

# International comparisons of trends in productivity and labor costs

*Manufacturing productivity slowed or declined in 1980 and unit labor costs accelerated, as output generally turned downward in the United States and 10 industrial nations; compensation was up in most countries but was offset by gains in consumer prices*

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Manufacturing productivity declined during 1980 in the United States, Canada, and Germany and slowed in the eight other industrial countries studied, as output turned down in all countries except Japan and Italy and adjustments in employee hours were mixed. Productivity was down 0.3 percent in the United States and 1.4 percent in Canada, and was up by more than 6 percent in Japan and Italy, and an average 2.3 percent in all eight European countries.

Unit labor costs accelerated in all 11 countries in 1980, but the increases varied—from less than 1 percent in Japan (where unit labor costs declined the previous year) to 11 percent in the United States and Sweden, nearly 15 percent in France and Italy, and 23 percent in the United Kingdom. Measured in U.S. dollars (to account for relative changes in exchange rates), unit labor costs declined 2.5 percent in Japan; exchange rate changes moderated cost trends in Denmark and Italy, but accentuated those in Canada and the other European countries, with the United Kingdom registering a 35-percent increase.

Hourly compensation rose 7 to 11 percent in most

countries in 1980, larger increases occurring only in France (15 percent) and in Italy and the United Kingdom (21 and 23 percent). For most countries, the increases were within 1 percent of those of the previous year. Because consumer prices accelerated, however, real hourly compensation declined in five of the countries and increased 5 percent or less in every other country.

This article describes developments in manufacturing productivity (as measured by output per hour), hourly compensation, real compensation, and unit labor costs in 1980, and in the years since 1973, in the United States, Canada, Japan, France, Germany, Italy, the United Kingdom, and four smaller European countries—Belgium, Denmark, the Netherlands, and Sweden.<sup>1</sup> Data are presented for the eight European countries and for the 10 foreign countries combined.<sup>2</sup> Percent changes for 1960–80, 1960–73, and 1973–80 shown in the tables are computed using the least squares method—that is, from the least squares trend of the logarithms of index numbers—in order to remove much of the effect of cyclical changes on the average rates of change and thereby estimate the underlying trends.<sup>3</sup> The data reflect revised underlying statistics for several countries—notably Japan, Denmark, and the United Kingdom.<sup>4</sup> (Annual indexes from 1950 forward are available from authors.)

Although the productivity measure relates output to the hours of persons employed in manufacturing, it

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does not measure the specific contributions of labor as a single factor of production. Rather, it reflects the joint effects of many influences, including new technology, capital investment, the level of output, capacity utilization, energy use, and managerial effectiveness, as well as the skills and efforts of the work force.

### Manufacturing productivity

In 1980, manufacturing productivity declined about 1.5 percent in Canada and 0.3 percent in the United States and Germany. Productivity increased, but at a slower rate than in the preceding year, in the other European countries and Japan—about 0.5 percent in France, Sweden, and the United Kingdom and 1.5 percent in Denmark; 3 to 4 percent in Belgium and the Netherlands; and more than 6 percent in Japan and Italy. (See table 1.)

In the 7 years since 1973, manufacturing productivity has increased at average annual rates of more than 6 percent in Japan and Belgium; between 3 and 6 percent in France, Germany, Italy, Denmark, and the Netherlands; and only 2 percent in the United States, Canada, Sweden, and the United Kingdom. For all countries, this represents a slowdown from the 1960–73 period.

The 1980 productivity declines in the United States and Canada reflected decreases in output which were only partly offset by declines in hours. In the United Kingdom, a substantial drop in output (9 percent) was more than offset by decreases in hours. Output either fell or slowed substantially from 1979 in all countries except Japan and Italy, which registered gains of

around 7 percent. Labor input declined in every country except Japan and Germany.

The 1980 output drop in the United States (4.6 percent) was greater than the decline which occurred in 1974, but less than the subsequent decline in 1975. In the United Kingdom, the 9-percent output decline in 1980 was greater than in the previous recession.

The underlying rate of growth for manufacturing output in the 1973–80 period was about 2 percent in Canada, 1.8 percent in Europe, and 6 percent in Japan, compared with 2.5 percent in the United States. Among the European countries, only France, Italy, and Denmark had higher underlying rates than the United States.

In 1980, total hours rose about 1 percent in Japan and Germany, but fell in all other countries. The largest declines were in the United States and Belgium—4 to 5 percent—and the United Kingdom—nearly 10 percent. Employment changes corresponded with changes in total hours, except for Italy where employment increased moderately. (See table 2.)

