PREFACE

There is a growing demand for official and internationally harmonised statistics on the information society and its growing influence on different aspects of our society. As a consequence of these needs, the Directors General of the five Nordic statistical institutes decided in November 1999 to establish a Nordic group for the development of statistics on the information society. For the year 2002, the Nordic Council of Ministers together with the national statistical institutes have funded the work of the group with the aim to further develop and co-ordinate Nordic statistics on the information society. As part of the project, the statistical institutes of the Nordic Countries have produced this publication about information society statistics in the Nordic Countries.

The publication is an extension and update of the two previous volumes published under the title "The ICT sector in the Nordic Countries". The new topics covered by this publication are ICT use by individuals and the digital divide, ICT infrastructure and ICT use in enterprises. The work on the publication has been co-ordinated by Statistics Finland. The authors are Ari Leppälahti, Editor, Mervi Niemi, Chapter 3 and Aarno Airaksinen, Chapter 6.

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SUMMARY

Nordic people were well equipped with ICT appliances in 2002: about 90 per cent of the Nordic citizens had access to a mobile phone, over 70 per cent to a computer and a little over 60 per cent had an Internet connection at home. Measured by ICT penetration, the Nordic Countries are the leading ones in the OECD. Except for mobile phones, the penetration of ICT into homes is somewhat lower in Finland than in the other Nordic Countries. However, measured by the use of the computer all the countries are about equal, 72–76 per cent of people recently had used a computer. People in Iceland are the most active Internet users. Swedes are also slightly more active in using the Internet when compared to people in the other Nordic countries. Over half of the Nordic population are regular e-mail users.

In general, differences between men and women in the access to and use of ICT are negligible. However, there is some indication that men are a little more intensive Internet users. In terms of the digital divide, a divide according to age still exists. People aged 60–74 as well as pensioners have distinctly less ICT equipment at home than other age groups, and a clear majority of them do not use a computer or the Internet. The impact of education is not as great as that of age, even though those with advanced education make definitely more use of ICT. As to regional differences, in Finland residents in the Helsinki metropolitan area have Internet access at home more often than those living in other parts of the country. In Sweden, there is in practice no difference between the greater Stockholm area and other regions, and in Denmark and Norway there is only a slight difference in favour of the capital region.

The most focal change in the telecommunications sector during the past decade has been the deregulation of telecommunications markets, as a result of which monopolies have broken up. As a consequence, the markets have grown during the last decade. International statistics indicate that in 2000 the charges and the price level of telecommunications services in the Nordic Countries were moderate when compared to the OECD average.

The densities of fixed and mobile connections are high in all the Nordic Countries. Mobile communication, in particular, has expanded significantly during recent years. Today, mobile subscriptions already number more than 80 per 100 persons in most of the Nordic Countries. Broadband access has also been spreading lately, although it was still quite rare as recently as at the end of 2001.

The size of the ICT sector, that is ICT manufacturing and ICT services, in the Nordic Countries is estimated to employ 510,000 persons, or 8.8 per cent of the total number of persons employed in the private sector in the year 2000. However, the rapid growth of ICT-related employment of the late 1990s slowed down in 2000, especially in ICT manufacturing. The ICT sector, and manufacturing in

particular, is an important sector in Finland and Sweden. In these countries ICT manufacturing provides about 10 per cent of the employment and 16-24 per cent of the turnover in manufacturing as a whole. ICT services are a fairly significant sector in Denmark as they employ 14 per cent of the service sector labour force. In Iceland and in Norway, ICT manufacturing is of minor importance, but ICT services account for about 8 per cent of total service employment.

As to production and foreign trade, ICT goods, especially telecommunications equipment, have a major role in Finland and Sweden. In 2000, the proportion of ICT goods of total manufacturing production was 12–16 per cent in Sweden and Finland, as compared to 3–5 per cent in Norway and Denmark. The same is reflected in exports, as in 2001 the proportions of ICT goods of total exports were 22 per cent in Finland and 13 per cent in Sweden. However, the world-wide setbacks of the ICT industry are clearly visible in a downturn in trade in 2000–2001, for in the year 2000 these proportions were 25 per cent in Finland and 20 per cent in Sweden. ICT exports of Denmark (8–10 per cent of the total), Norway (3–4 per cent) and Iceland (0.1–0.2 per cent) have remained stable.

Generally national differences in the use of ICT in enterprises are not large. The clearest difference between the enterprises in the Nordic Countries is that smaller enterprises are using ICT less often than larger enterprises.

Nowadays, computers are used in almost all enterprises. In addition, the Internet has become very widespread in Nordic enterprises by the end of 2001. Internet access was most common in Sweden, Denmark and Finland, Iceland following closely. Norwegian enterprises had Internet access least often. Homepages were clearly most frequent in Sweden, Denmark following not far behind, whereas they were least frequent in Norway. A high-speed connection to the Internet is most common in Iceland where about two out of three enterprises have such a connection. In Finland and Denmark about half of the enterprises, in Sweden 43 per cent and in Norway one third of the enterprises have a high-speed connection. Internet sales were most common in Icelandic enterprises, where 16 per cent of the enterprises with at least 10 employees had Internet sales. In other countries the frequency varied between 8 and 11 per cent. The largest part of Internet sales goes to the home market in all countries. In all countries but Iceland around 80 per cent of the Internet sales were made to enterprises or to the public sector. In Iceland about two thirds of the sales were made to households.

1 INTRODUCTION

New ways to conceptualise economy and society create a need to revise statistical production as well. One of the current topics is the information society, which refers to the transformations brought about by the development of information and communication technologies (ICT). The impacts of ICT have been pervasive: even though the IT industry has had setbacks after the booming 1990s, there is no denying its ever increasing role in manufacturing and services, and in society in general. As to individuals, new mobile and digital technological appliances have shaped the ways of communication, patterns of time use, as well as the qualifications required in the workplace and in everyday life.

Attempts to measure the information society in statistics in a comprehensive way do not have a long history. As usual in the development of a new statistical system, there have been ac hoc studies and applications of existing data. Another aspect of data on the information society is that much of them are available from sources of varying quality. This is especially problematic in international comparisons. In this publication we rely on the data produced by the statistical offices of the Nordic Countries except where otherwise indicated. These other data sources are recognised institutions like the OECD or public authorities, for example.

The description of the information society in this report consists of three parts:

- ICT infrastructure
- ICT sector in the economy
- The use of ICT and the digital divide – inequalities in the use of ICT

The infrastructure for the information society consists of both a technological base and human resources. The technological prerequisites are, for example, telecommunication networks and related services. The human potential for ICT comprise the qualifications embodied in individuals. However, in this volume only the technological aspects of the infrastructure are dealt with.

The data on the ICT sector describe the importance of ICT industries in manufacturing and services, production, employment, and as a source of turnover. To describe the importance of ICT products there are data on their production and on their role in foreign trade.

