

Economic Commentary

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U.S. and Foreign Productivity and Competitiveness

by Gerald H. Anderson

Although the level of productivity is very high in the United States, productivity growth has slowed sharply in recent years. Moreover, growth of productivity is significantly slower in the United States than in the other major industrialized nations. For example, annual real growth in gross national product per employed worker in the United States slowed from 1.9 percent in 1963-73 to only 0.1 percent in 1973-79. In the latter period, Japan's productivity growth was 3.4 percent per year, West Germany's, 3.2 percent, and France's, 2.7 percent.¹ This *Economic Commentary* compares U.S. and foreign productivity growth rates, explores the relationship between productivity growth and changes in international price competitiveness, and examines the impact on the U.S. share of world manufactured goods exports.

This study yields some surprising results. With productivity growth being slower in the United States than abroad, one might expect that costs and prices of U.S. export goods would rise faster than the costs and

prices of foreign goods, with the result that American goods would lose price competitiveness. However, exchange-rate changes and a slower increase in wages have offset the slower growth in U.S. productivity, so that prices of U.S. goods are rising less rapidly than those of foreign goods. The improvement in U.S. competitiveness has helped arrest the sharp decline in the share of U.S. manufactured goods in world markets. However, U.S. manufactured goods have not regained their earlier position of relative importance in world export markets.

Slowdown in Productivity Growth

Productivity is a ratio of outputs to inputs, and it reflects the quality of inputs to production and the skill with which they are combined. Total factor productivity is the ratio of outputs to inputs of all the factors of production—labor, capital equipment, and land. Instead of total factor productivity, this study examines the productivity, and particularly the increases in productivity, of just one factor—labor. Labor productivity—output per man-hour or GNP per employed worker—is used here because labor productivity data are readily available for several countries and because labor costs are a high proportion of total costs in manufacturing.

Growth in labor productivity in the U.S. private business sector has slowed sharply since 1968 from the average rate

1. See *Economic Report of the President*, January 1980, p. 85, Table 15.

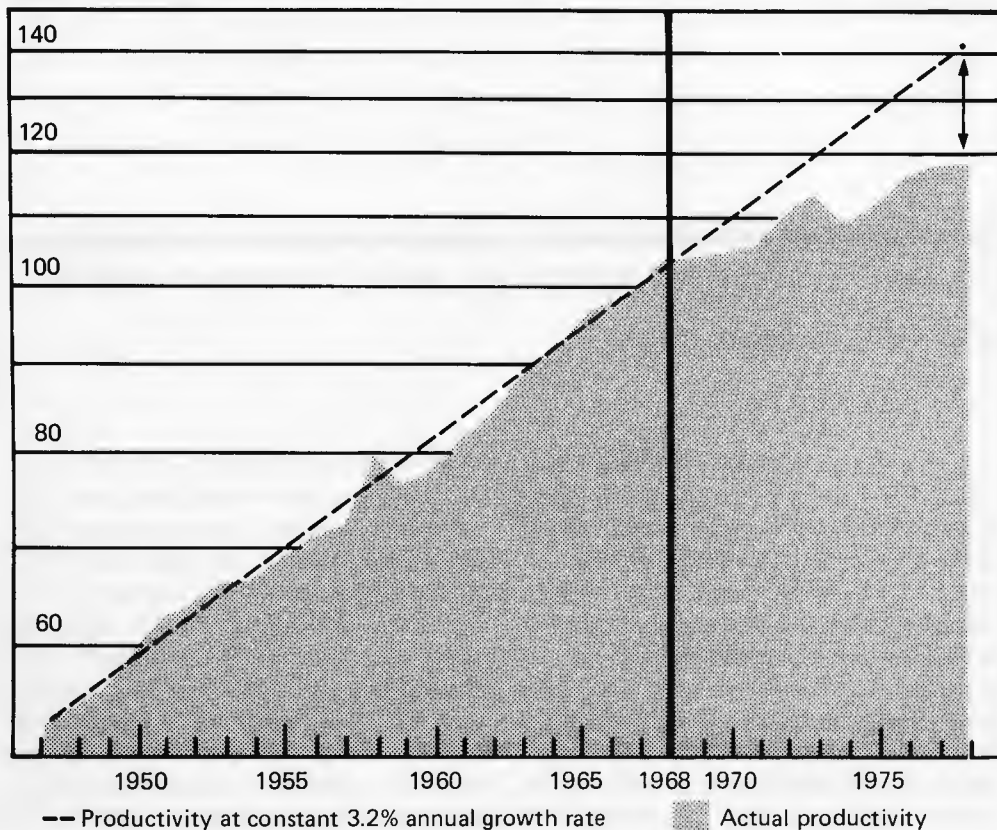
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The views stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