The 1980 decline in U.S. employment and hours was the first since the 1974–75 recession. In contrast, employment and hours have continued to decline in all or nearly all years in every European country except Italy. U.S. employment and hours surpassed 1973 levels in 1978 and continued rising in 1979. However, because of the 1980 declines, U.S. manufacturing employment was only 1.5 percent above the 1973 level and total hours were down 1 percent. Among the other countries, only Canada and Italy show 1973–80 employment increases

**Table 1. Changes in manufacturing productivity and output in 11 countries, 1960–80**

[Annual changes in percent]

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Sweden	Eight European countries	Ten foreign countries
Output per hour:													
1960–80	2.7	3.8	9.4	5.6	5.4	5.9	3.6	7.2	6.4	7.3	5.2	5.4	5.9
1960–73	3.0	4.5	10.7	6.0	5.5	6.9	4.3	7.0	6.4	7.6	6.7	5.9	6.4
1973–80	1.7	2.2	6.8	4.9	4.8	3.6	1.9	6.2	5.1	5.6	2.1	4.2	4.7
1974	-2.4	1.6	2.4	3.5	6.0	4.9	.8	5.4	3.3	8.3	3.6	4.3	3.9
1975	2.9	2.6	3.9	3.1	4.8	-4.4	-2.0	5.2	10.4	1.7	.4	1.4	1.9
1976	4.4	4.9	9.4	8.2	6.3	8.6	4.0	10.3	7.7	12.7	1.0	7.1	7.3
1977	2.4	5.1	7.2	5.1	5.3	1.1	1.6	5.0	3.7	4.1	-1.5	3.4	4.3
1978	.9	3.1	7.9	5.3	3.8	2.9	3.2	6.0	4.4	6.0	4.3	4.1	5.0
1979	1.1	1.2	8.0	5.4	6.3	7.3	3.3	5.8	2.3	5.5	8.1	5.9	6.1
1980	.3	1.4	6.2	.6	-.7	6.7	.3	3.6	1.7	3.7	.6	2.3	3.1
Output:													
1960–80	3.7	4.9	10.2	5.5	4.0	5.6	1.8	5.3	4.4	4.9	3.4	4.2	5.4
1960–73	4.7	6.3	13.0	6.6	5.3	6.8	3.0	6.5	5.2	6.4	5.1	5.4	6.8
1973–80	2.5	1.9	6.1	2.7	2.1	3.4	1.1	1.4	2.7	1.7	.4	1.8	2.9
1974	-4.2	3.8	2.0	3.2	.3	6.4	1.2	4.3	1.5	4.4	4.8	2.1	1.2
1975	7.1	-6.3	-4.0	2.1	5.2	-9.7	7.0	6.6	-2.1	-6.7	-1.5	5.4	5.1
1976	9.6	5.5	13.3	7.0	7.2	12.6	2.0	8.4	8.8	8.0	.4	6.9	8.4
1977	6.7	1.4	7.3	3.7	2.8	2.1	1.9	-.6	2.1	.9	-5.6	2.2	3.4
1978	5.4	5.7	7.3	2.7	1.8	1.8	.5	1.9	2.7	1.8	1.3	1.7	3.4
1979	3.1	3.8	9.2	3.1	5.0	6.7	.2	3.6	3.5	2.7	6.7	4.0	5.4
1980	4.6	-2.6	7.1	1.1	.3	6.5	-9.4	-1.3	.0	.9	-6	.5	1.5

NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers.

**Table 2. Changes in manufacturing employment and hours in 11 countries, 1960-80**

[Annual changes in percent]

