News

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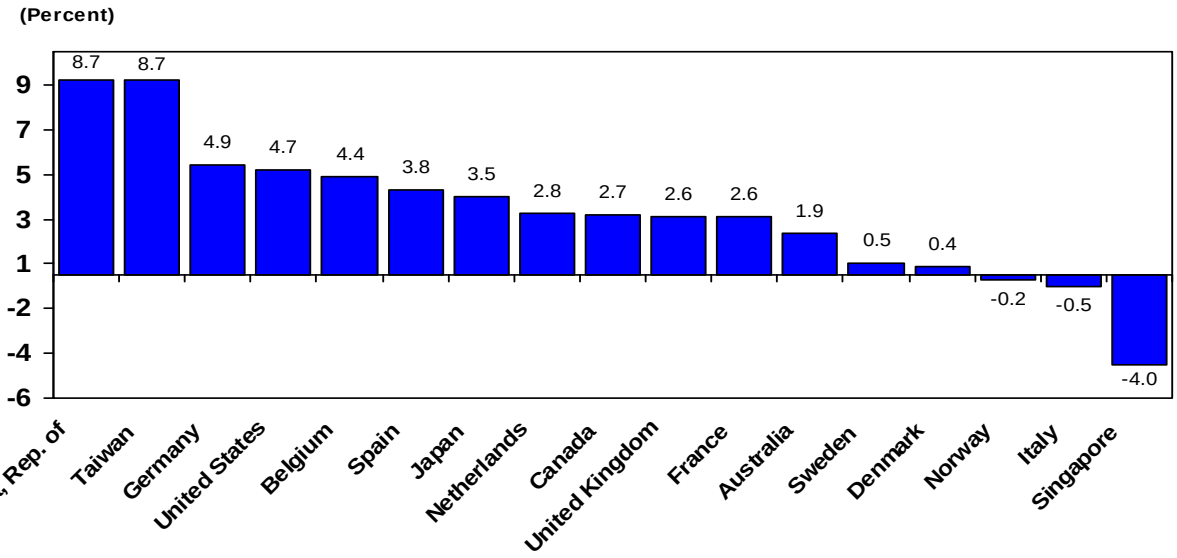
INTERNATIONAL COMPARISONS OF MANUFACTURING PRODUCTIVITY AND UNIT LABOR COST TRENDS 2007, REVISED

Manufacturing labor productivity increased in 2007 in 14 of the 17 economies compared by the U.S. Department of Labor's Bureau of Labor Statistics. The Republic of Korea and Taiwan had the largest productivity increases of 8.7 percent each. The United States productivity increase of 4.7 percent was the fourth largest. Singapore, included for the first time in these comparisons, had the steepest decline (-4.0 percent) of the three economies where productivity declined. (See chart 1.)

Over the 2000–2007 period, of the 17 economies studied, only Korea, Taiwan, and Sweden had greater productivity growth in manufacturing than the United States. Average annual growth rates for selected measures over various time periods are shown in tables A and B.

The data presented for the United States differ from those appearing in BLS Productivity and Costs news releases. (See technical notes.) They also do not reflect the annual benchmark revision of the BLS Current Employment Statistics program data released on February 6, 2009.

Chart 1. Percent change in manufacturing output per hour, 2006–2007



Changes in unit labor costs can be expressed either in national currency units or in U.S. dollars. Expressed in national currency units, manufacturing unit labor costs increased in ten and declined in seven of the economies in 2007. The decline for the United States (-1.1 percent) was the fifth steepest decline among the economies compared. However, expressed in U.S. dollars, manufacturing unit labor costs increased in 14 of the economies and declined in 3, including the United States. The U.S. manufacturing sector improved its competitiveness against all economies compared except Taiwan and Japan. Declines in the dollar's exchange rate reversed the direction of movement in four countries and had the largest impact on Australia, from +3.2 percent increase in unit labor costs in national currency to +15.0 percent increase in unit labor costs expressed in U.S. dollars. This difference can be explained by the strong appreciation of the Australian dollar relative to the U.S. dollar. (See chart 2.)