Chart 1 Output per Man-Hour in the U.S. Private Business Economy, 1947-78

1967 = 100

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SOURCE: American Productivity Center, *Productivity Perspectives*; based on data from U.S. Bureau of Labor Statistics.

of the preceding 20 years (see chart 1). The subsectors of the private business sector have not behaved uniformly. The productivity growth rates of the mining and construction subsectors, for example, have been substantially slower, while that of the communications subsector has been substantially faster, than the productivity growth rate of the entire private business sector.

The manufacturing subsector, which is the primary focus of this article, has exhibited a persistent slowing in productivity growth that began before the slowing in the private business sector as a whole. Average annual growth of labor productivity in manufacturing was 3.2 percent from 1948 to 1955, 2.8 percent from 1955 to 1965, 2.4 percent from 1965 to 1973, and 1.5 percent from 1973 to 1978.²

Between the fourth quarter of 1978 and the fourth quarter of 1980, productivity grew at only a 0.7 percent annual rate, but much of that poor performance probably is a cyclical phenomenon. Productivity often is adversely affected when output falls, because firms reduce output before they cut employment; during this period, output in manufacturing fell at a 1.1 percent annual rate.

Productivity Growth, Price Competitiveness, and Market Share

The relationship between productivity growth and international price competitiveness contains several links. The existence of

2. See *Economic Report of the President*, January 1980, p. 85, Table 16.

so many links in the chain from productivity growth to exchange-rate-adjusted price changes makes the connection between the two rather loose. Productivity growth combines with labor compensation increases to determine changes in unit-labor costs. Unit-labor-cost changes, together with changes in unit costs of materials and capital, determine changes in total cost of production. Changes in production costs plus changes in profit margins determine changes in market price, measured in home country currency. International comparisons, of course, require that prices measured in different currencies be converted to a common currency. Such conversions are done at the rate of exchange between currencies. Obviously, international differences in rates of home currency price changes can be altered when adjusted for changes in currency exchange rates.

A nation's price competitiveness in exporting is said to have improved if its export prices rise less than those of other nations. Improvement in price competitiveness can be reflected in growth of a nation's share of the world market for exports, but this is not always the case. If a firm, or a nation, is able to reduce its price for a product, relative to the price charged for a similar product by other firms or nations, the price cutter will enhance its ability to sell the product. The responsiveness to a given price reduction is called the price elasticity of demand for the product and is measured as the ratio of the percentage change in quantity sold to the percentage change in price, assuming other factors affecting demand are unchanged. Elasticity, however, can differ greatly among products; while it can be asserted that a (relative) price reduction enhances a seller's price competitiveness, more information would be needed to specify the magnitude of the increase in sales and market share.

The impact on sales and market share of a change in price competitiveness is even more difficult to assess for a broad category of goods, such as manufactured goods, because of differences in the price elasticities of different goods. Suppose, for example,

that prices for some goods decline, while prices for other goods rise, with the net result being a reduction in a nation's price level relative to prices of goods from competitors. Although the nation's overall price competitiveness will be enhanced, it might not capture a larger share of the overall export market if the price elasticity is high for products whose prices have risen but low for products whose prices have fallen.

Factors other than changes in price competitiveness can also alter market shares. A nation's overall market share will change if the nation specializes in goods whose demand is growing faster or slower than the average for other goods or if its exports are concentrated in geographic areas whose demands for imports are growing faster or slower than average.

