

**UNECE**United Nations Economic Commission for Europe

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Strong recovery of robot investment is projected in the United States for 2003

Robot investment was down in 2002....

North American investment in industrial robots increased from about 3,900 units to almost 12,800 units in the period 1992-1999. In 2000, sales increased by 1% to almost 13,000 units (see figure 1). In 2001 and 2002, shipments fell by 17% and 8%, respectively. As a comparison, the value of the American market for machine tools fell by as much as 36%. Robot investments seem to be less sensitive to recession than other types of investment goods.

..but recovered sharply in the first half of 2003

Orders from North American customers skyrocketed by 35% in the first half of 2003, compared with the same period in 2002, indicating that robot investment will surge during 2003. For the period 2003-2006, the market in North America is projected to grow by a yearly average of 7%.

Over 100,000 robots in operation

At the end of 2002, the operational robot stock in North America is estimated to have reached approximately 104,000 units, representing an increase of 6% over 2001. By the end of 2006, the stock of operational robots is estimated to reach at least 135,000 units.

United States lagging behind the European Union...

For every 10,000 persons employed in the United States manufacturing industry at the end of 2002, there were 58 industrial robots, compared with 135 in Germany and 86 in the European Union (see figure 2). In the United States motor vehicle industry there are as many as 770 robots per 10,000 production workers, but this is still far behind Japan (1,700 units), Italy (1,130 units) and Germany (1,000 units).

.../

Robot prices are down, labour costs are up...

Between 1984 and 1990, the average unit value of robots shipped almost doubled, from \$65,000 to \$115,000 (in current prices). After that, however, the unit value fell continuously, and amounted to between \$95,000 and \$90,000 in the period 1993-1998. In 1999-2001, the unit price fell to the range of \$79,000-\$83,000. In 2002, the average price fell to \$75,000.

Between 1990 and 2002, prices of industrial robots fell from index 100 to 37, without taking into account that robots installed in 2002 had a much higher performance than those installed in 1990 (see figure 4). If quality changes had been taken into account, it was estimated that the index would have fallen to 19. In other words, an average robot sold in 2002 would have cost only a fifth of what a robot with the same performance would have cost in 1990, if it had been possible to produce such a robot in that year.

At the same time, the index of labour compensation in the American business sector increased from 100 to 151. This implies that the relative prices of robots fell from 100 in 1990 to 24 in 2002 without quality adjustment, and to 12 when taking quality improvements into account.

Hourly wages, excluding social costs, for production workers in the motor vehicle industry increased from \$14.56 to \$20.50 in this period. In the food industry the corresponding hourly wages were \$9.62 and \$13.23, respectively, a level which is one explanation why the food industry is lagging behind in the use of robots.

The motor vehicle industry in the lead in robot use

The automotive industry is by far the largest customer for robots, accounting for at least 50% of the installed base, followed by industries such as off-road vehicles, electronics, food, pharmaceuticals, appliances, aerospace and metal fabrication.

Welding and material handling dominate...

Welding robots accounted at the end of 2002 for about 49% of the estimated total stock of operational robots, of which spot welding accounted for 32 percentage points. Material handling and palletizing/packaging taken together had a share of about 26%, followed by assembly with about 8%. Machining and dispensing each had a share of between 6% and 7%.

For the global development of industrial robots and service robots, see a parallel press release (ECE/STAT/03/P01) issued on the same day as the present one.

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Figure 1a. Estimated operational stock of robots at year-end and shipments during the year