Chart 2. Percent change in manufacturing unit labor costs, 2006-2007

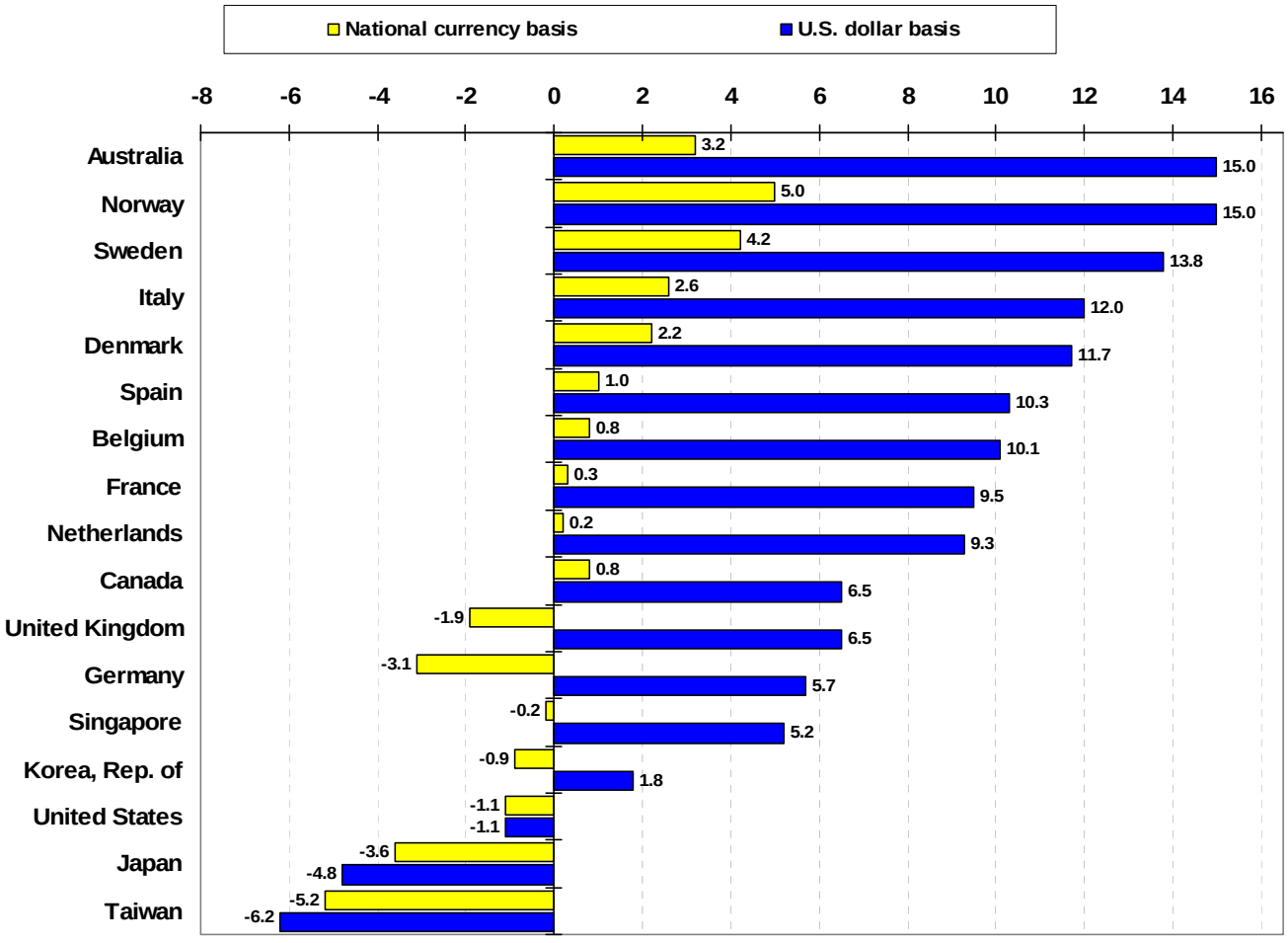


Table A. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 2006-2007

Percent change

Country or area	Output per Hour	Output	Total hours	Employ-ment	Average hours	Total compen-sation	Hourly compen-sation	Unit Labor Costs		Exchange rate(1)
								National currency	U.S. dollars	
United States	4.7	2.9	-1.7	-1.7	0.0	1.7	3.5	-1.1	-1.1	--
Canada	2.7	-0.9	-3.5	-3.4	-0.1	-0.1	3.6	0.8	6.5	5.6
Australia	1.9	3.3	1.3	1.8	-0.5	6.6	5.3	3.2	15.0	11.4
Japan	3.5	3.6	0.2	0.5	-0.4	-0.1	-0.2	-3.6	-4.8	-1.2
Korea, Republic of	8.7	6.5	-2.1	-1.3	-0.8	5.5	7.8	-0.9	1.8	2.7
Singapore	-4.0	5.8	10.2	9.9	0.2	5.6	-4.2	-0.2	5.2	5.4
Taiwan	8.7	10.4	1.5	1.4	0.1	4.6	3.0	-5.2	-6.2	-1.1
Belgium	4.4	2.6	-1.7	-0.9	-0.8	3.5	5.3	0.8	10.1	9.1
Denmark	0.4	3.6	3.2	1.8	1.4	5.9	2.6	2.2	11.7	9.2
France	2.6	1.2	-1.3	-1.3	0.0	1.6	2.9	0.3	9.5	9.1
Germany	4.9	6.1	1.2	1.2	-0.1	2.8	1.6	-3.1	5.7	9.1
Italy	-0.5	1.0	1.5	0.9	0.6	3.7	2.1	2.6	12.0	9.1
Netherlands	2.8	3.2	0.4	0.2	0.3	3.4	2.9	0.2	9.3	9.1
Norway	-0.2	5.3	5.5	5.0	0.5	10.5	4.8	5.0	15.0	9.5
Spain	3.8	2.8	-1.0	-0.6	-0.4	3.8	4.9	1.0	10.3	9.1
Sweden	0.5	2.3	1.8	0.6	1.2	6.7	4.8	4.2	13.8	9.1
United Kingdom	2.6	0.7	-1.9	-2.2	0.4	-1.2	0.7	-1.9	6.5	8.6

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

Additional data available

Annual indexes of the variables shown in table A are estimated for the time period 1950-2007 and are available at http://www.bls.gov/ilc/. However, for analytical purposes, the international comparisons in this release go back to 1979.