The use of ICT is measured in both enterprises and among individuals. New opportunities for commerce created by ICT applications are important topics in enterprises. As to individuals, besides basic statistics, such as the overall use of the computer and Internet, some evaluations are also presented from the perspective of the digital divide. As is known, the concept of the digital divide refers to inequalities in individuals' access to and use of ICT. Even though the Nordic Countries are among the most advanced ones in the adoption and use of ICT, differences in access to and use of ICT related to age, gender, education or place of residence are still important.

2 ACCESS AND USE OF ICT BY INDIVIDUALS AND DIGITAL DIVIDE

In the latter part of the 1990s new communication technologies started to enter into people's everyday life. Mobile phones, computers and the Internet opened up new channels of communication. In several studies it has been shown that the Nordic Countries have been in the forefront of the ICT penetration and use. In order to describe the state of the art today we present the results of the survey on ICT access and use in 2002.[1] The survey has been carried out in Denmark, Finland and Sweden. The data were gathered by interviews using a harmonised questionnaire and a common methodology. In Denmark, recall period for computer and the Internet use was one month, Finland and Sweden three months. Norway[2] and Iceland[3] have provided some data from other sources.

The main topics addressed are:

- access to ICT at home (mobile phone, computer, the Internet, etc.)
- use of computer and the Internet
- purpose of Internet use

The focus is on individuals, the household or family characteristics are included only as background variables.

The chapter has two parts. The first part consists of an overview of the general structure in the Nordic Countries, some international comparisons as well as comparisons between the Nordic Countries. In the second part more detailed results are presented from the viewpoint of the digital divide.

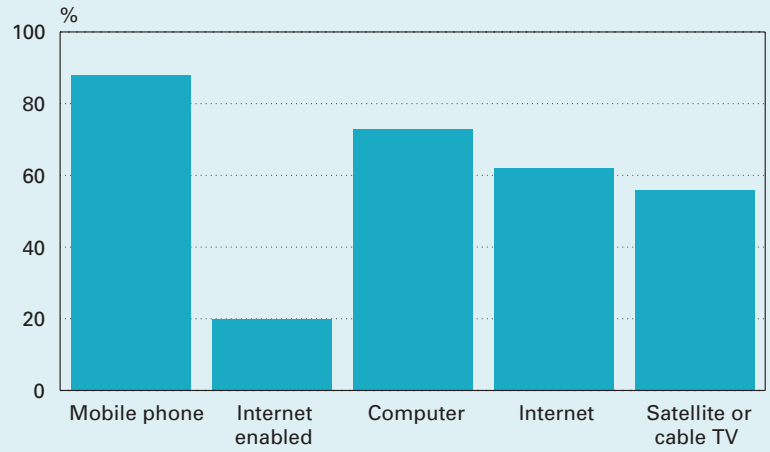
2.1 Access and use of ICT

2.1.1 General pattern in the Nordic countries

An important indicator on the penetration of the ICT is individuals´ access to the ICT equipment at home. Even though the term 'access at home' is used concerning all the ICT equipment, it can be argued that the phrasing has a different meaning in the case of mobile phone as compared to computer or the Internet. A mobile phone is a personal communication device and even if someone in the person's home has a mobile phone it does not imply access to it in the same way as an access to a home computer.

1 Iceland and Norway 2001
2 Media use survey
3 Eurobarometer, Gallup Europe

Figure 2.1
Access at home to: mobile phone, Internet-enabled mobile phone, computer, Internet, satellite or cable TV. General pattern in the Nordic Countries in 2002



Internet: data cover all the Nordic Countries. Mobile phone and computer: the data cover Denmark, Finland, Norway and Sweden
Others: the data cover Denmark, Finland, and Sweden

With the penetration rate around 90 per cent, the mobile phone has become standard equipment in the homes of the Nordic people (Figure 2.1). In fact, it can be assumed that the mobile phone penetration rate has come close to the saturation point and the future changes in the access rate will be minor ones. However, it seems that advanced models still have growth potential, since, for instance, a mobile phone with an Internet connection is so far at hand to only fifth of the Nordic population.

Over 70 per cent of people aged 16 to 74 have an access to a computer at home. A clear majority of the home computers are equipped with the Internet; the rate of Internet access at home is 62 per cent among the total Nordic population. Obviously, computers and the Internet can also be used in other places than home. During the three months covered by the survey 74 per cent of the Nordic people had used a computer and 66 per cent the Internet.

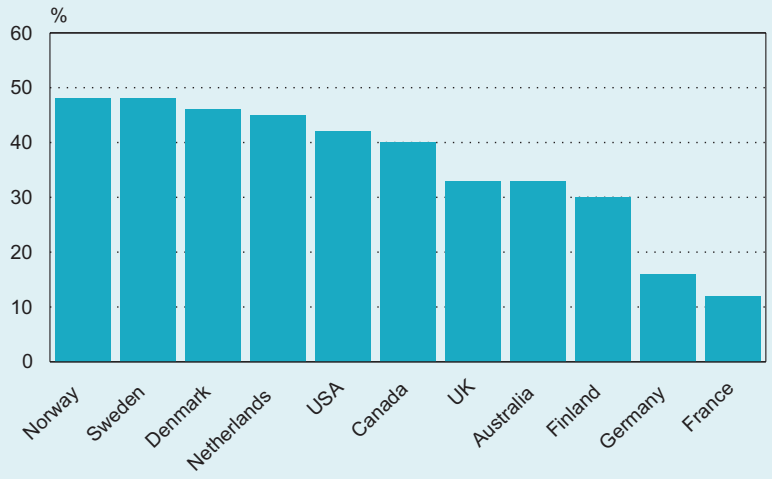
The satellite or cable TV is rather widespread with about half of the Nordic population covered. The digital TV is at the moment only emerging and it is not dealt with here.

There are various data sources on ICT access and use in different countries. However, they are often problematic because of diverse methodologies, definitions or target populations. Nonetheless, in various studies it has been indicated that in general the Nordic Countries have had internationally high ICT penetration and use rates. In Figure 2.2 the percentages of households with access to the Internet in 2000 are compiled by the OECD and they are mainly based on the official national data sources. In 2000 Denmark, Sweden and Norway were the leading countries with the penetration rates close to 50 per cent. In Finland about 30 per cent of families had an Internet connection at that time. North America and the

Netherlands were close to the leading Nordic Countries, but countries such as Germany and France had distinctively lower Internet penetration rates.

It should be noticed that the access rates in Figure 2.2 are not comparable with the other figures of this publication as they are calculated by household and not by individual as elsewhere in the publication. Also, the Internet penetration has advanced rapidly and the new Nordic data describe the situation in 2001–2002. However, it can be said that the leading Nordic Countries were among the first ones to adopt the Internet widely at home.