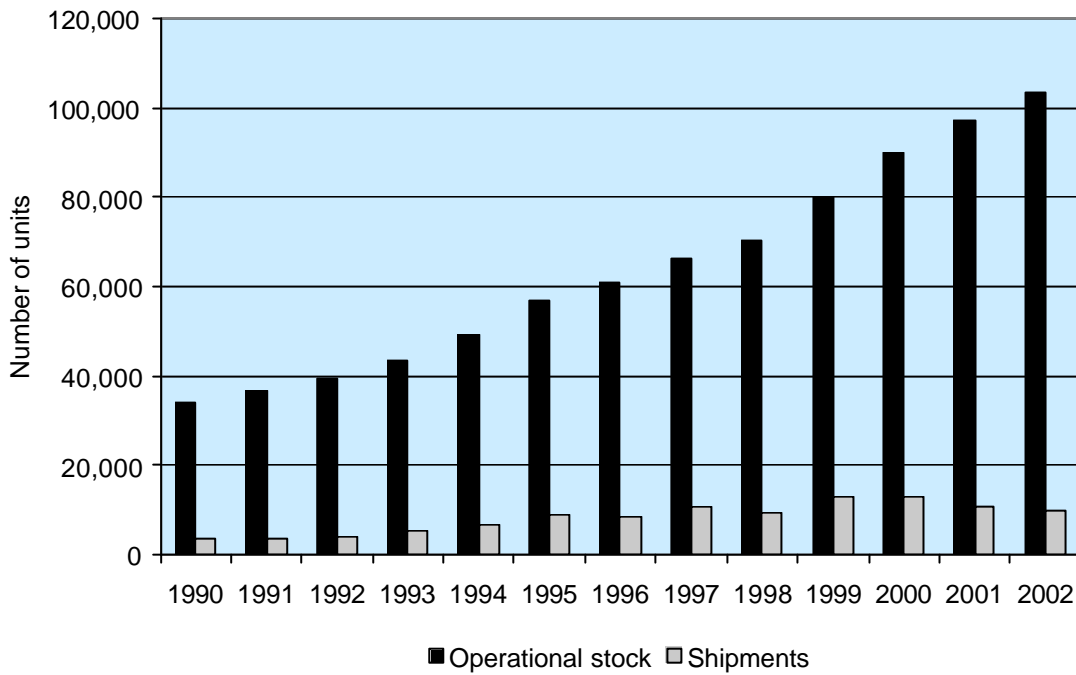
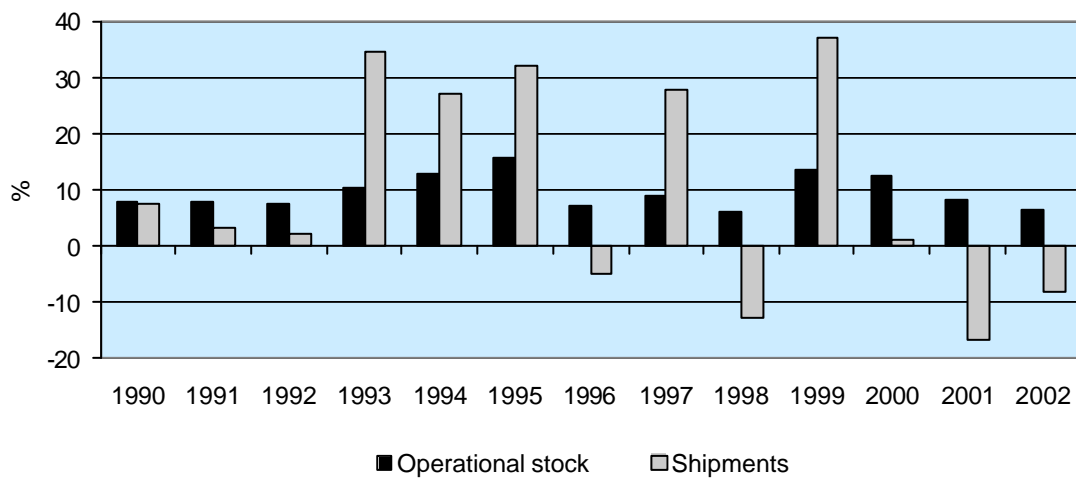


Figure 1b. Yearly percentage change in estimated operational stock and in shipments



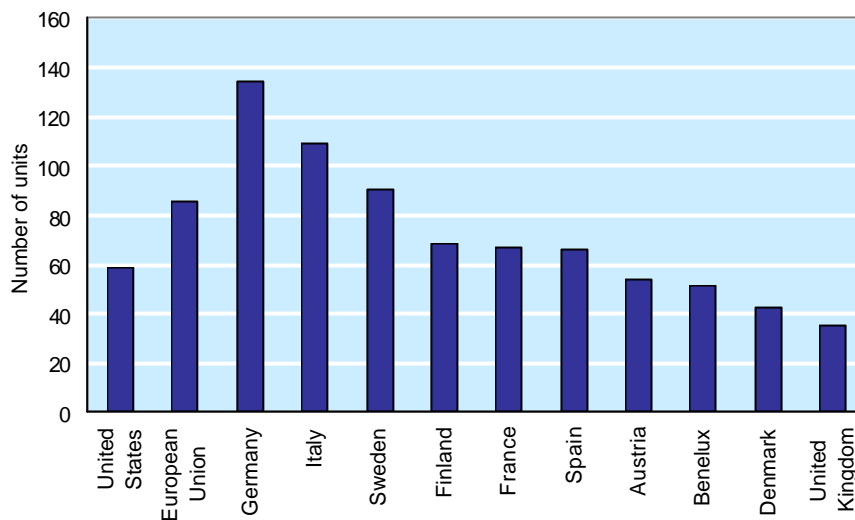
	2002
Japan a/	308
Rep. of Korea b/	128
United States	58
European Union	86
Germany	135
Italy	109
Sweden	91
Finland	68
France	67
Spain	66
Austria	54
Benelux	51
Denmark	43
United Kingdom	36
Australia	33
Norway	21
Portugal	9
Czech Rep.	8

Sources: UNECE and IFR.

a/ Up to and including 2000, data for Japan include all types of robots. As from 2001, data exclude dedicated robots, except for dedicated machining robots. As from 2001, Japanese statistics are therefore much more comparable with those of other countries.

b/ All types of industrial robots.

Figure 2. Number of robots per 10,000 persons employed in the manufacturing industry in 2002



	2001	2002
France	540	630
Germany	890	1,000
Italy	1,010	1,130
Japan	1,600	1,700
Spain	670	760
Sweden	540	570
United Kingdom	520	550
United States	690	770

Sources: UNECE and IFR.

