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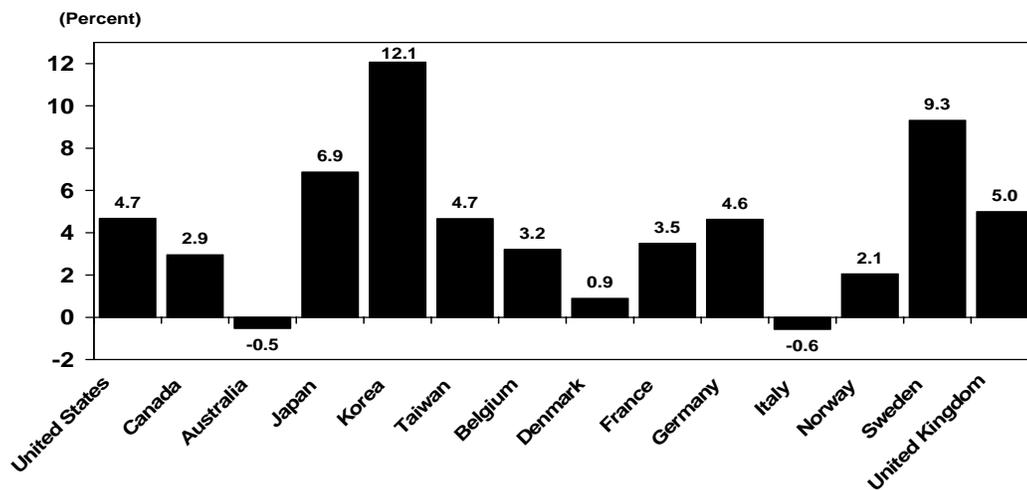
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INTERNATIONAL COMPARISONS OF MANUFACTURING PRODUCTIVITY AND UNIT LABOR COST TRENDS, 2004

Among fourteen countries under comparison, seven, including the United States, had manufacturing productivity gains of over 4.5 percent in 2004, according to the U.S. Department of Labor's Bureau of Labor Statistics. Korea registered the largest gain (+12.1 percent), followed by Sweden (+9.3 percent). Manufacturing productivity increased in all of the compared economies except Italy and Australia. (See chart 1.)

U.S. productivity growth in manufacturing in 2004 was 4.7 percent, about half the increase of 2003, and less than the average yearly increases over the last decade. It was greater, however, than the average annual growth rate since 1979. Six of the other 13 economies for which comparisons are available also had productivity growth in 2004 that exceeded their annual average increases over the 1979-2004 period. (Average annual growth rates for selected measures over various time periods are found in tables A and B.)

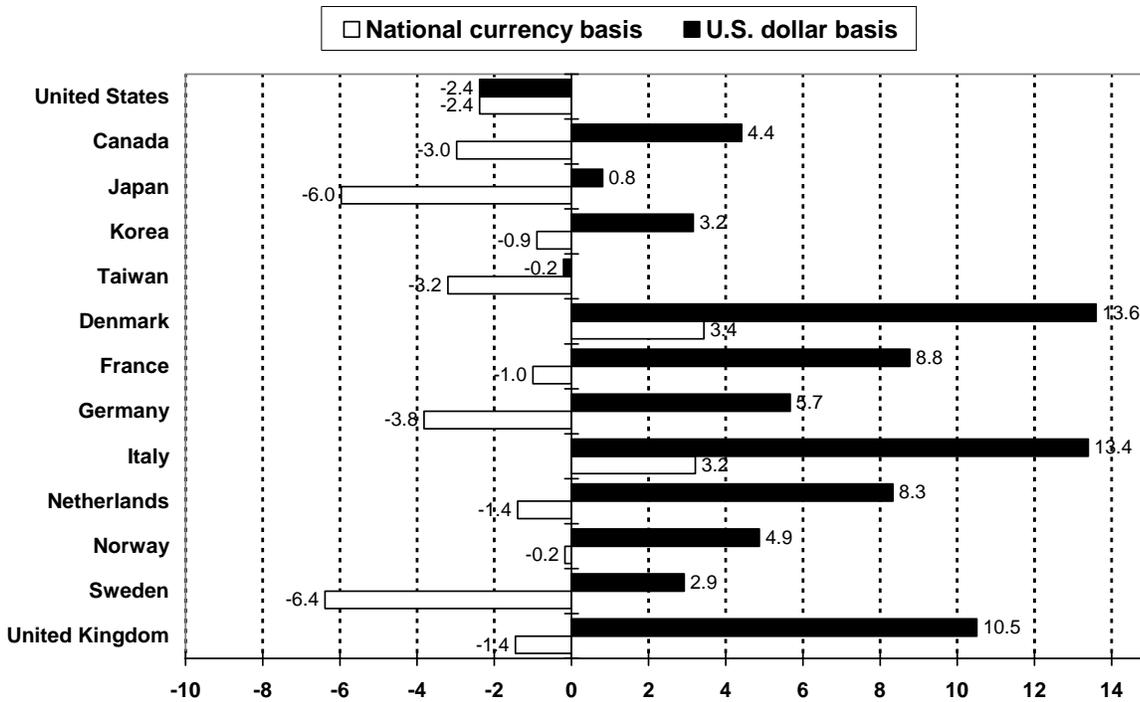
**Chart 1. Percent change in
manufacturing output per hour, 2003-2004**



