News
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USDL 07-1456
For Release: 10:00 A.M. EDT
Thursday, September 27, 2007

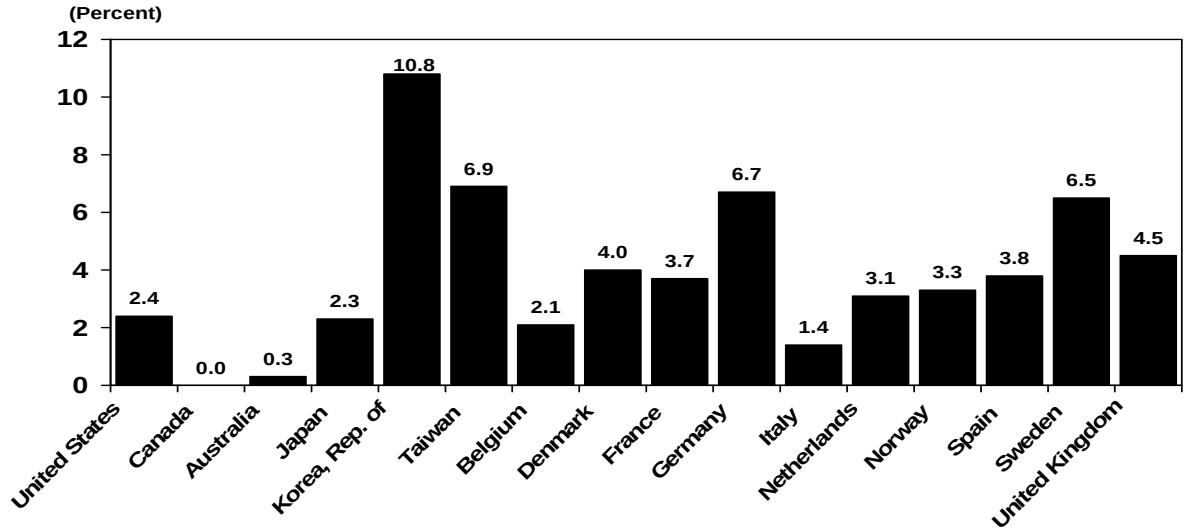
INTERNATIONAL COMPARISONS OF MANUFACTURING PRODUCTIVITY AND UNIT LABOR COST TRENDS 2006

Manufacturing labor productivity increased in 2006 in 15 of the 16 economies compared by the U.S. Department of Labor's Bureau of Labor Statistics. (See chart 1.) The Republic of Korea and Taiwan had the largest productivity increases (+10.8 and +6.9 percent, respectively). The U.S. productivity increase of 2.4 percent placed it eleventh among the 16 economies compared, and was less than the average annual growth rate since 2000. Canada was the only country with no productivity growth.

Over the 2000–2006 period, in the 16 economies studied, only Korea, Sweden, and Taiwan had greater productivity growth than the United States.

The data presented for the United States differ from those appearing in BLS Productivity and Costs news releases. (See technical notes.) Average annual growth rates for selected measures are shown in tables A and B.

Chart 1. Percent change in manufacturing output per hour, 2005–2006



Manufacturing unit labor costs, expressed in national currency units, declined in nine of the economies and increased in seven. The change for the United States was near the middle of the range, at +0.1 percent. (See chart 2.)

However, expressed in U.S. dollars, unit labor costs declined in six of the economies and increased in 10. Declines in the dollar's exchange rate reversed the direction of movement in three countries. The reversal was largest for Korea, from a decline in unit labor costs in national currency of 3.6 percent to an increase in unit labor costs expressed in U.S. dollars of 3.5 percent. This difference can be explained by the strong appreciation of the won relative to the U.S. dollar.