Figure 2.2
Households connected to the Internet in selected OECD countries in 2000



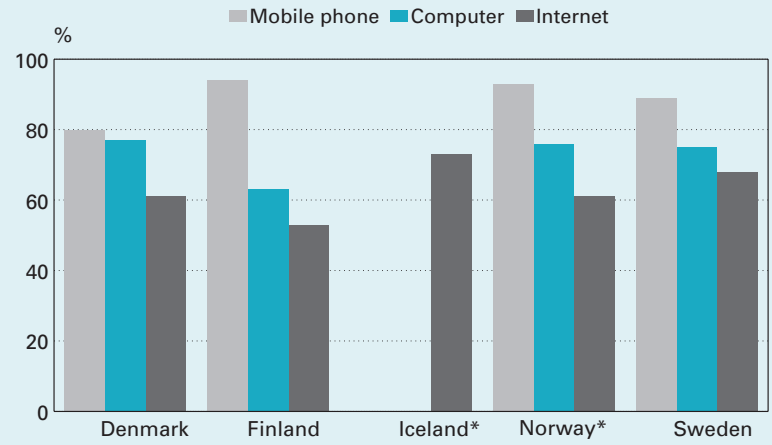
Source: OECD DSTI/DOC(2002)11. The digital divide: diffusion and use of ICTs

2.1.2 Cross-country comparisons

The Nordic Countries differ somewhat in the profile of ICT access (Figure 2.3). Comparing the mobile phone, computer and Internet access at home (for Iceland there are data on the Internet only) reveals that for individuals a mobile phone at home is the most common of the three in every country, but in Finland its relative penetration is highest. In other words, the Finns have a mobile phone at home as frequently as the other Nordic people do, but fewer Finns have a home access to a computer and thereby to the Internet. The gap between Finland and the other Nordic Countries is of the magnitude 10 percentage points.

The highest proportion of the population with Internet access at home is in Iceland, 73 per cent, followed by Sweden, 68 per cent. The figure for Denmark and Norway is 61 per cent. In access to a home computer there is no difference between Denmark, Norway and Sweden.

Figure 2.3
Access at home to mobile phone, computer and the Internet by country in 2002

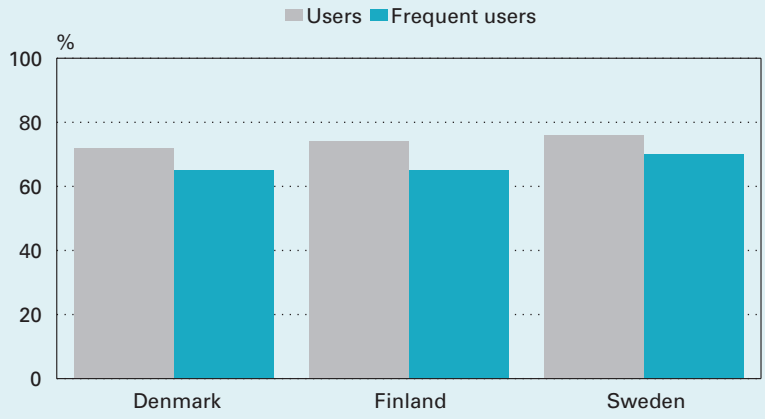


* 2001

As for the mobile phone, about 90 per cent have one at home except for in Denmark, where the figure is 80 per cent.

There are no differences between the countries in the overall computer use. Between 72–76 per cent had used a computer at home, in the workplace or somewhere else during the three months period (Figure 2.4).[4]

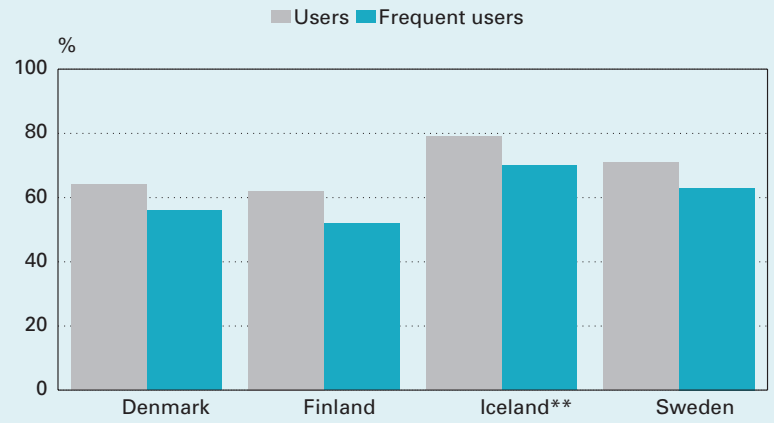
Figure 2.4
Computer users by country. Proportions of users and frequent users during the three* months in 2002



* Denmark: one month

4 Denmark: one month

Figure 2.5
Internet users by country. Proportions of users and frequent users during the three* months in 2002



* Denmark: one month
** 2001

Looking at the frequency of the use we find that those using a computer in the first place do it frequently. About 90 per cent of the computer users (65–70 per cent of the total population) use a computer at least weekly, the proportion of the daily users being 45–62 per cent in the total population (see Annex tables 2.7).

It seems that in Sweden a computer is used at the workplace more often than in Denmark or Finland. In all, 45 per cent in Sweden, 40 per cent in Finland and 37 per cent in Denmark use a computer at work. Only 7–11 per cent of the computer users had used a computer only at work. In other words, those using a computer in the first place are not really dependent on the equipment offered by their place of employment. The proportion of computer users using it only at home varies from 16–20 per cent in Finland and Sweden to 35 per cent in Denmark.

Despite the fact that computer plays an important role at work, home use is still more frequent. In Sweden 67 per cent had used a computer at home during the past three months, in Finland 56 per cent and in Denmark 64 per cent.

The proportion of Internet users is highest in Iceland (79 per cent) and in Sweden, 71 per cent of the surveyed population. Denmark and Finland are on the level of 62–64 per cent. In Iceland 70 per cent, in Sweden 63 per cent accessed the Internet at least once a week, the corresponding number of these active users was 56 per cent in Denmark and 52 per cent in Finland.

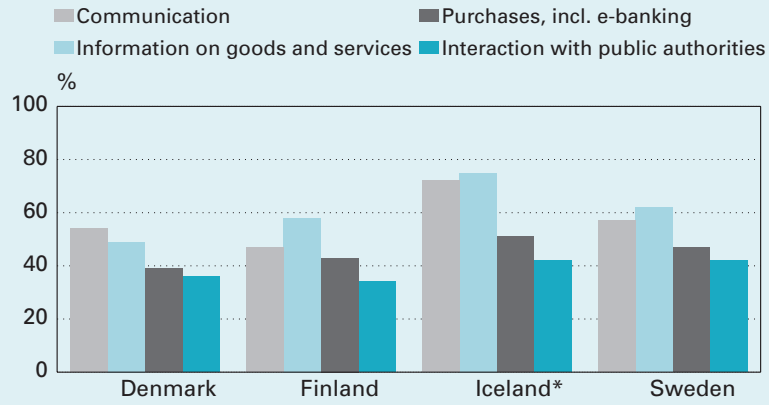
As for the place of Internet use, there are some differences between the countries. In Iceland 68 per cent of the population access the Internet regularly at home, the corresponding proportions are 41 per cent in Finland and 49 per cent in Denmark. In Finland 18 per cent of the Internet users use the web at home only, in Sweden 25 per cent and in Denmark 28 per cent. As regards the proportion of people in total population using the Internet at the workplace, the figures are 46 per

cent for Iceland, 37 per cent for Sweden, 31 per cent for Finland and 32 per cent for Denmark (Annex tables 2.8).

