2 The structure of the ICT sector in the Nordic Countries

2.0 Introduction

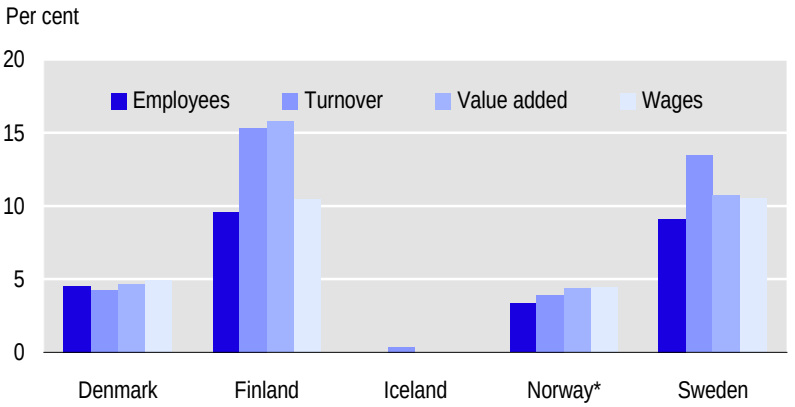
This chapter gives a description of the overall economic importance of the ICT sector in the Nordic countries measured by the number of employees, turnover, value added and wages. The ICT sector is cross-cutting by definition, as the sector includes both manufacturing and services activities. As the statistics are not cross-cutting in coverage in all Nordic countries the manufacturing and the services part of the ICT sector are analysed separately in order to be able to make comparisons across countries.

The aim of this project is to present statistics on a homogeneous basis, but this is not always possible to achieve due to the use of already existing statistics and registers. In this publication "employment" is one of the variables operating with different definitions: As far as Denmark and Sweden are concerned, employment is calculated in number of full time employees, i.e. excluding personal owners of enterprises. Finnish data is calculated as full time persons employed, including personal owners of enterprises, whereas employment in the case of Iceland and Norway is calculated as number of employed persons. For that reason the results in this sub-chapter have to be interpreted with caution. For reasons of simplicity the wordings "employees" or "employment" are used through-out this chapter.

Based on the figures from the ICT manufacturing and the ICT services activities, the size of the ICT sector in all five Nordic countries can be estimated to amount to 448 000 employees in 1998 - or on average 7.9% of the total employment in the private sector[11] in the Nordic countries. Compared to an estimated share of 7.1% in 1994 the sector has experienced a relatively larger growth than the private sector as such in the middle of the nineties. 30% were employed within ICT manufacturing industry, whereas ICT consultancy services is the second largest single sub-sector within the Nordic ICT sector with 29% of the total employment within ICT. Wholesale represents 22% and Telecommunications 18% of the total employment in 1998 in the Nordic ICT sector.

[11] Cf. note 10 in chapter 1 and definition in annex III.

Figure 2.1 ICT manufacturing industry in per cent of total manufacturing industry. 1998



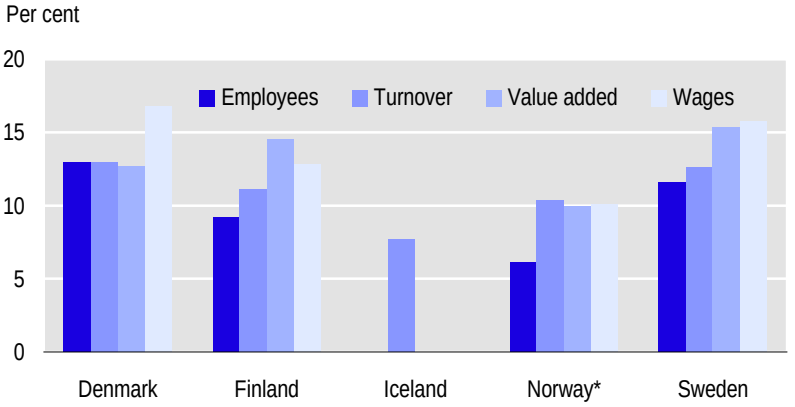
* Norway: employed persons

Especially in *Finland* and *Sweden* the *ICT manufacturing sector* is of major economic importance, as the ICT manufacturing sector in these two countries constitute almost 10% of the number of employees and 13-15% of turnover in 1998, cf. figure 2.1. In the three other Nordic countries the ICT manufacturing sector is of less importance, representing less than 5% of employment as well as turnover in the manufacturing sector in 1998. One of the explanations of this pattern is that the Finnish and Swedish ICT manufacturing sector include large groups of enterprises as Nokia and Ericsson.

The national importance of the *ICT services sector* shows a somewhat different picture with less significant differences between the countries. Especially in *Denmark* and *Sweden* the ICT services sector is important, employing 12-13% of the total number of employees and constituting a similar share of the turnover of the services sector in 1998. In Finland the ICT services sector represents 9% of employees and 11% of turnover, whereas the Norwegian ICT services sector constitutes 6% of the employed persons and 10% of the turnover in the services sector in 1998. In Iceland the ICT services sector accounts for 8% of the turnover of the services sector in 1998.

The overall pattern shows that the ICT sector, including both manufacturing and services, is of largest economic importance in Finland and Sweden, where it represents more than one fourth of the total turnover in the private sector. Measured by its share of the employment, the ICT sector is most important in Sweden, followed closely by Finland, Denmark and Norway.

Figure 2.2 ICT services activities in per cent of total services activities. 1998



* Norway: employed persons

2.1 Employment in the ICT sector

This sub-chapter analyses the employment within the ICT sector in more details, breaking down employment into more detailed groups of activities in order to get a better understanding of the national structure of the sector and the possible differences. The development of the ICT sector in the mid-nineties is also described, whereas the last part focuses on the concentration ratio in the sector compared to the economy in general.

The ICT sector is characterised by a rapid growth in employment - also compared to the economy in general, cf. table 2.1. In all Nordic countries the employment in the ICT sector has been growing faster in the observed period than the private sector in general - with the ICT manufacturing industry being the only exception. The job creation in the *ICT manufacturing industry* has been of similar magnitude as the growth of employment in the total private sector in Denmark and Norway, whereas the growth of the Finnish and Swedish ICT manufacturing industries has been faster than the growth of the private sector, and in Finland even exceeding the growth of the ICT services activities.