Chart 2. Percent change in manufacturing unit labor costs, 2005-2006

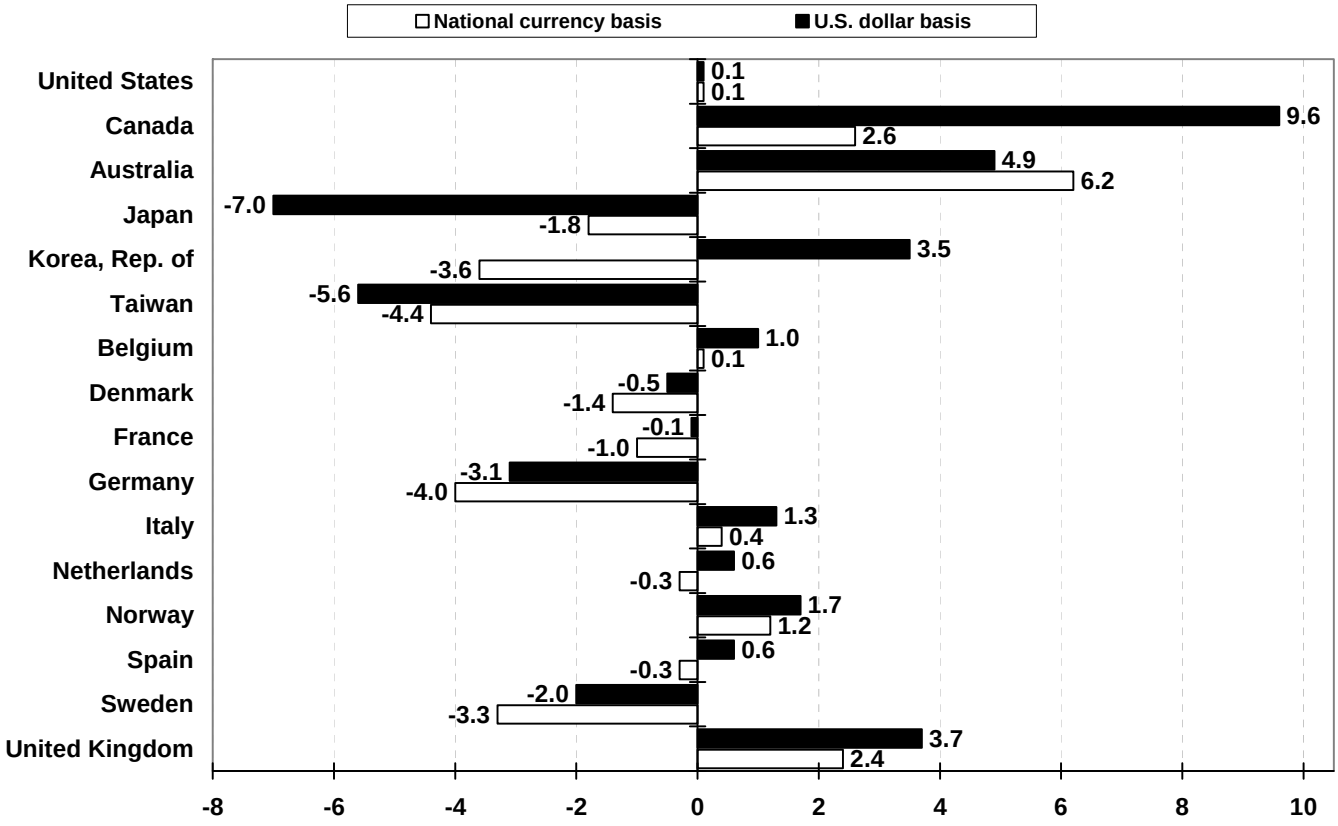


Table A. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 2005-2006

Percent change

Country or area	Output per Hour	Output	Total hours	Employ-ment	Average hours	Total compen-sation	Hourly compen-sation	Unit Labor Costs National currency	Unit Labor Costs U.S. dollars	Exchange rate(1)
United States	2.4	3.3	0.9	-0.5	1.4	3.4	2.5	0.1	0.1	--
Canada	0.0	-1.3	-1.3	-1.5	0.1	1.3	2.6	2.6	9.6	6.8
Australia	0.3	-1.3	-1.5	-1.2	-0.4	4.9	6.5	6.2	4.9	-1.2
Japan	2.3	4.8	2.5	1.7	0.8	3.0	0.5	-1.8	-7.0	-5.3
Korea, Republic of	10.8	8.4	-2.1	-0.4	-1.7	4.5	6.8	-3.6	3.5	7.3
Taiwan	6.9	7.2	0.3	1.1	-0.8	2.5	2.1	-4.4	-5.6	-1.2
Belgium	2.1	2.5	0.5	-0.4	0.8	2.6	2.1	0.1	1.0	0.9
Denmark	4.0	5.1	1.0	0.2	0.8	3.6	2.5	-1.4	-0.5	0.9
France	3.7	1.6	-2.0	-2.0	0.0	0.5	2.6	-1.0	-0.1	0.9
Germany	6.7	5.5	-1.1	-1.0	-0.1	1.2	2.4	-4.0	-3.1	0.9
Italy	1.4	3.7	2.3	1.2	1.0	4.2	1.8	0.4	1.3	0.9
Netherlands	3.1	2.3	-0.8	-0.8	0.1	2.0	2.8	-0.3	0.6	0.9
Norway	3.3	4.5	1.1	1.3	-0.2	5.7	4.6	1.2	1.7	0.5
Spain	3.8	3.3	-0.5	0.0	-0.5	3.0	3.5	-0.3	0.6	0.9
Sweden	6.5	5.7	-0.8	-0.7	0.0	2.2	3.0	-3.3	-2.0	1.3
United Kingdom	4.5	1.3	-3.1	-2.6	-0.4	3.7	7.0	2.4	3.7	1.3

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

Additional data available

Annual indexes of these variables are estimated for the time period 1950-2006 and are available at the Bureau of Labor Statistics, Division of Foreign Labor Statistics website at http://www.bls.gov/fls/home.htm. 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.

Manufacturing productivity, output, and labor input

In most of the compared economies manufacturing productivity increased between 2 and 5 percent in 2006. The United States, with 2.4 percent growth, fell within that interval. However, in Taiwan, Germany, and Sweden labor productivity grew by over 6 percent, and in Korea by 10.8 percent. Manufacturing productivity increased by only 0.3 percent in Australia and by 1.4 percent in Italy. Canada is the only economy that had no manufacturing productivity growth in 2006. (See tables A and B.)