Unit labor costs in manufacturing, expressed in national currency units, fell in 11 of the 13 economies for which data were available. Five economies posted greater declines than the United States (-2.4 percent). Unit labor costs declined most in Sweden (-6.4 percent), reflecting that country's strong productivity growth.

In 2004, the dollar decreased in value against the currencies of all the other 14 economies compared, although generally less than in 2003. The decline was particularly large against the Australian dollar and the British pound. As a result of the dollar's devaluation, besides the United States, only Taiwan showed a decline in dollar-denominated unit labor costs. (See chart 2 and table A.)

Chart 2. Percent change in manufacturing unit labor costs, 2003-2004



**Table A. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 2003-2004**

Percent change

Country or area	Output		Total hours	Employment	Average hours	Total compensation	Hourly compensation	Unit labor costs		Exchange rate (1)
	per hour	Output						National currency	U.S. dollars	
United States	4.7	4.3	- 0.4	- 1.2	0.8	1.8	2.2	- 2.4	- 2.4	---
Canada	2.9	3.8	0.8	- 1.0	1.8	0.7	- 0.1	- 3.0	4.4	7.6
Australia	- 0.5	0.0	0.5	0.6	- 0.1	NA	NA	NA	NA	12.9
Japan	6.9	5.5	- 1.3	- 2.4	1.1	- 0.8	0.5	- 6.0	0.8	7.2
Korea	12.1	11.4	- 0.6	0.5	- 1.1	10.4	11.1	- 0.9	3.2	4.1
Taiwan	4.7	9.4	4.5	3.2	1.3	5.9	1.3	- 3.2	- 0.2	3.1
Belgium	3.2	2.3	- 0.9	- 3.2	2.4	NA	NA	NA	NA	9.9
Denmark	0.9	- 2.8	- 3.6	- 3.0	- 0.6	0.6	4.4	3.4	13.6	9.8
France	3.5	1.0	- 2.4	- 2.4	0.0	0.0	2.5	- 1.0	8.8	9.9
Germany	4.6	4.6	0.0	- 1.5	1.5	0.6	0.6	- 3.8	5.7	9.9
Italy	- 0.6	0.0	0.5	- 0.3	0.9	3.2	2.6	3.2	13.4	9.9
Netherlands	NA	1.2	NA	- 4.0	NA	- 0.2	NA	- 1.4	8.3	9.9
Norway	2.1	1.8	- 0.3	- 3.0	2.8	1.6	1.9	- 0.2	4.9	5.1
Sweden	9.3	9.4	0.1	- 1.9	2.0	2.4	2.3	- 6.4	2.9	9.9
United Kingdom	5.0	1.8	- 3.0	- 3.7	0.7	0.3	3.5	- 1.4	10.5	12.1

(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 1950-2004 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 mid-August 2005. Revisions for 2003 and earlier years were made for several economies to incorporate data not available at the time of the February 2005 report.

United States

The U.S. output series in this release is a value-added measure produced by the Bureau of Economic Analysis (BEA) as part of the integrated annual GDP-by-industry and input-output (I-O) accounts. From 1987 they are based on the 1997 North American Industry Classification System (NAICS). Output for 2004 is an advance estimate by the BEA, incorporating summary source data from the final estimate of fourth-quarter GDP from the national income and product accounts. Additional details are available in Erich H. Strassner and Thomas F. Howells III, "Annual Industry Accounts: Advance Estimates for 2004," *Survey of Current Business*, May 2005.

The NAICS-based employment, hours, and compensation data back to 1987 are taken from the series published by BLS as part of the major sector productivity and cost measures for the United States.