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Sweden	Eight European countries	Ten foreign countries
<b>Aggregate hours:</b>													
1960-80	0.9	1.0	0.8	-0.1	-1.3	-0.3	-1.7	-1.8	-1.9	-2.3	-1.7	-1.1	-5
1960-73	1.6	1.7	2.1	.6	-2	-1	-1.2	-4	-1.1	-1.1	-1.5	-4	4
1973-80	.7	-3	-7	-2.1	-2.6	-1	-2.9	-4.5	-2.2	-3.7	-2.4	-2.3	-1.7
1974	-1.9	2.1	-4.3	-3	-5.4	1.4	-2.0	-1.0	-1.7	-3.6	1.2	-2.2	-2.7
1975	-9.7	-3.9	-7.6	-5.0	-9.6	-5.5	-5.1	-11.2	-11.3	-5.1	-1.1	-6.7	-6.8
1976	4.9	.6	3.6	-1.1	.8	3.8	-1.9	-1.7	1.0	-4.2	-1.5	-2	1.0
1977	4.2	-3.5	.1	-1.3	-2.4	1.0	2	-5.4	-1.5	-3.0	-4.1	-1.2	-9
1978	4.4	2.5	-5	-2.4	-1.9	-1.1	-2.6	-3.9	-1.6	-3.9	-5.4	-2.3	-1.5
1979	2.0	2.6	1.1	-2.2	-1.3	-6	-3.0	-2.6	1.2	-2.6	-1.3	-1.8	-7
1980	-4.1	-1.2	.8	-1.7	1.0	-2	-9.6	-4.7	-1.7	-2.7	-1.2	-2.7	-1.5
<b>Employment:</b>													
1960-80	1.0	1.3	1.6	.6	-4	1.2	-.9	-.5	-.6	-1.0	-.2	-.1	4
1960-73	1.5	1.9	3.0	1.2	.5	1.4	-.5	.6	.2	.0	-.2	.5	1.1
1973-80	.8	.3	-.8	-1.2	-1.8	.1	-2.2	-3.6	-1.7	-2.7	-.9	-1.5	-1.3
1974	-.4	2.0	.2	1.3	-2.6	2.5	1.9	1.1	-3.6	-.4	2.4	.3	4
1975	-8.6	-2.5	-5.1	-2.7	-6.7	-.4	-3.8	-6.1	-8.4	-3.3	.9	-3.9	-4.2
1976	3.7	.1	.4	-1.0	-2.4	.2	-2.2	-4.1	.6	-3.9	-.2	-1.7	-1.0
1977	3.6	-2.2	-.2	-.5	-.8	.1	-.4	-3.9	-.6	-2.7	-3.5	-.7	-.7
1978	4.2	2.5	-1.1	-1.7	-.6	-1.0	-2.4	-4.1	-.4	-2.8	-2.8	-1.6	-1.3
1979	2.6	3.9	.0	-1.8	.3	.5	-2.5	-2.7	1.3	-1.6	.3	-.9	-.5
1980	-3.4	-1.1	.9	-1.4	.7	.2	-5.9	-2.7	-2.6	-2.2	-.2	-1.6	-.9
<b>Average hours:</b>													
1960-80	.0	-.3	-.8	-.7	-.9	-1.5	-.8	-1.2	-1.4	-1.3	-1.4	-1.0	-.8
1960-73	.1	-.2	-.9	-.5	-.8	-1.5	-.7	-1.0	-1.3	-1.1	-1.3	-.9	-.8
1973-80	-.1	-.5	-.1	-.9	-.9	-.3	-.8	-.9	-.5	-1.0	-1.5	-.8	-.5
1974	-1.5	.1	-4.5	-1.5	-2.9	-1.1	-3.8	-2.1	2.0	-3.2	-1.1	-2.5	-3.0
1975	-1.2	-1.4	-2.6	-2.3	-3.1	-5.1	-1.3	-5.4	-3.2	-1.8	-2.0	-2.9	-2.8
1976	1.2	.5	3.2	-.1	3.2	3.5	.3	2.5	.4	-.3	-1.3	1.5	2.0
1977	.6	-1.3	.3	-.9	-1.6	.9	.6	-1.5	-.9	-.3	-.7	-.4	-.2
1978	2	.0	.6	-.7	-1.4	-.1	-.2	.3	-1.2	-1.1	-2.6	-.7	-.3
1979	-.6	-1.2	1.1	-.4	-.6	-1.1	-.5	.6	-.1	-1.1	-1.6	-.9	-.3
1980	-1.0	-.1	-.1	-.3	.3	-.4	-3.9	-2.0	1.0	-.5	-1.0	-1.1	-.6

NOTE: Rates of change computed from the least squares trend of the logarithms of the index numbers.

and no country shows an overall gain in aggregate hours. The following tabulation shows total percentage changes in employment and hours between 1973 and 1980:

	<i>Employment</i>	<i>Hours</i>
United States . . . . .	1.5	-0.9
Canada . . . . .	2.5	-1.0
Japan . . . . .	-5.0	-7.0
France . . . . .	-7.7	-13.3
Germany . . . . .	-11.6	-17.7
Italy . . . . .	2.2	-1.4
United Kingdom . . . . .	-14.5	-22.0
Belgium . . . . .	-20.6	-26.7
Denmark . . . . .	-13.4	-15.1
Netherlands . . . . .	-15.9	-22.7
Sweden . . . . .	-3.1	-12.7

