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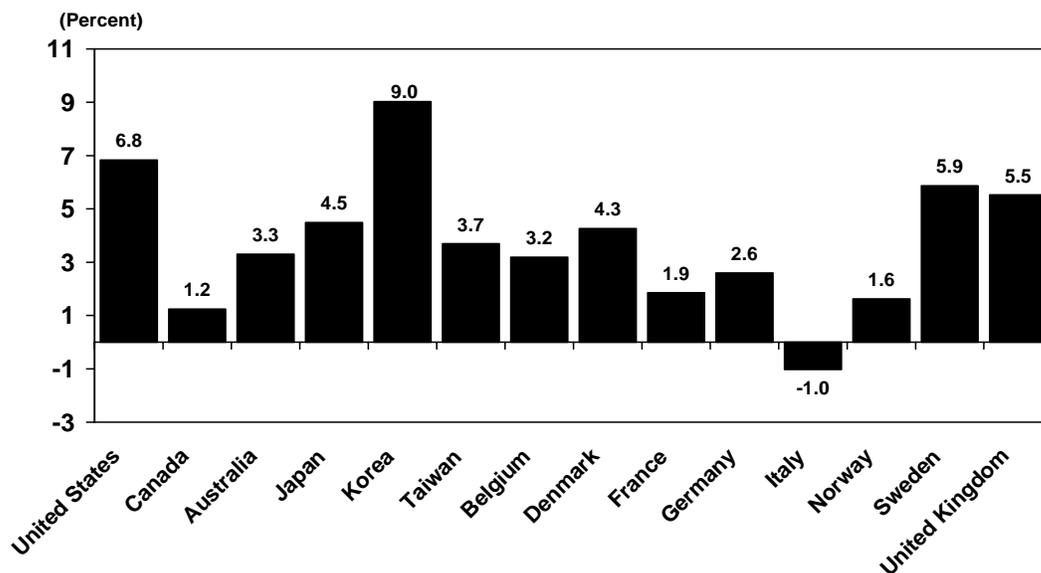
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INTERNATIONAL COMPARISONS OF MANUFACTURING PRODUCTIVITY AND UNIT LABOR COST TRENDS, 2003

The increase in U.S. manufacturing productivity in 2003 was the second highest (+6.8 percent) among the 14 economies compared, according to the U.S. Department of Labor's Bureau of Labor Statistics. Korea registered the largest gain (+9.0 percent). Manufacturing productivity increased in all the compared economies, except for Italy. (See chart 1.) In this news release, data for Australia are included for the first time.

As in 2002, U.S. productivity growth in manufacturing in 2003 was substantially above its average annual growth rate since 1979. Seven of the other 12 economies for which comparisons are available also had productivity growth in 2003 that exceeded their annual average over the 1979-2003 period. (Average annual growth rates for selected measures over various time periods are found in tables A and B.)

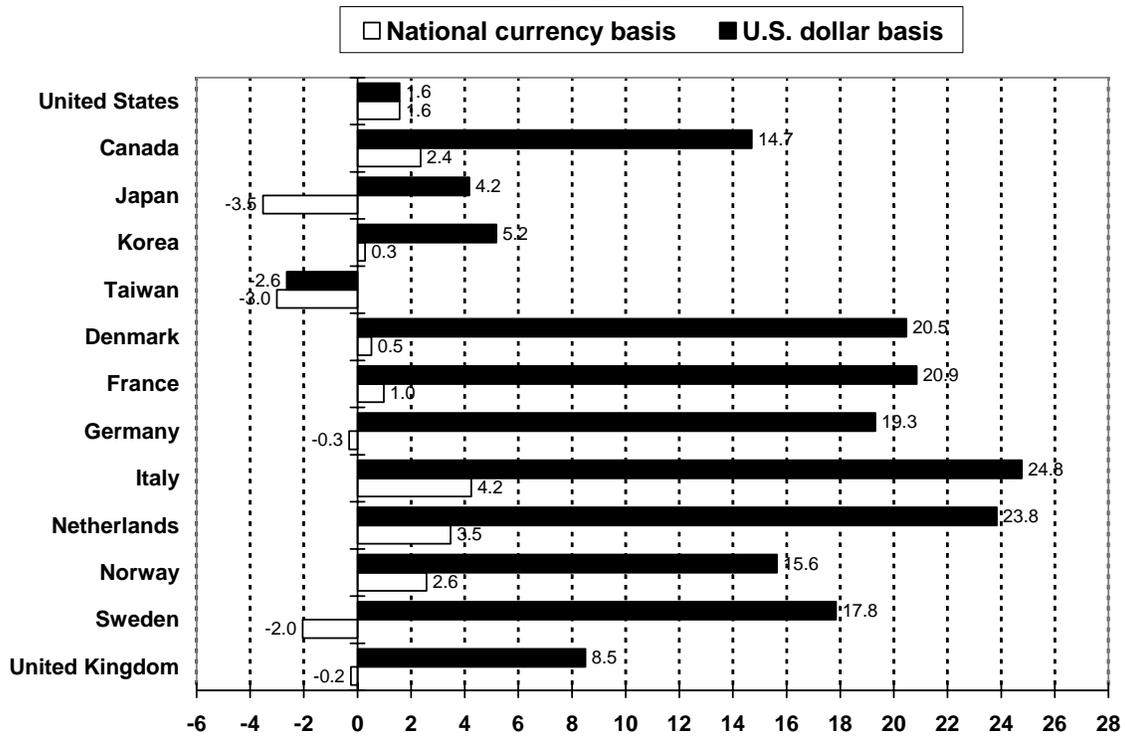
**Chart 1. Percent change in
manufacturing output per hour, 2003**



Unit labor costs in manufacturing, expressed in national currency units, rose in 8 of the 13 economies for which 2003 data are available, with a 1.6 percent increase in the United States. Of the five economies that recorded declines in unit labor costs, Japan and Taiwan experienced very small increases in hourly compensation, Sweden had a relatively large increase in productivity, with the remaining two having productivity increases that were slightly greater than the corresponding hourly compensation increases.