Table 2.1 Employment in ICT sector 1993-98. Index figures[12]

	ICT manufacturing industry	ICT services			Total ICT services	Total private sector*
		Wholesale	Telecommunications	Consultancy services		
	1995=100					
Denmark						
1993	96	90	87	122	99	94
1994	95	94	100	95	96	96
1995	100	100	100	100	100	100
1996	102	99	116	108	106	101
1997	101	106	105	117	109	103
1998	99	114	127	135	124	106
Finland						
1994	79	88	95	89	91	96
1995	100	100	100	100	100	100
1996	109	109	102	107	106	103
1997	119	119	107	116	114	108
1998	130	122	115	143	127	113
Norway						
1995	100	100	100	100	100	100
1996	103	103	104	113	106	102
1997	110	94	107	150	114	106
1998	111	99	107	173	124	110
Sweden						
1993	90	89	105	81	91	93
1994	94	93	106	87	95	97
1995	100	100	100	100	100	100
1996	101	102	111	115	110	102
1997	107	116	116	130	121	108
1998	119	122	106	153	129	112

Iceland: No data available

* NACE 15-37,45, 50-74, 92, 93

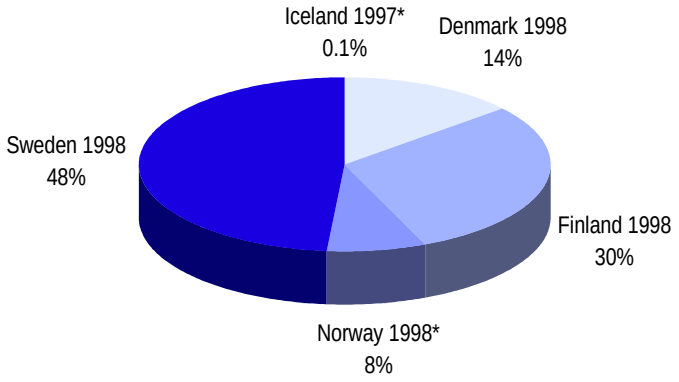
[12] It should be stressed that changes in the classification of enterprises from one year to the other can influence the observed figures in the time serie

The *ICT services sector* has seen a more rapid increase in employment in all the Nordic countries than the private sector in general, which to a very large extent is due to a very high growth rate of the employment in *ICT consultancy services*. In Denmark and Norway the *Telecommunications* sector has had a relatively larger growth rate than *ICT wholesale*, whereas the opposite situation applies to Sweden and Finland. This might be explained by the fact that the growth period of the Telecommunications sector in Sweden and Finland has set off earlier than the period observed.

2.1.1 Employment in the ICT manufacturing industry

The *ICT manufacturing industries* employed 135 500 employees in 1998 in all five Nordic countries, of which nearly half (48%) in the Swedish ICT manufacturing industry, 30% in the Finnish ICT manufacturing industry, 14% in the Danish ICT manufacturing industry, 8% in the Norwegian ICT manufacturing industry and 0.1% in the Icelandic ICT manufacturing industry, cf. figure 2.3.

Figure 2.3 Employment in the ICT manufacturing industry in the Nordic countries



* Iceland and Norway: employed persons

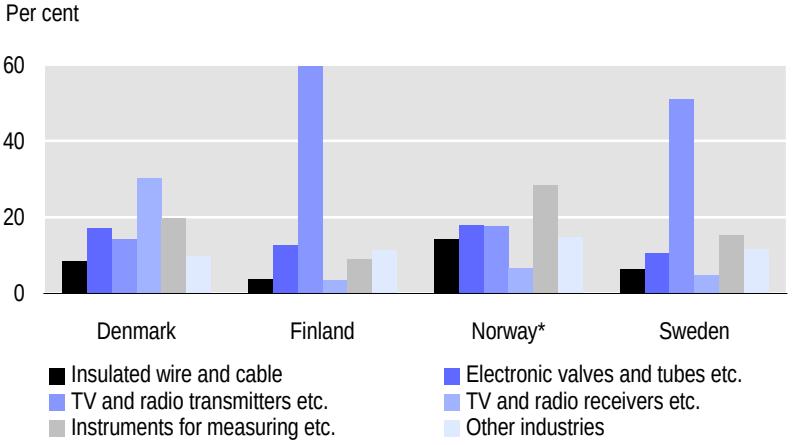
The ICT manufacturing industry consists of 8 manufacturing activity classes, whose importance varies between the Nordic countries[13], cf. figure 2.4. At the Nordic level *Manufacture of television and radio transmitters and apparatus for line telephony* (NACE 3220) is by far the largest industry with 62 000 employees in 1998, and thus representing 46% or nearly half of the employees in the Nordic ICT manufacturing sector in 1998. The second largest industry is *Manufacture of instruments and appliances for measuring, checking, testing etc.* (NACE 3320) with

[13] No breakdown for Iceland is possible.

20 500 employees or 15% of the employees in the ICT manufacturing sector.

At the national level there are significant differences between the countries. In *Denmark* nearly one third of the employees in the ICT manufacturing sector is employed within *Manufacture of television and radio receivers etc.* (NACE 3230). In no other Nordic countries this industry reaches the same relative size - the second largest share is found in Norway (7%). *Manufacture of instruments and appliances for measuring, checking, testing etc.* is the second largest industry, employing 20% of the employees within ICT manufacturing. Compared to the Swedish and especially the Finnish ICT manufacturing sector, the Danish ICT manufacturing sector is less specialised.

Figure 2.4 Employment in ITC manufacturing industries (NACE classes). 1998



* Norway: employed persons

Finland can be characterised as having the most specialised ICT manufacturing industry of all the Nordic countries. *Manufacture of television and radio transmitters and apparatus for line telephony* is the dominant industry where 60% of the total employment in the ICT manufacturing sector is found. As a consequence of this all other industries are of minor importance, with *Manufacture of electronic valves and tubes etc.* (NACE 3210) being the second largest industry, representing 13% of the employment.

In *Norway Manufacture of instruments and appliances for measuring, checking, testing etc.* is the largest ICT manufacturing industry with 28% of the employees. The two second largest industries are *Manufacture of electronic valves and tubes etc.* and *Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy* (each 18%). *Manufacture of insulated wire and cable* (NACE 3130) plays a

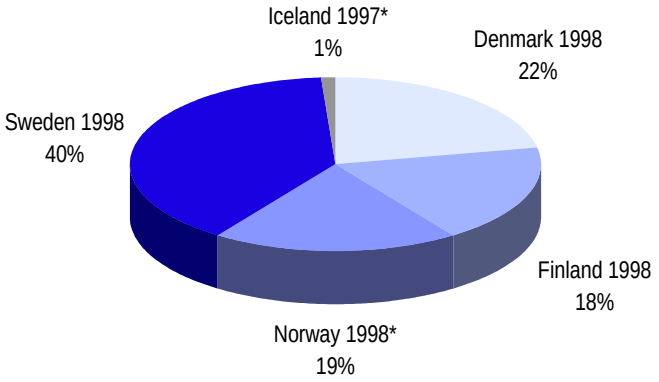
larger role in the Norwegian ICT manufacturing sector than in any other Nordic country as the industry constitutes 14% of the employment. By its employment structure, Norway is - together with Denmark - characterised by having the least specialised ICT manufacturing industry of the Nordic countries.

