

R&D in the business enterprise sector 1989

January 1991

Growth in R&D slowing down

A 4 per cent increase in R&D man-years

Finnish companies performed 14,526 research and development man-years in 1989, which represents an annual growth rate of approx. 4 per cent from 1987 to 1989. The annual growth rate of R&D man-years from 1985 to 1987 was approx. 6 per cent. The growth rate of R&D man-years has returned to the level of the mid-1970s. During the period from 1979 to 1989, growth in R&D man-years was fastest between 1983 and 1985, when the annual growth rate was nearly 12 per cent.

Companies spent FIM 5.5 billion on R&D

Corporate R&D expenditure relative to GDP grew steadily over the 1980s, rising from 0.86 per cent in 1984 to 0.92 per cent in 1985, 1.02 per cent in 1987 and 1.10 per cent in 1989.

Greater Helsinki's R&D expenditure down relative to the total for the economy

Greater Helsinki, where R&D is concentrated, accounted for 35.6 per cent of total R&D expenditure in Finland. This represents a fall of approx. 2.7 percentage points from 1987 to 1989. The combined proportion of total corporate R&D expenditure accounted for by the provinces of Uusimaa, Turku-Pori and Häme was 81 per cent in 1985, 80 per cent in 1987 and 76 per cent in 1989. In the developing provinces, growth was fastest in the provinces of Kymi and Oulu. Much of the growth in the former was due to an exceptionally heavy investment programme.

Figure 1. R&D man-years 1979-1989

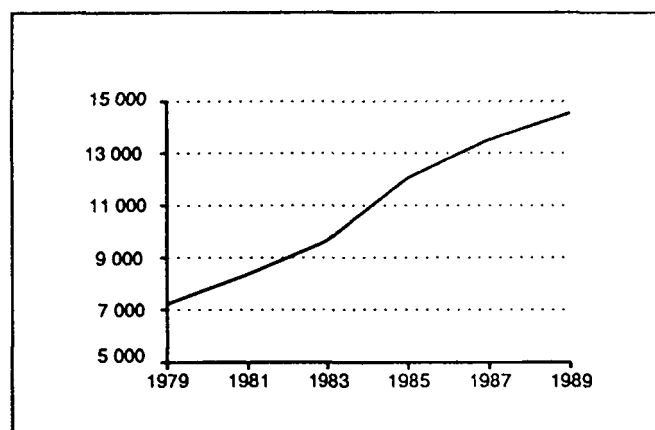


Table 1. R&D expenditure by province 1985-1989

Province	1985	1987	1989
	%	%	%
Uusimaa	53.0	50.8	50.7
- of which: Greater Helsinki 1)	..	38.3	35.6
Turku - Pori	17.1	17.1	14.0
Åland	0.0	0.0	0.0
Häme	11.1	11.9	11.3
Kymi	3.7	3.9	6.0
Mikkeli	1.0	0.9	1.4
Northern Karelia	0.6	0.7	0.6
Kuopio	1.3	1.7	1.8
Central Finland	3.7	3.4	3.3
Vaasa	3.8	4.4	4.6
Oulu	3.7	4.1	5.3
Lapland	1.0	1.1	1.0
Total (%)	100.0	100.0	100.0
(FIM million)	3 082	4002	5 499

1) Helsinki, Espoo, Vantaa and Kauniainen

Distribution of R&D expenditure unchanged across product groups

No significant changes occurred in the distribution of R&D expenditure across different product groups between 1987 and 1989. Electrical products continued to be the largest group. Machinery and equipment suffered a loss of two percentage points.

R&D expenditure's relative contribution to value added in production on the increase

The relative contribution of corporate R&D expenditure to value added in production has been growing steadily, from 3.0 per cent in 1985 to 3.7 per cent in 1987 and 4.2 per cent in 1989.

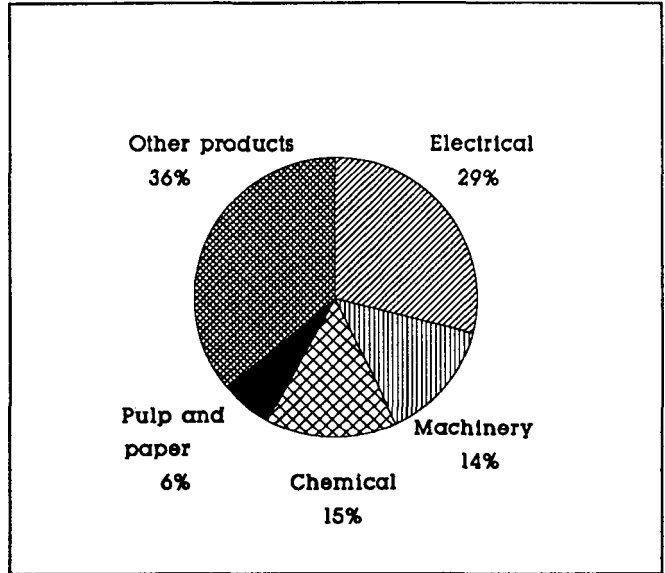
Slight increase in the number of companies engaging in R&D

The number of companies engaging in R&D rose by 32 from 1987 to 1989. In 1989, a total of 1,004 companies reported as engaging in R&D. The annual increase in the number of these companies has slowed since the mid-1980s.