### Hourly compensation

In 1980, hourly compensation increased 21 to 24 percent in Italy and the United Kingdom, 15 percent in France, and 7 to 11 percent in the other countries. These increases were somewhat smaller than those of the previous year in Canada, Germany, Denmark, and the Netherlands. For the United States, Japan, and France, the 1980 increases were slightly larger than the

year earlier changes; and for Sweden, Belgium, Italy, and the United Kingdom, the acceleration was more significant. (See table 3.)

In all countries, the compensation increases of the last 2 years were below the peak gains of 1974 or 1975. The moderation was greatest in Japan, where the recent 7 percent gains were less than one-fourth of their 31 percent peak advance. Compensation gains also slowed significantly in the smaller European countries—Belgium, the Netherlands, Sweden, and Denmark—where recent compensation increases were about one-half or less of their peak gains. Compensation increases did not diminish as much in Canada and the larger European countries; and in the United States, the 1979 and 1980 average increases were only about 10 percent below the 1975 peak. However, the peak 1975 compensation increase in the United States was relatively small—12 percent. In contrast, the peak compensation gains were about 30 percent in Italy, the United Kingdom, and Japan; around 20 percent in France, Belgium, Denmark, the Netherlands, and Sweden; and 15 percent in Canada and Germany.

Except for the Netherlands, hourly compensation increases have decelerated, then rebounded, since 1973. For most countries, the smallest compensation gains oc-

curred in 1978. In the United Kingdom and Sweden, the smallest gains occurred in 1977 and 1979, respectively. Compensation increases began moderating in 1976 in Japan and Germany, and since then annual wage gains have fluctuated. Only the Netherlands has shown a steady deceleration in hourly compensation increases since 1973.

Despite the rebounds, only in the United States, France, Italy, and the United Kingdom did recent increases in hourly compensation equal or exceed the underlying average rates of gain for 1973-80. In the other seven countries, the 1980 increases were well below the underlying trend.

*Real hourly compensation.* Real hourly compensation, which takes into account changes in consumer prices, declined in 5 of the 11 countries in 1980—down 2 to 3 percent in the United States and Sweden, and around 1 percent in Canada, Japan, and Denmark—and was almost unchanged in Italy and the Netherlands. Real compensation increased about 1 to 5 percent in France, Germany, Belgium, and the United Kingdom. However, except for Belgium, even these gains were lower than those of the previous year, as consumer prices accelerat-

ed at a more rapid rate than wages.

For the United States, 1980 was the second consecutive year of real declines in hourly compensation. None of the other countries had declines in real hourly compensation in 1979, although several did in 1977 or 1978. In general, consumer prices have not moderated as much as manufacturing compensation since the 1974-75 inflation peak. Furthermore, the 1980 consumer price increases in the United States, France, Italy, and Sweden matched or surpassed their previous high rates. Consequently, whereas most countries had substantial gains in real hourly compensation in 1974-75, few showed significant gains in 1980.

Over the 1973-80 period, real hourly compensation increased less than 1 percent annually in the United States; 1.7 percent in Japan; about 2 to 4 percent in Canada and most European countries; and 5 percent in Germany. This contrasts with 1960-73 real compensation gains of about 2 to 3 percent per year in the United States and Canada; about 4 to 6 percent in France, Germany, Denmark, Sweden, and the United Kingdom; and 7 to 8 percent in Japan, Italy, Belgium, and the Netherlands.

The fairly narrow range in the 1973-80 average annu-

**Table 3. Changes in manufacturing hourly compensation and in consumer prices, 11 countries, 1960-80**

[Annual changes in percent]