The widespread, and mostly large, increases in unit labor costs in U.S. dollar terms are explained by the depreciation of the dollar, particularly with respect to the euro and other European currencies. The U.S. dollar depreciated against the currencies of all the economies compared, but the depreciation was very slight versus the Taiwan dollar. Unit labor costs fell in U.S. dollar terms only in Taiwan. (See chart 2 and table A.)

Chart 2. Percent change in manufacturing unit labor costs, 2002-2003



**Table A. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 2002-2003**

Percent change

Country or area	Output per hour		Total hours	Employment	Average hours	Total compensation	Hourly compensation	Unit labor costs		Exchange rate (1)
	Output	hour						National currency	U.S. dollars	
United States	6.8	1.7	- 4.8	- 4.7	- 0.1	3.3	8.5	1.6	1.6	---
Canada	1.2	- 0.5	- 1.7	- 0.8	- 0.9	1.9	3.6	2.4	14.7	12.1
Australia	3.3	1.2	- 2.0	- 1.9	- 0.1	NA	NA	NA	NA	19.9
Japan	4.5	3.2	- 1.3	- 2.0	0.7	- 0.5	0.8	- 3.5	4.2	8.0
Korea	9.0	4.8	- 3.9	- 3.7	- 0.2	5.1	9.3	0.3	5.2	4.9
Taiwan	3.7	5.8	2.1	1.7	0.4	2.6	0.6	- 3.0	- 2.6	0.4
Belgium	3.2	- 0.6	- 3.7	- 3.0	- 0.7	NA	NA	NA	NA	19.7
Denmark	4.3	0.5	- 3.6	- 3.1	- 0.5	1.0	4.8	0.5	20.5	19.9
France	1.9	- 0.5	- 2.3	- 2.2	- 0.1	0.5	2.9	1.0	20.9	19.7
Germany	2.6	0.2	- 2.4	- 2.7	0.3	- 0.2	2.3	- 0.3	19.3	19.7
Italy	- 1.0	- 1.4	- 0.4	0.2	- 0.6	2.8	3.2	4.2	24.8	19.7
Netherlands	NA	- 2.8	NA	- 3.0	NA	0.6	NA	3.5	23.8	19.7
Norway	1.6	- 3.8	- 5.4	- 4.6	- 0.8	- 1.4	4.3	2.6	15.6	12.7
Sweden	5.9	2.0	- 3.7	- 2.9	- 0.8	- 0.1	3.7	- 2.0	17.8	20.3
United Kingdom	5.5	0.4	- 4.8	- 4.5	- 0.4	0.2	5.3	- 0.2	8.5	8.8

(1) Value of foreign currency relative to the U.S. dollar.

NA=Not Available

Additional data available

Annual indexes of these variables also are estimated for the time period 1950-2003 and are available at the Bureau of Labor Statistics, Division of Foreign Labor Statistics website at address <http://www.bls.gov/fls/home.htm>. Because the value added output data for U.S. manufacturing industries are not available prior to 1977, the comparative measure of output, output per hour, and unit labor costs for the United States begin with 1977. However, for analytical purposes, the international comparisons in this release go back to 1979.

For further information, contact the Office of Productivity and Technology by phone at 202-691-5654, by e-mail at flspr@bls.gov, or by mail at Bureau of Labor Statistics, 2 Massachusetts Avenue, NE, Room 2150, Washington, DC 20212.

Notes about the measures

The measures in this release are based on data available to BLS as of August 2004. Revisions for 2002 and earlier years were made for several countries to incorporate data not available at the time of the March 2004 report.

United States

U.S. data in this release have been revised from 1998 forward and are based for the first time on the 1997 North American Industry Classification System (NAICS). Output, a value-added measure, is based on a new methodology that balances and reconciles industry production with commodity usage. Data for 2003 are accelerated estimates from limited source data, prepared by the Bureau of Economic Analysis (BEA) using extrapolations from the National Income and Product Accounts (NIPAs). Additional details are available in "Improved Annual Industry Accounts for 1998-2003," *Survey of Current Business*, June 2004. The NAICS-based employment, hours, and compensation data back to 1998 are taken from the series published by BLS as part of the major sector productivity and costs measures for the United States. (Canadian data are also on a NAICS basis for 1997 onward. See Technical Notes.)

Australia

With this press release, Australia becomes the fifteenth country for which manufacturing productivity and unit labor costs are compared. Australian economic data are published by fiscal year, which runs from July 1 through June 30. The Australian Bureau of Statistics (ABS) was able to supply unpublished calendar-year data for real value added, employment, and hours worked for recent years. For earlier years, and for compensation, the Bureau of Labor Statistics made estimates using two-year moving averages of the data for fiscal years. The earliest year for which suitable fiscal-year data are available for real value added, employment, and hours is 1975. Manufacturing compensation data are not available for years prior to 1990. The data for the following series, for the years given, are estimates using two-year moving averages: real value added, 1975; employment, 1975-1986; hours, 1975-1986; compensation, 1990-2002.

Denmark

Denmark published new employment and hours worked series for all employed persons from 1966 forward. The data for compensation of employees also has been revised from 1966 forward. The deflation method used for converting output in current prices to output in real terms has been changed from a fixed base-year to an annual chain-linked Laspeyres method, consistent with the United Nations System of National Accounts (SNA 93) guidelines.