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

Singapore

With this news release, Singapore becomes the seventeenth economy included in the international comparisons of manufacturing productivity and unit labor costs. The main source of Singapore's economic data is the Singapore Department of Statistics. The data comply with international standards of national accounts and industrial classification. All provided series: output, employment, hours, and compensation are available from 1990 forward.

Manufacturing productivity, output, and labor input

In 2007, manufacturing productivity increased in 14 of the 17 economies compared. The United States increase of 4.7 percent was the fourth largest among the 17 economies. This increase was slightly above the 4.0 percent U.S. average annual increase since 1979. Korea and Taiwan led in productivity growth (+8.7 percent each), followed by Germany (+4.9 percent). Singapore's productivity decline of 4.0 percent significantly exceeded the declines in Italy and Norway (-0.5 and -0.2 percent respectively). Among the economies compared, Singapore also recorded the largest reversal from high manufacturing productivity growth rates in the nineties to the steepest decline in 2007. (See tables A and B.)

Between 2000 and 2007, productivity gains in the U.S. manufacturing sector were mainly due to declines in total hours. To a lesser degree, the productivity gains of the European manufacturing sectors compared here were also due to declines in total hours. By contrast, productivity gains in Korea and Taiwan were mainly due to increases in output.

Manufacturing output increased in 16 of the 17 economies in 2007. Taiwan was the leader in the growth of output with a +10.4 percent increase. In 2007, growth in manufacturing output in Germany, Norway, and Taiwan was noticeably higher than their average annual rates of increase over the 1979-2007 period, while the U.S. increase remained at 2.9 percent. Canada was the only economy that had a decline (-0.9 percent) in manufacturing output in 2007.

While 16 of the manufacturing economies had increases in 2007 in output, 10 had increases in total hours worked. Singapore and Norway had the largest increases in total hours worked of 10.2 and 5.5 percent, respectively. Canada had the steepest decline (-3.5 percent) in hours in 2007. The United States and Belgium had the fourth steepest decline in hours worked (-1.7 percent).

For the period 2000-2007, total hours worked in manufacturing declined in 16 of the 17 economies. The United Kingdom had the steepest average annual decline (-3.9 percent), followed by the United States (-3.1 percent). Singapore was the only economy that experienced growth (+3.7 percent) in total hours worked in this period.

In 2007, manufacturing employment increased in 10 of the 17 economies. Singapore had the largest increase in employment (+9.9 percent) – almost double the next largest growth in Norway (+5.0 percent). Canada had the largest decline in employment (-3.4 percent), followed by the United Kingdom (-2.2 percent) and the United States (-1.7 percent).

Over the 2000-2007 period, the United Kingdom and the United States experienced the steepest average annual declines in manufacturing employment (-4.0 and -3.0 percent respectively).

In 2007 average hours worked in manufacturing declined in 7 of the 17 economies and increased in 8, while the United States and France showed no change in average hours worked. This compares to 11 economies with declining average annual hours over the 2000-2007 period.

Manufacturing hourly compensation and unit labor costs

Total labor compensation in manufacturing increased in 14 of the 17 economies in 2007. The largest increases were in Norway (+10.5 percent) and Sweden (+6.7 percent). U. S. compensation rose by 1.7 percent. Total labor compensation declined in the United Kingdom, Canada and Japan. (See tables A and B.)

Hourly compensation in manufacturing increased also in 15 of the 17 economies in 2007, with Singapore and Japan as the exceptions. The largest increase was in Korea (+7.8 percent), followed by Australia and Belgium (+5.3 percent each). The U.S. increase of 3.5 percent in hourly compensation was below its average annual increase since 1979. (See tables A and B.)

Expressed in national currencies, unit labor costs increased in ten economies in 2007 and decreased in seven. The largest increase occurred in Norway (+5.0 percent) and the largest decline was in Taiwan (-5.2 percent). Unit labor costs in U.S. manufacturing decreased by 1.1 percent, compared to an average annual increase of 0.6 percent since 1979.

Expressed in U.S. dollars, manufacturing unit labor costs increased in 14 economies in 2007 and declined in 3, including the United States. Steeper declines occurred in Taiwan and Japan. Thus, the manufacturing sector in the United States improved its cost competitiveness against all economies compared except Taiwan and Japan.

The unit labor costs of four economies, Germany, the United Kingdom, Singapore, and Korea, went from decreases to increases when computed on a U.S. dollar basis. Australia and Norway had the largest currency appreciations in 2007. Australia also showed the largest difference, from +3.2 percent increase in unit labor costs in national currency to +15.0 percent increase in unit labor costs expressed in U.S. dollars.

Movements in exchange rates are often the dominant force behind changes in comparative unit labor costs and international competitiveness. In 2007, the U.S. dollar weakened against most of the currencies being compared. The exceptions were the currencies of Japan and Taiwan, which depreciated against the dollar. This depreciation of the U.S. dollar against most currencies continues a trend that began in 2001. In 2007, the dollar fell 9.1 percent against the euro, following a decline of 0.9 percent in 2006.

Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 1979-2007

Average annual rates of change(1)

Country or area	1979-2007	1979-1990	1990-1995	1995-2000	2000-2007	2005-2006	2006-2007
Output per hour							
United States	r4.0	2.8	3.7	5.6	r5.0	r4.7	r4.7
Canada	2.4	2.1	3.4	3.8	r1.3	r2.2	r2.7
Australia	r2.2	r2.3	1.3	r3.4	r1.9	1.0	r1.9
Japan	3.6	3.8	3.3	3.4	r3.7	r1.0	r3.5
Korea, Republic of	NA	NA	9.4	10.8	7.6	10.1	8.7
Singapore	NA	NA	6.9	6.5	1.7	2.4	-4.0
Taiwan	r5.8	6.1	4.7	5.6	6.4	r6.8	8.7
Belgium	3.4	4.2	3.1	r2.4	r3.1	r3.7	r4.4
Denmark	r2.4	2.2	2.7	1.8	r2.7	r4.6	r0.4
France	3.8	3.8	3.4	4.6	3.5	4.0	2.6
Germany (2)	r3.1	2.1	2.9	3.7	r4.3	r8.4	r4.9
Italy	2.2	3.4	3.8	1.4	-0.2	-0.4	-0.5
Netherlands	r3.4	r3.3	3.7	3.3	3.2	3.2	2.8
Norway	r1.8	1.9	0.1	1.4	r3.0	r-2.0	-0.2
Spain	2.5	3.3	3.1	0.8	2.1	2.0	3.8
Sweden	r4.5	2.1	5.5	6.8	r6.0	r9.4	r0.5
United Kingdom	3.6	4.1	2.8	2.7	r4.1	r5.1	r2.6
Output							
United States	r2.9	2.2	3.6	5.4	r1.8	r5.5	r2.9
Canada	2.1	1.9	2.2	6.2	r-0.2	r-0.4	r-0.9
Australia	1.5	1.6	0.8	2.6	1.1	r-0.9	r3.3
Japan	2.7	4.7	0.4	1.2	2.3	r3.5	r3.6
Korea, Republic of	8.8	10.7	8.2	7.9	6.9	8.5	6.5
Singapore	NA	NA	8.0	6.7	5.5	11.9	5.8
Taiwan	r6.1	7.4	4.4	5.8	5.7	r7.2	r10.4
Belgium	r1.8	2.6	0.6	r2.3	r1.0	r2.8	r2.6
Denmark	r1.3	1.3	2.1	1.7	r0.6	r4.1	r3.6
France	1.6	1.5	0.6	3.4	1.2	1.1	1.2
Germany (2)	r1.4	1.2	-1.0	2.2	r2.9	r7.3	r6.1
Italy	1.5	2.6	1.6	1.2	-0.2	1.2	1.0
Netherlands	2.2	2.4	2.0	3.3	1.4	2.7	3.2
Norway	r0.9	-0.5	0.7	1.4	r2.9	r3.0	r5.3
Spain	2.2	2.1	0.6	5.0	1.5	1.9	2.8
Sweden	r3.8	1.7	3.8	7.4	r4.6	r7.9	r2.3
United Kingdom	r0.7	0.9	0.5	1.3	r0.1	r1.8	r0.7

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 1979-2007

Average annual rates of change(1)

Country or area	1979-2007	1979-1990	1990-1995	1995-2000	2000-2007	2005-2006	2006-2007
Total hours							
United States	-1.1	-0.6	-0.1	-0.1	-3.1	0.7	-1.7
Canada	r-0.3	-0.2	-1.2	2.3	r-1.5	r-2.5	r-3.5
Australia	r-0.7	-0.7	-0.5	-0.9	r-0.8	-1.9	r1.3
Japan	-0.9	0.8	-2.8	-2.1	-1.4	2.4	r0.2
Korea, Republic of	NA	NA	-1.1	-2.6	-0.7	-1.4	-2.1
Singapore	NA	NA	1.0	0.2	3.7	9.3	10.2
Taiwan	0.3	1.2	-0.3	0.1	-0.6	0.3	1.5
Belgium	r-1.6	-1.6	-2.4	-0.1	r-2.1	r-0.9	r-1.7
Denmark	r-1.0	-1.0	-0.7	-0.1	r-2.0	r-0.4	r3.2
France	-2.1	-2.2	-2.8	-1.1	-2.3	-2.8	-1.3
Germany (2)	-1.6	-0.9	-3.8	-1.4	-1.3	r-1.1	r1.2
Italy	-0.7	-0.8	-2.1	-0.2	-0.1	1.6	1.5
Netherlands	-1.1	-0.9	-1.7	0.0	-1.8	-0.5	0.4
Norway	r-0.8	-2.3	0.6	0.0	r-0.1	r5.1	r5.5
Spain	-0.3	-1.2	-2.4	4.1	-0.6	-0.1	-1.0
Sweden	-0.7	-0.4	-1.7	0.5	r-1.3	r-1.4	r1.8
United Kingdom	-2.8	-3.1	-2.3	-1.4	-3.9	-3.1	-1.9
Employment							
United States	-1.2	-0.8	-0.5	0.0	-3.0	-0.6	-1.7
Canada	r-0.4	-0.3	-1.5	2.2	r-1.4	r-2.7	r-3.4
Australia	-1.3	-1.3	-2.3	-1.1	-0.7	-1.2	1.8
Japan	-0.6	1.0	-1.6	-2.0	r-1.5	1.5	r0.5
Korea, Republic of	NA	NA	-0.8	-2.5	0.4	0.3	-1.3
Singapore	NA	NA	0.7	-0.1	3.5	8.6	9.9
Taiwan	0.9	2.0	-0.3	0.4	0.2	1.1	1.4
Belgium	r-1.5	-1.6	-2.2	-0.6	r-1.6	-1.1	r-0.9
Denmark	r-1.0	-0.4	-1.2	-1.2	r-1.7	r-0.1	r1.8
France	-1.6	-1.8	-2.5	-0.3	-1.8	-1.9	-1.3
Germany (2)	-1.2	-0.1	-4.2	-0.8	-1.0	r-0.8	r1.2
Italy	-0.7	-0.8	-1.9	-0.2	0.2	0.9	0.9
Netherlands	-1.0	-0.6	-1.6	0.1	-1.8	-0.6	0.2
Norway	r-0.9	-2.2	0.4	0.2	r-0.4	r5.0	r5.0
Spain	0.1	-0.7	-2.0	3.3	0.5	-0.2	-0.6
Sweden	-1.4	-1.0	-3.5	0.2	-1.4	r-0.8	r0.6
United Kingdom	-2.8	-2.9	-2.7	-1.2	-4.0	-2.7	-2.2