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Sweden	Eight European countries	Ten foreign countries
<b>Hourly compensation:</b>													
1960-80	6.7	8.6	15.1	12.0	10.3	16.0	12.7	12.4	13.3	13.2	11.8	11.9	12.1
1960-73	5.0	6.4	14.6	9.7	9.4	12.3	8.7	10.7	11.8	12.8	10.1	9.9	10.2
1973-80	9.3	11.9	10.5	15.2	9.7	20.1	19.1	12.0	13.1	10.6	13.8	13.8	12.8
1974	10.6	15.1	31.2	20.2	15.3	24.6	25.0	22.0	21.0	19.2	17.8	18.5	21.4
1975	11.9	14.8	17.0	19.7	12.7	28.9	30.3	20.6	19.3	14.4	21.3	18.6	18.1
1976	8.0	14.3	6.7	14.3	7.3	19.8	17.0	12.1	11.7	12.4	18.0	12.7	11.0
1977	8.3	12.8	9.7	14.1	9.9	18.8	11.7	11.0	11.8	8.6	8.6	11.7	11.1
1978	8.2	7.5	5.9	12.9	8.5	14.4	16.2	7.0	10.3	8.6	13.5	11.6	9.9
1979	9.8	9.9	6.6	13.9	9.1	17.6	19.3	7.4	10.9	7.5	8.4	13.0	11.1
1980	10.7	9.4	7.1	15.0	7.9	21.3	23.6	10.1	10.7	6.9	11.1	15.0	12.5
<b>Real hourly compensation:</b>													
1960-80	1.5	3.1	6.9	5.1	6.2	7.2	3.8	6.6	5.2	6.6	5.0	5.6	5.5
1960-73	1.8	3.0	8.2	5.1	6.3	7.9	3.7	6.9	5.3	7.4	5.3	5.7	5.8
1973-80	.7	2.6	1.7	4.2	5.2	2.7	3.1	3.9	2.3	3.4	3.3	4.0	3.2
1974	-.3	3.8	6.5	5.7	7.9	4.3	7.8	8.3	5.0	8.7	7.2	6.7	6.7
1975	2.5	3.6	4.7	7.1	6.2	10.0	4.9	6.9	8.8	3.8	10.5	6.5	6.0
1976	2.1	6.3	-2.5	4.2	2.8	2.8	.4	2.7	2.4	3.3	7.0	2.9	1.5
1977	1.7	4.4	1.5	4.3	6.1	-.4	-3.6	3.6	0.6	1.8	-2.6	2.0	1.9
1978	.5	-1.3	1.6	3.5	5.9	1.7	7.3	2.4	0.2	4.4	3.2	4.6	3.5
1979	-1.3	.7	2.8	2.9	5.1	1.6	5.2	2.8	1.2	3.1	1.1	3.9	3.2
1980	-2.5	-.7	-.6	1.3	2.5	.1	4.7	3.2	-1.4	.3	-2.3	2.8	1.4
<b>Consumer Price Index:</b>													
1960-80	5.1	5.3	7.7	6.6	3.8	8.1	8.6	5.5	7.8	6.2	6.4	6.0	6.2
1960-73	3.2	3.2	5.9	4.3	3.0	4.1	4.8	3.6	6.2	5.0	4.6	4.0	4.1
1973-80	8.6	9.1	8.7	10.6	4.3	16.9	15.6	7.8	10.6	7.0	10.2	9.5	9.3
1974	11.0	10.9	23.2	13.7	6.9	19.4	16.0	12.7	15.2	9.6	9.9	11.0	13.7
1975	9.1	10.8	11.7	11.8	6.1	17.2	24.2	12.8	9.6	10.2	9.8	11.4	11.4
1976	5.8	7.5	9.4	9.6	4.4	16.5	16.5	9.2	9.0	8.8	10.3	9.5	9.4
1977	6.5	8.0	8.1	9.4	3.5	19.3	15.9	7.1	11.1	6.7	11.4	9.5	9.1
1978	7.7	9.0	4.2	9.1	2.5	12.4	8.3	4.5	10.1	4.1	10.0	6.7	6.3
1979	11.3	9.1	3.7	10.8	3.9	15.7	13.4	4.5	9.6	4.2	7.2	8.8	7.6
1980	13.5	10.1	7.7	13.6	5.3	21.1	18.0	6.7	12.3	6.5	13.7	11.9	10.9

Note: Rates of change computed from the least squares trend of the logarithms of the index numbers.

al real hourly compensation increases (1 to 5 percent) contrasts with the wider differentials in nominal hourly compensation growth rates (9 to 20 percent). The two countries with the largest hourly compensation increases—the United Kingdom and Italy at 20 percent—also had the largest price increases (more than 15 percent) and consequently had only average real compensation gains. On the other hand, Germany, with the smallest hourly compensation increase (except for the United States), had the largest real compensation gain because prices offset less than half the compensation change. The United States had the smallest 1973–80 real compensation gain because consumer prices offset more than 90 percent of the compensation increase.