Manufacturing output increased in 14 of the 16 economies in 2006. Korea, Sweden, and Taiwan continued to be the leaders in the growth of output, as they have been for the last decade. In 2006, growth in manufacturing output in Germany, Norway and Denmark was also noticeably higher than their average annual rates of increase over the 1979-2006 period. The U.S. increase of 3.3 percent was also above its average annual increase since 1979 of 2.9 percent.

While 14 of the economies had increases in output in 2006, 9 economies had reductions in total hours worked in manufacturing. The United Kingdom had the greatest decline (-3.1 percent) in hours in 2006, followed by Korea (-2.1 percent) and France (-2.0 percent). Total hours worked increased in the United States by 0.9 percent, and by over 2 percent in Japan and Italy.

Manufacturing employment declined in 10 of the 16 economies in 2006. The United Kingdom experienced the steepest decline (-2.6 percent), followed by France (-2.0 percent). The decline was 0.5 percent in the United States.

Seven of the sixteen economies experienced decreases in average hours worked in 2006, seven registered increases, and two had no change. This compares to thirteen economies with declining average annual manufacturing hours over the 2000–2006 period. Korea and Taiwan had the greatest declines in average hours worked in 2006, while the United States had the largest increase of 1.4 percent.

Manufacturing hourly compensation and unit labor costs

Total labor compensation in manufacturing increased in all 16 economies in 2006, from 0.5 percent in France to 5.7 percent in Norway. For most, the increases were between 2 and 4 percent. Total labor compensation in U.S. manufacturing increased by 3.4 percent in 2006, and increased at a 3.6 percent average annual rate over the 1979-2006 period. (See tables A and B.)

Hourly compensation in manufacturing also increased in all 16 economies in 2006. The greatest increases were in the United Kingdom (7.0 percent), Korea (6.8 percent), and Australia (6.5 percent). Japan had the lowest rate of increase in 2006 (0.5 percent). The U.S. increase of 2.5 percent in hourly compensation was below its average annual increase since 1979. (See tables A and B.)

Unit labor costs, expressed in national currencies, declined in nine countries in 2006, and increased in seven. The largest increase occurred in Australia (+6.2 percent) and the greatest decline was in Taiwan (-4.4 percent). Unit labor costs were about unchanged in U.S. manufacturing at +0.1 percent.