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 1979-2007

Average annual rates of change(1)

Country or area	1979-2007	1979-1990	1990-1995	1995-2000	2000-2007	2005-2006	2006-2007
Average hours							
United States	0.1	0.2	0.4	-0.1	-0.1	1.3	0.0
Canada	0.1	0.1	0.3	0.1	-0.1	0.1	r-0.1
Australia	0.6	0.6	1.9	0.3	r-0.2	-0.7	r-0.5
Japan	-0.3	-0.2	-1.3	-0.1	0.1	r0.9	-0.4
Korea, Republic of	NA	NA	-0.2	-0.1	-1.1	-1.7	-0.8
Singapore	NA	NA	0.3	0.3	0.2	0.6	0.2
Taiwan	-0.6	-0.8	0.0	-0.3	-0.8	-0.8	0.1
Belgium	r-0.1	0.0	-0.2	0.5	r-0.6	r0.2	r-0.8
Denmark	0.0	-0.5	0.6	1.1	r-0.3	r-0.3	r1.4
France	-0.5	-0.5	-0.3	-0.8	-0.5	-0.9	0.0
Germany (2)	-0.4	-0.9	0.4	-0.6	-0.3	-0.2	-0.1
Italy	-0.1	0.1	-0.2	0.0	-0.3	0.7	0.6
Netherlands	-0.1	-0.2	0.0	-0.1	0.0	0.1	0.3
Norway	0.0	-0.1	0.2	-0.2	0.3	r0.1	r0.5
Spain	-0.4	-0.5	-0.4	0.8	-1.1	0.2	-0.4
Sweden	0.7	0.7	1.9	0.3	r0.1	r-0.6	r1.2
United Kingdom	0.0	-0.2	0.4	-0.1	0.1	-0.4	0.4
Total labor compensation(3): National currency basis							
United States	3.5	4.9	3.4	4.5	0.8	4.9	1.7
Canada	4.4	6.5	2.4	5.2	r1.9	r0.4	r-0.1
Australia	NA	NA	3.2	3.1	r4.6	r4.8	r6.6
Japan	1.7	5.5	0.7	-1.0	r-1.4	r1.3	r-0.1
Korea, Republic of	13.5	19.6	17.6	5.4	7.3	7.0	5.5
Singapore	NA	NA	8.7	2.4	3.8	6.7	5.6
Taiwan	r7.4	13.5	6.8	3.6	r1.7	r3.5	r4.6
Belgium	2.7	4.4	1.3	1.9	r1.6	r2.7	r3.5
Denmark	r4.3	7.0	2.3	2.8	r2.5	r4.4	r5.9
France	3.5	6.7	1.6	1.7	1.3	1.9	1.6
Germany (2)	2.7	4.6	2.4	1.6	0.9	r3.0	r2.8
Italy	6.3	11.6	3.9	2.4	2.9	3.6	3.7
Netherlands	2.8	3.2	2.7	3.4	1.8	2.3	3.4
Norway	r5.4	6.4	4.1	5.1	r4.9	r11.6	r10.5
Spain	6.8	10.1	5.5	5.6	3.6	4.2	3.8
Sweden	r5.4	8.8	1.9	5.3	r2.7	r1.5	r6.7
United Kingdom	3.8	7.1	1.5	3.3	0.7	r3.1	r-1.2

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 1979-2007

Average annual rates of change(1)