The United States had the slowest growth of productivity in manufacturing from 1967 to 1979 of seven major nations, including Canada, Japan, France, West Germany, Italy, and the United Kingdom (see table 1). These nations together account for 83 percent of the GNP of the 23 industrialized nations that are members of the Organization for Economic Cooperation and Development (OECD) and account for most of the world's production of manufactured goods. In this 12-year period, productivity of manufacturing employees increased a total of only 29 percent in the United States, compared with increases ranging from 56 percent to 131 percent in the other countries (except the United Kingdom, which at 33 percent barely exceeded the performance of the United States).

In the same period, hourly compensation of manufacturing employees also increased at a substantially slower pace in the United States than abroad. Hourly compensation is a broad measure of labor cost, because it includes wages, the cost of fringe benefits, and other employer expenses such as social security taxes, workmen's compensation insurance premiums, and unemployment compensation fund contributions. The data are based on total cost per hour worked and are nominal increases, without adjustment for inflation.

Table 1 Productivity, Compensation, and Unit-Labor Costs in Manufacturing, 1967-79

Country	Output per man-hour, percent change	Hourly compensation, percent change	Unit-labor cost in national currency, percent change	Exchange rate, ^a percent change	Unit-labor cost in U.S. dollars, percent change	Real compensation, percent change
United States	29	151	94	--	94	15
United Kingdom	33	430	299	-22.8	208	48
Canada	56	213	100	-7.9	84	42
Italy	88	670	310	-24.9	208	134
West Germany	84	237	84	117.5	299	103
France	90	354	139	15.6	177	76
Japan	131	434	132	66.0	284	104

a. Price in U.S. dollars of one unit of national currency.

SOURCE: U. S. Department of Commerce.

Productivity increases and hourly compensation increases have opposing influences on unit-labor cost: productivity increases reduce unit-labor cost, and compensation increases raise unit-labor cost. In the 1967-79 period, all seven countries experienced compensation increases that were larger than their productivity increases, raising unit-labor costs by amounts ranging from 84 percent to 310 percent. The United States experienced the second smallest increase in unit-labor cost, because the relative slowness of its compensation increases outweighed the meagerness of its productivity gains.

Exchange-rate changes in this period were substantial. The German mark more than doubled in value relative to the U.S. dollar, while the value of the Italian lira fell by one-fourth relative to the U.S. dollar. The Japanese, British, and French currencies also experienced large changes, while the Canadian unit had a smaller change (see table 1).

When the unit-labor-cost increases cited above are adjusted for exchange-rate changes, U.S. unit-labor-cost increases are found to be much smaller than in other countries except Canada. The U.S. increase, for example, is only about one-third the size of the Japanese and German increases and one-half of the Italian, British, and French increases. Canadian unit-labor costs, which rose slightly more than U.S. costs when measured in

home currencies, rose slightly less than U.S. costs when the depreciation of the Canadian dollar is taken into account.

Labor costs constitute the major share of total costs of production in manufacturing, so it might be expected that increases in total costs, and in prices, would be in proportion to unit-labor-cost increases. If indexes of the unit value of exports are used as proxies for price indexes, they suggest that prices of manufactured export goods increased roughly in proportion to increases in unit-labor costs in manufacturing (see table 2). The United States, which showed the second smallest increase in unit-labor costs, also experienced the second smallest increase in unit value of exports.

Table 2 Unit-Labor Costs and Unit Values of Manufactures Exports, 1967-79

Country	Unit-labor cost in U.S. dollars		Unit value in U.S. dollars	
	Percent increase	Rank	Percent increase	Rank
Canada	84	1	104	1
United States	94	2	140	2
France	177	3	194	5
Italy	208	4	177	4
United Kingdom	208	4	200	6
Japan	284	6	172	3
West Germany	299	7	221	7

SOURCE: U.S. Department of Commerce.

The three countries (Canada, United States, and France) with smaller increases in unit-labor costs experienced unit-value increases somewhat larger than their unit-labor-cost increases; the four countries (Italy, United Kingdom, Japan, and West Germany) with larger unit-labor-cost increases experienced unit-value increases that were smaller than their unit-labor-cost increases. This rather puzzling phenomenon might have been caused by changes in raw materials prices, interest rates, or other producer costs or by changes in profit margins. The profit margin explanation is consistent with reasoning that manufacturers experiencing relatively small increases in unit-labor costs may have been able to increase their profit margins, while those burdened with relatively large increases in unit-labor costs may have been compelled to reduce profit margins to remain competitive.