Expressed in U.S. dollars, manufacturing unit labor costs increased in ten economies in 2006, and declined in six. The unit labor costs of three economies, Korea, the Netherlands, and Spain, went from decreases to increases when computed on a U.S. dollar basis. This reversal happened because of the appreciation of their currencies versus the dollar. Korea, with the greatest currency appreciation, experienced the greatest reversal, from -3.6 to +3.5 percent.

Movements in exchange rates often are the dominant force behind changes in comparative unit labor costs and international competitiveness. In 2006 the U.S. dollar weakened against most of the currencies being compared. The only exceptions were Japan, Australia, and Taiwan, where the currencies depreciated against the dollar. This depreciation of the U.S. dollar against most currencies continues a trend that began after 2000. In 2006 the dollar fell by 0.9 percent against the euro, following a decline of 0.1 percent in 2005.

Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 1979-2006

Average annual rates of change(1)

Country or area	1979-2006	1979-1990	1990-1995	1995-2000	2000-2006	2004-2005	2005-2006
Output per hour							
United States	4.0	2.8	3.7	5.5	5.1	3.4	2.4
Canada	2.3	2.1	3.4	3.8	0.5	3.7	0.0
Australia	2.9	2.9	2.9	3.8	2.0	1.0	0.3
Japan	3.6	3.8	3.3	3.4	3.5	4.0	2.3
Korea, Republic of	NA	NA	9.4	10.8	7.4	6.8	10.8
Taiwan	5.7	6.1	4.7	5.6	6.0	7.2	6.9
Belgium	3.3	4.2	3.1	2.2	2.8	2.8	2.1
Denmark	2.4	2.2	2.7	1.8	3.0	2.0	4.0
France	3.8	3.6	3.8	4.6	3.4	4.3	3.7
Germany (2)	2.9	2.1	2.9	3.7	3.8	5.6	6.7
Italy	1.7	2.8	2.7	0.9	-0.6	-0.1	1.4
Netherlands	3.4	3.4	3.7	3.3	3.1	3.5	3.1
Norway	2.0	1.9	0.1	1.4	4.3	2.4	3.3
Spain	2.5	3.3	3.1	0.8	1.8	0.8	3.8
Sweden	4.8	2.5	5.8	7.2	6.5	6.2	6.5
United Kingdom	3.6	4.1	3.1	2.2	4.4	3.6	4.5
Output							
United States	2.9	2.2	3.6	5.4	1.7	2.2	3.3
Canada	2.2	1.9	2.2	6.2	-0.4	0.7	-1.3
Australia	1.4	1.6	0.8	2.6	0.7	0.2	-1.3
Japan	2.6	4.7	0.4	1.2	1.8	2.6	4.8
Korea, Republic of	8.9	10.7	8.2	7.9	6.9	7.1	8.4
Taiwan	6.0	7.4	4.4	5.8	4.9	6.6	7.2
Belgium	1.7	2.6	0.6	2.1	0.6	-0.5	2.5
Denmark	1.4	1.3	2.1	1.7	0.7	1.6	5.1
France	1.6	1.3	0.9	3.5	1.1	1.3	1.6
Germany (2)	1.2	1.2	-1.0	2.2	2.1	3.3	5.5
Italy	1.3	2.6	1.6	0.7	-0.8	-2.5	3.7
Netherlands	2.1	2.4	2.0	3.3	0.7	0.0	2.3
Norway	0.8	-0.5	0.7	1.4	2.6	3.6	4.5
Spain	2.2	2.1	0.6	5.0	1.3	0.3	3.3
Sweden	3.8	1.8	3.8	7.4	4.5	4.1	5.7
United Kingdom	0.6	0.9	0.5	1.3	-0.3	-1.2	1.3

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 1979-2006

Average annual rates of change(1)