Korea

Korea made changes in its national accounts methods to bring them into closer accord with SNA 93 guidelines. These changes, from 1995 forward, have resulted in revisions downward in manufacturing value added and revisions upward in compensation. The annual rates of change in both series were little affected by the revisions.

Manufacturing productivity, output, and labor input

The growth in labor productivity (output per hour) in U.S. manufacturing remained high at 6.8 percent in 2003. This growth was not as high as the record set in 2002 of 10.2 percent, an increase that has been revised upward by one percentage point over the figure in the March press release. U.S. productivity growth in 2003 trailed only that of Korea, at 9.0 percent, and was followed closely by Sweden (+5.9 percent) and the United Kingdom (+5.5 percent). All other economies recorded productivity increases except Italy, which experienced a decline in productivity of 1.0 percent, following a greater decrease in 2002. For the second year, productivity growth continued to be low in Canada (+1.2 percent) and in Norway (+1.6 percent). The United Kingdom, Denmark, Japan, Australia, and Germany had higher productivity growth in 2003 than in 2002.

The increases in labor productivity occurred despite a decline in manufacturing output in 6 of the 15 economies. In 2003, manufacturing output grew most in the Asian economies. The increase in U.S. manufacturing output (+1.7 percent) was exceeded by only one of the nine European countries, Sweden (+2.0 percent). Five of the European countries experienced declines in manufacturing output in 2003, and the others had only very small increases. Output also declined in Canada. (See table B.)

Hours worked in manufacturing declined in 2003 in all the economies except Taiwan. Norway had the greatest decline in hours worked (-5.4 percent), followed by the United States and the United Kingdom, both with declines of 4.8 percent. In 2002, the United States had the greatest decline among countries compared. In eight of the countries with declines in hours worked, output increased in 2003, resulting in substantial productivity increases in most cases. In four other countries, declines in manufacturing output were more than offset by greater falls in hours worked, also resulting in productivity increases. Only in Italy was the output decline greater than the drop in hours worked, resulting in a fall in productivity. (See tables A and B.)

The reductions in hours worked in manufacturing continued a general trend during the last decades in the manufacturing sectors of these economies. Canada and Taiwan were exceptions, with aggregate hours worked in manufacturing increasing in both since 1979. In most of the other economies, hours worked in manufacturing reached their maximum levels in the 1960s and 1970s (the United States in 1979) and have exhibited a downward trend since then. Five of the eight European countries for which hours data are available had greater declines than the United States over the period 1979-2003. In Taiwan and Korea, manufacturing hours have been declining since the late 1980s. In most economies, the rate of decline slowed somewhat in the second half of the 1990s when compared with the 1990-1995 period. (See table B.)

For most economies, reductions in manufacturing hours over the last several decades were the result of declines in both manufacturing employment and average hours worked. The reduction in average hours began earlier, but the decline in employment has been steeper and steadier. In the United States, Australia, Italy, and Sweden, average hours have risen slightly since 1979. (See table B.)

In 2003, the U.S. decline in manufacturing employment was the largest among the economies compared for the third year in a row. Manufacturing employment also declined in all the other economies except Italy and Taiwan. Taiwan, Japan, and Germany were the only economies that had increases in average hours worked in 2003. (See tables A and B.)

Manufacturing hourly compensation and unit labor costs

The United States had the second highest increase in hourly compensation in manufacturing in 2003, expressed in national currencies. All of the 12 economies for which statistics are available had increases, with Korea at 9.3 percent outpacing the 8.5 percent U.S. rate. Of the 11 countries with data for the 1979–2003 period, the United States was the only one to have a greater increase in 2003 than its average annual growth rate for the entire period. Total compensation data are not available for Australia and Belgium for 2003. The absence of hourly compensation data for the Netherlands for 2003 is a result of unavailable hours data. (See table B.)

Unit labor costs, expressed in national currency units, exhibited a mixed pattern in 2003, with increases in 8 of the 13 countries for which data are available. Of the seven economies with increases that have data going back to 1979, three had increases in 2003 that were above their 1979-2003 trend and four had increases that were below. Italy had the greatest increase in unit labor costs at 4.2 percent and Japan, with average gains in productivity and below average increases in hourly compensation, had the biggest fall in unit labor costs. U.S. unit labor costs increased by 1.6 percent in 2003, as the increase in hourly compensation surpassed the growth in productivity.

To compare changes in competitiveness across economies, the effect of exchange rate fluctuations must be taken into account by expressing unit labor costs in a common monetary unit. When a foreign currency appreciates against the U.S. dollar, more dollars must be paid in exchange for each national currency unit. This leads to a larger increase, or a smaller decline, in unit labor costs in U.S. dollar terms than the corresponding change in unit labor costs expressed in the national currency. This makes products from that country more expensive and lessens its competitiveness.

In 2003, the U.S. dollar depreciated against the currencies of all the economies compared, continuing a weakening trend after 2001. In most cases, the depreciation was much greater, with the exception of Norway, than the depreciations that occurred in 2002: 19.7 percent against the euro, 20.3 percent against the Swedish krona, 19.9 percent against the Australian dollar and the Danish krone, 12.7 percent against the Norwegian krone, and 12.1 percent against the Canadian dollar. Only versus the Taiwanese dollar, at 0.4 percent, was the depreciation of the U.S. dollar negligible. (See table B.)

The weakness in the U.S. dollar pushed up dollar-denominated unit labor costs for most U.S. competitors in 2003, even where unit labor costs in national currencies declined. Unit labor costs of all other countries either increased more (seven countries), turned from decreases to increases (four countries), or decreased less (Taiwan) when expressed in U.S. dollars than in national currencies. In 8 of the 13 economies, unit labor

costs in U.S. dollars rose at double-digit rates. In France, Italy, Denmark, and the Netherlands, these increases surpassed 20 percent. The European increases were all well above the average annual rates of increase since 1979, though they were still less than in the 1985-1987 period, when the dollar weakened even more. (See tables A and B and chart 3.)

