

**UNECE**United Nations Economic Commission for Europe

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Geneva, 20 October 2004

## **Buoyant robot sales in North America**

### ***Robot sales jumped 28% in 2003....***

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). The recession took its toll in 2001 and 2002, when 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. This slump in robot sales was, however, temporary because in 2003 robot investment jumped by 28%.

### ***...and continued to show strong growth in the first half of 2004***

Orders from North American customers surged by 18% in the first half of 2004, compared with the same period in 2003. For the period 2004-2007, the market in North America is projected to grow by a yearly average of 6%.

### ***Over 100,000 robots in operation***

At the end of 2003, the operational robot stock in North America is estimated to have reached approximately 112,000 units, representing an increase of 7% over 2002. By the end of 2007, the stock of operational robots is estimated to reach at least 145,000 units.

### ***United States lagging behind the European Union...***

For every 10,000 persons employed in the United States manufacturing industry at the end of 2003, there were 63 industrial robots, compared with 148 in Germany and 93 in the European Union (see figure 2). In the United States motor vehicle industry there are as many as 740 robots per 10,000 production workers, but this is still far behind Japan (1,400 units), Italy (1,400 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. As from 2002, the average price started to fall, reaching \$70,000 in 2003.

Between 1990 and 2003, prices of industrial robots fell from index 100 to 44, without taking into account that robots installed in 2003 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 2003 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 156. This implies that the relative prices of robots fell from 100 in 1990 to 28 in 2003 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 \$21.66 in this period. In the food industry the corresponding hourly wages were \$9.62 and \$12.80, 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 2003 for about 50% 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 28%, followed by assembly with about 7%. 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/04/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