Slight increase in the proportion of university graduates among R&D staff

The proportion of those with a doctor's degree or a licentiate among corporate R&D staff increased from 1987 to 1989. In 1987, the proportion of staff with a doctor's degree was 1.6 per cent and that of staff with a licentiate 1.9 per cent. The corresponding figures for 1989 are 1.9 per cent and 2.3 per cent. In 1989, about 35 per cent of R&D staff were university graduates. In 1985 and 1987, the cor-

Figure 2. R&D expenditure by product group 1989



responding figures were 32 per cent and 34 per cent. The proportion of women among university graduates grew by about three percentage points from 1987 to 1989, or to a total of approximately one-fifth.

Among R&D staff, the proportions of engineers and technicians graduated from technical institutes remained virtually unchanged from 1987 to 1989. The category "other vocational education" covered about one-fifth of R&D staff in 1989. About 5 per cent had received no vocational education.

Figure 3. Women as a proportion of R&D staff by education 1989

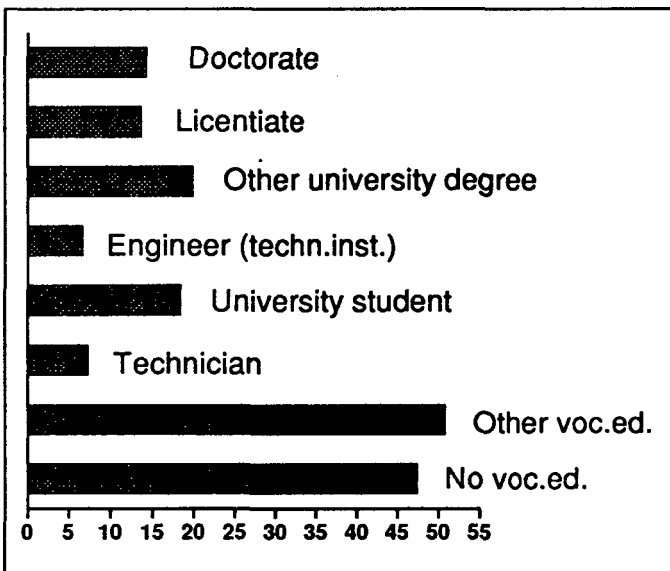
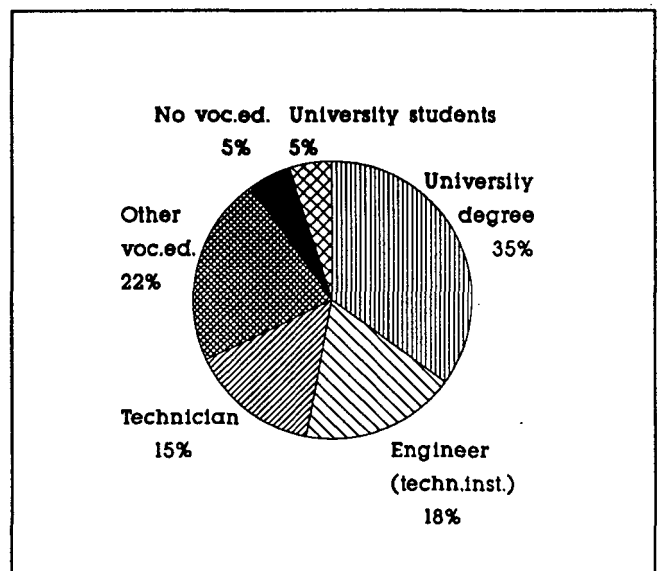


Figure 4. R&D staff by educational structure 1989



**Table 2. R&D in Finnish business enterprise sector in Finland
Data on staff, man-years and expenditure in 1989**

Main activity of unit	R&D staff		R&D man-years		Expenditure on unit's own R&D		Number of units
	Total	Females	Total	Proportion FIM acc. for by univ. grad. (%)	million	Prop. of external funding (%)	
Companies, total	18605	4455	14526	35	5499	9	1200
Agriculture, forestry and fishing	53	11	40	27	13	23	14
Mining and quarrying	28	20	31	37	10	20	5
Manufacturing, total	14242	3489	11759	34	4281	7	814
Food, beverages, tobacco	867	532	721	46	252	3	58
Textiles	138	77	87	30	28	11	28
Clothing, leather products, footwear	50	11	23	14	6	0	16
Wood products, excl. furniture	282	92	188	29	80	4	39
Pulp, paper, paper products	961	346	712	39	249	4	32
Publishing and printing	28	6	14	36	6	17	13
Furniture	139	11	80	14	22	5	32
Chemicals	967	459	922	32	426	1	12
Chemical, oil and coal products	1648	862	1537	43	487	5	30
Rubber and plastics products	276	43	164	24	84	2	32
Glass, clay and stone products	434	77	339	36	149	3	30
Metals	243	19	212	65	100	6	15
Metal products	353	24	250	15	81	16	77
Machinery and equipment	2196	212	1667	29	676	8	164
Electrical products, instruments	4684	659	4104	34	1418	9	162
Vehicles	831	48	656	21	193	15	41
Other products	145	11	83	16	24	8	33
Energy and water supply	720	161	408	30	246	12	22
Construction	195	18	110	35	47	4	31
Wholesale and retail trade	266	43	163	28	55	20	67
Transport	285	47	186	55	84	2	5
Finance and insurance	82	23	50	45	16	19	6
Business services	1897	305	1076	42	477	14	200
Education and research	667	297	589	37	196	44	16
Other public services	170	41	114	55	74	7	20



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The data in this publication are derived from a Central Statistical Office questionnaire filled out by companies. More details appear from the set of statistical tables compiled on corporate research and development in Finland (product no. 9651).

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