Another way to describe the intensity of Internet use is to measure the actual time spent on the net. In Denmark, Finland and Sweden Internet users spent approximately 7 hours on average in a week on the Internet.

The Internet is mainly used for information search and communication. As Icelanders are the most active Internet users they also score the highest rates in the information search (75 per cent) and communication (72 per cent). Communication (i.e. emails) is relatively more common in other Nordic countries than what it is in Finland. Over half of the adult population (or over 80 per cent of the Internet users) in Sweden and Denmark use email in their regular communication. The Finnish net users, on the other hand, are relatively more frequently engaged in information search. The figures for 'purchases' include regular use of electronic banking (e.g. via the Internet) and not only purchases of individual goods or services. For interaction with public authorities the Internet is the most frequently used in Sweden and in Iceland (Figure 2.6).

Figure 2.6
Purpose of Internet activities by country: communication, search of information on goods and services, purchasing goods and services, interaction with public authorities in 2002



* 2001

2.2 Digital divide

In general there is a widespread consensus on the positive impact of ICT on the economy and on the quality of people's everyday life. But the diffusion and growing importance of ICT has also brought forward concerns of possible inequalities in the development. Are there groups among individuals, firms or regions that are lagging behind, as the new communication technologies are becoming more and more

In the case of individuals the digital divide refers to the differences in infrastructure, access and use of the information and communication technologies (ICT). It can be about individuals, households, firms or regions. The basic determinants for individuals and households are age, education, employment situation, household size and to somewhat lesser degree gender. For regions distinguishing characteristics have been the cross-country or urban/rural distinctions.

ubiquitous? In several studies, the concept 'digital divide' has been introduced for analysis of these differences.

The purpose of this report is to present the survey results by a breakdown of the above mentioned characteristics. The aim is not to evaluate the importance of the divide between the groups, but less access or less use of ICT is what the digital divide means here. Obviously, for some groups (or individuals), the access or use of ICT might be of less relevance or interest and consequently they cannot be considered as deprived as different lifestyles and preferences are reflected in the results. Also, one should consider what is meant by the concept such as the digital divide in the affluent, by any international standards highly developed Nordic Countries. Of course, even though there are wide opportunities to use ICT, an important question about people's understanding and abilities in ICT remains. However, only the possibilities for access and the actual use of ICT are considered in this report.

As mentioned earlier, the ICT survey data consist of Denmark, Finland and Sweden. In addition, there are some key figures for Iceland and Norway. Even though the data do not completely cover all the countries, given the well-known similarities of the Nordic societies it can be assumed that the data available provide a reasonably appropriate description of some patterns of the digital divide in the Nordic Countries.

The presentation is selective, the focus being on the most distinguishable features. Obviously, the digital divide is the most relevant for the groups most 'deprived' in the access or use of ICT. But, even if there is a clear difference in the access or use by one variable, care should be taken in the interpretation of the results. This is because of the interplay of the various individual characteristics. In order to assess more precisely the effect of the individual characteristics multivariate analysis would be needed. However, that is out of the scope of this publication. Detailed results are given in the Annex tables.

2.2.1 Access to ICT by individual characteristics

In the access to mobile phone, computer or the Internet at home there are no evident differences by gender, although men tend to have slightly higher figures by

a few percentage points, for example in the Internet access at home (Table 2.1 and Annex tables 2.5).

In the Nordic countries about 74–88 per cent of people aged 16–49 have access to the home computer (Table 2.2). After the age of 50 the access rate declines somewhat, but it is in the oldest age group in which the home computer is still not very common. Indeed, people over 60 years of age still have by far the lowest rate of access to various ICT appliances at home. For example in Sweden, 88 per cent of persons aged 30–49 have access to a computer and 80 per cent to the Internet at home while the figures for senior citizens (over 60 years) are 44 and 35 per cent, respectively. In Finland the age group 30–49 years has a computer access of 74 per cent whereas for the oldest group the figure is only 28 per cent. In Norway the figures are 86 and 38 per cent. As for the mobile phone the situation is somewhat different, since in Finland and Norway about 80 per cent of the persons over 60 years have access at home, but in Denmark the proportion is still only 58 per cent (Annex tables 2.5).

Combining gender with age reveals that in Denmark, Sweden and Norway the difference in the Internet access between men and women seems to be higher in the oldest (60–74) age group than in the younger ones. In Sweden in the 60 years or over age group, 42 per cent of men but only 29 per cent of women have the Internet at home. For instance, among young people aged 16–29, 79 per cent of men and 73 of women have access to the Internet. In the age groups 30–59 there is no difference between the genders.

Table 2.1
Access to the Internet at home by gender and country in 2002

	Denmark %	Finland %	Iceland* %	Norway* %	Sweden %
All	**61**	**53**	**73**	**61**	**68**
Male	65	55	75	64	69
Female	58	51	72	57	66

* 2001

Table 2.2
Access to computer at home by age and country in 2002

Age	Denmark %	Finland %	Norway* %	Sweden %
All	**77**	**63**	**76**	**75**
16–29	87	76	83	83
30–49	86	74	86	88
50–59	76	60	75	75
60–74	47	28	38	44

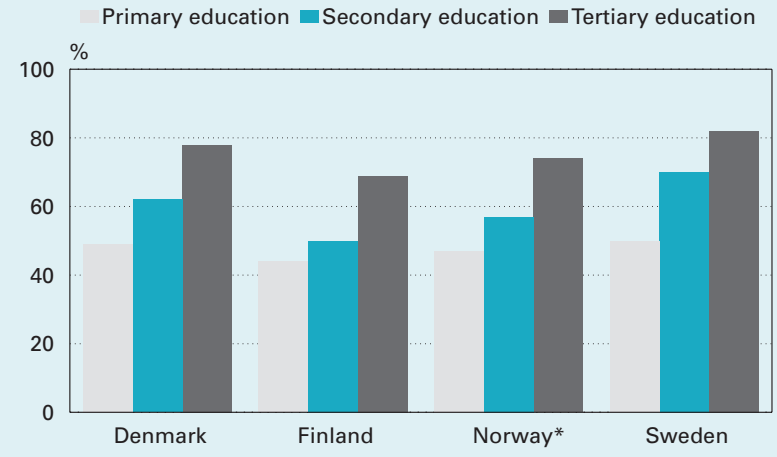
* 2001

Norway indicates a similar result with access rates of 28 per cent for men and 18 per cent for females in the oldest age group, compared to 65 per cent for men and 61 per cent for women in the group of 16–29-year-olds. In Finland age does not seem to increase the difference between the genders. The access rates of people aged 60–74 are 27 per cent for men and 23 per cent for women, which can be compared for example to 62 and 56 per cent in the case of young people (see Annex tables 2.6).

People's educational background produces expected results, the access rate increases with the level of education, but as compared to the age effect the correlation is more even, that is, there is not one group expressing a strikingly different penetration rate (see Figure 2.7). But, if we compare the tertiary education and primary education groups only, the difference is about 25–32 percentage points. Also, the general pattern is very similar in all the four Nordic countries. Thus, education matters, for example in Denmark and Sweden roughly half of the persons with primary education have home access to the Internet whereas about 80 per cent of people with degrees from vocational colleges or universities have the Internet at home.