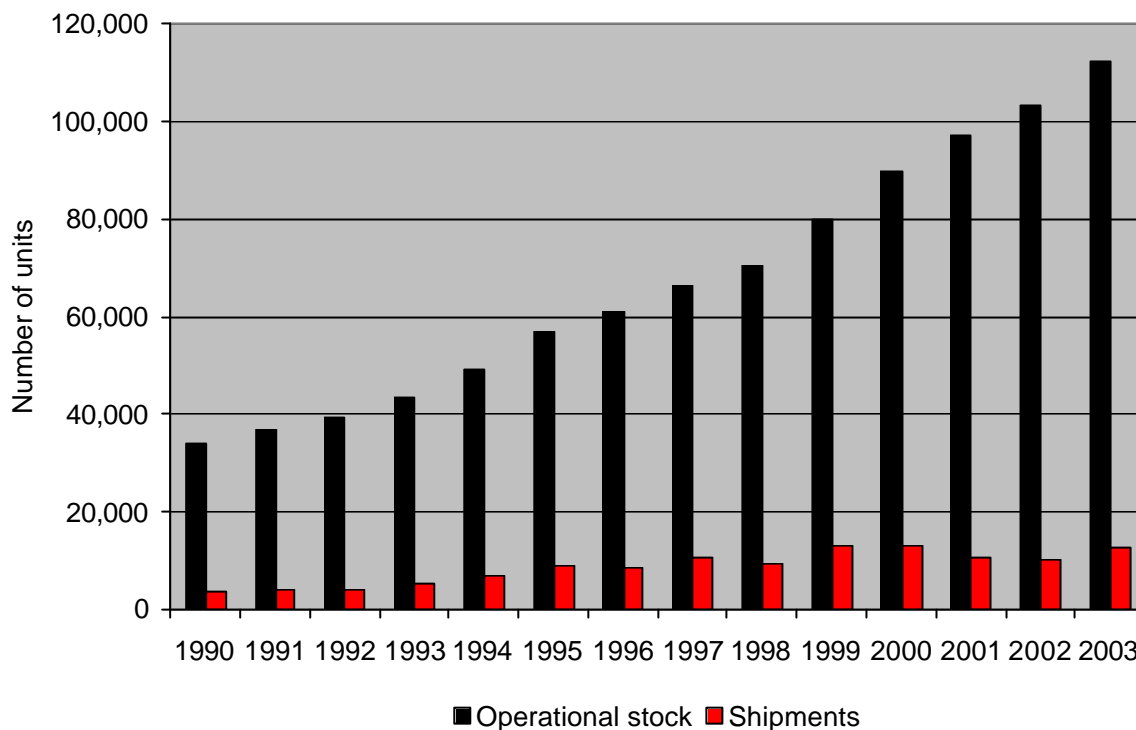
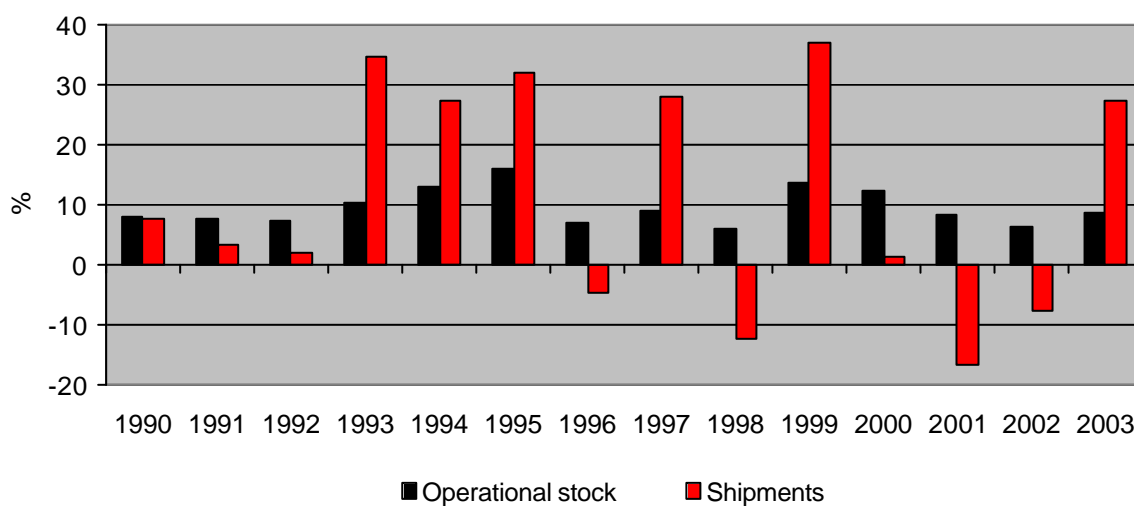


Figure 1b. Yearly percentage change in estimated operational stock and in shipments



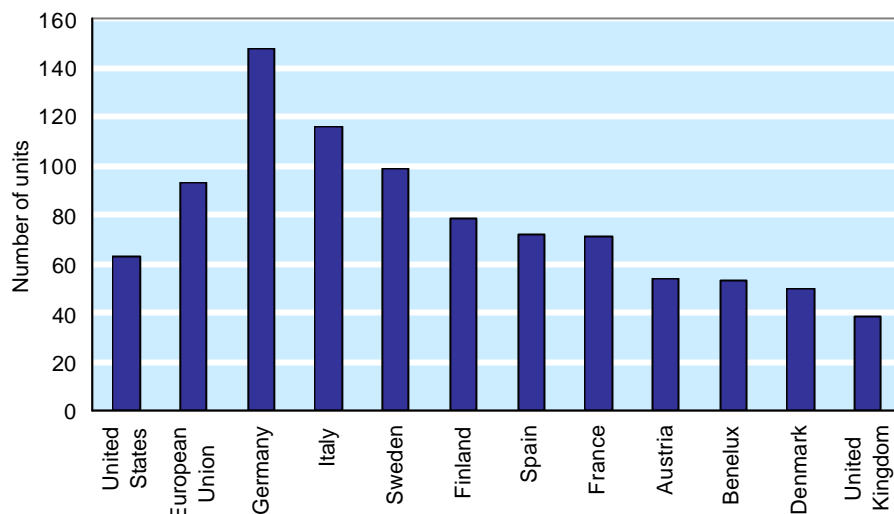
	2003
Japan a/	322
Rep. of Korea b/	138
<b>United States</b>	<b>63</b>
<b>European Union</b>	<b>93</b>
Germany	148
Italy	116
Sweden	99
Finland	78
Spain	72
France	71
Austria	54
Benelux	53
Denmark	50
United Kingdom	39
Australia	36
Norway	24
Portugal	15
Czech Rep. a/	12