**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Output per hour							
United States	3.8	3.0	3.3	r 4.7	6.0	r 10.2	6.8
Canada	2.5	2.2	3.8	2.8	0.7	2.8	1.2
Australia	3.1	2.7	2.9	3.9	3.2	2.9	3.3
Japan	3.6	3.8	3.3	4.1	2.4	r 3.0	4.5
Korea	NA	NA	9.7	r 10.8	5.9	r 9.8	9.0
Taiwan	5.9	6.4	5.3	r 5.6	5.5	r 6.3	3.7
Belgium	3.7	4.2	3.2	2.9	3.8	6.8	3.2
Denmark	2.4	2.1	2.7	r 2.4	2.6	r 3.2	4.3
France	4.2	4.2	4.0	r 4.5	3.5	r 4.8	1.9
Germany ²	2.4	2.1	3.3	2.5	1.9	2.5	2.6
Italy	1.6	2.2	2.2	1.0	-0.8	r -1.7	-1.0
Netherlands	NA	3.5	3.5	2.5	NA	r 2.2	NA
Norway	1.5	2.0	0.5	1.1	2.1	r 1.7	1.6
Sweden	4.3	2.5	5.7	7.1	3.8	r 9.0	5.9
United Kingdom	3.8	4.5	3.6	r 2.6	3.7	r 2.1	5.5
Output							
United States	2.6	2.3	3.1	r 4.5	-0.5	r 2.4	1.7
Canada	2.6	1.9	2.4	5.9	-0.4	2.9	-0.5
Australia	1.7	1.6	0.9	2.6	1.7	3.9	1.2
Japan	2.5	4.7	0.4	2.0	-0.8	-2.0	3.2
Korea	8.6	10.1	8.4	r 7.9	4.8	r 7.6	4.8
Taiwan	6.0	7.6	5.0	5.7	2.0	6.3	5.8
Belgium	1.9	2.6	0.6	2.9	0.3	1.0	-0.6
Denmark	1.2	1.0	r 2.0	r 1.6	-0.1	r -0.6	0.5
France	2.0	2.0	1.1	3.5	1.1	r 0.9	-0.5
Germany ²	0.6	1.2	-0.7	1.0	-0.1	-0.2	0.2
Italy	1.3	2.0	1.5	1.2	-1.0	r -1.2	-1.4
Netherlands	1.9	2.5	1.8	2.6	-1.4	r -0.8	-2.8
Norway	0.0	-0.4	1.1	1.0	-1.7	r -0.7	-3.8
Sweden	3.2	1.8	3.7	7.4	1.1	r 4.1	2.0
United Kingdom	0.6	0.9	0.5	1.3	-1.4	r -3.1	0.4

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Total hours							
United States	-1.2	-0.7	-0.1	-0.2	-6.2	r -7.1	-4.8
Canada	0.1	-0.2	-1.3	3.0	-1.1	0.1	-1.7
Australia	-1.4	-1.1	-2.0	-1.2	-1.5	1.0	-2.0
Japan	-1.0	0.8	-2.8	-2.0	-3.1	r -4.8	-1.3
Korea	NA	NA	-1.2	-2.6	-1.0	r -2.0	-3.9
Taiwan	0.1	1.2	-0.3	r 0.1	-3.3	-0.1	2.1
Belgium	-1.7	-1.6	-2.5	-0.1	-3.4	-5.5	-3.7
Denmark	-1.1	-1.1	-0.6	r -0.8	-2.7	r -3.7	-3.6
France	-2.1	-2.1	-2.8	r -1.0	-2.3	r -3.8	-2.3
Germany ²	-1.8	- .9	-3.9	-1.5	-2.0	-2.7	-2.4
Italy	-0.3	-0.2	-0.7	0.1	-0.3	r 0.5	-0.4
Netherlands	NA	-1.0	-1.7	0.0	NA	r -2.9	NA
Norway	-1.4	-2.3	0.6	-0.1	-3.7	-2.4	-5.4
Sweden	-1.0	-0.7	-1.9	0.3	-2.7	-4.5	-3.7
United Kingdom	-3.1	-3.4	-3.0	r -1.3	-4.8	r -5.1	-4.8
Employment							
United States	-1.2	-0.8	-0.6	-0.1	-5.5	r -7.3	-4.7
Canada	0.1	-0.2	-1.5	2.8	-0.4	0.3	-0.8
Australia	-1.5	-1.3	-2.3	-1.1	-1.4	1.0	-1.9
Japan	-0.7	1.0	-1.6	-1.9	-3.1	-4.7	-2.0
Korea	NA	NA	-0.9	-2.5	0.0	r -1.2	-3.7
Taiwan	0.7	2.0	-0.3	r 0.4	-1.6	-1.8	1.7
Belgium	-1.5	-1.6	-2.2	-0.7	-2.0	-3.6	-3.0
Denmark	-1.0	-0.5	-1.2	r -0.9	-2.6	r -3.3	-3.1
France	-1.4	-1.6	-2.5	-0.3	-0.9	-1.7	-2.2
Germany ²	-1.3	-0.1	-4.2	-0.8	-1.5	-2.2	-2.7
Italy	-0.7	-0.9	-1.6	0.1	0.3	r 0.8	0.2
Netherlands	-0.9	-0.8	-1.6	0.2	-2.1	r -2.9	-3.0
Norway	-1.3	-2.2	0.3	0.1	-2.9	r -1.2	-4.6
Sweden	-1.4	-1.0	-3.5	0.0	-1.6	-2.8	-2.9
United Kingdom	-2.7	-2.9	r -2.6	r -1.4	-4.5	r -4.4	-4.5