Analysing education and gender together indicates an interesting result for Finland and Norway, according to which the differences by gender in the Internet access seem to be increasing with the level of education. In Finland, in the group of primary education, 46 per cent of men and 43 per cent of women have home access to the Internet. But, in the group of tertiary education the access figures for men is 74 and for women 65 per cent. In Norway the corresponding figures are 45 per cent (men/primary education), 48 per cent (women/primary education) and 80 per cent (men/tertiary education), 69 per cent (women/ tertiary education). In other words, the level of education does not increase women's activity in the access to the

Figure 2.7
Access to the Internet at home by level of education in 2002



* 2001

Internet as much as it does with men. This is not the case in Denmark or in Sweden (see Annex tables 2.6).

As for the effect of the employment status, students are the most likely to have ICT at home with the computer access of 83–92 per cent and the Internet access of 64–88 per cent. However, the difference to the employed persons is small. In Denmark, Norway and Sweden 82–84 per cent of the employed persons have a home computer, in Finland 71 per cent. As for pensioners, their rate of computer or Internet access is about half of the students or employed, for example the figure for access to a computer at home is about 28–42 per cent. There are some country differences in the Internet access of retired persons. In Denmark, Finland, Iceland and Sweden 24–29 per cent of the pensioners have home access to the Internet, but in Norway the figure is 19 per cent (Annex tables 2.5). The relative difference between pensioners and other groups is greatest in Iceland.

As for the Internet-enabled mobile phone there are data from Denmark (17 per cent have access at home) and Finland (20 per cent). Access is slightly more common for men than for women. In addition, younger people have advanced mobile phones more often than older people, in fact in the age group 60 years or over as well as among retired persons the access rate is only 3–9 per cent. Those with tertiary education have more often an Internet-enabled mobile phone, but the effect is not as strong as that of age.

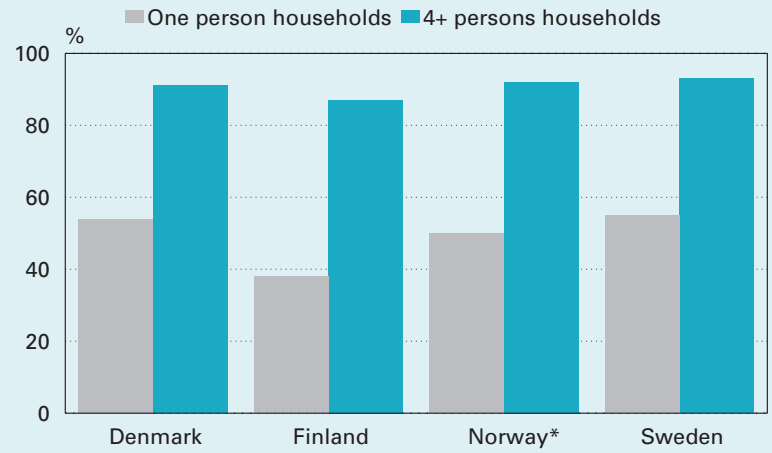
Own homepages on the Internet may not be of need to a number of people. Overall in Denmark, Finland and Sweden, 5–6 per cent reported that they had constructed personal WWW pages. Not surprisingly, Internet pages are the most common among students, of whom about 10–13 per cent reported as having them.

2.2.2 Access to ICT by household type

Access to ICT at home describes the diffusion of ICT into households of different characteristics. The figures presented here refer to individuals belonging to certain types of households. Thus, they do not describe how many households/families have access to ICT. Of individual household types data are presented by household size and by classification with/without children. Unfortunately, no breakdown by household income can be presented, which topic would be interesting from the point of view of the digital divide.

There is a rather strong connection between the household size and the posession of a computer or the Internet access from home (Figure 2.8 and Annex tables 2.5). Individuals living in bigger households or in families with children have more often a computer at home. Single adult households have the lowest computer penetration rate and people living in households with at least four persons the highest. Especially in Finland only 38 per cent of single adults have access to a computer at home, in Denmark and Sweden the corresponding figure is about 55 per cent and in Norway 50 per cent. In comparison, of persons living in large households with at least four persons about 90 per cent have access to a home computer in all four countries.

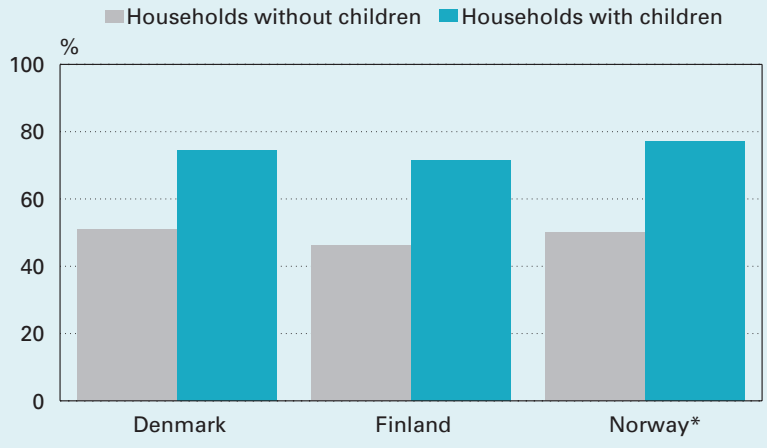
Figure 2.8
Percentage of persons with access to computer at home by household size and country in 2002



* 2001

Also, if a person lives in a household with children he/she is more likely to have access to a home computer than those living in households without children. For instance, the figures for Denmark are 82 and 73 per cent, for Finland 84 and 56 per cent and for Norway 91 and 66 per cent, respectively.

Figure 2.9
Percentage of persons with access to the Internet at home by household type and country in 2002



* 2001

Access to the Internet expresses about the same pattern as with computer. For example, in Figure 2.9 it can be seen that access to the Internet at home is clearly more common in all the three countries for individuals living in families with children than for those living in households without children.

In access to the mobile phone the person's household background has about a similar effect as in the case of computers and the Internet. However, even of the persons living in single adult households about 80 per cent have access to the mobile phone in Finland and Norway, in Denmark the figure is 62 per cent.

Even though people living in single adult households have a lower ICT access rate, the interpretation from the point of view of the digital divide is not straightforward. Families with children may acquire computers and the Internet for the purposes of education and games, which might not be the preference of single adults. Also single adult households are often retired persons.

2.2.3 Use of computer

The use of computer was measured by asking the respondents whether they had used a computer and if so, how often and where, during the last three months[5] at the time of interview. As mentioned above, 72–76 per cent of the adult population had used a computer. Details on the computer use are presented in Annex tables 2.7.

Men and women are almost equally active computer users, although men in Denmark have a somewhat higher figure (75 against 68 per cent). However, except for Finland, men are more active frequent users, that is, those who use computer every week. In Sweden 74 per cent of men and 67 per cent of women are weekly users, in Denmark 69 per cent of men and 62 per cent of women.