Country or area	1979-2006	1979-1990	1990-1995	1995-2000	2000-2006	2004-2005	2005-2006
Total hours							
United States	-1.0	-0.6	-0.1	-0.1	-3.2	-1.2	0.9
Canada	-0.1	-0.2	-1.2	2.3	-0.9	-2.8	-1.3
Australia	-1.4	-1.3	-2.0	-1.2	-1.2	-0.8	-1.5
Japan	-1.0	0.8	-2.8	-2.2	-1.6	-1.3	2.5
Korea, Republic of	NA	NA	-1.1	-2.6	-0.5	0.2	-2.1
Taiwan	0.2	1.2	-0.3	0.1	-1.0	-0.6	0.3
Belgium	-1.6	-1.6	-2.4	-0.1	-2.1	-3.2	0.5
Denmark	-1.0	-1.0	-0.7	-0.1	-2.2	-0.4	1.0
France	-2.1	-2.2	-2.8	-1.1	-2.2	-2.8	-2.0
Germany (2)	-1.7	-0.9	-3.8	-1.4	-1.7	-2.2	-1.1
Italy	-0.4	-0.2	-1.0	-0.2	-0.2	-2.4	2.3
Netherlands	-1.2	-1.0	-1.7	0.0	-2.3	-3.3	-0.8
Norway	-1.2	-2.3	0.6	0.0	-1.6	1.1	1.1
Spain	-0.3	-1.2	-2.4	4.1	-0.5	-0.5	-0.5
Sweden	-1.0	-0.7	-1.9	0.3	-1.9	-2.0	-0.8
United Kingdom	-2.9	-3.1	-2.6	-0.9	-4.5	-4.6	-3.1
Employment							
United States	-1.1	-0.8	-0.5	0.0	-3.2	-0.6	-0.5
Canada	-0.2	-0.3	-1.5	2.2	-0.8	-1.6	-1.5
Australia	-1.4	-1.3	-2.3	-1.1	-1.1	-1.7	-1.2
Japan	-0.7	1.0	-1.6	-2.0	-1.9	-0.8	1.7
Korea, Republic of	NA	NA	-0.8	-2.5	0.6	0.9	-0.4
Taiwan	0.8	2.0	-0.3	0.4	0.0	0.4	1.1
Belgium	-1.5	-1.6	-2.2	-0.6	-1.5	-0.9	-0.4
Denmark	-1.1	-0.4	-1.2	-1.2	-2.2	-2.0	0.2
France	-1.6	-1.7	-2.5	-0.3	-1.8	-2.6	-2.0
Germany (2)	-1.3	-0.1	-4.2	-0.8	-1.4	-1.7	-1.0
Italy	-0.7	-0.8	-1.9	-0.2	0.0	-1.7	1.2
Netherlands	-1.1	-0.8	-1.6	0.1	-2.2	-3.0	-0.8
Norway	-1.2	-2.2	0.4	0.2	-1.8	0.5	1.3
Spain	0.1	-0.7	-2.0	3.3	0.8	1.0	0.0
Sweden	-1.4	-1.0	-3.5	0.0	-1.6	-2.2	-0.7
United Kingdom	-2.8	-2.9	-2.4	-1.4	-4.3	-4.5	-2.6

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 1979-2006

Average annual rates of change(1)