Australia

Australian data are published by fiscal years, which run from July 1 through June 30. The Australian Bureau of Statistics provided unpublished calendar year data for real value added, employment, and hours worked. For compensation, the Bureau of Labor Statistics estimated calendar-year series using two-year moving averages of the data for fiscal years. Manufacturing compensation data for fiscal year 2005, needed for estimating calendar year 2004, are not yet available. Such data also are not available for years prior to 1990.

Belgium

Data for compensation in manufacturing for 2004 are not available in this report.

Netherlands

Data for hours worked in manufacturing have not been released for 2004. Consequently, 2004 estimates of labor productivity and hourly compensation are not available for this report.

Manufacturing productivity, output, and labor input

The growth in labor productivity (output per hour) in U.S. manufacturing was 4.7 percent in 2004. While this growth rate remained below the U.S. average annual gains in recent periods, it exceeded the gains of the period since 1979. (See table B.) In 2004, 8 of the 14 economies compared posted manufacturing productivity gains between 2.1 and 5.0 percent.

From 2000 to 2004, of the 14 economies for which comparable data are available, only Korea posted higher average annual manufacturing productivity growth than the United States. Other economies with relatively high average annual productivity gains over 2000–2004 were Sweden, Taiwan, and Japan. Manufacturing productivity declined in Italy during these years, while Canada and Denmark recorded the smallest increase. Productivity data for 2004 are not estimated for the Netherlands because hours data are not available. (See tables A and B.)

Changes in manufacturing labor productivity correspond to changes in output and in total hours worked. U.S. output growth was only slightly lower in 2004 than in 2003. Nonetheless, the 2004 productivity increase was only half of the 2003 increase, a reflection of the slower decline of hours worked. U.S. manufacturing productivity and output increased in every period shown in table B. Productivity increased more rapidly than output, as aggregate hours declined throughout the period. A similar pattern emerged for most of the other economies compared. (See table B.)

Of the 12 economies that experienced growth in manufacturing labor productivity in 2004, 11 also had increases in manufacturing output. Output increased most in Korea (+11.4 percent). Other economies where manufacturing output increased by more than 4 percent in 2004 were the United States, Sweden, Taiwan, Japan, and Germany. Only Denmark showed a decline in output. (See table A.)

Manufacturing hours declined by 0.4 percent in the United States in 2004, continuing a downward trend in hours during the period since 1979. In fact, the U.S. hours decline reflects a trend in most industrial economies, as hours worked fell over the 1979–2004 period in 11 of the 13 economies for which hours data are available over that period. Nevertheless, hours worked in 2004 rose in five economies and remained constant in one. Taiwan experienced the largest increase (+4.5 percent). (See table B.) The U.S. decline was smaller than those in 6 other economies.

Total hours worked are a function of both the number of people employed and the average hours worked per person. In 2004, manufacturing employment fell in 12 of the 15 economies. With the exception of Italy, European employment declines in 2004 accelerated compared to the average annual declines of the last 25 years. By contrast, the 2004 U.S. decline (-1.2 percent) was the same as the average annual decline since 1979. In 2004, employment increased most in Taiwan (+3.2), and also grew in Australia and Korea. (See tables A and B.)

In 2004, average hours worked per person in manufacturing increased in 10 of the 14 economies for which hours data are available, while remaining constant in France and decreasing in only Korea, Denmark, and Australia. Average hours increased most in Norway (2.8 percent) and Belgium (2.4 percent). In the United States, average hours worked rose by 0.8 percent.

Of the eight countries to experience aggregate hour declines, only in Korea did these declines occur because average hours declined more than employment increased. Generally, aggregate hours declined because employment declined more than average hours increased. (See table A.)

Manufacturing hourly compensation and unit labor costs

In 2004, manufacturing hourly compensation, expressed in national currency units, increased in 11 of the 12 economies for which comparable data are available. Only Canada's hourly compensation declined. Korea had the largest growth rate (+11.1 percent). Most of the increases (six economies) were between 1.3 and 2.6 percent. The U.S. hourly compensation increase (+2.2 percent) was less than half its average annual growth rate for 1979–2004. Hourly compensation data for 2004 are not estimated for Australia, Belgium, and the Netherlands, because either compensation or hours data are not available. (See table B.)

Relative changes in manufacturing unit labor costs, expressed in national currency units, are directly proportional to relative changes in hourly compensation, and inversely proportional to relative changes in labor productivity. In 2004, both hourly compensation and labor productivity increased in 10 of the economies compared, so that the changes in unit labor costs were determined by the relative magnitudes of these increases. Unit labor costs, in national currency units, fell in 11 of the 13 economies compared. The drop was greatest in Sweden (-6.4 percent) and Japan (-6.0 percent), reflecting both countries' large increases in manufacturing productivity.

