

# Research and Development in Finland 1987

28.3. 1989

## R&D expenditure 1.7% of GDP

R&D expenditure in 1987 was about FIM 6 790 million or 1.7% of GDP at market prices. The corresponding figure for 1983 was 1.3%.

As a proportion of GDP R&D expenditure has been growing steadily during the eighties, but is still considerably smaller than, for instance, in Sweden or in the Federal Republic of Germany. Of the Nordic countries, Norway is near the Finnish level.

## Growth most rapid in enterprises

R&D expenditure at constant prices increased on the average by 10% per year from 1983 to 1987. The increase was most rapid in enterprises, about 11%. The increase in public sector R&D expenditure was slightly below 9%, the increase in universities' R&D expenditure slightly above 9%.

The fast increase in corporate R&D is shown by the growth of corporate R&D expenditure to 59% of total R&D expenditure, which is 2 percent units higher than in 1983. The share of higher education is for the first time bigger than that of the public sector.

## 26 200 R&D man-years performed

The average annual growth in R&D man-years from 1983 to 1987 was 7%. The growth was 9% in enterprises, 4% in the public sector and 5% in higher education sector.

Figure 1. R&D expenditure as a proportion of GDP 1987

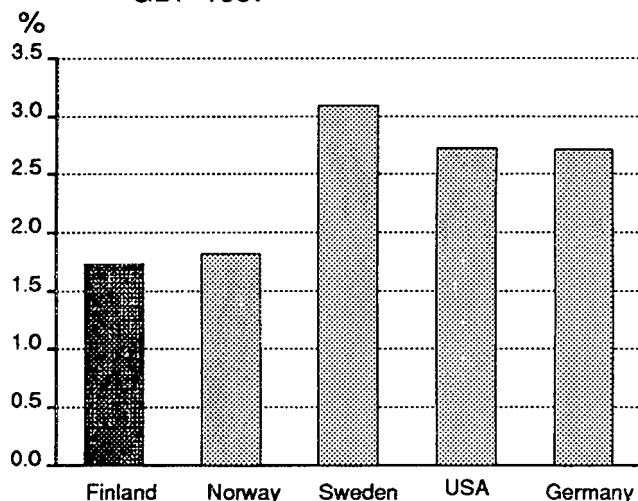
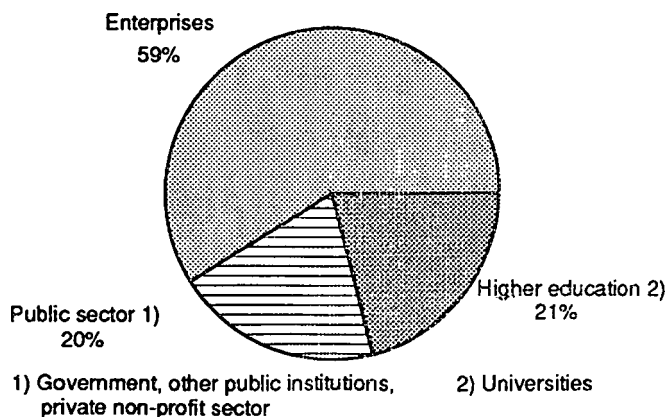


Figure 2. R&D expenditure by sector in 1987



## The role of the public sector in the financing of R&D has declined during the eighties

As can be seen from Table 1, the relative contribution of enterprises to the financing of R&D has increased while that of the public sector has declined during the eighties.

## Regional concentration in R&D

In all the three sectors, R&D is concentrated in the province of Uusimaa, especially the Helsinki region. Uusimaa accounts for over half of R&D expenditure.

There is most concentration in the public sector, least in higher education sector. This is explained partly by the relatively high level of universities R&D expenditure in the province of Oulu and by the relatively modest level of public sector R&D expenditure in the province of Turku and Pori.

## Half of persons holding post-graduate degrees employed in R&D

Of all holders of Ph.D. or licentiate degrees aged under 65, about half were engaged in R&D. Of them, 13% worked in enterprises, 19% in the public sector and 68% in universities.

The proportion of Ph.D.s and licentiates in R&D personnel was greatest in higher education and smallest in enterprises. On the other hand, the proportion of college engineers and technicians in R&D personnel was bigger in enterprises than in the public sector or in higher education.

## Nearly 900 FIM million in special government appropriations for R&D projects

In the Government budget for 1987 FIM 894 million was allocated for specific R&D projects. Of this amount, 36% was aimed at enterprises, 27% at universities, 23% at the public sector. The remaining 14% went to various private non-profit organisations, individual researchers and for international R&D co-operation.