Country or area	1979-2006	1979-1990	1990-1995	1995-2000	2000-2006	2004-2005	2005-2006
Average hours							
United States	0.1	0.2	0.4	-0.1	-0.1	-0.6	1.4
Canada	0.1	0.1	0.3	0.1	-0.2	-1.3	0.1
Australia	0.0	0.0	0.3	-0.1	-0.1	0.9	-0.4
Japan	-0.3	-0.2	-1.3	-0.2	0.2	-0.5	0.8
Korea, Republic of	NA	NA	-0.2	-0.1	-1.1	-0.6	-1.7
Taiwan	-0.6	-0.8	0.0	-0.3	-1.0	-1.0	-0.8
Belgium	-0.1	0.0	-0.2	0.5	-0.5	-2.3	0.8
Denmark	0.1	-0.5	0.6	1.1	0.0	1.7	0.8
France	-0.5	-0.5	-0.3	-0.8	-0.4	-0.2	0.0
Germany (2)	-0.4	-0.9	0.4	-0.6	-0.2	-0.5	-0.1
Italy	0.4	0.6	0.9	0.0	-0.2	-0.7	1.0
Netherlands	-0.1	-0.2	0.0	-0.1	-0.1	-0.4	0.1
Norway	0.0	-0.1	0.2	-0.2	0.1	0.6	-0.2
Spain	-0.4	-0.5	-0.4	0.8	-1.3	-1.5	-0.5
Sweden	0.4	0.3	1.7	0.2	-0.2	0.2	0.0
United Kingdom	-0.1	-0.2	-0.1	0.5	-0.2	-0.1	-0.4
Total labor compensation(3): National currency basis							
United States	3.6	4.9	3.4	4.5	0.8	3.0	3.4
Canada	4.5	6.5	2.4	5.2	1.9	0.9	1.3
Australia	NA	NA	3.2	3.1	3.8	4.1	4.9
Japan	1.9	5.5	0.7	-1.0	-1.3	-0.1	3.0
Korea, Republic of	13.7	19.6	17.6	5.4	7.3	8.2	4.5
Taiwan	7.5	13.5	6.8	3.6	1.1	3.7	2.5
Belgium	2.7	4.4	1.3	1.9	1.4	0.9	2.6
Denmark	4.1	7.0	2.3	2.8	1.6	1.7	3.6
France	3.6	7.3	1.7	1.7	0.3	-3.4	0.5
Germany (2)	2.6	4.6	2.4	1.6	0.3	-1.1	1.2
Italy	6.4	11.4	3.9	2.6	2.7	0.5	4.2
Netherlands	2.7	3.1	2.7	3.4	1.5	-1.4	2.0
Norway	5.0	6.4	4.1	5.1	2.9	5.0	5.7
Spain	6.9	10.1	5.5	5.6	3.3	3.5	3.0
Sweden	5.2	8.4	2.0	5.3	2.0	0.3	2.2
United Kingdom	3.9	7.1	1.5	3.3	0.8	-0.5	3.7

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 1979-2006

Average annual rates of change(1)

Country or area	1979-2006	1979-1990	1990-1995	1995-2000	2000-2006	2004-2005	2005-2006
Hourly compensation(3): National currency basis							
United States	4.7	5.5	3.5	4.7	4.2	4.2	2.5
Canada	4.6	6.8	3.6	2.9	2.9	3.9	2.6
Australia	NA	NA	5.4	4.3	5.1	5.0	6.5
Japan	2.8	4.6	3.6	1.2	0.4	1.1	0.5
Korea, Republic of	NA	NA	18.9	8.1	7.8	8.0	6.8
Taiwan	7.3	12.1	7.1	3.4	2.1	4.4	2.1
Belgium	4.3	6.1	3.8	2.0	3.5	4.2	2.1
Denmark	5.2	8.1	2.9	2.9	3.9	2.0	2.5
France	5.9	9.8	4.6	2.8	2.5	-0.6	2.6
Germany (2)	4.4	5.6	6.4	3.1	2.0	1.1	2.4
Italy	6.8	11.6	5.0	2.8	2.9	3.0	1.8
Netherlands	4.0	4.1	4.5	3.4	3.9	2.0	2.8
Norway	6.2	9.0	3.4	5.2	4.6	3.9	4.6
Spain	7.2	11.4	8.2	1.4	3.8	4.1	3.5
Sweden	6.2	9.1	4.0	5.1	3.9	2.3	3.0
United Kingdom	7.0	10.6	4.2	4.2	5.5	4.3	7.0
Unit labor costs(3): National currency basis							
United States	0.7	2.6	-0.2	-0.8	-0.8	0.8	0.1
Canada	2.2	4.6	0.3	-0.9	2.3	0.2	2.6
Australia	NA	NA	2.4	0.5	3.1	4.0	6.2
Japan	-0.7	0.8	0.3	-2.2	-3.1	-2.7	-1.8
Korea, Republic of	4.4	8.1	8.7	-2.4	0.4	1.1	-3.6
Taiwan	1.5	5.6	2.3	-2.1	-3.6	-2.7	-4.4
Belgium	1.0	1.8	0.7	-0.2	0.7	1.5	0.1
Denmark	2.7	5.7	0.2	1.1	0.9	0.1	-1.4
France	2.0	5.9	0.7	-1.7	-0.8	-4.7	-1.0
Germany (2)	1.5	3.3	3.4	-0.5	-1.8	-4.2	-4.0
Italy	5.0	8.5	2.3	1.9	3.6	3.1	0.4
Netherlands	0.6	0.7	0.7	0.1	0.7	-1.4	-0.3
Norway	4.2	6.9	3.4	3.7	0.3	1.4	1.2
Spain	4.6	7.8	4.9	0.5	2.0	3.2	-0.3
Sweden	1.3	6.5	-1.7	-1.9	-2.4	-3.6	-3.3
United Kingdom	3.3	6.2	1.0	2.0	1.0	0.7	2.4