In the United States manufacturing unit labor costs declined by 2.4 percent as productivity gains outstripped hourly compensation gains. This drop in U.S. unit labor costs followed a 1.4 percent decline in 2003, and was almost twice the average annual reductions over the 2000-2004 period. In 2004, unit labor costs increased only in Denmark (+3.4 percent) and Italy (+3.2 percent). (See tables A and B.)

Often exchange rate movements are the dominant influence on the relative changes in the unit labor costs of different economies. In 2004, the U.S. dollar depreciated against the currencies of all the economies compared. However, the 2004 depreciation of the U.S. dollar was smaller than in 2003 for all currencies except the British pound and Taiwan dollar. In 2003 the U.S. dollar experienced double-digit depreciation against 6 of the 10 currencies compared, as opposed to only 2 currencies in 2004 – the Australian dollar and the British pound. (See tables A and B.)

The depreciation of the U.S. dollar contributed to the increase in U.S. dollar-denominated manufacturing unit labor costs in most of the other economies being compared. However, compared with 2003, the increases in 2004 held at single-digit rates in all economies except for Denmark, Italy, and the United Kingdom. Besides the United States, U.S. dollar-denominated unit labor costs declined only in Taiwan. The Taiwan dollar did not appreciate against the U.S. dollar (+3.1 percent) enough to counter a 3.2 percent decline in local currency-denominated unit labor costs. The depreciation of the U.S. dollar in 2003 and 2004 was the main contributing factor to the increase in unit labor costs, denominated in U.S. dollars, in most of the economies compared. (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, 1979-2004**

Average annual rates of change¹

Country or area	1979-2004	1979-1990	1990-1995	1995-2000	2000-2004	2002-2003	2003-2004
Output per hour							
United States	4.2	3.0	3.7	5.7	6.4	r 9.9	4.7
Canada	2.6	2.0	3.8	3.2	1.8	r 2.3	2.9
Australia	3.0	2.8	2.9	3.9	2.5	3.8	-0.5
Japan	4.0	3.8	3.3	4.1	5.0	11.0	6.9
Korea	NA	NA	9.6	10.8	6.9	r 7.0	12.1
Taiwan	5.7	6.2	5.2	5.5	5.4	3.6	4.7
Belgium	3.6	4.2	3.2	2.9	3.3	4.7	3.2
Denmark	2.2	2.1	2.7	r 1.8	2.0	r 5.0	0.9
France	4.2	4.2	r 4.6	r 5.1	2.5	r 0.3	3.5
Germany ²	2.7	2.1	r 2.9	r 3.7	2.8	r 2.5	4.6
Italy	1.5	2.2	2.2	1.0	-0.7	r -0.9	-0.6
Netherlands	NA	3.5	3.5	2.5	NA	4.9	NA
Norway	1.6	2.0	0.5	1.1	2.3	r 1.4	2.1
Sweden	4.6	2.5	5.7	7.1	5.8	6.5	9.3
United Kingdom	3.5	r 3.8	3.3	2.6	3.9	r 4.9	5.0
Output							
United States	3.0	r 2.3	3.6	5.4	1.3	4.5	4.3
Canada	2.5	1.8	2.4	5.9	0.5	r 0.4	3.8
Australia	1.6	1.6	0.9	2.6	1.5	1.7	0.0
Japan	2.9	4.7	0.4	2.0	2.1	9.6	5.5
Korea	8.8	10.1	8.4	7.9	6.6	r 5.5	11.4
Taiwan	6.0	7.5	4.9	5.6	3.9	5.7	9.4
Belgium	2.0	2.6	0.6	2.9	0.8	0.8	2.3
Denmark	1.0	1.0	r 2.1	r 1.7	-1.1	r -0.4	-2.8
France	2.0	2.0	r 1.7	r 3.9	0.3	r -0.6	1.0
Germany ²	0.9	1.2	r -1.0	r 2.2	1.1	r -0.2	4.6
Italy	1.3	2.0	1.5	1.2	-0.8	r -1.3	0.0
Netherlands	1.9	2.5	1.8	2.6	-0.3	r -1.6	1.2
Norway	0.1	-0.4	1.1	1.0	-0.7	r -4.1	1.8
Sweden	3.6	1.8	3.7	7.4	3.8	2.6	9.4
United Kingdom	0.6	0.9	0.5	1.3	-0.7	r 0.1	1.8

