productivity is a measure of inputs (labor, capital, and materials) relative to outputs (goods and services). A common measure of productivity is labor productivity, or output per hour worked.

Productivity growth is vital to a nation's standard of living, its inflation rate, and its ability to compete in world markets. A variety of factors influence long-term productivity growth, particularly the quality of human capital (the education, training, and experience of the workforce), production techniques, and product technology and innovation. Cyclical forces also affect growth: labor productivity rises during early stages of economic expansions because output increases faster than hours worked, and declines during economic contractions because labor trends tend to be neutral.

Since at least the early 1970s, slow productivity growth has been a source of serious concern, especially among public policymakers. In the nonfarm sector of the economy, labor productivity rose at a 2.4 percent average annual rate between 1948 and 1973. It then slowed to a 0.5 percent annual rate of increase between 1973 and 1982, before rising to a 1.9 percent rate in the current expansion (see figure 3).

Analysts cannot agree on any single source for the productivity slowdown in the 1970s, but a number of studies indicate such factors as energy price shocks, slow capital formation, and lack of innovation. Also cited is a shift in the composition of output from high to low-productivity sectors of the economy, greater numbers of unskilled and inexperienced workers, and increased government regulations affecting safety and the environment.

Productivity growth has improved from the 1970s, but so far in this expansion, it still lags the trend growth of the 1948-73 period. The current expansion, now in its 72nd month, is the longest peacetime expansion on record. Some analysts expected that the reversal of some of the factors that contributed to the productivity slowdown in the 1970s should also contribute to faster productivity growth in the 1990s. In the nonfarm,
The Manufacturing Sector

While productivity growth in the non-farm sector in the current expansion is only slightly improved from the 1970s, manufacturing performance— including productivity, labor compensation, and unit labor costs—has matched or exceeded that of any postwar expansion.

Manufacturing productivity grew at an average annual rate of 4.3 percent between 1973:IVQ and 1986:IVQ—a rate twice the growth rate of the 1975-80 expansion (see figure 2). Some of this rapid growth was achieved by holding down employment growth, which contributed to a substantial slowing in labor compensation and a decline in unit labor costs. Labor costs represent the bulk of unit costs in manufacturing. In this expansion, labor compensation has risen at a moderate 3.3 percent average annual rate, and rose only 2.1 percent in 1987, even though labor cost pressures have risen strongly in advanced stages of previous expansions.

Several factors may account for this atypical behavior, including a disinflationary economic environment and intensified foreign competition. One study suggests that changes in manufacturing compensation practices and a decline in unionization are among the reasons for slower growth in labor compensation in recent years. The combination of strong performance in productivity and moderate growth in labor costs in the United States has resulted in the best performance in unit labor costs of any expansion in the postwar period. Unit labor costs have declined at an average annual rate of 1.0 percent over the course of the current expansion, and have declined at an average annual rate of 2.1 percent since 1984. This has contributed to a substantial decline in unit labor costs of 1973-87.

Productivity and unit labor cost performance by U.S. manufacturers have been highly correlated with those for major trading partners. The scenario is very similar for 1987: U.S. unit labor costs fell 2.0 percent compared to the trade-weighted average.

In addition to manufacturing costs, exchange-rate movements can affect price competitiveness in world markets. From mid-1985 until early 1987, the U.S. dollar rose strongly versus European currencies and to a lesser extent against the Canadian dollar and the Japanese yen. During that span, U.S. unit labor costs (on a national currency basis) rose much less than all but two of the countries in the trade-weighted index. After adjustment for changes in exchange rates, though, U.S. unit labor costs increased the most.

The exchange rate movements that worsened the already deteriorating U.S. competitiveness relative to Japan have reversed direction since then. The Japanese yen and most European currencies appreciated relative to the dollar from 1985 through 1987. In terms of U.S. dollars, U.S. manufacturing unit labor costs in that period fell 22.6 percent relative to the trade-weighted average. Specifically, manufacturing unit labor costs declined 17.8 percent compared to Japanese costs. Productivity and unit labor cost performance by U.S. manufacturers has made a major contribution toward increased competitiveness. U.S. unit labor costs have been nearly flat or have fallen every year since 1982. Within the trade-weighted index, only Japan has come close to matching the U.S. performance on a national currency basis. Much of the swing in comparative advantage, though, was amplified by favorable exchange-rate movements.

The U.S. dollar appreciated against the Japanese yen considerably more than against most European currencies. U.S. trade with Japan has been adversely affected by the exchange-rate movements.

The dollar's decline has been the most important factor in U.S. competitiveness. However, the 1980s have been marked by a broad-based improvement in cost competitiveness. U.S. unit labor costs have fallen every year since 1982. The U.S. dollar has not appreciated against any major trading partners, and the yen has appreciated less than strongly.
nonmanufacturing sector of the economy, however, productivity growth continues to lag the strong performance of the 1961-69 expansion and has shown no signs of recouping its longer-term trend rate of 1948-73.

The Manufacturing Sector
While productivity growth in the nonmanufacturing sector in the current expansion is only slightly improved from the 1970s, manufacturing performance— including productivity, labor compensation, and unit labor costs—has matched or exceeded that of any postwar expansion.

Manufacturing productivity grew at an annual average rate of 4.3 percent between 1982:IVQ and 1988:IIQ—nearly twice the growth rate of the 1975-80 expansion (see figure 2). Some of this rapid growth was achieved by holding down employment growth, which contributed to a substantial slowing in labor compensation and a decline in unit labor costs.