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Average hours							
United States	0.1	0.2	0.4	-0.1	-0.7	r 0.2	-0.1
Canada	0.0	0.0	0.3	0.1	-0.7	-0.2	-0.9
Australia	0.1	0.2	0.3	-0.1	0.0	0.0	-0.1
Japan	-0.4	-0.2	-1.3	-0.1	0.0	r 0.0	0.7
Korea	NA	NA	-0.2	-0.1	-1.1	-0.7	-0.2
Taiwan	-0.6	-0.8	0.0	-0.3	-1.8	1.7	0.4
Belgium	-0.1	0.0	-0.3	0.6	-1.5	-2.0	-0.7
Denmark	-0.2	-0.6	0.6	r 0.1	-0.1	r -0.4	-0.5
France	-0.6	-0.5	-0.3	r -0.7	-1.4	r -2.1	-0.1
Germany ²	-0.5	-0.9	0.3	-0.6	-0.4	-0.5	0.3
Italy	0.4	0.6	0.9	0.0	-0.6	r -0.3	-0.6
Netherlands	NA	-0.2	0.0	-0.2	NA	0.0	NA
Norway	-0.2	-0.1	0.3	-0.2	-0.9	r -1.2	-0.8
Sweden	0.4	0.3	1.7	0.2	-1.1	-1.7	-0.8
United Kingdom	-0.4	-0.6	r -0.4	r 0.1	-0.3	r -0.7	-0.4
Total labor compensation in manufacturing³: National currency basis							
United States	3.7	5.0	3.4	r 4.1	-0.7	r -0.9	3.3
Canada	4.9	6.6	2.4	5.5	2.0	2.6	1.9
Australia	NA	NA	3.5	3.1	NA	4.5	NA
Japan	2.4	5.5	0.7	-1.1	-0.4	r 2.0	-0.5
Korea	NA	NA	16.8	r 5.4	6.4	r 7.9	5.1
Taiwan	7.9	13.5	6.8	4.2	-3.3	r -2.8	2.6
Belgium	NA	4.4	1.3	2.0	NA	1.5	NA
Denmark	4.4	6.8	2.3	r 3.0	2.0	r 0.9	1.0
France	3.6	6.5	1.1	1.1	1.8	r 1.5	0.5
Germany ²	3.0	4.6	2.3	1.6	0.7	-0.3	-0.2
Italy	7.0	11.4	4.2	2.9	2.8	r 3.0	2.8
Netherlands	3.0	3.1	2.8	3.4	2.7	r 3.5	0.6
Norway	5.0	6.5	4.0	5.0	1.5	r 3.4	-1.4
Sweden	5.5	8.4	2.0	5.3	1.3	r -1.1	-0.1
United Kingdom	4.5	7.1	r 2.4	r 3.4	0.1	r 0.1	0.2

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Hourly compensation: National currency basis							
United States	4.9	5.6	3.5	r 4.3	5.8	r 6.7	8.5
Canada	4.8	6.8	3.7	r 2.4	3.2	r 2.5	3.6
Australia	NA	NA	5.6	4.3	NA	3.5	NA
Japan	3.4	4.6	3.6	1.0	2.9	7.1	0.8
Korea	NA	NA	18.2	r 8.1	7.5	r 10.1	9.3
Taiwan	7.8	12.1	7.1	4.0	0.0	r -2.8	0.6
Belgium	NA	6.1	3.9	2.0	NA	7.3	NA
Denmark	5.6	7.9	2.9	r 3.8	4.8	r 4.9	4.8
France	5.8	8.8	4.0	r 2.2	4.2	r 5.4	2.9
Germany ²	4.9	5.6	6.4	3.2	2.7	2.5	2.3
Italy	7.3	11.7	4.9	2.8	3.1	r 2.4	3.2
Netherlands	NA	4.1	4.5	3.3	NA	r 6.5	NA
Norway	6.6	9.0	3.4	5.2	5.4	6.0	4.3
Sweden	6.6	9.1	4.0	5.1	4.1	r 3.5	3.7
United Kingdom	7.8	10.9	r 5.6	r 4.8	5.2	r 5.5	5.3
Unit labor costs³: National currency basis							
United States	1.1	2.6	0.2	r -0.4	-0.2	r -3.2	1.6
Canada	2.3	4.6	-0.1	-0.4	2.4	-0.3	2.4
Australia	NA	NA	2.6	0.4	NA	0.5	NA
Japan	-0.2	0.8	0.3	-3.0	0.4	r 4.0	-3.5
Korea	NA	NA	7.8	r -2.4	1.5	r 0.3	0.3
Taiwan	1.8	5.4	1.7	-1.5	-5.2	r -8.6	-3.0
Belgium	NA	1.8	0.7	-0.9	NA	0.5	NA
Denmark	3.2	5.7	r 0.2	r 1.4	2.2	r 1.6	0.5
France	1.6	4.4	-0.1	-2.2	0.7	r 0.6	1.0
Germany ²	2.4	3.3	3.1	0.6	0.8	0.0	-0.3
Italy	5.6	9.3	2.6	r 1.8	3.9	r 4.2	4.2
Netherlands	1.2	0.6	1.0	0.8	4.2	r 4.3	3.5
Norway	5.0	6.9	2.9	4.0	3.2	4.2	2.6
Sweden	2.2	6.5	-1.6	-1.9	0.3	r -5.0	-2.0
United Kingdom	3.8	6.2	2.0	r 2.1	1.5	r 3.3	-0.2