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2004**

Average annual rates of change¹

Country or area	1979-2004	1979-1990	1990-1995	1995-2000	2000-2004	2002-2003	2003-2004
Total hours							
United States	-1.1	-0.6	-0.1	-0.2	-4.8	r -4.9	-0.4
Canada	0.0	-0.2	-1.3	2.6	-1.3	r -1.9	0.8
Australia	-1.3	-1.2	-2.0	-1.2	-1.0	-2.0	0.5
Japan	-1.1	0.8	-2.8	-2.0	-2.7	-1.3	-1.3
Korea	NA	NA	-1.1	-2.6	-0.3	r -1.3	-0.6
Taiwan	0.3	1.2	-0.3	0.1	-1.4	2.1	4.5
Belgium	-1.6	-1.6	-2.5	-0.1	-2.4	-3.7	-0.9
Denmark	-1.1	-1.1	r -0.7	r -0.1	-3.0	r -5.2	-3.6
France	-2.1	-2.1	-2.8	r -1.1	-2.2	r -0.8	-2.4
Germany ²	-1.7	-0.9	r -3.8	r -1.4	-1.6	r -2.6	0.0
Italy	-0.2	-0.2	-0.7	0.1	-0.1	r -0.5	0.5
Netherlands	NA	-1.0	-1.7	0.0	NA	-6.3	NA
Norway	-1.4	-2.3	0.6	-0.1	-3.0	-5.4	-0.3
Sweden	-0.9	-0.7	-1.9	0.3	-1.9	-3.6	0.1
United Kingdom	-2.8	r -2.8	-2.8	-1.3	-4.4	r -4.6	-3.0
Employment							
United States	-1.2	-0.8	-0.5	-0.1	-4.5	r -4.8	-1.2
Canada	-0.1	-0.2	-1.5	2.4	-1.3	r -1.4	-1.0
Australia	-1.4	-1.3	-2.3	-1.1	-0.9	-1.9	0.6
Japan	-0.7	1.0	-1.6	-1.9	-3.0	r -2.2	-2.4
Korea	NA	NA	-0.8	-2.5	0.8	r -1.2	0.5
Taiwan	0.8	2.0	-0.3	0.4	-0.4	1.7	3.2
Belgium	-1.6	-1.6	-2.2	-0.7	-2.4	-3.3	-3.2
Denmark	-1.1	-0.5	-1.2	r -1.2	-2.5	r -4.7	-3.0
France	-1.5	-1.6	-2.5	-0.3	-1.1	r -0.6	-2.4
Germany ²	-1.3	-0.1	-4.2	-0.8	-1.5	r -2.6	-1.5
Italy	-0.7	-0.9	-1.6	0.1	0.2	0.2	-0.3
Netherlands	-1.0	-0.8	-1.6	0.2	-2.5	r -3.2	-4.0
Norway	-1.4	-2.2	0.3	0.1	-3.1	r -4.7	-3.0
Sweden	-1.4	-1.0	-3.5	0.0	-1.6	-2.8	-1.9
United Kingdom	-2.6	r -2.6	-2.6	-1.4	-4.4	r -4.8	-3.7

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2004**

Average annual rates of change¹

Country or area	1979-2004	1979-1990	1990-1995	1995-2000	2000-2004	2002-2003	2003-2004
Average hours							
United States	0.1	0.2	0.4	-0.2	-0.3	-0.1	0.8
Canada	0.1	0.0	0.3	0.2	0.0	r -0.5	1.8
Australia	0.1	0.1	0.3	-0.1	0.0	-0.1	-0.1
Japan	-0.3	-0.2	-1.3	-0.1	0.3	r 0.9	1.1
Korea	NA	NA	-0.2	-0.1	-1.0	r -0.1	-1.1
Taiwan	-0.6	-0.8	0.0	-0.3	-1.0	0.4	1.3
Belgium	0.1	0.0	-0.3	0.6	0.1	-0.4	2.4
Denmark	0.0	-0.6	0.6	r 1.1	-0.5	-0.5	-0.6
France	-0.6	-0.5	-0.3	r -0.8	-1.0	r -0.2	0.0
Germany ²	-0.4	-0.9	r 0.4	-0.6	-0.1	r 0.0	1.5
Italy	0.4	0.6	0.9	0.0	-0.3	r -0.7	0.9
Netherlands	NA	-0.2	0.0	-0.2	NA	-3.1	NA
Norway	0.0	-0.1	0.3	-0.2	0.1	-0.8	2.8
Sweden	0.5	0.3	1.7	0.2	-0.3	-0.9	2.0
United Kingdom	-0.1	-0.2	-0.2	0.1	0.0	r 0.2	0.7
Total labor compensation in manufacturing³: National currency basis							
United States	3.7	4.9	3.4	4.4	0.0	r 3.0	1.8
Canada	4.6	6.5	2.4	5.2	1.2	r 1.4	0.7
Australia	NA	NA	3.5	3.1	NA	3.2	NA
Japan	1.9	5.5	0.7	-1.1	-2.2	r -0.6	-0.8
Korea	14.2	19.6	17.6	5.4	7.0	r 3.5	10.4
Taiwan	7.8	13.5	6.8	3.6	-0.3	3.7	5.9
Belgium	NA	4.4	1.3	2.0	NA	0.3	NA
Denmark	4.2	6.8	2.3	r 2.8	1.5	r -0.4	0.6
France	3.5	6.5	1.1	1.1	1.5	r 3.1	0.0
Germany ²	2.9	4.6	r 2.4	1.6	0.4	r -0.5	0.6
Italy	6.8	11.4	4.2	2.9	2.9	r 2.7	3.2
Netherlands	2.9	3.1	2.8	3.4	1.8	0.6	-0.2
Norway	4.8	6.5	4.0	5.0	1.2	-1.4	1.6
Sweden	5.5	8.4	2.0	5.3	2.1	r -0.3	2.4
United Kingdom	4.3	7.1	2.4	3.4	0.1	0.2	0.3