In *Sweden* the ICT manufacturing sector is the largest in the Nordic countries constituting 65 800 employees or 49% of the total employment in the Nordic ICT manufacturing industry. *Manufacture of television and radio transmitters and apparatus for line telephony* is almost as dominant as in Finland, as 51% of the employment in the ICT manufacturing industry is found within this industry. The second largest industry is *Manufacture of instruments and appliances for measuring, checking, testing etc*. representing 15% of the employment.

2.1.2 Employment in the ICT services sector

The *ICT services sector* employed 312 500 employees in 1998 in the Nordic countries, of which 40% in the Swedish ICT services sector, 22% in the Danish ICT services sector, 19% in the Norwegian ICT services sector, 18% in the Finnish ICT service sector, and less than 1% in the Icelandic ICT services sector, cf. figure 2.5.

Figure 2.5 Employment in the ICT services sector in the Nordic countries

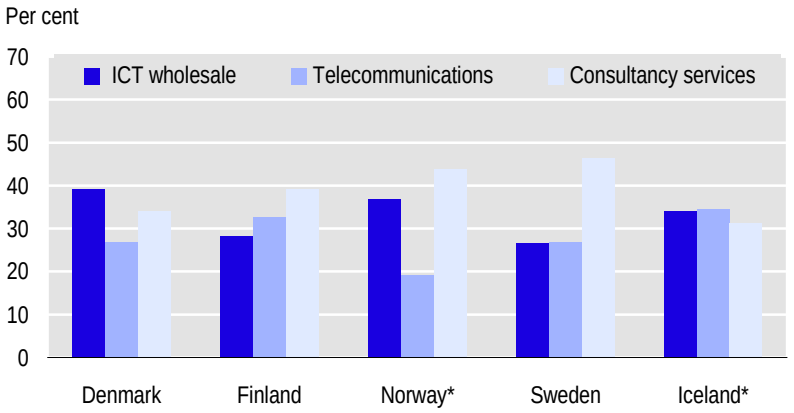


* Iceland and Norway: employed persons

Like the ICT manufacturing sector, the ICT services sector shows a somewhat different structure from one country to another, even though the variations between the Nordic countries are less significant than in ICT manufacturing, cf. figure 2.6. In general *ICT consultancy services* is the largest services sub-sector in the Nordic countries, representing nearly

130 400 employees or 42% of the total employment in the ICT services sector in 1998. With 99 100 - or 32% of the employees - *ICT Wholesale* is the second largest ICT services sub-sector. *Telecommunications* constitutes the last 26% of the employment at the Nordic level having almost 83 000 employees in 1998.

Figure 2.6 Employment in ICT services. 1998



* Iceland and Norway: employed persons
* Iceland data for 1997

In *Denmark* ICT wholesale activities account for the largest share (39%) of the ICT services sector employment in 1998, followed by ICT consultancy services (34%). Denmark is the only Nordic country where ICT wholesale constitutes the largest share of the employment in ICT services. Telecommunications represents the last 27% of the employment. None of the sub-sectors is significantly dominant compared to the other Nordic countries.

Iceland is the only Nordic country where Telecommunications is the dominant ICT services sub-sector measured by its employment. A little more than one third of the employment is related to this sub-sector. The Icelandic ICT services sector is characterised by a nearly even distribution of the employment between the sub-sectors.

In *Finland* ICT consultancy services is the largest ICT services sub-sector, representing 39% of the employees in 1998. Telecommunications is the second largest sub-sector with 18 600 or one third of the employees. Like the Danish ICT services sector, none of the sub-sectors are especially dominant.

Norway is dominated by ICT consultancy services, which represents nearly half (44%) of the employment in ICT services. At the same time Telecommunications constitutes the lowest share of ICT services in any

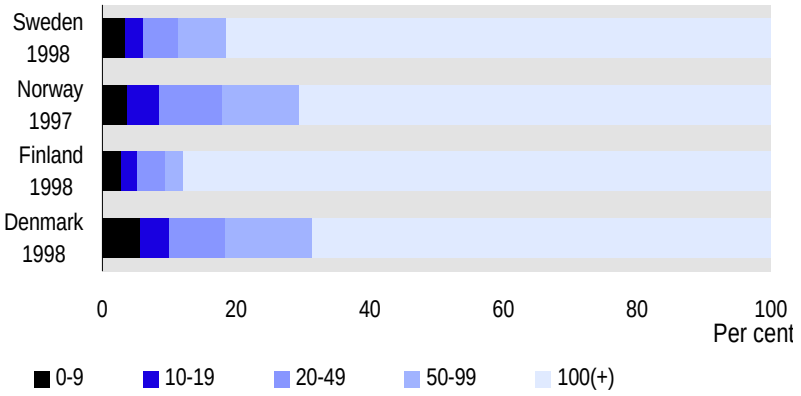
of the Nordic countries, as only 19% of the employment is related to this sub-sector.

In *Sweden* the ICT services sector is even more dominated by ICT consultancy services than in Norway as the employment constitutes 46% of the employment in the ICT services sector in 1998. The sub-sector represents a little more than 18% of all employees in the Nordic ICT services sector. ICT wholesale and Telecommunications each account for 27% of the employees.