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 2003



	2001	2003
France	720	910
Germany	760	1,000
Italy	1,040	1,400
Japan	1,300	1,400
Spain	650	800
Sweden	560	560
United Kingdom	580	660
United States	640	740

Sources: UNECE and IFR.

Figure 3. Number of robots per 10,000 production workers in the motor vehicle industry, 2001 and 2003

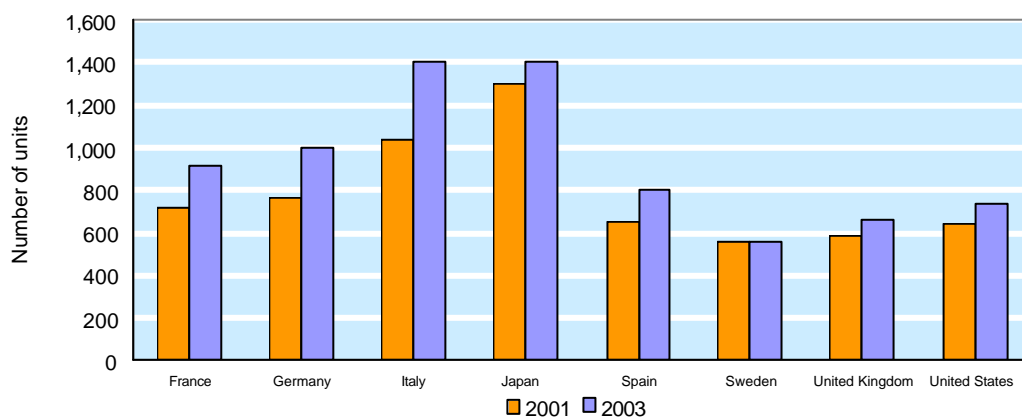
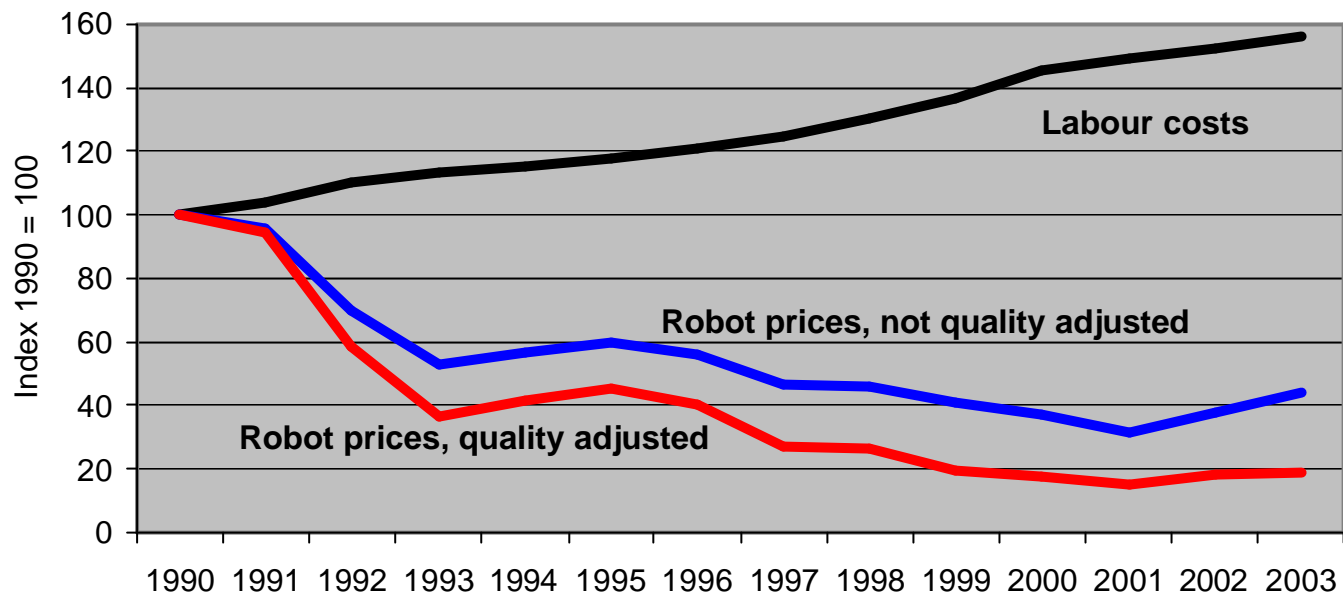
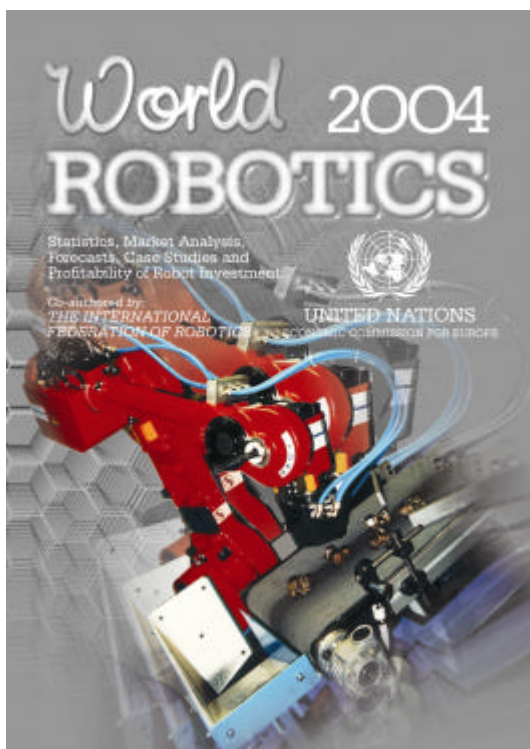