Country or area	1979-2007	1979-1990	1990-1995	1995-2000	2000-2007	2005-2006	2006-2007
Hourly compensation(3): National currency basis							
United States	4.6	5.5	3.5	4.7	4.0	4.1	3.5
Canada	4.7	6.8	3.6	2.9	r3.5	r3.1	r3.6
Australia	NA	NA	r3.7	4.0	r5.5	r6.7	r5.3
Japan	r2.7	4.6	3.6	1.2	0.0	r-1.1	r-0.2
Korea, Republic of	NA	NA	18.9	8.1	8.1	8.6	7.8
Singapore	NA	NA	7.6	2.2	0.1	-2.4	-4.2
Taiwan	r7.1	12.1	7.1	3.4	r2.3	r3.2	r3.0
Belgium	r4.4	6.1	3.8	2.0	r3.8	r3.6	r5.3
Denmark	r5.4	8.1	2.9	2.9	r4.7	r4.9	r2.6
France	5.8	9.1	4.5	2.8	3.7	4.9	2.9
Germany (2)	4.4	5.6	6.4	3.1	2.2	4.1	r1.6
Italy	7.1	12.5	6.1	2.7	3.0	2.0	2.1
Netherlands	3.9	4.1	4.5	3.4	3.6	2.8	2.9
Norway	6.3	9.0	3.4	5.2	r5.0	r6.1	r4.8
Spain	7.2	11.4	8.2	1.4	4.2	4.3	4.9
Sweden	r6.1	9.1	3.7	4.8	r4.1	2.9	r4.8
United Kingdom	6.8	10.5	3.9	4.7	4.8	r6.4	r0.7
Unit labor costs(3): National currency basis							
United States	r0.6	2.6	-0.2	-0.8	r-1.0	r-0.6	r-1.1
Canada	2.2	4.6	0.3	-0.9	r2.2	r0.9	r0.8
Australia	NA	NA	2.4	0.5	r3.5	r5.7	r3.2
Japan	-0.9	0.8	0.3	-2.2	r-3.5	r-2.0	r-3.6
Korea, Republic of	4.3	8.1	8.7	-2.4	0.4	-1.4	-0.9
Singapore	NA	NA	0.6	-4.1	-1.6	-4.7	-0.2
Taiwan	r1.2	5.6	2.3	-2.1	r-3.8	r-3.4	r-5.2
Belgium	r0.9	1.8	0.7	r-0.4	0.6	-0.1	r0.8
Denmark	2.9	5.7	0.2	1.1	r2.0	r0.3	r2.2
France	1.9	5.1	1.0	-1.7	0.1	0.9	0.3
Germany (2)	r1.3	3.3	3.4	-0.5	r-2.0	r-4.0	-3.1
Italy	4.8	8.8	2.2	1.2	3.1	2.4	2.6
Netherlands	r0.5	0.8	0.7	0.1	r0.3	-0.4	0.2
Norway	r4.4	6.9	3.3	3.7	r1.9	r8.3	r5.0
Spain	4.5	7.8	4.9	0.5	2.0	2.3	1.0
Sweden	r1.5	6.9	-1.8	-1.9	r-1.9	r-5.9	r4.2
United Kingdom	3.1	6.2	1.1	r1.9	r0.6	r1.3	r-1.9

Continued on next page

Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 17 countries or areas, 1979-2007

Average annual rates of change(1)

Country or area	1979-2007	1979-1990	1990-1995	1995-2000	2000-2007	2005-2006	2006-2007
Unit labor costs(3): U.S. dollar basis							
United States	r0.6	2.6	-0.2	-0.8	r-1.0	r-0.6	r-1.1
Canada	r2.5	4.6	-2.9	-2.4	r7.0	r7.8	r6.5
Australia	NA	NA	1.3	-4.2	r9.1	r4.5	r15.0
Japan	1.3	4.6	9.4	-4.8	-4.8	r-7.3	r-4.8
Korea, Republic of	1.9	4.4	6.9	-9.5	3.3	5.8	1.8
Singapore	NA	NA	5.7	-7.8	0.3	-0.1	5.2
Taiwan	r1.6	8.5	2.7	-5.3	r-4.5	r-4.5	r-6.2
Belgium	r0.9	0.6	3.3	r-7.9	r6.5	0.8	r10.1
Denmark	2.8	4.1	2.2	-6.1	7.9	r1.2	r11.7
France	1.4	2.7	2.8	-8.4	6.0	1.8	9.5
Germany (2)	r2.2	4.5	5.9	-8.0	r3.7	r-3.1	r5.7
Italy	2.8	5.2	-3.9	-3.7	9.1	3.3	12.0
Netherlands	r1.3	1.7	3.3	-7.6	6.2	0.5	9.3
Norway	r3.9	4.9	3.1	-2.9	r8.1	r8.9	r15.0
Spain	2.3	3.8	0.8	-6.6	8.0	3.2	10.3
Sweden	-0.1	3.8	-5.4	-6.7	r2.5	r-4.7	r13.8
United Kingdom	2.9	4.5	-1.4	1.1	r4.7	r2.6	r6.5
Exchange rates(4)							
United States	--	--	--	--	--	--	--
Canada	0.3	0.0	-3.2	-1.6	4.8	6.8	5.6
Australia	-1.0	-3.2	-1.1	-4.7	5.4	-1.2	11.4
Japan	2.2	3.8	9.1	-2.7	-1.3	-5.3	-1.2
Korea, Republic of	-2.3	-3.4	-1.7	-7.3	2.8	7.3	2.7
Singapore	NA	NA	5.0	-3.9	2.0	4.8	5.4
Taiwan	0.3	2.7	0.3	-3.3	-0.7	-1.2	-1.1
Belgium	0.0	-1.2	2.5	-7.6	5.8	0.9	9.1
Denmark	-0.1	-1.5	2.0	-7.1	5.8	0.9	9.2
France	-0.4	-2.2	1.8	-6.8	5.8	0.9	9.1
Germany (2)	0.9	1.1	2.5	-7.5	5.8	0.9	9.1
Italy	-1.9	-3.3	-6.0	-4.9	5.8	0.9	9.1
Netherlands	0.8	0.9	2.6	-7.6	5.8	0.9	9.1
Norway	-0.5	-1.9	-0.3	-6.4	6.0	0.5	9.5
Spain	-2.1	-3.7	-3.9	-7.1	5.8	0.9	9.1
Sweden	-1.6	-2.9	-3.7	-4.9	4.5	1.3	9.1
United Kingdom	-0.2	-1.6	-2.4	-0.8	4.1	1.3	8.6