2.1.3 Concentration in the ICT sector

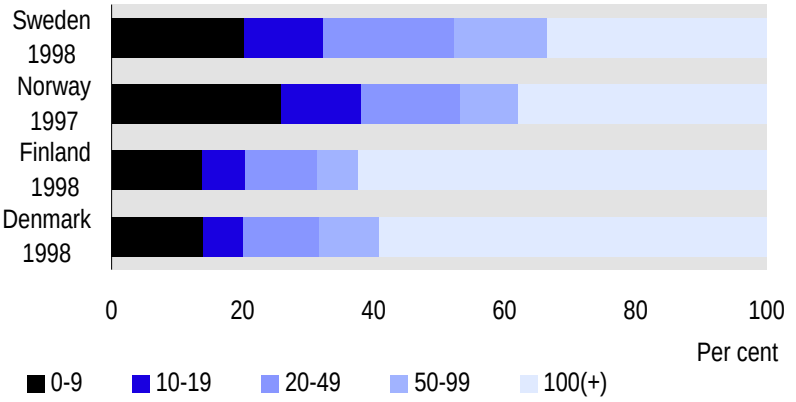
The ICT sector is more concentrated than the private sector in general[14], which goes for the ICT manufacturing sector as well as the ICT services sector. Especially in Finland and Sweden the ICT manufacturing sector is highly concentrated, cf. figure 2.7. In Finland 88% and in Sweden 82% of the employment in the ICT manufacturing sector is concentrated in enterprises with 100 or more employees. This level of concentration is higher than the average in manufacturing industry, which amounts to about two thirds of the total employment in both countries. Compared to this, the level of concentration in Denmark and Norway is significantly smaller, comprising a little more than two thirds in both countries. Never the less the relatively smaller concentration ratio still exceeds the average of the private sector.

Figure 2.7 Employment in ICT manufacturing industry by enterprise size classes



[14] Data for Iceland is not available.

Figure 2.8 Employment in ICT services by enterprise size classes



The employment in the Danish ICT sector is more concentrated than in the private sector in general. In the *ICT manufacturing sector* 69% of the persons are employed in enterprises with 100 or more employees, cf. table 2.2, whereas the similar share of the Manufacturing industries in general is 59%. In the *ICT services sector* this tendency is even more distinct, as 59% of the employment is concentrated in enterprises with 100 or more employees, compared to a level of 32% in the Services activities in general.

The Telecommunications sector in *Denmark* shows a concentration ratio of 92%, exceeding both the Finnish and Swedish Telecommunications sector, for which the similar shares are 89% and 42%, respectively. The lowest concentration ratio in the ICT services sector is found within the ICT consultancy services (44%), but still this ratio is much higher compared to the Services activities in general. The micro enterprises with less than 10 employees represent 23% of the employment within ICT consultancy services in Denmark, exceeding the share of micro enterprises in other ICT services sub-sectors.

Table 2.2 Employment by enterprise size class Denmark 1998

	Enterprise size class (number of employees)						Total
	0	1-9	10-19	20-49	50-99	100+	
	per cent						
ICT manufacturing industry	1	5	4	9	13	69	100
ICT services total	4	10	6	12	9	59	100
of which:							
Wholesale	2	11	8	16	11	52	100
Telecommuni-cations	0	1	1	2	4	92	100
Consultancy services	8	15	8	14	10	44	100
Total manufacturing industry	2	10	7	12	10	59	100
Total services activities	8	28	11	13	8	32	100
Total private sector*	6	23	10	13	9	39	100

* NACE 15-37, 45, 50-74, 92, 93

The employment structure in *Finland* is generally characterised by concentration of the employment in the large enterprises, and the ICT sector is even more concentrated. In ICT manufacturing 88% of the employment is found in large enterprises, against a concentration ratio of 68% in Manufacturing industries in general. The concentration ratio of the ICT services is 62%, whereas the similar rate in Services in general is 44%.

Table 2.3 Employment by enterprise size class Finland 1998

	Enterprise size class (number of employees)						Total
	0	1-9	10-19	20-49	50-99	100+	
	per cent						
ICT manufacturing industry	0	3	2	4	3	88	100
ICT services total	1	13	7	11	6	62	100
of which:							
Wholesale	0	18	11	15	7	49	100
Telecommunications	0	1	0	4	5	89	100
Consultancy services	1	20	8	14	7	50	100
Total manufacturing industry	0	9	6	9	8	68	100
Total services activities	1	30	9	10	6	44	100
Total private sector*	1	24	8	10	7	50	100

* NACE 15-37, 45, 50-74, 92, 93

The ICT manufacturing sector in *Sweden* has a concentration ratio very similar to the Finnish, whereas the ICT services sector differs from both the Danish and Finnish by the low concentration, cf. table 2.4. Only 35% of the employment in the ICT services sector is concentrated in the largest enterprises, compared to a share of 62% in the Finnish and 59% in the Danish ICT services sector. Especially the Telecommunications sector distinguishes itself by a concentration rate of employment in enterprises with 100 or more employees of only 42%. In Denmark and Finland the similar shares amount to 92% and 89%, respectively.

Table 2.4 Employment by enterprise size class Sweden 1998

	Enterprise size class (number of employees)						Total
	0	1-9	10-19	20-49	50-99	100+	
	per cent						
ICT manufacturing industry	0	3	3	5	7	82	100
ICT services total	0	20	12	20	14	35	100
of which:							
Wholesale	0	23	16	22	14	25	100
Telecommuni-cations	0	13	8	19	18	42	100
Consultancy services	0	22	12	19	12	36	100
Total manufacturing industry	0	10	7	12	12	60	100
Total services activities	0	32	15	18	11	24	100
Total private sector*	0	26	12	16	11	35	100

* NACE 15-37, 45, 50-74, 92, 93

Table 2.5 Employment by enterprise size class Norway 1997

	Enterprise size class (number of employees)						Total
	0	1-9	10-19	20-49	50-99	100+	
	per cent						
ICT manufacturing industry	0	4	5	9	12	71	100
ICT services total	0	26	12	15	9	38	100
of which:							
Wholesale	0	29	16	18	9	28	100
Telecommuni-cations	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Consultancy services	0	22	9	12	9	48	100
Total manufacturing industry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total services activities	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total private sector*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

* NACE 15-37, 45, 50-74, 92, 93

The size class structure of the ICT manufacturing industries in *Norway* is relatively close to the Danish ICT manufacturing industries with a concentration ratio of 71%, cf. table 2.5. At the same time the ICT wholesale services have the lowest concentration ratio of the four Nordic countries, while the ICT consultancy services are slightly more concentrated than the Danish consultancy services.