Figure 3. Number of robots per 10,000 production workers in the motor vehicle industry, 2001 and 2002

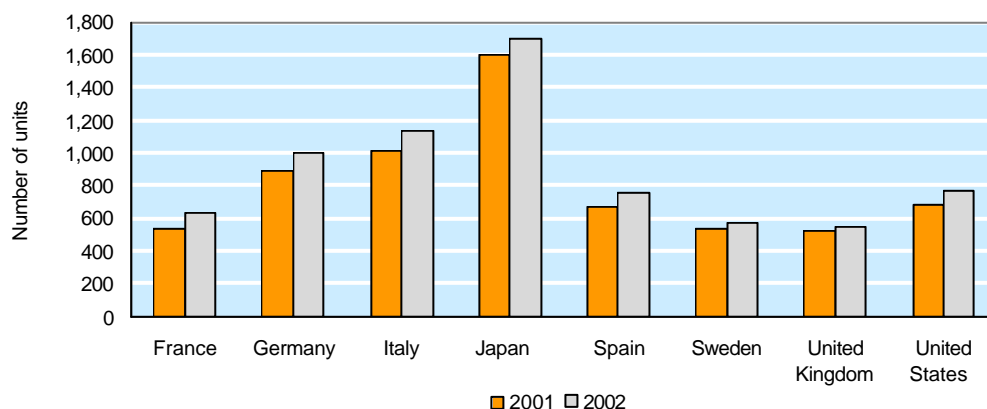
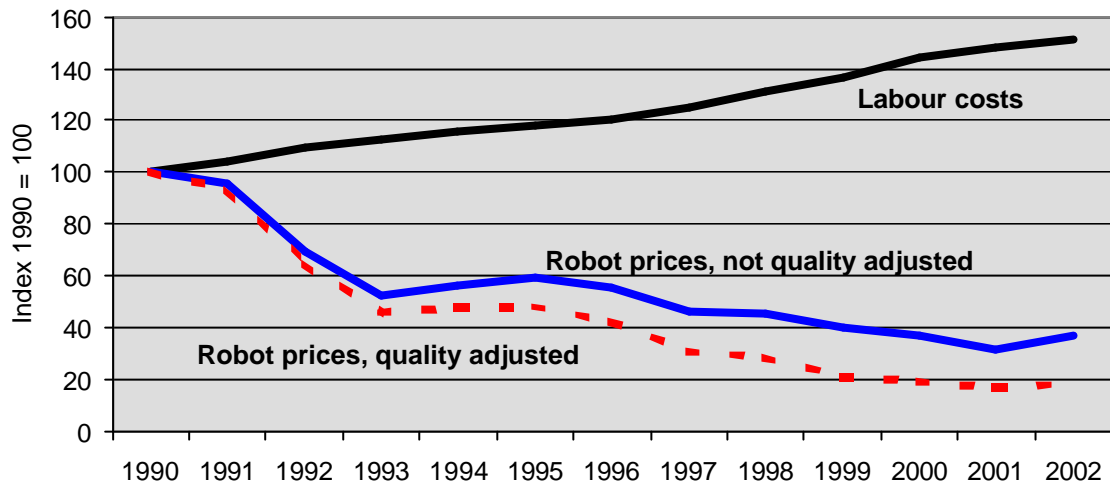
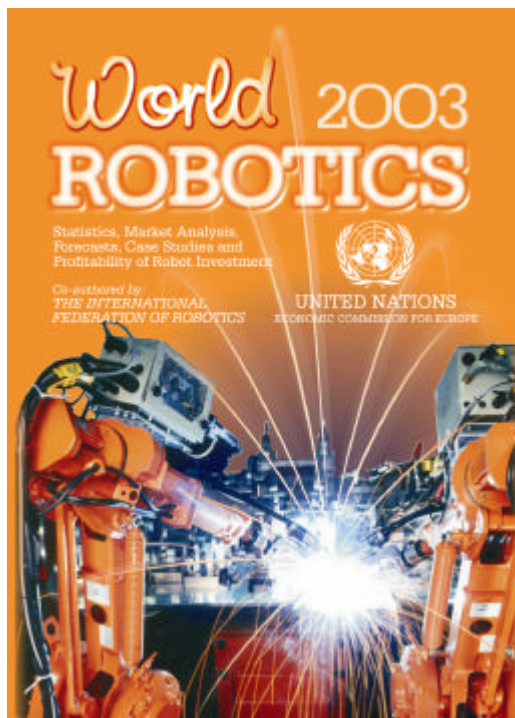


Figure 4
Price index of industrial robots in the United States, with and without quality
adjustment. Index of labour compensation in the US business sector



The publication **World Robotics 2003 – Statistics, Market Analysis, Forecasts, Case Studies and Profitability of Robot Investment** is available, quoting Sales No. GV.E.03.0.16 or ISBN No. 92-1-101059-4, through the usual United Nations sales agents in various countries or from the United Nations Office at Geneva (see address below), priced at US\$ 130:



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