Table 1. Financing of R&D 1981-1987

Provider of financing	1981	1983	1987
	%	%	%
Enterprises	52	56	59
Public sector <sup>1)</sup>	46	42	38
Other	2	2	3

1) including loans by the Technological Development center and financing from general university funds

Table 2. R&D expenditure by province and sector 1987

Province	Enterprises	Public sector	Higher education	All
	%	%	%	%
Uusimaa	67.0	42.6	52.4	
-of which				
Helsinki area <sup>1)</sup>	39.5	65.4	42.5	45.4
Turku and Pori	17.1	2.3	14.8	13.6
Åland	0.0	0.2	-	0.0
Häme	11.8	13.7	11.5	12.2
Kymi	3.9	0.4	2.4	2.9
Mikkeli	0.9	0.6	0.4	0.7
Northern Karelia	0.7	1.6	2.7	1.3
Kuopio	1.6	1.9	4.5	2.3
Central Finland	3.4	2.5	6.1	3.7
Vaasa	4.4	1.1	1.1	3.0
Oulu	4.1	4.6	12.8	6.0
Lapland	1.0	3.0	1.1	1.5
Unspecified	0.3	1.1	0.0	0.4
Expenditure (FIM million)	4002	1389	1401	6792
Proportion (%)	59	20	21	100

1) Helsinki, Espoo, Vantaa, Kauniainen

Figure 3. R&D personnel by sector and level of education

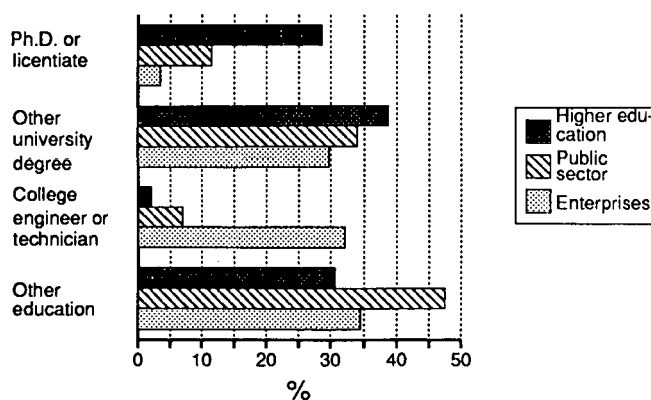


Table 3. Research and development 1983 and 1987

Sector	R&D man-years			R&D expenditure		
	1983	1987	Average annual change	1983	1987	Average annual real change
			%	FIM mill.	FIM mill.	%
Enterprises	9 660	13 514	9	2 060	4 002	11
Public sector 1)	5 075	6 015	4	791	1 389	9
Higher education	5 483	6 698	5	775	1 401	9
<b>Total</b>	<b>20 218</b>	<b>26 227</b>	<b>7</b>	<b>3 626</b>	<b>6 792</b>	<b>10</b>

Table 4. R&amp;D by source of financing and by sector in 1983 ja 1987

Sector	Source of the fund							Total
	Enterprises	Public sector	Appropriations for universities	Universities	Funds, foundations, foreign sources	Imputed pension costs		
	Milj.mk							
Enterprises	1983	1 906	136	-	-	18	-	2 060
	1987	3 795	185	-	-	22	-	4 002
Public sector 1)	1983	87	616	-	-	32	56	791
	1987	145	1 115	-	-	40	89	1 389
Higher education	1983	22	184	486	-	22	61	775
	1987	54	368	790	37	58	94	1 401
Total	1983	2 015	936	486	-	72	117	3 626
	1987	3 994	1 668	790	37	120	183	6 792
Average annual real change (%)		12	9	7	-	7	6	10

1) Government, other public institutions, private non-profit institutions



# RESEARCH AND DEVELOPMENT IN FINLAND 1987

SVT Suomen Virallinen Tilasto  
Finlands Officiella Statistik  
Official Statistics of Finland

Central Statistical  
Office of Finland

Education and research  
1989:5

**Enquiries:**

Central Statistical Office of Finland  
P.O. Box 504  
SF-00101 Helsinki  
Phone internat. +358 0 173 41

Mikael Åkerblom  
Ari Leppälahti  
Markku Virtaharju

The data in this publication derive from a Central Statistical Office questionnaire sent to enterprises, public bodies and universities, and from other sources of higher education data. Detailed definitions and results are presented in the appendix table on research and development 1987 (available in Finnish only).

## SCIENCE AND TECHNOLOGY (Publications in English)

Education and  
research series      1989:1 R&D in the Business Enterprise Sector  
                                 1989:5 Research and Development in Finland 1987

Science and Technology 1989

*Julkaisujen myynti:*

*Försäljning:*

*Hinta – Pris*

Tilastokeskus  
PL 504  
00101 Helsinki  
Puh. (90) 173 41

Statistikcentralen  
PB 504  
00101 Helsingfors  
Tel. (90) 173 41

20 FIM

ISSN 0784-8242  
= Koulutus ja tutkimus  
ISSN 0786-5481