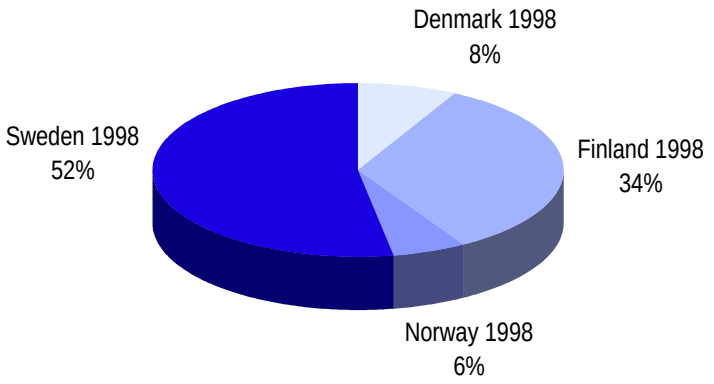
2.2 Economic information

The focus in this statistical description of the ICT sector in the Nordic countries is on the employment aspects of the ICT activities. In this sub-chapter a number of economic indicators (turnover, gross value added and wages and salaries) are presented in order to supplement the structure described in 2.1.

2.2.1 Turnover

The total turnover of the *ICT manufacturing industry* in the Nordic countries is estimated to amount to 36 billion ECU in 1998, of which the ICT manufacturing industry in Sweden accounted for 52%, followed by the ICT manufacturing industry in Finland (34%), Denmark (8%), Norway (6%) and Iceland (0.04%).

Figure 2.9 Turnover in ICT manufacturing activities in the Nordic countries

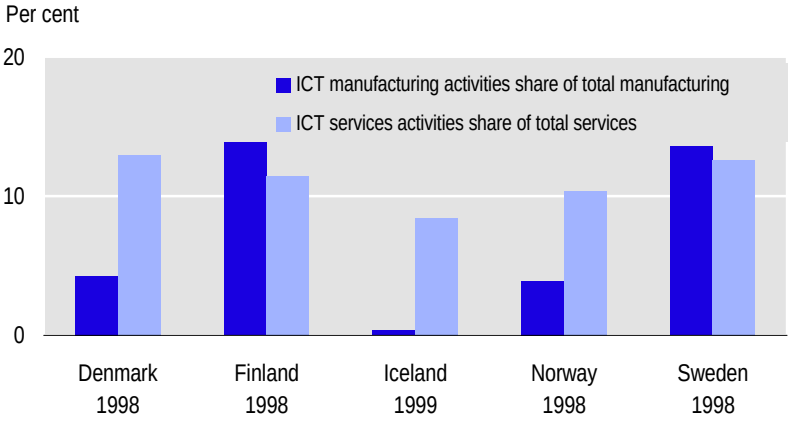


The national shares of the *ICT manufacturing industry* show a pattern similar to employment, as the ICT manufacturing industry in *Finland* shows the relatively largest share of the total turnover in manufacturing industry (15%) compared to 13% for the Swedish ICT manufacturing industry, followed by Denmark (4%), Norway (4%) and Iceland (0.4%), cf. figure 2.10.

Compared to the similar employment shares, the figures show two tendencies: for *Sweden and Finland* - the two countries with the largest ICT manufacturing sector - ICT manufacturing generates a turnover share exceeding the employment share. The opposite pattern applies to *Denmark*, *Norway* and *Iceland* with a larger share of the employment than of

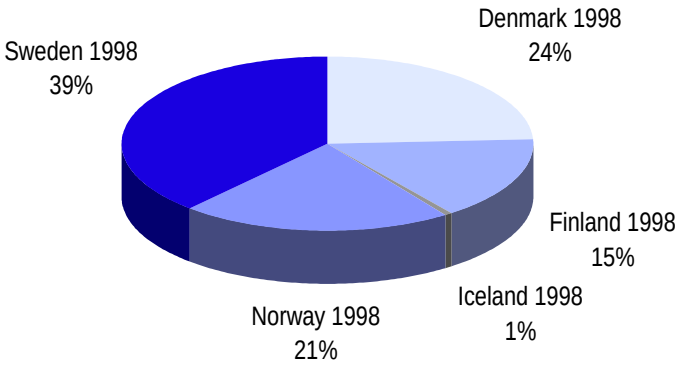
turnover, cf. table 2.1. A possible explanation is the presence of the large multinational enterprises of domestic origin in Sweden and Finland.

Figure 2.10 Share of turnover in ICT manufacturing industry and ICT services sector



The total turnover of the *ICT services sector* in the five Nordic countries is estimated to 78 billion ECU in 1998. The national distribution is not exactly the same for the ICT services, as Sweden is still representing the largest share (39%), but then followed by Denmark (24%), Norway (21%), Finland (15%) and finally Iceland (1%).

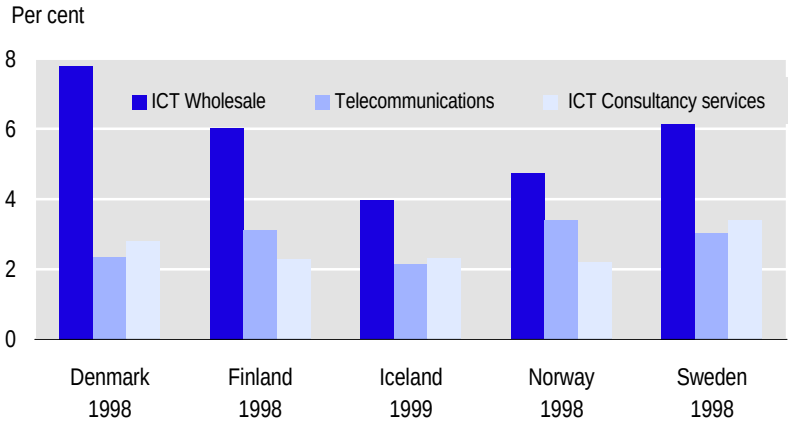
Figure 2.11 Turnover in the ICT services sector in the Nordic countries



Not surprisingly, *ICT wholesale* is by far the largest ICT services sub-sector in *Denmark*, *Finland* and *Sweden*, cf. figure 2.16. ICT wholesale creates approximately the same share of turnover of the national services

sector (6-8%) in these three countries, by that exceeding the shares of Norway and Iceland. In *Finland* and *Iceland*, *Telecommunications* represent the second largest ICT sub-sector regarding turnover, while *Sweden* is characterised by the relative large importance of *ICT consultancy services*.

Figure 2.12 Share of turnover in ICT services in per cent of total services sector



The relation between the turnover and the employment share also shows differences concerning the ICT services as *Finland, Sweden and Norway* all have a larger turnover share although of minor magnitudes, and the reverse can be registered for *Denmark* and *Iceland.*

The analysis of the development of the employment in the ICT sector in the Nordic countries showed a sector characterised by a considerable growth, cf. table 2.1. Looking at the development of the turnover in current prices of the ICT sector in mid-nineties the growth is even more rapid. This is especially the case for the *ICT manufacturing industry* in Finland, where the turnover more than doubled from 1995 to 1998 and in *Sweden*, where the turnover has increased remarkably in the same period. These are also the countries which have the largest ICT manufacturing industries.