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2004**

Average annual rates of change¹

Country or area	1979-2004	1979-1990	1990-1995	1995-2000	2000-2004	2002-2003	2003-2004
Hourly compensation: National currency basis							
United States	4.9	5.5	3.5	4.7	5.0	r 8.3	2.2
Canada	4.6	6.8	3.8	2.5	2.5	r 3.4	-0.1
Australia	NA	NA	5.6	4.3	NA	5.3	NA
Japan	3.0	4.6	3.6	1.0	0.5	r 0.7	0.5
Korea	NA	NA	18.9	8.1	7.3	r 5.0	11.1
Taiwan	7.5	12.1	7.1	3.4	1.2	1.6	1.3
Belgium	NA	6.1	3.9	2.0	NA	4.1	NA
Denmark	5.4	7.9	2.9	r 2.9	4.7	r 5.0	4.4
France	5.7	8.8	4.0	2.2	3.7	r 4.0	2.5
Germany ²	4.7	5.6	6.4	3.1	2.1	r 2.2	0.6
Italy	7.1	11.7	4.9	2.8	3.0	3.2	2.6
Netherlands	NA	4.1	4.5	3.3	NA	7.3	NA
Norway	6.3	9.0	3.4	5.2	4.3	4.3	1.9
Sweden	6.5	9.1	4.0	5.1	4.1	r 3.5	2.3
United Kingdom	7.2	r 10.2	5.4	r 4.7	4.7	r 5.1	3.5
Unit labor costs³: National currency basis							
United States	0.6	2.5	-0.2	-0.9	-1.3	r -1.4	-2.4
Canada	2.0	4.7	0.0	-0.6	0.7	r 1.0	-3.0
Australia	NA	NA	2.6	0.4	NA	1.4	NA
Japan	-0.9	0.8	0.3	-3.0	-4.2	r -9.3	-6.0
Korea	5.0	8.6	8.5	-2.4	0.3	r -1.9	-0.9
Taiwan	1.7	5.5	1.9	-1.9	-4.0	-1.9	-3.2
Belgium	NA	1.8	0.7	-0.9	NA	-0.5	NA
Denmark	3.1	5.7	0.2	r 1.1	2.6	r 0.0	3.4
France	1.4	4.4	r -0.6	r -2.7	1.1	r 3.7	-1.0
Germany ²	1.9	3.3	r 3.4	r -0.5	-0.7	r -0.4	-3.8
Italy	5.5	9.3	2.6	1.8	3.7	r 4.1	3.2
Netherlands	0.9	0.6	1.0	0.8	2.1	r 2.3	-1.4
Norway	4.7	6.9	2.9	4.0	2.0	r 2.8	-0.2
Sweden	1.8	6.5	-1.6	-1.9	-1.6	r -2.8	-6.4
United Kingdom	3.6	6.2	2.0	r 2.0	0.7	r 0.1	-1.4