Despite its enhanced price-competitive position, the United States lost market share. The U.S. share of exports from 15 major industrial countries declined from 20.3 percent in 1967 to 15.5 percent in 1979 (see table 3). In the same period, France, West Germany, Italy, and Japan all increased their

market shares, despite their disadvantages of substantially greater increases in unit-labor costs and unit values of exports. Adding to the mystery, Canada also lost market share despite enhanced price competitiveness. Perhaps the composition of U.S. export goods and U.S. market areas played important roles in the loss of market share. It may be that demand for particular U.S. goods or the demand from particular market areas grew less rapidly than the average experienced by other major exporting nations. The United States experienced a sharp reduction of market share—from 20.3 percent to 15.7 percent—in the six years from 1967 to 1973, but little net change in the following six years. Price competitiveness improved in both periods, but the improvement was greater in the earlier period, prior to the time that the market share decline was arrested. Perhaps the earlier period's increase in price competitiveness, acting with a lag, stanchied the decline of market share.

U.S. Economic Performance

There is ample reason for dissatisfaction with U.S. international economic performance. Improved price competitiveness

Table 3 Shares of World Exports of Manufactures, 1967-79^a

Period	United States	France	West Germany	Italy	United Kingdom	Japan	Canada
1967	20.3	8.1	18.7	6.7	11.6	9.4	5.7
1968	20.1	7.8	18.6	7.0	10.8	10.2	6.1
1969	19.3	7.8	18.7	7.0	10.7	10.7	6.0
1970	18.4	8.3	19.0	6.9	10.1	11.2	6.0
1971	16.8	8.4	19.3	7.0	10.5	12.5	5.8
1972	15.8	8.9	19.6	7.3	9.6	12.8	5.5
1973	15.7	9.1	21.0	6.5	9.0	12.3	4.8
1974	16.7	8.7	20.6	6.5	8.4	13.8	4.3
1975	17.2	9.7	19.4	7.1	8.9	13.0	4.1
1976	16.8	9.2	19.7	6.8	8.4	14.1	4.5
1977	15.3	9.3	19.9	7.3	8.9	14.8	4.4
1978	15.0	9.3	19.8	7.3	9.1	14.9	4.3
1979	15.5	10.0	19.9	8.0	9.3	13.1	4.0

a. *World exports* are defined as the sum of the exports from 15 major industrial countries, including exports to the United States.

SOURCE: U.S. Department of Commerce.

failed to yield an increased market share; at best, it can be argued that the sharp decline in market share prior to 1973 was arrested. Moreover, the improvement in price competitiveness was achieved in two undesirable ways.

First, U.S. unit-labor costs rose more slowly than foreign costs because of slow increases in nominal compensation rather than the preferred avenue of rapid increases in labor productivity. Faster increase in labor productivity would have been a better avenue, as it would have been more likely also to lead to faster gains in real compensation, which is a rough proxy for worker real income. But because the United States had the smallest increase in labor productivity in the period, it also had the smallest gain in real (inflation-adjusted) compensation (see table 1, columns 2 and 7).

Dollar depreciation was the second avenue that led the United States to enhanced price competitiveness. The U.S. dollar fell in value relative to the currencies of Japan, France, and West Germany between 1967 and 1979. Currency depreciation is undesirable in that it exacerbates inflation by making imported goods more expensive. Moreover, it worsens

the international terms of trade in the sense that a depreciated dollar means the United States must export more to pay for an unchanged amount of imported goods.

Conclusion

The fact that productivity in manufacturing has been growing slower in the United States than abroad could be expected to give a price advantage to foreign firms. However, that has not been the case. Relatively slow increases in U.S. labor compensation and depreciation of the U.S. dollar against some currencies improved the price competitiveness of the United States in manufactured goods.

Improved price competitiveness notwithstanding, the United States has seen its share of the world market for manufactured goods shrink. This surprisingly dismal performance compounds one injury with another. Increased price competitiveness was obtained in undesirable ways, but the hard-won advantage failed to lead to a larger market share. The cause for this failure to exploit the improved relative price position remains a puzzle.

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