Also the *ICT Services sector* has had a noticeable growth in the mid-nineties, exceeding the level of growth in the services activities in general in all the Nordic countries. In Denmark and in Norway the growth in ICT services activities was more rapid than the growth in ICT manufacturing. Within the sub-sectors of ICT Services, the increase of turnover is largest in *ICT Consultancy services* in Denmark, Sweden and Norway, where turnover has nearly doubled from 1995 to 1998. In Finland the largest growth has taken place within Telecommunications.

Table 2.5 Turnover (current prices), index figures[15]

	ICT manu-factu-ring industry	ICT services			Total ICT services	Total private sector*
		Whole-sale	Tele-commu-nications	Consul-tancy services		
	1995=100					
Denmark						
1993	95	77	80	72	77	87
1994	100	93	94	86	92	95
1995	100	100	100	100	100	100
1996	110	112	97	92	105	103
1997	118	128	108	122	123	109
1998	123	144	122	153	141	113
Finland						
1994	76	80	91	92	85	93
1995	100	100	100	100	100	100
1996	117	122	120	113	120	107
1997	155	148	147	119	141	119
1998	210	161	194	177	172	129
Norway						
1995	100	100	100	100	100	100
1996	112	105	112	116	109	106
1997	126	109	128	155	122	116
1998	128	118	143	194	138	123
Sweden						
1993	58	62	44	69	59	77
1994	81	71	93	87	80	88
1995	100	100	100	100	100	100
1996	117	98	91	112	99	101
1997	136	112	106	124	113	111
1998	161	130	123	156	134	118

* NACE 15-37,45, 50-74, 92, 93

2.2.2 Value added

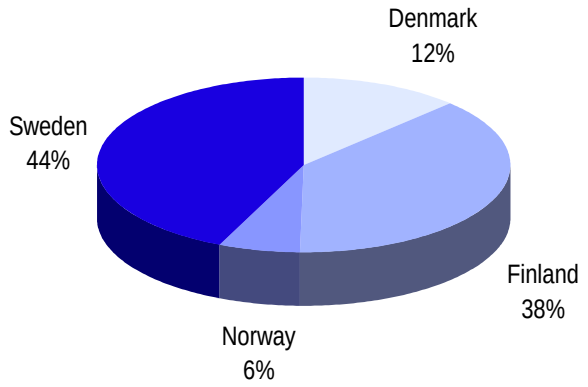
When identifying the economic importance of the ICT sector, gross value added is a better indicator than turnover. The gross value added indicates the profitability of the sector, as the gross value added is the earnings which are left to pay the production factors labour and fixed capital. On the Nordic level Sweden generates 44% of the gross value added of the ICT manufacturing sector, Finland 38%[16], Denmark 12% and Norway 6%, cf. figure 2.13[17].

[15] It should be stressed that changes in the classification of enterprises from one year to the other can influence the observed figures in the time series

[16] Value added at factor costs

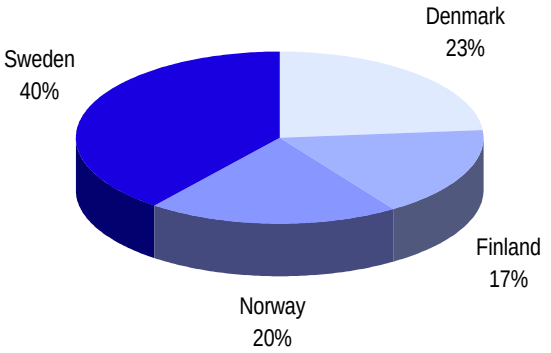
[17] No data on value added is available from Iceland.

Figure 2.13 Gross value added in the ICT manufacturing sector in the Nordic countries 1998



Compared to the turnover shares Denmark and Finland generate a relatively larger share of value added (turnover shares are 8% and 33%, respectively, while value added represents 12% and 38%, respectively). On the other hand Sweden's share of value added is lower than its turnover share (44% and 53%, respectively). For Norway the shares of turnover and value added are both 6%.

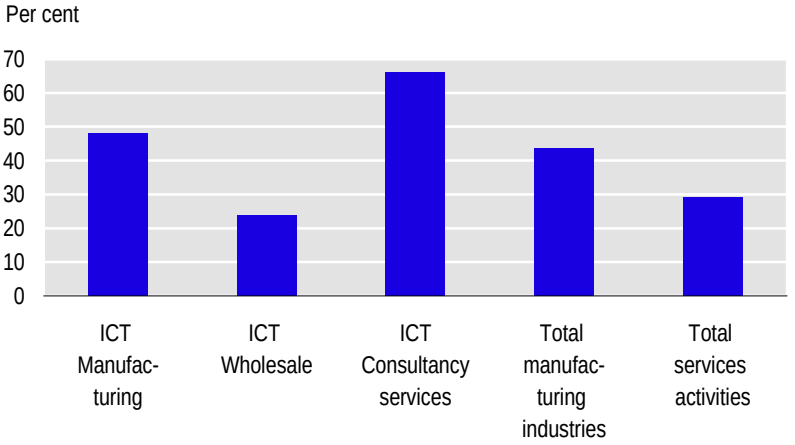
Figure 2.14 Gross value added in the ICT services sector in the Nordic countries 1998



Gross value added shares in ICT services are very similar to the shares of turnover, cf. figure 2.14. Sweden generates 40% of gross value added in ICT services on the Nordic level, which is slightly more than its share of turnover (38%). Denmark represents 23% of gross value added (turnover share 24%), Norway 20% (turnover share 21%) and Finland 17% (turnover share 16%).