Figure 4.  
Price index of industrial robots in the United States, with and without quality  
adjustment. Index of labour compensation in the US business sector



The publication **World Robotics 2004 – Statistics, Market Analysis, Forecasts, Case Studies and Profitability of Robot Investment** is available, quoting Sales No. GV.E.04.0.20 or ISBN No. 92-1-101084-5, through the usual United Nations sales agents in various countries or from the United Nations Office at Geneva (see address below), priced at US\$ 150:



**Sales and Marketing Section  
United Nations**

Palais des Nations  
CH - 1211 Geneva 10, Switzerland

Phone: +41(0)22 917 26 00 / 26 14

Fax: +41(0)22 917 00 27

E-mail: [unpubli@unog.ch](mailto:unpubli@unog.ch)

For more information about the publication, please contact:

Mr. Jan Karlsson  
Statistical Division  
United Nations Economic Commission  
for Europe (UNECE)  
Palais des Nations  
CH - 1211 Geneva 10, Switzerland

Phone: +41(0)22 917 32 85  
Fax: +41(0)22 917 00 40  
E-mail: [jan.karlsson@unece.org](mailto:jan.karlsson@unece.org)

or: International Federation of Robotics (IFR)  
Statistical Department  
c/o VDMA Robotics+Automation  
Lyoner Str. 18  
D – 60528 Frankfurt am Main  
Germany

Phone: +49 (69) 6603 1502  
Fax: +49 (69) 6603 2502  
E-mail: [gudrun.litzenberger@vdma.org](mailto:gudrun.litzenberger@vdma.org)