r=revised NA=data not available
(1) Rates of change based on the compound rate method.
(2) Data for years before 1991 pertain to the former West Germany.
(3) Adjusted for employment taxes and government subsidies to estimate the actual cost to employers.
(4) Value of foreign currency relative to the U.S. dollar.

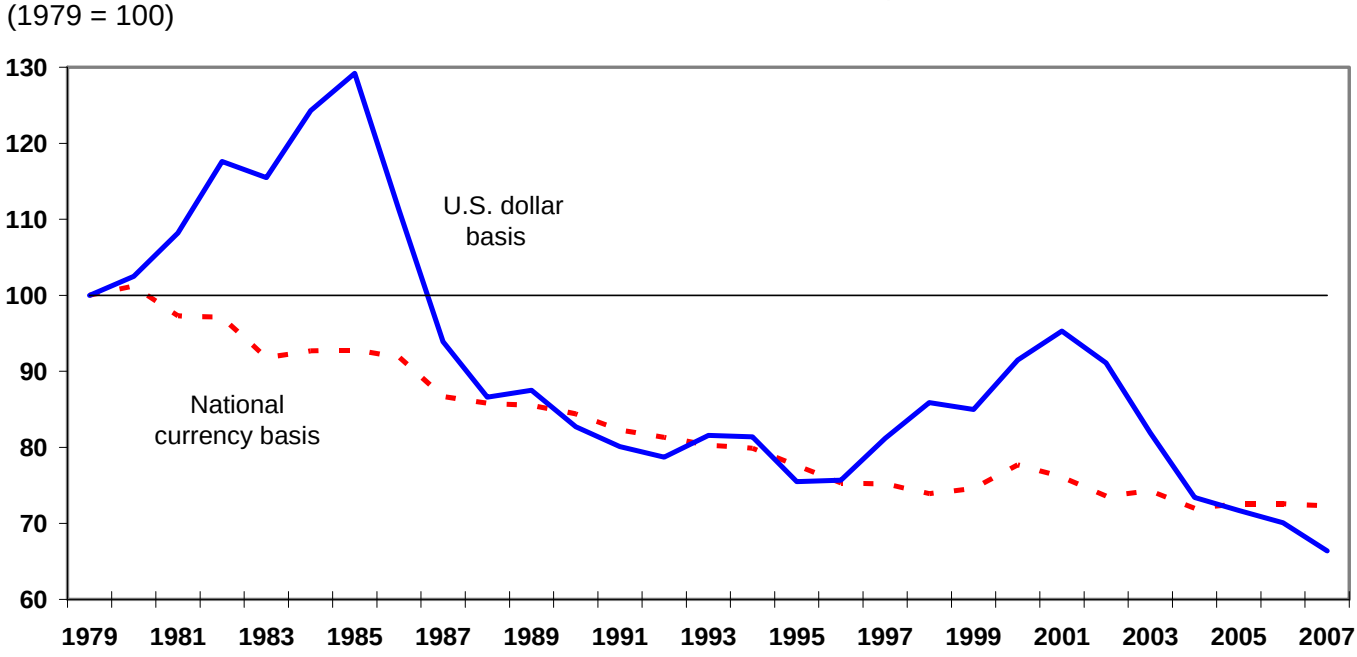
Trade-weighted unit labor costs

BLS constructs indexes of U.S. unit labor cost trends relative to a competitors' index, which is a trade-weighted average of unit labor cost trends in the other economies, in order 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 14 economies for which comparable data are available over the period of comparison. Australia and Singapore have been omitted because unit labor cost data are not available before 1990. 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 14[(1)] other economies, 1979-2007



(1) Australia and Singapore have been omitted from this chart because data are not available before 1990.

In the chart, the dotted line shows that, on a national currency basis, U.S. unit labor costs tended to fall more or increase less than unit labor costs in the other economies from 1979 until 1998. After that, the year-to-year fluctuations do not follow a clear trend.

The solid line compares the unit labor costs on a U.S. dollar basis. From 1979 to 1985, and again from 1995 to 2001, U.S. unit labor costs on a U.S. dollar basis generally rose more or declined less than in the other economies, due to the appreciation of the dollar. Since 2001, relative U.S. unit labor costs declined with the weakening of the U.S. dollar.