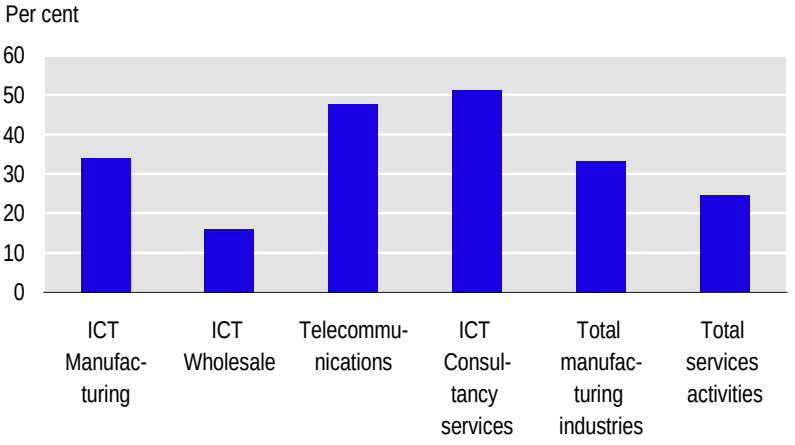
In *Denmark*, the ICT manufacturing industry generates a slightly larger share of gross value added compared to turnover than the manufacturing industry in general, cf. figure 2.15. In the ICT services sector especially the ICT consultancy services generates a relatively high gross value added compared to both ICT manufacturing industry, ICT wholesale and the services sector as such.

Figure 2.15 Gross value added in per cent of turnover. Denmark 1998



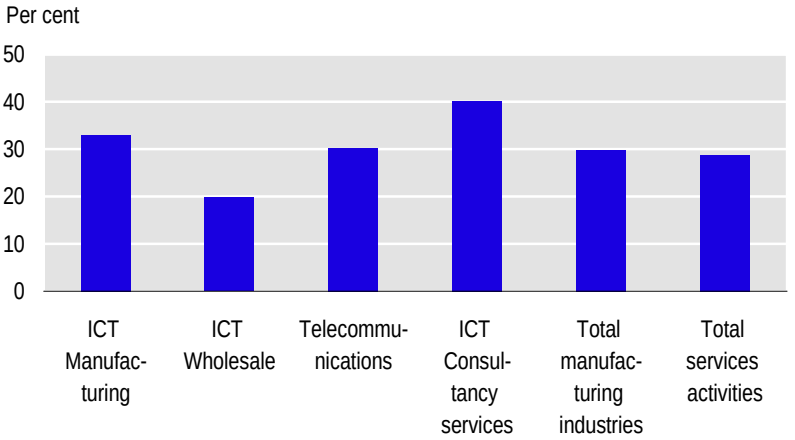
In Finland the gross value added compared to turnover in ICT manufacturing industry and in Manufacturing industry in general is of the same size, whereas ICT consultancy services generate a gross value added compared to tunover which is twice the size of the total services activities, cf. figure 2.16.

Figure 2.16 Gross value added in per cent of turnover. Finland 1998



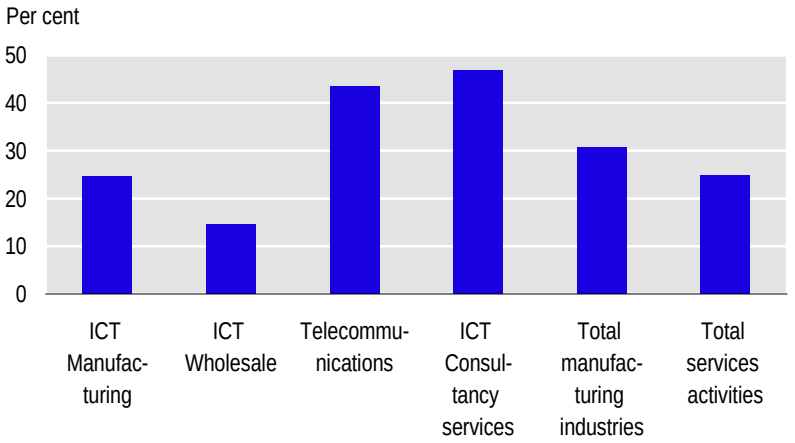
In Norway the gross value added compared to turnover does not differ quite as much between the sectors as in Denmark and Finland though the overall picture is similar to these two countries, cf. figure 2.17. ICT consultancy services is the ICT sub-sector generating the highest share of gross value added compared to turnover, while the share of ICT wholesale is somewhat below both the total Manufacturing sector and the total Services activities.

Figure 2.17 Gross value added in per cent of turnover. Norway 1998



In *Sweden*, a somewhat different pattern can be found, as the ICT manufacturing industry generates less gross value added compared to turnover than the manufacturing industry as such, cf. figure 2.18. Within the ICT services sector, the highest share is found in ICT consultancy services and Telecommunications, both creating a larger share than services in general.

Figure 2.18 Gross value added in per cent of turnover. Sweden 1998

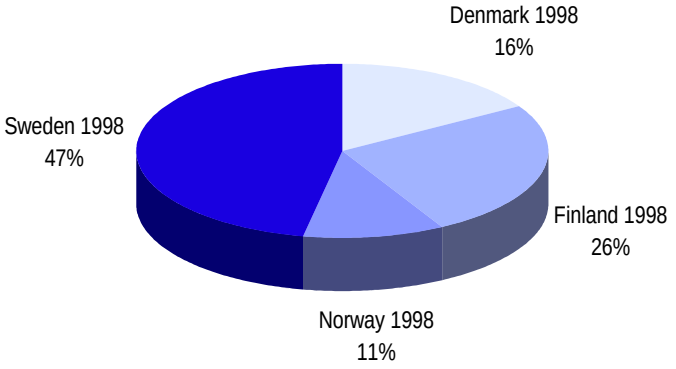


2.2.3 Wages and salaries

Wages and salaries are difficult to compare across countries as actual level of taxation, other personnel costs, general level of living costs influence the purchasing power of the wages paid. In this project, wages and salaries are only analysed in relation to the employment share at the level of each sub-sector. This sub-chapter does not include figures for Iceland for which no data is available.

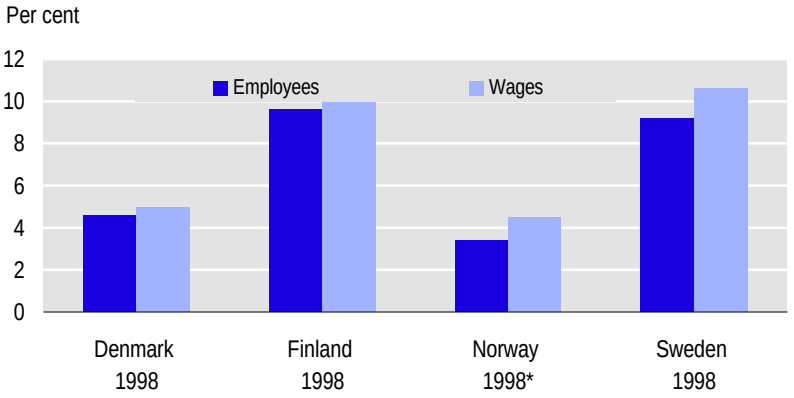
As the statistics used in this project operate with different definitions of "employment" as full-time employees (Denmark and Finland), employees (Sweden) and persons employed (Norway), the results in this sub-chapter have to be interpreted with utmost caution.