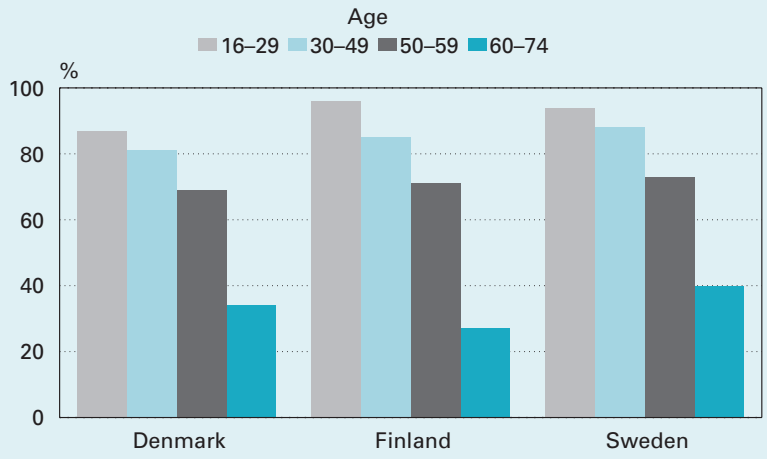
There is a strong connection between age and computer activities (Figure 2.10). A similar pattern emerges from each country. In all the countries from which the data are available, the proportion of computer users decreases with age. Almost all the young people are computer users and even at the age of 50–59 still about 70 per cent, while after 60 years of age computer use drops sharply. The age gap is widest in Finland where the difference between the youngest and the oldest age group is as much as 70 percentage points.

The effect of age is of course reflected in the fact that retired persons are the least active computer users as compared to employed, students or other categories. Of the pensioners 27–31 per cent are computer users. Not surprisingly, since ICT is an intrinsic part of today's education and training, practically all the students had used a computer during the three-month period. Of the persons active in the working life eight out of ten use a computer regularly.

Obviously, the share of the population using computers is larger than the one having the appliances at home. However, in Denmark 42 per cent of the retired persons had a computer at home but only 28 per cent had made use of it. Similarly

5 Denmark: one month

Figure 2.10
Use of computer by age and country in 2002



in Sweden 44 per cent of persons aged over 60 have the possibility to use a computer at home, but only 40 per cent are actually using it. In contrast, the access and use figures of persons aged 60–74 are about equal in Finland. For younger people, students and employed persons the number of users exceed that of access at home.

Education is also an important determinant. In the three-category breakdown the group of primary education has the user percentage between 56–60 whilst about 90 per cent of those who have tertiary (academic, advanced professional) education use computer. The distribution according to education also reflects different tasks in different professions, of those with elementary education only about 10–20 per cent use a computer at work, while 60–70 per cent of people with tertiary education utilise a computer at their work (Annex tables 2.7).

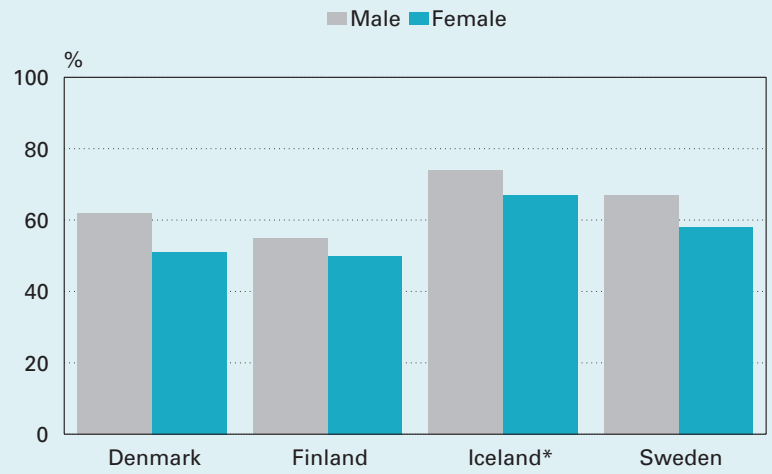
2.2.4 Use of the Internet

Because roughly 90 per cent of the computer users had entered the Internet as well, the pattern of Internet use follows closely that of computer use.

Men are slightly more active to use Internet than women. In Finland, Iceland and Sweden the difference between the genders is only 2–5 percentage points, but in Denmark 69 per cent of men as compared to 60 per cent of women had used the Internet during the past three[6] months. In the case of active users (at least once a week) there is also a more evident difference in Sweden with the figures of 67 per cent for men and 58 per cent for women (Figure 2.11 and Annex tables 2.8).

6 Denmark: one month

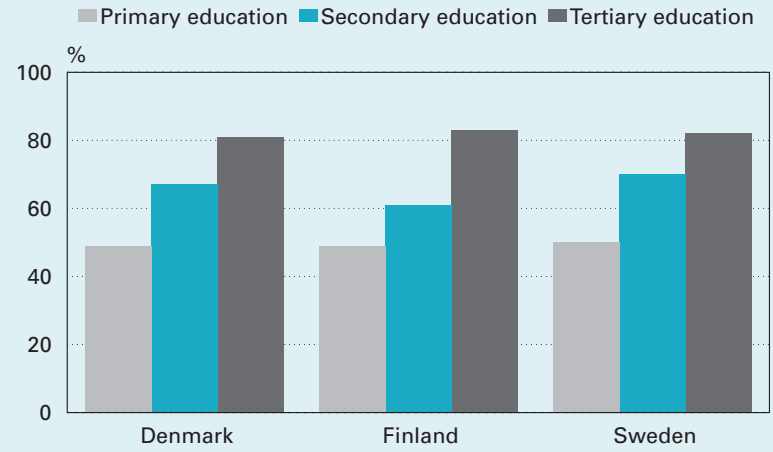
Figure 2.11
Weekly Internet users by gender and country in 2002



* 2001

In Denmark and Finland 19–23, in Iceland and Sweden about 30 per cent, of the persons aged 60–74 had used the Internet. As for young people aged 16–29 the proportion of the Internet users varies from 85 per cent in Denmark up to 96 per cent in Iceland. The overall pattern of age and Internet use resembles that of computer use.

Figure 2.12
Use of the Internet by level of education in 2002



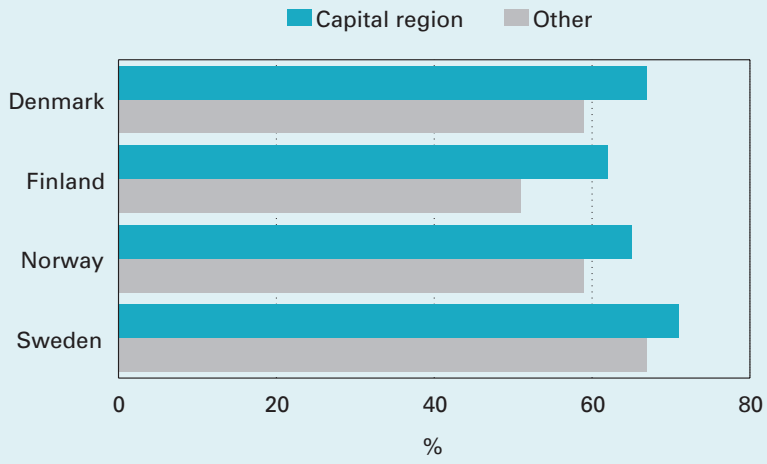
Again, the educational background also has an effect. Half of those with basic education are Internet users while 80–90 per cent of the highly educated visit the web at least once in three months. Between the countries there is some difference in the group of secondary education with 73 per cent of Internet users in Sweden, followed by Denmark's 67 per cent and Finland's 61 per cent (Figure 2.12).