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Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 16 countries or areas, 1979-2006

Average annual rates of change(1)

Country or area	1979-2006	1979-1990	1990-1995	1995-2000	2000-2006	2004-2005	2005-2006
Unit labor costs(3): U.S. dollar basis							
United States	0.7	2.6	-0.2	-0.8	-0.8	0.8	0.1
Canada	2.4	4.6	-2.9	-2.4	7.1	7.6	9.6
Australia	NA	NA	1.3	-4.2	7.6	7.6	4.9
Japan	1.6	4.6	9.4	-4.8	-4.3	-4.4	-7.0
Korea, Republic of	1.8	4.4	6.9	-9.5	3.2	13.1	3.5
Taiwan	1.8	8.5	2.7	-5.3	-4.2	1.1	-5.6
Belgium	0.6	0.6	3.3	-7.7	6.0	1.5	1.0
Denmark	2.3	4.1	2.2	-6.1	6.2	-0.1	-0.5
France	1.2	3.6	2.5	-8.4	4.4	-4.6	-0.1
Germany (2)	2.1	4.5	5.9	-8.0	3.4	-4.1	-3.1
Italy	2.6	5.0	-3.8	-3.1	9.0	3.2	1.3
Netherlands	1.1	1.6	3.3	-7.6	6.0	-1.3	0.6
Norway	3.3	4.9	3.1	-2.9	5.8	6.1	1.7
Spain	2.0	3.8	0.8	-6.6	7.3	3.3	0.6
Sweden	-0.7	3.4	-5.3	-6.7	1.2	-5.2	-2.0
United Kingdom	2.7	4.5	-1.4	1.1	4.4	0.0	3.7
Exchange rates(4)							
United States	--	--	--	--	--	--	--
Canada	0.1	0.0	-3.2	-1.6	4.6	7.4	6.8
Australia	-1.5	-3.2	-1.1	-4.7	4.4	3.6	-1.2
Japan	2.4	3.8	9.1	-2.7	-1.3	-1.8	-5.3
Korea, Republic of	-2.5	-3.4	-1.7	-7.3	2.9	11.9	7.3
Taiwan	0.4	2.7	0.3	-3.3	-0.6	3.9	-1.2
Belgium	-0.3	-1.2	2.5	-7.6	5.3	0.1	0.9
Denmark	-0.5	-1.5	2.0	-7.1	5.3	-0.1	0.9
France	-0.8	-2.2	1.8	-6.8	5.3	0.1	0.9
Germany (2)	0.6	1.1	2.5	-7.5	5.3	0.1	0.9
Italy	-2.3	-3.3	-6.0	-4.9	5.3	0.1	0.9
Netherlands	0.5	0.9	2.6	-7.6	5.3	0.1	0.9
Norway	-0.9	-1.9	-0.3	-6.4	5.5	4.6	0.5
Spain	-2.5	-3.7	-3.9	-7.1	5.3	0.1	0.9
Sweden	-2.0	-2.9	-3.7	-4.9	3.7	-1.6	1.3
United Kingdom	-0.5	-1.6	-2.4	-0.8	3.3	-0.7	1.3

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.