Figure 2.19 Wages and salaries in the ICT manufacturing sector in the Nordic countries



Sweden accounts for 47% of wages and salaries in ICT manufacturing on the Nordic level, cf. figure 2.19, which nearly equals the share of employment which is 48%. The Danish and Norwegian ICT manufacturing industries on the other hand represents slightly higher shares of wages and salaries than of employment, while the opposite applies to Finland.

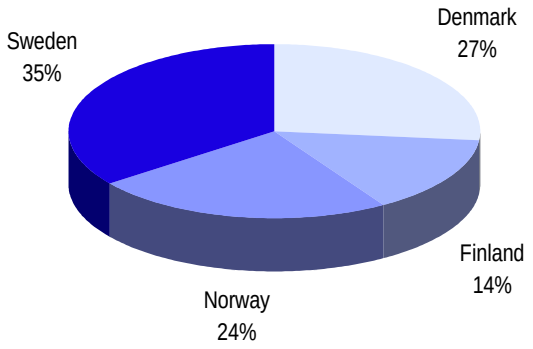
Figure 2.20 ICT manufacturing industry. Share of total wages and salaries and employment in manufacturing industry in the Nordic countries



* Norway: employed persons

ICT manufacturing industry is characterised by the fact that in all the Nordic countries the relative share of total wages and salaries is higher than their shares of employment, cf. figure 2.20. This indicates that the average wage per employee is higher than for manufacturing industry in general. The variations between the Nordic countries are of minor magnitude.

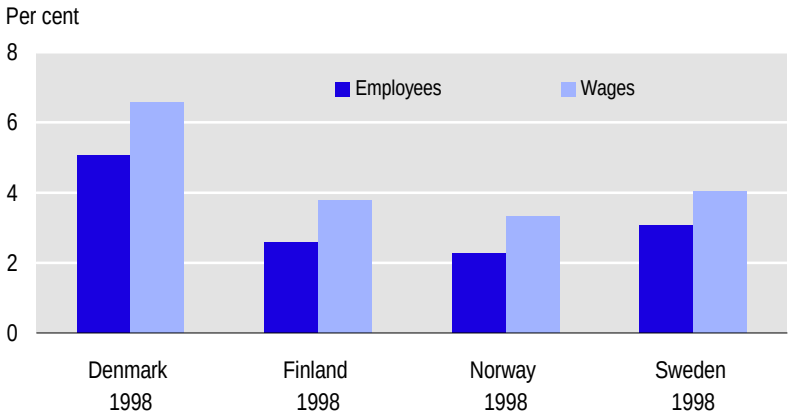
Figure 2.21 Wages and salaries in the ICT services sector in the Nordic countries 1998



Sweden plays a less significant role in the *ICT services sector* than in ICT manufacturing, but still it represents more than one third of the total wages and salaries paid in all four Nordic countries. The ICT services sector is characterised by the larger proportion of wages and salaries

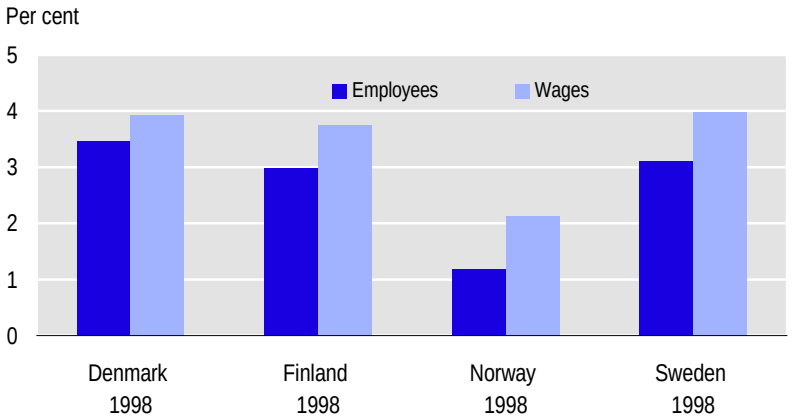
compared to employment than the services sector in general, cf. figures 2.22-2.24. The differences are much larger than for the ICT manufacturing industry, indicating that the requirements of the qualifications and skills of the employees within ICT services are higher than of the employees within services in general. The qualifications of the employees in the form of the formal level of education of the employees are investigated further in chapter 5.

Figure 2.22 ICT wholesale. Share of total wages and salaries and employment of private services sector



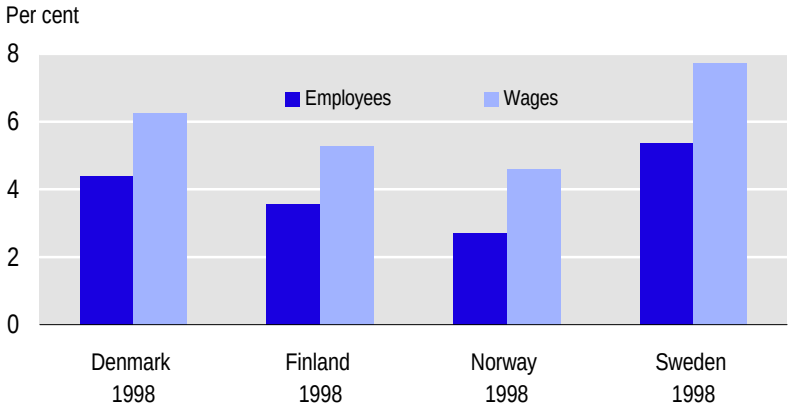
In Denmark where the ICT wholesale is relatively more important than in the other Nordic countries the share of wages and salaries amounts to 7%, of total wages in the services activities, compared to an employment share of 5%, cf. figure 2.22.

Figure 2.23 Telecommunications. Share of total wages and salaries and employment of private services sector



In Telecommunications the relative shares of wages and salaries compared to employment shares show larger differences among the Nordic countries than ICT wholesale, cf. figure 2.23.

Figure 2.24 ICT consultancy services. Share of total wages and salaries and employment of private services sector.



Also within ICT consultancy services the share of wages and salaries exceeds the relative share of employment, cf. figure 2.24. In all the Nordic countries the share of wages and salaries is higher than the share of employment. At the same time the differences are larger than within the other sub-sectors of ICT services as well as within ICT manufacturing industry.