Continued on next page

**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Unit labor costs³: U.S. dollar basis							
United States	1.1	2.6	0.2	r -0.4	-0.2	r -3.2	1.6
Canada	1.5	4.6	-3.3	-2.0	4.5	r -1.6	14.7
Australia	NA	NA	1.5	-4.3	NA	5.8	NA
Japan	2.5	4.6	9.4	-5.7	-2.0	r 1.0	4.2
Korea	NA	NA	6.0	r -9.5	-0.3	r 3.7	5.2
Taiwan	2.0	8.2	2.0	-4.7	-8.2	r 10.4	-2.6
Belgium	NA	0.6	3.3	-8.4	NA	6.1	NA
Denmark	2.2	4.1	r 2.3	r -5.8	9.5	r 7.3	20.5
France	0.3	2.1	1.7	-8.9	7.8	6.2	20.9
Germany ²	2.7	4.5	5.6	-6.9	7.9	5.6	19.3
Italy	2.5	5.7	-3.5	r -3.2	11.2	r 10.0	24.8
Netherlands	1.3	1.5	3.6	-6.9	11.5	r 10.1	23.8
Norway	3.5	4.9	2.6	-2.7	11.0	17.4	15.6
Sweden	-0.5	3.4	-5.2	-6.7	4.6	r 1.0	17.8
United Kingdom	2.7	4.5	r -0.5	r 1.3	4.1	r 7.8	8.5
Exchange rates⁴							
United States	---	---	---	---	---	---	---
Canada	-0.7	0.0	-3.2	-1.6	2.0	-1.4	12.1
Australia	-2.2	-3.2	-1.1	-4.7	3.9	5.2	19.9
Japan	2.7	3.8	9.1	-2.7	-2.4	-2.9	8.0
Korea	-3.7	-3.4	-1.7	-7.3	-1.7	3.3	4.9
Taiwan	0.2	2.7	0.3	-3.3	-3.1	-2.1	0.4
Belgium	-0.8	-1.2	2.5	-7.6	7.0	5.6	19.7
Denmark	-0.9	-1.5	2.0	-7.1	7.2	5.7	19.9
France	-1.3	-2.2	1.8	-6.8	7.0	5.6	19.7
Germany ²	0.2	1.1	2.5	-7.5	7.0	5.6	19.7
Italy	-3.0	-3.3	-6.0	-4.9	7.0	5.6	19.7
Netherlands	0.1	0.9	2.6	-7.6	7.0	5.6	19.7
Norway	-1.4	-1.9	-0.3	-6.4	7.6	12.7	12.7
Sweden	-2.6	-2.9	-3.7	-4.9	4.3	6.4	20.3
United Kingdom	-1.1	-1.6	-2.4	-0.8	2.5	4.4	8.8

r = revised

NA = not available

¹Rates of change based on the compound rate method.

³Adjusted for employment taxes and government subsidies to estimate the actual cost to employers.

²Data for years before 1991 pertain to the former West Germany.

⁴Value of foreign currency relative to the U.S. dollar.

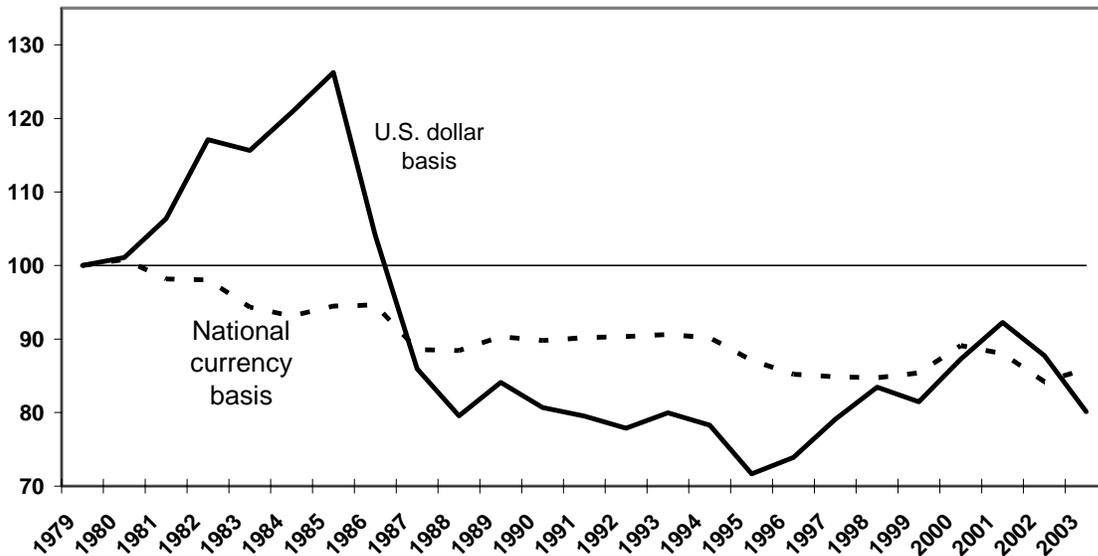
Trade-weighted unit labor costs

BLS constructs indexes of U.S. unit labor cost trends relative to a trade-weighted average of unit labor cost trends in the other economies to take account of differences in the relative importance of foreign economies to U.S. trade in manufactured goods. Relative trade-weighted unit labor cost indexes are calculated on both a national currency and a U.S. dollar basis. In this release, the relative U.S. trade-weighted indexes are estimated against 11 economies for which comparable data are available over this period; the indexes underlying this chart are shown in table C.

Chart 3 begins in 1979, a year in which U.S. manufacturing output reached a business cycle peak.