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2004**

Average annual rates of change¹

Country or area	1979-2004	1979-1990	1990-1995	1995-2000	2000-2004	2002-2003	2003-2004
Unit labor costs³: U.S. dollar basis							
United States	0.6	2.5	-0.2	-0.9	-1.3	r -1.4	-2.4
Canada	1.6	4.7	-3.2	-2.2	4.1	r 13.3	4.4
Australia	NA	NA	1.5	-4.3	NA	r 21.7	NA
Japan	1.9	4.6	9.4	-5.7	-4.3	r -2.1	0.8
Korea	1.4	4.9	6.7	-9.5	0.0	r 2.9	3.2
Taiwan	2.0	8.4	2.2	-5.1	-5.5	-1.5	-0.2
Belgium	NA	0.6	3.3	-8.4	NA	r 19.2	NA
Denmark	2.6	4.1	r 2.2	r -6.1	10.7	r 19.9	13.6
France	0.6	2.1	r 1.2	r -9.4	9.0	r 24.2	8.8
Germany ²	2.5	4.5	r 5.9	r -8.0	7.0	r 19.3	5.7
Italy	2.9	5.7	-3.5	-3.2	11.7	r 24.6	13.4
Netherlands	1.5	1.5	3.6	-6.9	10.0	r 22.4	8.3
Norway	3.5	4.9	2.6	-2.7	9.0	r 15.9	4.9
Sweden	-0.4	3.4	-5.2	-6.7	4.0	r 17.0	2.9
United Kingdom	3.0	4.5	-0.5	r 1.2	5.6	r 8.9	10.5
Exchange rates⁴							
United States	--	--	--	--	--	--	--
Canada	-0.4	0.0	-3.2	-1.6	3.4	12.1	7.6
Australia	-1.7	-3.2	-1.1	-4.7	6.1	r 20.0	12.9
Japan	2.8	3.8	9.1	-2.7	-0.1	8.0	7.2
Korea	-3.4	-3.4	-1.7	-7.3	-0.3	4.9	4.1
Taiwan	0.3	2.7	0.3	-3.3	-1.6	0.4	3.1
Belgium ⁵	-0.4	-1.2	2.5	-7.6	7.7	19.7	9.9
Denmark	-0.5	-1.5	2.0	-7.1	7.8	19.9	9.8
France ⁵	-0.9	-2.2	1.8	-6.8	7.7	19.7	9.9
Germany ^{2,5}	0.6	1.1	2.5	-7.5	7.7	19.7	9.9
Italy ⁵	-2.5	-3.3	-6.0	-4.9	7.7	19.7	9.9
Netherlands ⁵	0.5	0.9	2.6	-7.6	7.7	19.7	9.9
Norway	-1.1	-1.9	-0.3	-6.4	6.9	r 12.8	5.1
Sweden	-2.1	-2.9	-3.7	-4.9	5.7	r 20.4	9.9
United Kingdom	-0.6	-1.6	-2.4	-0.8	4.9	8.8	12.1

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.

⁵Euro area.

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

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

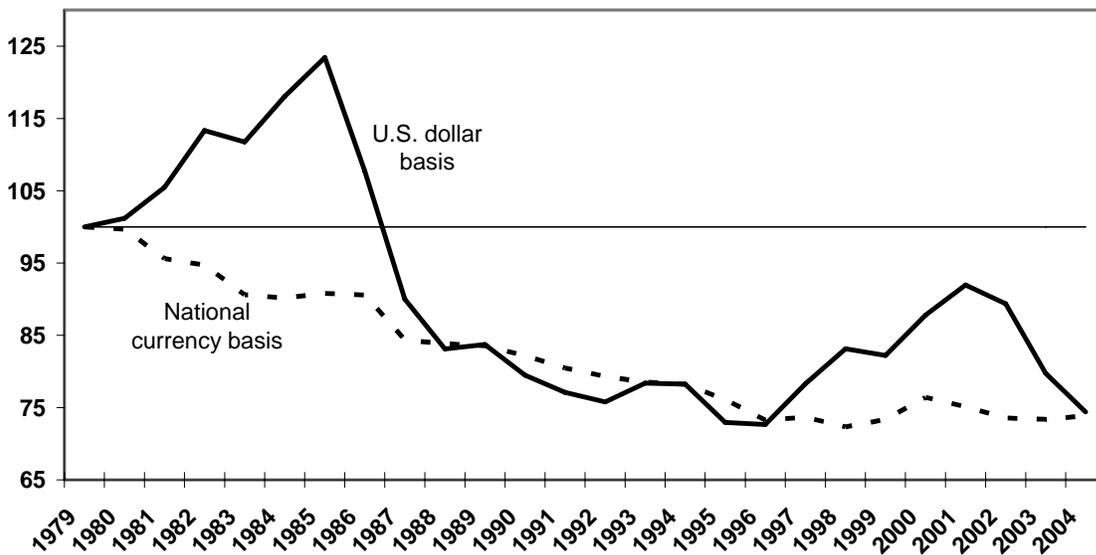
Trade-weighted unit labor costs

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 12 economies for which comparable data are available over the period of comparison; the indexes underlying this chart are shown in table C. The trade weights used in this release represent a change from previous releases. (See Technical Notes.)