Labor costs represent the bulk of unit costs in manufacturing. In this expansion, labor compensation has risen at a moderate 3.3 percent average annual rate, and rose only 2.1 percent in 1987, even though labor cost pressures have been strong in advanced stages of previous expansions.

Several factors may account for this atypical behavior, including a disinflationary economic environment and intensified foreign competition. One study suggests that changes in manufacturing compensation practices and a decline in unionization are among the reasons for slower growth in labor compensation in recent years.

The combination of strong performance in productivity and moderate growth in labor compensation has resulted in the best performance in unit labor costs of any expansion in the postwar period. Unit labor costs have declined at an annual average rate of 1.0 percent over the course of the current expansion, and have shown some improvement in recent years.

In 1987, the United States held down unit labor costs 2.1 percent less than all but two of the countries (for which data are complete) within the group to register a decline in unit labor costs.

Labor costs, in turn, have fallen every year since 1982. The scenario is very similar for 1987: U.S. unit labor costs fell 2.0 percent compared to the trade-weighted average.

The 1980s have seen highly industrialized nations, including Japan, West Germany, and the United States, slowed relative to rates in the 1960s and early 1970s. In fact, productivity growth in the United States, Japan, and the United Kingdom during the late 1970s fell to about half the pace of the previous decade.

International Comparisons
From 1973 to 1979, manufacturing productivity growth in most of the highly industrialized nations, including Japan, West Germany, and the United States, slowed relative to rates in the 1960s and early 1970s. In fact, productivity growth in the United States, Japan, and the United Kingdom during the late 1970s fell to about half the pace of the previous decade.

International Comparisons from 1973 to 1979, manufacturing productivity growth in most of the highly industrialized nations, including Japan, West Germany, and the United States, slowed relative to rates in the 1960s and early 1970s. In fact, productivity growth in the United States, Japan, and the United Kingdom during the late 1970s fell to about half the pace of the previous decade. Industrialized nations had mixed results in improving their manufacturing productivity during the 1980s (see table 3). Only the United States, Italy, Sweden, and the United Kingdom have achieved significant productivity gains that exceeded their rates during most of the 1970s. Furthermore, only the United States and the United Kingdom have raised productivity growth enough to surpass pre-1973 trend rates.

Although manufacturing price competitiveness is influenced by several factors, unit labor costs are one of the most important. The price competitiveness of U.S. products relative to foreign products will tend to improve if unit labor costs rise abroad more than in the United States.

Manufacturing productivity, compensation, and unit labor costs—

<table>
<thead>
<tr>
<th>Year</th>
<th>Productivity</th>
<th>Compensation</th>
<th>Unit Labor Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961:IVQ</td>
<td>4.5</td>
<td>8.5</td>
<td>13.0</td>
</tr>
<tr>
<td>1975:IVQ</td>
<td>5.5</td>
<td>10.5</td>
<td>16.0</td>
</tr>
<tr>
<td>1982:IVQ</td>
<td>6.5</td>
<td>12.5</td>
<td>18.5</td>
</tr>
</tbody>
</table>


Note: Data are seasonally adjusted.

In addition to manufacturing costs, exchange-rate movements can affect price competitiveness in world markets. From mid-1980 until early 1985, the U.S. dollar rose strongly versus European currencies and to a lesser extent against the Canadian dollar and the Japanese yen. During that span, U.S. unit labor costs (on a national currency basis) rose much less than all but two of the countries in the trade-weighted index. After adjustment for changes in exchange rates, though, U.S. unit labor costs increased the most.

The exchange rate movements that worsened the already deteriorating U.S. competitiveness from 1979 to 1985 have reversed direction since then. The Japanese yen and most European currencies appreciated relative to the dollar from 1985 through 1987. In terms of U.S. dollars, U.S. manufacturing unit labor costs in that period fell 2.6 percent relative to the trade-weighted average. Specifically, U.S. manufacturing unit labor costs declined 17.8 percent compared to Japanese costs.

Productivity and unit labor cost performance by U.S. manufacturers have made a major contribution toward increased competitiveness. U.S. unit labor costs have been nearly flat or have fallen every year since 1982. Within the trade-weighted index, only Japan has come close to matching the U.S. performance on a national currency basis. Much of the swing in comparative advantage, though, was amplified by favorable exchange-rate movements.

This is not to suggest that the United States should depend on exchange-rate changes to achieve further improvement in cost competitiveness relative to our major trading partners. Dollar depreciation has adverse effects on domestic inflation because of higher import prices, whereas higher productivity growth helps to lower unit costs and prices, benefitting consumers and businesses.
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American competitiveness in world markets has greatly improved in the current business expansion. This improvement has contributed to a rising trend in competitiveness, which includes labor, capital, and materials used in output. This Economic Commentary is based on labor productivity only.


2. The improving trend in the trade balance since mid-1985 has been associated with improved product and cost performance relative to those of our major trading partners. Although the effects of currency value fluctuations on the trade balance have been significant, the improvement has been attributed to changes in the exchange value of the dollar.

3. This article was written while the authors were at the Federal Reserve Bank of Cleveland.


5. The U.S. trade deficit has been on an improving trend recently, largely due to changes in the exchange value of the dollar. Also associated with this trend, however, is the improvement in manufacturing competitiveness, evidenced by moderation in labor costs and by rapid growth in manufacturing productivity.