Chart 3. U.S. manufacturing unit labor costs relative to 11⁽¹⁾ competitors, 1979-2002

(1979 = 100)



(1) Data for Australia, Belgium, and Korea are not available for 1979 and/or for 2003. These three countries have been omitted from this chart.

In the chart, the solid line indicates that U.S. unit labor costs rose faster than "competitors" costs from 1979 to 1986 on a U.S. dollar basis. In most years from 1986 to 1995, U.S. costs either rose at a slower rate than the "competitors" costs or fell at a faster rate. From 1996 to 1998, however, the strength of the U.S. dollar caused relative U.S. unit labor costs to rise. After a dip in 1999, the index of relative U.S. unit labor costs rose in 2000 and 2001, only to dip again after 2001 with a weakening of the U.S. dollar.

Table C. U.S. manufacturing unit labor costs relative to 11⁽¹⁾ competitors, 1979-2003

Year	Unit Labor Costs National Currency Basis			Unit Labor Costs U.S. Dollar Basis		
	Own Index	Competitors' Index	Ratio	Own Index	Competitors' Index	Ratio
1979	100.0	100.0	100.0	100.0	100.0	100.0
1980	111.4	110.5	100.8	111.4	110.2	101.1
1981	116.5	118.7	98.2	116.5	109.5	106.4
1982	124.2	126.7	98.1	124.2	106.1	117.1
1983	121.6	128.9	94.3	121.6	105.1	115.6
1984	121.0	130.0	93.1	121.0	100.2	120.8
1985	123.4	130.6	94.5	123.4	97.7	126.3
1986	128.9	136.2	94.6	128.9	123.8	104.1
1987	122.8	138.6	88.6	122.8	142.9	85.9
1988	122.5	138.6	88.4	122.5	154.0	79.6
1989	128.0	141.7	90.3	128.0	152.2	84.1
1990	132.4	147.4	89.8	132.4	164.1	80.7
1991	138.0	153.1	90.2	138.0	173.6	79.5
1992	141.3	156.5	90.3	141.3	181.5	77.9
1993	142.3	157.0	90.6	142.3	177.9	80.0
1994	139.2	154.4	90.1	139.2	177.8	78.3
1995	134.0	153.8	87.1	134.0	187.0	71.7
1996	132.1	155.0	85.2	132.1	178.8	73.9
1997	129.9	153.1	84.9	129.9	164.3	79.1
1998	131.2	154.8	84.7	131.2	157.2	83.4
1999	129.8	152.0	85.4	129.8	159.4	81.5
2000	131.2	146.8	89.4	131.2	150.0	87.5
2001	132.7	150.3	88.3	132.7	143.4	92.5
2002	128.4	152.1	84.4	128.4	145.9	88.0
2003	130.4	151.4	86.2	130.4	162.3	80.4

(1) Data for Australia, Belgium, and Korea are not available for 1979 and/or for 2003. These three countries have been omitted from this table.

Technical Notes

The comparisons in this release make use of data made available to BLS as of August 2004 by the statistical agencies of the individual countries.

Labor productivity is defined as real output per hour worked. Although the labor productivity measure presented in this release relates output to the hours worked of persons employed in manufacturing, it 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, capacity utilization, energy use, and managerial skills, as well as the skills and efforts of the workforce.

Unit labor costs are defined as the cost of labor input required to produce one unit of output. They are computed as compensation in nominal terms divided by real output.

The Bureau of Labor Statistics constructs trends of manufacturing labor productivity, hourly compensation costs, and unit labor costs from three basic aggregate measures – output, total labor hours, and total compensation. The hours and compensation measures refer to employees (wage and salary earners) in Belgium and Taiwan. For all other economies, the measures refer to all employed persons, including employees, self-employed persons, and unpaid family workers. For all of the economies, the term “hours” refers to hours worked.

In general, the measures relate to total manufacturing as defined by the International Standard Industrial Classification (ISIC). However, the measures for Denmark include mining and exclude manufacturing handicrafts from 1950 to 1966, and the measures for France include parts of mining. From 1998 forward, data for the United States are in accordance with the North American Industrial Classification System (NAICS 97). Prior to that, they are in accordance with the Standard Industrial Classifications (SIC 87, 1987-1997; SIC 72, 1950-1986). From 1997 forward, data for Canada are in accordance with the NAICS 97 and, prior to 1997, with the Canadian SIC 80.

For most countries, the data for the most recent years are based on the United Nations System of National Accounts 1993 (SNA 93) or its sub-system, the European System of Integrated National Accounts (ESA 95). For other countries, data were compiled according to previously used systems.

To obtain historical time series, BLS may link together data series which were compiled according to different accounting systems by the countries' statistical agencies.

Output. For most countries, the output measures are real value added in manufacturing from national accounts. However, output for Japan prior to 1970 and for the Netherlands prior to 1960 are indexes of industrial production. The manufacturing value added measures for the United Kingdom are essentially identical to their indexes of industrial production.

The output measure for manufacturing in the United States is the chain-weighted index of real gross product originating (deflated value added), introduced by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce in August 1996. Because these value added output data for U.S. manufacturing industries are not available for years prior to 1977, the comparative U.S. measures of output, output per hour, and unit labor costs begin with 1977. For more information on the U.S. measure, see

“Improved Estimates of Gross Product by Industry for 1947-98,” *Survey of Current Business*, June 2000, pp. 24-38.

The U.S. output series used for international comparisons differs from the manufacturing output series that BLS publishes as part of its major sector productivity and costs measures for the United States. While both series are based on annually-changing price weights, the international comparisons program uses a value added output concept, while the major sector series is on a sectoral output basis and begins with 1949. Sectoral output is gross output less intrasector sales and transfers. The U.S. major sector productivity and costs measures can be found at <http://www.bls.gov/lpc/home.htm>. For information on sectoral output, see “Measurement of productivity growth in U.S. manufacturing,” *Monthly Labor Review*, July 1995, pp. 13-28.