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 12⁽¹⁾ competitors, 1979-2004

(1979 = 100)



(1) Australia and Belgium have been omitted because data for 1979 or 2004 are not available.

In the chart, the solid line indicates that U.S. unit labor costs rose faster than "competitors" costs from 1979 to 1985 on a U.S. dollar basis. In most years from 1986 to 1996, U.S. costs either rose at a slower rate than the "competitors" costs or fell at a faster rate. From 1997 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 12⁽¹⁾ competitors, 1979-2004

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	111.9	112.2	99.7	111.9	110.6	101.2
1981	117.1	122.4	95.6	117.1	111.0	105.5
1982	125.3	132.2	94.7	125.3	110.5	113.3
1983	121.9	134.5	90.6	121.9	109.1	111.7
1984	121.8	135.1	90.2	121.8	103.2	118.1
1985	124.0	136.6	90.8	124.0	100.5	123.5
1986	129.0	142.4	90.6	129.0	119.8	107.7
1987	123.0	145.8	84.4	123.0	136.7	90.0
1988	124.1	148.1	83.8	124.1	149.4	83.1
1989	127.0	152.0	83.6	127.0	151.7	83.7
1990	130.8	159.3	82.2	130.8	164.7	79.5
1991	134.2	166.8	80.5	134.2	174.0	77.1
1992	135.2	170.5	79.3	135.2	178.5	75.8
1993	134.3	171.0	78.5	134.3	171.3	78.4
1994	131.7	168.3	78.2	131.7	168.3	78.2
1995	129.4	170.0	76.1	129.4	177.4	72.9
1996	126.6	172.9	73.2	126.6	174.2	72.7
1997	124.7	169.3	73.7	124.7	159.4	78.3
1998	123.3	170.5	72.3	123.3	148.3	83.1
1999	122.1	166.4	73.4	122.1	148.5	82.2
2000	123.4	161.5	76.4	123.4	140.5	87.8
2001	125.0	166.4	75.1	125.0	135.9	92.0
2002	121.7	165.4	73.6	121.7	136.2	89.4
2003	119.9	163.4	73.4	119.9	150.4	79.8
2004	117.1	158.5	73.9	117.1	157.4	74.4

(1) Australia and Belgium have been omitted because data for 1979 or 2004 are not available.

Technical Notes

The comparisons in this release make use of data made available to BLS as of mid-August 2005 by the national statistical agencies.

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 France include parts of mining. From 1987 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 (Output: SIC 72; Labor Input and Compensation: SIC 87). Canadian output, employment, and hours data are in accordance with NAICS 97 beginning in 1997 while compensation data are also in accordance with NAICS 97 starting in 1961.

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 and for earlier years, 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 national 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 and “Gross Domestic Product by Industry for 1987-2000,” *Survey of Current Business*, November 2004, pp. 33-53.

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), 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 a measure of aggregate hours worked that was 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.

Compensation (Labor Cost). The compensation measures are from national accounts data and are in nominal terms. 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.

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 prior to 1991 pertain to the former West Germany. The data series are linked in 1991.

Data for Australia. Australian data are published by fiscal years, which run from July 1 through June 30. The Australian Bureau of Statistics provides unpublished calendar-year data for real value added, employment, and hours worked. For compensation, the Bureau of Labor Statistics estimates calendar-year series using two-year moving averages of the data for fiscal years. Manufacturing compensation data are not available for years prior to 1990.

Data for Recent Years. 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 used to calculate the relative unit labor cost indexes of the United States and the other economies are based on the relative dollar value of U.S. trade in manufactured commodities (exports plus imports) with each country or area in 2004. The trade data are compiled by the U.S. Census Bureau. This represents a change from previous releases, where the trade weights were based on a series of weights developed by the International Monetary Fund, and on trade flows over the 1989–91 period.

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	37.53	Germany	10.54
Japan	17.58	Italy	3.75
Korea	7.01	Netherlands	3.41
Taiwan	5.45	Norway	0.42
Denmark	0.57	Sweden	1.55
France	4.99	United Kingdom	7.20

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. 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.