Table C. U.S. manufacturing unit labor costs relative to 14(1) competitors, 1979-2007

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	112.7	111.4	101.2	112.7	110.0	102.5
1981	117.6	120.9	97.3	117.6	108.8	108.2
1982	127.4	131.3	97.1	127.4	108.3	117.6
1983	122.7	133.6	91.8	122.7	106.2	115.5
1984	123.8	133.5	92.7	123.8	99.6	124.3
1985	126.2	136.0	92.8	126.2	97.7	129.2
1986	130.1	141.5	91.9	130.1	117.0	111.2
1987	125.4	144.6	86.7	125.4	133.6	93.9
1988	126.4	147.4	85.8	126.4	146.0	86.6
1989	129.4	151.3	85.5	129.4	147.8	87.5
1990	133.3	157.9	84.4	133.3	161.1	82.7
1991	136.7	166.1	82.3	136.7	170.7	80.1
1992	137.8	169.6	81.3	137.8	175.2	78.7
1993	136.7	170.4	80.3	136.7	167.6	81.6
1994	134.1	167.8	79.9	134.1	164.7	81.4
1995	131.6	169.6	77.6	131.6	174.3	75.5
1996	129.0	171.4	75.3	129.0	170.4	75.7
1997	127.1	169.1	75.2	127.1	156.5	81.2
1998	125.7	170.1	73.9	125.7	146.4	85.9
1999	124.4	166.7	74.6	124.4	146.3	85.0
2000	126.1	162.3	77.7	126.1	137.8	91.5
2001	127.7	167.8	76.1	127.7	134.1	95.3
2002	123.8	168.2	73.6	123.8	135.9	91.1
2003	124.6	167.7	74.3	124.6	152.2	81.9
2004	119.9	166.6	72.0	119.9	163.4	73.4
2005	119.7	164.9	72.6	119.7	166.9	71.7
2006	119.0	164.0	72.6	119.0	169.8	70.1
2007	117.7	162.7	72.3	117.7	177.2	66.4

(1) Australia and Singapore have been omitted from this table because data are not available before 1990.

Technical Notes

The comparisons in this release are based on data available to the Bureau of Labor Statistics as of the end of January 2009 from the national statistical offices of the 17 economies compared.

Definitions. 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. Unit labor costs can also be computed by dividing hourly compensation by output per hour, that is, by labor productivity.

Methodology. BLS constructs trends of manufacturing labor productivity and unit labor costs from three basic aggregate measures: output, total labor hours, and total compensation. The hours and compensation measures, as well as the employment 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.

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. Data for the United States are in accordance with the North American Industry Classification System (NAICS 97), except compensation data before 1987. Canadian data are in accordance with NAICS 97 starting in 1961.

The data for the most recent years are based on the United Nations System of National Accounts 1993 (SNA 93). 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 offices.

Output. For most of the economies, the output measures are real value added in manufacturing, based on 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.

Most economies now estimate manufacturing real output using moving price weights, as recommended by SNA 93. 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). Taiwan and Korea still use fixed price weights to estimate real output.

Measures of real output also may differ among economies because of different approaches to quality adjustments.

For the United States, the output measure for the manufacturing sector is a chain-weighted index of real gross product originating (deflated value added) produced by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce. 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 1947-86. New Estimates Based on the North American Industry Classification System," *Survey of Current Business*, December 2005, pp. 70-84.

The U.S. manufacturing 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. The international comparisons program uses a value added output concept, while the major sector series is on a sectoral output basis. Sectoral output is gross output less intra-sector 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 economies' national accounts, whereas sectoral output would require a complex estimation procedure. Even though 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 economies in the extent of vertical integration of industries.

Labor Input. For the most recent years, the term "hours" refers to hours worked. For some earlier years, BLS uses other hours measures.

For the United States, the employment and hours data series beginning with 1987 are taken from the NAICS-based manufacturing all-employed series published by BLS as part of the major sector productivity and cost measures. For the period before 1987, these series are linked to NAICS-based, employees-only data from the Current Employment Statistics (CES) program.

For most other economies, recent years' aggregate hours series are obtained from national statistical offices, usually from national accounts. However, for some earlier years, BLS calculates the aggregate hours series using employment figures published with the national accounts, or other comprehensive employment series, and data on average hours worked.

Compensation (Labor Cost). The compensation measures are from national accounts. 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 using labor. For most economies, labor cost is the same as compensation. However, for Australia, Canada, France, Singapore, 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, BLS 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 estimates based on various current indicators until national accounts and other preferred statistics 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 economy in 2007. The trade data are compiled by the U.S. Census Bureau.

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

	Weight		*Weight*
Canada	36.12	Germany	10.64
Japan	16.00	Italy	3.54
Korea	6.09	Netherlands	3.68
Taiwan	4.84	Norway	0.54
Belgium	3.02	Spain	1.36
Denmark	0.65	Sweden	1.42
France	4.82	United Kingdom	7.28

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 economies. Each economy measures manufacturing output in its own currency units. To compare outputs among economies, 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, for most economies, 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). In subsequent years several other European countries became EMU members. 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.

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	166.386 Spanish pesetas

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