Value added measures have been used for the international comparisons series because the data are more readily available from the countries' national accounts, whereas sectoral output would require a complex estimation procedure. Also, although BLS has determined that sectoral output is the correct concept for U.S. measures of productivity, there are other considerations that may make value added a better concept for international comparisons of labor productivity, such as differences among countries in the extent of vertical integration of industries.

Estimation of manufacturing real output using moving price weights, as recommended by SNA 93, is becoming prevalent. However, many earlier time periods within the historical real output series have been estimated using fixed price weights, with the weights updated periodically (for example, every 5 or 10 years).

Measures of real output also may differ among countries because of different approaches to estimating the prices of high-technology products like computers and, in general, of products that undergo rapid quality change.

Labor Input. For the United States, the hours worked data are taken from the BLS major sector productivity program. The aggregate hours worked series used for France (from 1970 forward), Australia, Canada, Denmark, Norway, and Sweden are series published with the national accounts. For the former West Germany after 1959 and Germany from 1991, BLS uses aggregate hours worked, which were developed by a research institute of the German Ministry of Labor for use with the national accounts employment figures. For the United Kingdom from 1992, an annual index of total manufacturing hours is used. For all other countries, the U.K. before 1992, and the former West Germany before 1959, BLS constructs its own estimates of aggregate hours, using employment figures published with the national accounts, or other comprehensive employment series, and estimates of average annual hours worked. The Italian hours worked series is based on estimates by the Bank of Italy. In this news release, the all employed actual hours worked data for Denmark, beginning with 1966, are new series released by that country's statistical office.

Compensation (Labor Cost). The compensation measures are from national accounts data. Compensation includes employer expenditures for legally required insurance programs and contractual and private benefit plans, in addition to all payments made in cash or in kind directly to employees. When data for the self-employed are not available, total compensation is estimated by assuming the same average compensation for the self-

employed as for employees. Real compensation for the United States is derived using the Consumer Price Index research series (CPI-U-RS).

Labor cost is defined as compensation plus employment taxes minus employment subsidies, i.e. the cost to employers of hiring labor. For most countries, labor cost is the same as compensation. However, for Australia, Canada, France, and Sweden, compensation is increased to account for important taxes on payroll or employment. For the United Kingdom, compensation is reduced between 1967 and 1991 to account for subsidies.

Data for Germany. German data pertain to unified Germany from 1991 forward and to the former West Germany for prior years. The data series are linked in 1991. In the index tables, separate indexes are shown for unified Germany and for former West Germany. West German estimates end with 1998 and have not been revised by BLS since the news release USDL 99-235, on Aug. 27, 1999.

Current Indicators. The measures for recent years may be based on current indicators of output (such as industrial production indexes), employment, average hours, and hourly compensation until national accounts and other statistics, normally used for the long-term measures, become available.

Trade-Weighted Measures. The trade weights for Canada, Japan, and the European countries were obtained by re-scaling a series of weights, developed by the International Monetary Fund, based on average trade flows over the 1989-91 period. These weights are based on aggregate trade data for total manufacturing and take account of both bilateral trade and the relative importance of "third country" markets. The 1989-91 weights do not include Taiwan. BLS developed weights for Taiwan by using data from an earlier study from the International Monetary Fund and other sources. The weight used for Germany is based on the trade weight of the former West Germany.

The following weights were used for the entire period for which trade-weighted unit labor cost measures are produced:

<i>Country</i>	<i>Weight</i>		<i>Country</i>	<i>Weight</i>
Canada	25.87		Italy	4.70
Japan	31.23		Netherlands	2.30
Taiwan	5.92		Norway	0.49
Denmark	0.49		Sweden	1.93
France	6.03		United Kingdom	9.18
Germany	11.86			

Level Comparisons. The BLS measures are limited to trend comparisons. BLS does not prepare level comparisons of manufacturing productivity and unit labor costs because of data limitations and technical problems in comparing the levels of manufacturing output among countries. Each country measures manufacturing output in its own currency units. To compare outputs among countries, a common unit of measure is needed. Market exchange rates are not suitable as a basis for comparing output levels. What is needed are purchasing power parities, which are the number of foreign currency

units required to buy goods and services equivalent to what can be bought with one unit of U.S. currency.

Purchasing power parities are available for total gross domestic product (GDP) from the Organization for Economic Cooperation and Development (OECD). However, these parities are derived for expenditures made by consumers, business, and government for goods and services – not for value added by industry. Therefore, they do not provide purchasing power parities by industry. The parities developed for total GDP are not suitable for each component industry, such as manufacturing.

European exchange rates. On Jan. 1, 1999, 11 European countries joined the European Monetary Union (EMU). Greece joined on Jan. 1, 2001. The euro, the official currency of the EMU, was established at fixed conversion rates to the previous national currencies of EMU members. Data on manufacturing value added and labor compensation for euro-area countries are now reported in euros. And exchange rates between the previous national currencies of euro-area countries and the U.S. dollar are no longer reported; only the exchange rate between the euro and the U.S. dollar is available.

In order to maintain historical continuity of data series, data for euro-area countries for years before 1999 have been converted to euros by applying the fixed euro/national currency conversion rates. For countries and years where output, compensation, and exchange rates are converted from national currency units into euros, the following fixed conversion rates are used:

1 euro equals:	40.3399	Belgian francs	1936.27	Italian lire
	6.55957	French francs	2.20371	Netherlands guilders
	1.95583	German marks		

The currency exchange rates cited in this publication are annual averages of daily buying rates in New York City.