*Real compensation measurement.* Hourly compensation is designed to measure employer expenditures for the benefit of workers. Compensation includes gross payments made directly to employees—pay for time worked; vacation, holiday, and other leave pay; and all bonuses and other special payments—and also employer contributions to legally-required insurance programs and to contractual and private welfare plans for the benefit of employees.

Hourly compensation includes more than the current labor income of employees. It includes employer expenditures for benefit programs from which employees may derive additional current income (for example, family allowances or reimbursements for medical expenses). It also includes employer contributions for benefit plans from which employees may derive future benefits (such as national and supplementary company or union pension plans).

Real compensation, therefore, measures the constant purchasing power of total labor compensation, including employer (and employee) payments to both current and deferred social benefit plans. Real compensation covers much more than real spendable weekly earnings—an alternative real income measure—which excludes employer and employee contributions for social insurance and employee income taxes.<sup>5</sup>

Real hourly compensation was computed by dividing hourly compensation by the consumer price index for each country. The consumer price index is a statistical measure of the changes in prices of goods and services bought by either the whole population or a particular group.

It should be noted that the real compensation measures are not strictly comparable among all 11 countries because of differences in their consumer price indexes. First, the indexes do not cover the same population groups in each country. (These differences should not have any significant effect on comparative trends, however. For Germany and the Netherlands, indexes covering different population groups show almost the same

price trends.) Second, the indexes for France, Sweden, and the United Kingdom are computed using annually revised weights, while the indexes for the other countries are base weighted. Third, and most important, the indexes treat owner-occupied housing differently. In France, Italy, Belgium, and Denmark, owner-occupied housing costs (except possibly maintenance and municipal rates) are excluded from index coverage on the premise that home purchase is an investment. In Japan, Germany, the Netherlands, and the United Kingdom before 1975, owner-occupied housing is covered by an imputed rent measure. Indexes for the other countries, and the United Kingdom beginning 1975, cover certain house purchase expenditures, including mortgage interest. The United Kingdom covers mortgage interest, measured using current interest rate trends, but not house prices. Sweden computes a user cost function which includes measures of depreciation and the cost of both invested and borrowed capital. Canada also computes a user cost function which includes depreciation cost and mortgage interest, measured using average interest rate trends. The United States covers home purchase along with other housing costs, including current house prices and mortgage interest at current rates.

The differences in the treatment of owner-occupied housing can have a significant effect on measured consumer price—and real compensation—trends.<sup>6</sup> In particular, countries measuring current mortgage interest rates will show relatively higher consumer price increases during periods of rising interest rates (and relatively lower increases during rate declines).

For the United States, the average annual percent increase in consumer prices for 1975–80 was 8 percent based on a BLS experimental index which covers homeownership with an imputed rent measure, compared with the 9-percent measured by the conventional price index. Furthermore, the differences between the two indexes are even greater in the last 2 years. Therefore, using the “imputed rent” consumer price index, real hourly compensation shows no decrease at all in 1979 and a much smaller decline (.6) in 1980.

### Unit labor costs

Unit labor costs, which reflect changes in both productivity and hourly compensation, increased about 6 percent in 1980 in Belgium; 9 to 11 percent in the United States, Canada, Germany, Sweden, and Denmark; 14 percent in France and Italy; and 23 percent in the United Kingdom; but less than 1 percent in Japan and only 3 percent in the Netherlands. (See table 4.)

The 1980 increases were higher than those of 1979 in all countries—but only moderately so in Denmark and the Netherlands. The acceleration in unit labor costs was either entirely or primarily the result of the deterioration in productivity growth in most countries, partic-

**Table 4. Changes in manufacturing unit labor costs in 11 countries, 1960-80**

[Annual changes in percent]