2.2.5 Regional aspects

Besides the attributes on the level of individuals the region has also been a topical issue in the discussion on the digital divide. Evidently, as with the economic or social divides, the main dividing line is between the affluent industrialised countries and the developing countries. However, among the developed OECD countries, attention has been given to the intra-country difference along the urban/rural dimension.

In access to the Internet at home there is a fairly evident difference in Finland between the Helsinki metropolitan area (62 per cent with an Internet connection at home) and the rest of the country (51 per cent). In Denmark and Norway the difference is 6–8 percentage points. In Sweden, hardly any distinction can be made between greater Stockholm and the rest of the country. Thus, the digital divide between the central areas capital and other regions has only a weak support in the Nordic countries as a whole.

Figure 2.13
Access to the Internet at home, the capital region compared to other regions in Denmark, Finland, Norway* and Sweden in 2002



* 2001

Annex 2

Annex 2.1 Statistical tables

Annex 2.2 Description of the surveys on the ICT access and use

Annex 2.1 Statistical tables

Annex table 2.1
Access of individuals to ICT at home by country in 2002

	Mobile phone		Computer			Internet	Satellite or cable TV
	All	Internet enabled mobile phone	All	Desktop computer	Portable or handheld computer		
	%	%	%	%	%	%	%
All	**88**	**20**	**73**	**69**	**18**	**62**	**56**
Denmark	80	17	77	75	18	61	57
Finland	94	20	63	60	13	53	42
Iceland[1)]	–	–	–	–	–	73	–
Norway[1)]	93	–	76	–	–	61	–
Sweden	89	22	75	71	21	68	64

[1)] 2001

Annex table 2.2
Frequency of the computer use by country in 2002

	Users in the last 3 months	Frequent users		At least once a week	Users at least once a month	Users less than once a month
		All	Daily			
	%	%	%	%	%	%
All	**74**	**67**	**50**	**18**	**5**	**2**
Denmark[1)]	72	65	52	14	4	2
Finland	74	65	45	20	6	3
Sweden	76	70	51	19	4	1

[1)] Users in the last month

Annex table 2.3
Frequency of the Internet use by country in 2002

	Users in the last 3 months	Frequent users		Users at least once a week	Users at least once a month	Users less than once a month	Hours per week, Internet users
		All	Daily users				
	%	%	%	%	%	%	Average h/week
All	**66**	**58**	**34**	**24**	**6**	**2**	**6.7**
Denmark[1)]	64	56	37	20	6	2	7.6
Finland	62	52	29	24	7	3	6.0
Iceland[2)]	79	70	45	25	5	4	–
Sweden	71	63	36	27	6	2	6.6

[1)] Users in the last month
[2)] 2001

Annex table 2.4
Purposes of the Internet use by country in 2002

	Communication		Information on goods and services	Purchases		Interaction with public authorities
	All	E-mails		All	Financial services	
	%	%	%	%	%	%
All	**54**	**53**	**57**	**44**	**38**	**38**
Denmark	54	54	49	39	33	36
Finland	47	46	58	43	40	34
Iceland[1)]	72	–	75	51	–	42
Sweden	57	57	62	47	39	42

[1)] 2001

Annex table 2.5a
Access to ICT at home by individual characteristics. Denmark in 2002

	Mobile phone	Computer	Internet	Internet enabled mobile phone	Own web pages in the Internet
	%	%	%	%	%
All	**80**	**77**	**61**	**17**	**6**
Household size					
1	62	54	35	10	4
2	79	75	59	13	5
3	91	90	75	22	8
4+	90	91	76	24	7
Family type					
No children	74	73	74	19	6
With children	89	82	51	14	6
Gender					
Male	84	80	65	19	8
Female	77	75	58	15	4
Age					
16–29	89	87	68	22	8
30–49	88	86	72	22	7
50–59	76	76	57	12	4
60–74	58	47	33	4	2
Education					
Primary	78	67	49	14	4
Secondary	83	79	62	17	6
Tertiary	79	90	78	20	8
Employment					
Employed	85	84	69	19	6
Student	88	92	70	24	10
Retired	56	42	28	3	2
Other	74	70	53	10	5

Annex table 2.5b
Access to ICT at home by individual characteristics. Finland in 2002

	Mobile phone	Computer	Internet	Internet enabled mobile phone	Own web pages in the Internet
	%	%	%	%	%
All	**94**	**63**	**53**	**20**	**5**
Household size					
1	83	38	29	13	5
2	93	52	42	15	4
3	98	75	65	23	6
4+	99	87	75	29	6
Family type					
No children	92	56	46	17	5
With children	99	84	71	27	5
Gender					
Male	95	64	55	23	7
Female	92	62	51	16	3
Age					
16–29	100	76	59	29	10
30–49	98	74	64	23	5
50–59	95	60	52	13	3
60–74	76	28	25	8	1
Education					
Primary	90	51	44	19	4
Secondary	95	63	50	18	4
Tertiary	95	80	69	23	6
Employment					
Employed	97	71	61	21	5
Student	99	83	66	29	12
Retired	74	28	26	9	1
Other	93	50	39	15	2

Annex table 2.5c
Access to ICT at home by individual characteristics. Iceland in 2001

	Mobile phone	Computer	Internet	Internet enabled mobile phone	Own web pages in the Internet
	%	%	%	%	%
All	–	–	**73**	–	–
Household size					
1	–	–	–	–	–
2	–	–	–	–	–
3	–	–		–	–
4+	–	–	–	–	–
Family type					
No children	–	–	–	–	–
With children	–	–	–	–	–
Gender					
Male	–	–	75	–	–
Female	–	–	72	–	–
Age					
16–29	–	–	80	–	–
30–49	–	–	82	–	–
50–59	–	–	70	–	–
60–74	–	–	38	–	–
Education					
Primary	–	–	–	–	–
Secondary	–	–	–	–	–
Tertiary	–	–	–	–	–
Employment					
Employed	–	–	75	–	–
Student	–	–	88	–	–
Retired	–	–	24	–	–
Other	–	–	70	–	–

Annex table 2.5d
Access to ICT at home by individual characteristics. Norway in 2001