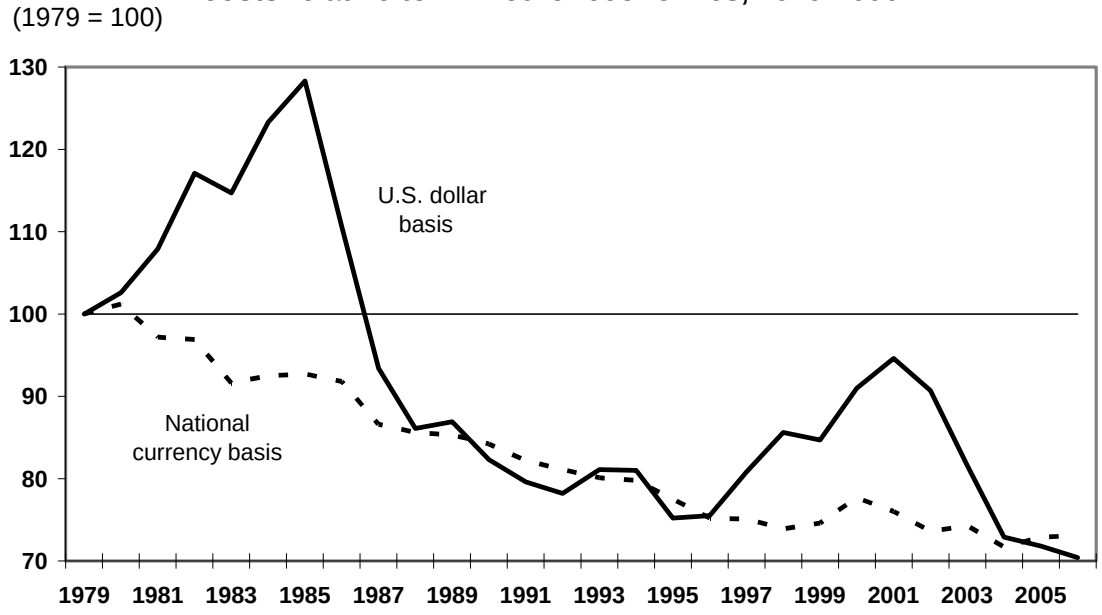
Trade-weighted unit labor costs

BLS constructs indexes of U.S. unit labor cost trends relative to a 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 14 economies for which comparable data are available over the period of comparison; 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, 1979-2006



(1) Australia has 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 throughout this period.

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, 1979-2006

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	109.9	102.6
1981	117.6	121.0	97.2	117.6	109.1	107.9
1982	127.4	131.5	96.9	127.4	108.8	117.1
1983	122.7	133.9	91.6	122.7	107.0	114.7
1984	123.8	133.8	92.5	123.8	100.4	123.3
1985	126.2	136.2	92.7	126.2	98.3	128.3
1986	130.1	141.7	91.8	130.1	117.6	110.6
1987	125.4	144.9	86.6	125.4	134.3	93.4
1988	126.4	147.6	85.6	126.4	146.9	86.1
1989	129.4	151.6	85.3	129.4	148.9	86.9
1990	133.2	158.2	84.2	133.2	161.9	82.3
1991	136.7	166.4	82.1	136.7	171.7	79.6
1992	137.8	169.9	81.1	137.8	176.1	78.2
1993	136.7	170.7	80.1	136.7	168.7	81.1
1994	134.1	168.1	79.8	134.1	165.7	81.0
1995	131.6	169.7	77.5	131.6	175.0	75.2
1996	129.1	171.5	75.2	129.1	171.0	75.5
1997	127.1	169.2	75.1	127.1	157.2	80.8
1998	125.7	170.2	73.9	125.7	146.8	85.6
1999	124.4	166.8	74.6	124.4	146.9	84.7
2000	126.2	162.4	77.7	126.2	138.7	91.0
2001	127.7	168.0	76.0	127.7	135.0	94.6
2002	123.9	168.4	73.6	123.9	136.6	90.7
2003	124.7	167.9	74.3	124.7	152.9	81.6
2004	119.1	166.2	71.7	119.1	163.4	72.9
2005	120.0	164.6	72.9	120.0	167.1	71.8
2006	120.1	164.3	73.1	120.1	170.6	70.4

(1) Australia has 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 August 2007 from the national statistical offices of the 16 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, 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.

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) or its sub-system, the European System of Integrated National Accounts (ESA 95). 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 economies, 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.

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 estimating the prices of high-technology products like computers and, in general, of products that undergo rapid quality change.

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. 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 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 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 all of the economies 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 economies and for

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 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 economies, 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, 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 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 2005. 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	36.80	Germany	10.33
Japan	16.59	Italy	3.65
Korea	6.20	Netherlands	3.37
Taiwan	4.89	Norway	0.42
Belgium	2.70	Spain	1.23
Denmark	0.60	Sweden	1.52
France	4.73	United Kingdom	6.97

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 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 they were joined by Greece and Slovenia. 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.