Year	United States	Canada	Japan	France	Germany	Italy	United Kingdom	Belgium	Denmark	Netherlands	Sweden	Eight European countries	Ten foreign countries
Unit labor costs:													
1960-80	3.8	4.7	5.3	5.9	4.7	9.5	8.8	4.9	6.5	5.5	6.5	6.2	5.8
1960-73	1.9	1.8	3.5	3.1	3.7	5.1	4.1	3.5	5.1	4.8	3.5	3.8	3.5
1973-80	7.5	9.5	3.4	9.9	4.7	16.0	17.2	5.5	7.6	4.8	11.2	9.2	7.7
1974	13.3	13.2	28.1	16.2	8.7	18.7	24.1	15.8	17.1	10.0	13.5	13.5	16.8
1975	8.8	17.8	12.6	16.1	7.5	34.9	32.5	14.6	8.0	16.4	21.7	16.9	15.9
1976	3.4	9.0	-2.5	5.6	.9	10.4	12.7	1.6	3.7	.3	17.3	5.3	3.5
1977	5.7	7.3	2.4	8.6	4.4	17.5	10.7	5.6	7.8	4.3	11.0	8.2	6.6
1978	7.3	4.3	-1.8	7.3	4.6	11.2	12.8	1.0	5.6	2.5	6.7	7.1	4.7
1979	8.6	8.6	-1.3	8.1	2.7	9.6	15.4	1.5	8.3	1.9	.3	6.7	4.7
1980	11.0	10.9	.8	14.3	8.7	13.7	23.3	6.3	8.9	3.1	10.5	12.4	9.1
Unit labor costs in U.S. dollars:													
1960-80	3.8	4.4	8.0	6.5	9.3	7.7	6.6	7.8	7.9	8.9	7.8	7.6	7.3
1960-73	1.9	1.9	4.9	2.8	6.1	5.4	2.6	4.6	5.0	6.1	4.2	4.2	3.9
1973-80	7.5	6.4	8.3	10.9	11.2	9.6	15.3	10.6	9.3	10.3	11.3	11.4	10.3
1974	13.3	15.8	19.0	7.2	11.5	6.2	18.5	15.5	16.0	13.9	11.5	11.3	13.3
1975	8.8	13.3	10.7	30.3	13.1	34.5	25.8	21.5	14.6	23.8	30.2	22.9	19.7
1976	3.4	12.5	-2.4	-5.3	-1.6	-13.3	-8.5	-3.4	-1.6	-4.8	11.5	-5.1	-3.9
1977	5.7	.4	13.3	5.5	13.1	10.5	7.0	13.7	8.5	12.3	8.2	9.7	9.8
1978	7.3	2.8	26.2	17.1	21.0	15.6	24.0	15.1	15.1	16.4	5.6	18.6	19.1
1979	8.6	5.7	5.7	14.3	12.4	12.0	27.7	8.8	13.4	9.7	5.1	14.5	8.7
1980	11.0	11.1	-2.5	15.3	9.8	10.5	35.1	6.7	1.8	4.2	12.0	14.1	9.6

NOTE Rates of change computed from the least squares trend of the logarithms of the index numbers.

ularly in France, Germany, and Sweden. In Belgium, Italy, and the United Kingdom, hourly compensation advances as well as productivity slowdowns contributed substantially to the cost acceleration.

*In U.S. dollars.* When measured in U.S. dollars, with changes in exchange rates taken into account, unit labor costs declined 2.5 percent in Japan in 1980 and increased about 2 to 4 percent in Denmark and the Netherlands; 7 percent in Belgium; 10 to 12 percent in the United States, Canada, Germany, Italy, and Sweden; 15 percent in France; and 35 percent in the United Kingdom.

For the United Kingdom, 1980 was the third year of substantial foreign currency appreciation of the pound. On the other hand, the Danish krona declined more than 6 percent relative to the dollar in 1980 after substantial increases in the previous 2 years. The Japanese and Italian currencies declined about 3 percent relative to the dollar; the other currencies were almost unchanged—up less than 1.5 percent. (In 1981, however, all the foreign currencies have declined against the dollar.)

Exchange rates have fluctuated considerably since 1973, and each foreign currency has undergone one or more large appreciations or declines versus the dollar. The overall effects of the exchange rate movements from 1973 to 1980 have been to add about 5 to 6 percent to the annual unit labor cost increases for Japan, Germany, Belgium, and the Netherlands and 1 to 2 percent for France and Denmark, while offsetting the average annual cost increases of the United Kingdom and Cana-

da by 2 to 3 percent, and of Italy by more than 6 percent. For Sweden, the overall effect of exchange rate changes during the 1973-80 period was negligible.

Exchange rate changes have, to a large extent, offset the substantial differentials in unit labor cost trends among the countries. Consequently, in all countries except the United Kingdom, the underlying trends in unit labor costs measured in U.S. dollars show much less variation from country to country than do unit labor costs in national currency. From 1973 to 1980, unit labor costs measured in U.S. dollars increased about 6 to 8 percent per year in the United States, Canada, and Japan and 9 to 11 percent in the continental European countries, compared with average annual increases (measured in national currencies) that ranged from only 3.4 percent in Japan, around 5 percent in Germany, Belgium, and the Netherlands, and up to 16 percent in Italy.

The United Kingdom, since 1977, has been an exception. From 1973 to 1977, the relative value of the pound fell 29 percent. Consequently, a very large gain of 105 percent in unit labor costs was reduced to 46 percent when measured in U.S. dollars—compared with an increase of 35 percent in the United States. However, from 1977 to 1980, the United Kingdom had larger unit labor cost gains than any of the other countries and the value of the pound rose 33 percent. Consequently, a 61-percent increase in unit labor costs became 114 percent in U.S. dollars—compared with an increase of 29 percent in the United States. During 1973-80, unit labor costs in the United Kingdom rose 17.2 percent per year in pounds and 15.3 percent in U.S. dollars. □

## FOOTNOTES

<sup>1</sup>The data relate to all employed persons, including the self employed, in the United States and Canada and to all wage and salary employees in the other countries. Hours refer to hours paid in the United States, hours worked in the other countries.

Compensation includes all payments made by employers directly to their employees (before deductions), plus employer contributions to legally required insurance programs and to contractual and private welfare plans for the benefit of employees. Labor costs include, in addition to compensation, employer expenditures for recruitment and training; the cost of cafeterias, medical facilities, and other plant facilities and services; and taxes (other than social security taxes, which are part of compensation) levied on payrolls or employment rolls. Annual data are not available for total labor costs. Labor costs, as used in this article, approximate more closely the concept of compensation. However, unit labor costs have been adjusted to include all significant changes in taxes that are regarded as labor costs. Hourly compensation—along with the real compensation measures—are not so adjusted in this article. For the United States and Canada, compensation of self-employed workers is measured by assuming that their hourly compensation is equal to the average for wage and salary employees.

<sup>2</sup>To compute the series for the eight European countries and ten foreign countries, the data have been combined by aggregating the output, compensation, and hours figures for each year, adjusting where necessary for compatibility of coverage and concept. Average exchange rates for 1974–80 were used to aggregate the output and compensation data. The use of 1974–80 exchange rates, however, does not imply that these rates reflect the comparative real value of currencies for manufacturing output. Moreover, the use of exchange rates for a different time period would have little effect on the combined series.

<sup>3</sup>This differs from the compound rate of change method used by Arthur Neef and Patricia Capdevielle in "International comparisons of productivity and labor costs," *Monthly Labor Review*, December 1980, pp. 32–39.

<sup>4</sup>For Japan, gross product originating in manufacturing in constant prices, used as the output measure since 1970, was rebased on 1975 constant prices rather than 1970 constant prices. For Denmark, the output, employment, and employee compensation measures (for 1966 through 1977) are now based on their new national accounts statistics. For the United Kingdom, the employment data for 1976–79 are now based on final data from the annual Census of Manufactures. The final data show a greater employment drop, and therefore the productivity decline since 1973 is less severe than that shown in Neef-Capdevielle, "International comparisons."

The 1980 measures for five countries—France, Germany, Italy, the United Kingdom and Sweden—are based in part on preliminary national accounts statistics. For the other six countries, the measures for 1980 are based on current indicators of manufacturing output, employment and hours, and hourly compensation. The estimates based on current indicators, as well as preliminary national account statistics, are subject to revision as more complete information becomes available.

<sup>5</sup>For a comparison of the two real labor income measures for the United States, see Jack Alterman, "Compensation per man-hour and take-home pay," *Monthly Labor Review*, June 1971, pp. 25–34.

<sup>6</sup>For an analysis of the effect on measured inflation of the treatment of owner-occupied housing, weighting, and other factors for the United States, see Jack E. Triplett, "Reconciling the CPI and the PCE Deflator," *Monthly Labor Review*, September 1981, pp. 3–17.

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### The beginnings of flexitime

Flexitime—the most common of the alternative work patterns—was adopted by European employers as a means of attracting more workers. Not surprisingly, the concept is most widely used in Germany and Switzerland, where labor shortages have been most acute.

Flexitime was born in 1967 at the German aerospace firm of Messerschmidt-Bolkow-Blohm and instituted among 4,000 employees at the corporation's headquarters near Munich. Since then, Austria, Belgium, Britain, Italy, the Netherlands, and the Scandinavian nations have shown significant interest in flexible working hours.

In the United States the concept has grown more slowly, partly because there has been no reason to solicit employees in most areas of the country, partly because legislative and union protections on hours and overtime have acted as restraints.

"Innovations in Working Patterns,"  
*Transatlantic Perspectives*,  
January 1981, p. 27

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