	Mobile phone	Computer	Internet	Internet enabled mobile phone	Own web pages in the Internet
	%	%	%	%	%
All	**93**	**76**	**61**	–	–
Household size					
1	77	50	36	–	–
2	94	65	48	–	–
3	95	87	72	–	–
4+	99	92	78	–	–
Family type					
No children	90	66	50	–	–
With children	97	91	77	–	–
Gender					
Male	94	78	64	–	–
Female	91	73	57	–	–
Age					
16–29	97	83	63	–	–
30–49	95	86	73	–	–
50–59	93	75	62	–	–
60–74	80	38	23	–	–
Education					
Primary	89	61	47	–	–
Secondary	94	74	57	–	–
Tertiary	94	87	74	–	–
Employment					
Employed	95	83	68	–	–
Student	97	86	64	–	–
Retired	78	33	19	–	–
Other	92	73	58	–	_

Annex table 2.5e
Access to ICT at home by individual characteristics. Sweden in 2002

	Mobile phone	Computer	Internet	Internet enabled mobile phone	Own web pages in the Internet
	%	%	%	%	%
All	**89**	**75**	**68**	**22**	**6**
Household size					
1	–	55	46	–	6
2	–	68	60	–	5
3	–	89	84	–	7
4+	–	93	85	–	8
Family type					
No children	–	–	–	–	–
With children	–	–	–	–	–
Gender					
Male	92	77	69	29	8
Female	87	74	66	14	4
Age					
16–29	–	83	76	–	12
30–49	–	88	80	–	7
50–59	–	75	69	–	4
60–74	–	44	35	–	1
Education					
Primary	–	59	50	–	6
Secondary	–	78	70	–	6
Tertiary	–	89	82	–	7
Employment					
Employed	–	82	75	–	6
Student	–	89	81	–	13
Retired	–	38	29	–	1
Other	–	72	60	–	10

Annex table 2.6a
Access to ICT at home, by gender and age, gender and education. Denmark in 2002

GENDER AND AGE

MOBILE PHONE	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**80**	**89**	**88**	**76**	**58**
Male	84	89	90	78	68
Female	77	88	85	73	49

COMPUTER	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**77**	**87**	**86**	**76**	**47**
Male	80	90	86	79	53
Female	75	84	87	73	41

INTERNET	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**61**	**68**	**72**	**57**	**33**
Male	65	71	74	59	41
Female	58	64	71	55	26

GENDER AND EDUCATION

MOBILE PHONE		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**80**	**78**	**83**	**79**
Male	84	85	84	83
Female	77	73	82	76

COMPUTER		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**77**	**67**	**79**	**90**
Male	80	71	79	94
Female	75	63	79	87

INTERNET		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**61**	**49**	**62**	**78**
Male	65	56	62	80
Female	58	44	61	76

Annex table 2.6b
Access to ICT at home, by gender and age, gender and education. Finland in 2002

GENDER AND AGE

MOBILE PHONE	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**94**	**100**	**98**	**95**	**76**
Male	95	99	98	95	82
Female	92	100	98	95	70

COMPUTER	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**63**	**76**	**74**	**60**	**28**
Male	64	78	73	58	29
Female	62	74	75	62	27

INTERNET	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**53**	**59**	**64**	**52**	**25**
Male	55	62	65	51	27
Female	51	56	63	52	23

GENDER AND EDUCATION

MOBILE PHONE		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**94**	**90**	**95**	**95**
Male	95	93	96	96
Female	92	87	95	95

COMPUTER		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**63**	**51**	**63**	**80**
Male	64	53	65	82
Female	62	48	62	80

INTERNET		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**53**	**44**	**50**	**69**
Male	55	46	53	74
Female	51	43	48	65

Annex table 2.6c
Access to ICT at home, by gender and age, gender and education. Norway in 2001

GENDER AND AGE

MOBILE PHONE	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**93**	**97**	**95**	**93**	**80**
Male	94	98	96	95	85
Female	91	97	94	92	74

COMPUTER	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**76**	**83**	**86**	**75**	**38**
Male	78	83	87	79	45
Female	73	82	85	72	31

INTERNET	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**61**	**63**	**73**	**62**	**23**
Male	64	65	75	66	28
Female	57	61	71	57	18

GENDER AND EDUCATION

MOBILE PHONE		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**93**	**89**	**94**	**94**
Male	94	92	94	96
Female	91	85	93	91

COMPUTER		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**76**	**61**	**74**	**87**
Male	78	61	77	91
Female	73	60	70	84

INTERNET		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**61**	**47**	**57**	**74**
Male	64	45	60	80
Female	57	48	52	69

Annex table 2.6d
Access to ICT at home, by gender and age, gender and education. Sweden in 2002

GENDER AND AGE

MOBILE PHONE	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**89**	**–**	**–**	**–**	**–**
Male	92	–	–	–	–
Female	87	–	–	–	–

COMPUTER	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**75**	**83**	**88**	**75**	**45**
Male	77	86	88	75	49
Female	74	80	88	76	41

INTERNET	All	Age			
		16–29	30–49	50–59	60–74
	%	%	%	%	%
All	**68**	**76**	**80**	**69**	**35**
Male	70	79	78	70	42
Female	66	73	81	67	29

GENDER AND EDUCATION

MOBILE PHONE		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**89**	**–**	**–**	**–**
Male	92	–	–	–
Female	87	–	–	–

COMPUTER		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**75**	**59**	**78**	**89**
Male	77	63	79	91
Female	74	55	77	88

INTERNET		Education		
	All	Primary	Secondary	Tertiary
	%	%	%	%
All	**68**	**50**	**70**	**82**
Male	70	53	73	84
Female	66	48	68	80

Annex table 2.7a
Use of computer by individual characteristics. Denmark in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last month	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education[1]	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**72**	**65**	**52**	**14**	**4**	**2**	**64**	**25**	**37**	**6**	**10**	**–**
Gender												
Male	75	69	56	13	4	2	69	26	39	5	9	–
Female	68	62	48	14	4	2	59	23	34	7	11	–
Age												
16–29	87	80	60	20	5	2	80	29	19	2	40	–
30–49	81	75	61	14	4	2	73	25	54	8	2	–
50–59	69	62	53	9	5	1	59	21	48	10	0	–
60–74	32	28	19	9	4	–	32	24	10	2	0	–
Education												
Primary	56	48	34	14	5	2	52	27	11	3	17	–
Secondary	75	68	55	14	5	2	66	27	41	8	7	–
Tertiary	87	83	72	11	2	2	80	17	67	8	3	–
Employment												
Employed	79	73	61	12	4	2	69	22	57	9	–	–
Student	95	87	66	22	6	2	86	20	–	–	75	–
Retired	28	22	11	10	4	2	28	28	–	–	–	–
Other	59	54	33	21	5	1	59	58	–	–	–	–

[1] Students only

Annex table 2.7b
Use of computer by individual characteristics. Finland in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last 3 months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**74**	**65**	**45**	**20**	**6**	**3**	**56**	**12**	**40**	**8**	**12**	**26**
Gender												
Male	75	66	47	19	6	2	58	12	41	7	12	25
Female	74	64	43	21	6	3	54	12	39	8	13	26
Age												
16–29	96	86	51	35	8	2	72	9	24	4	48	50
30–49	85	76	57	19	6	3	67	14	60	9	2	24
50–59	71	60	47	14	6	4	48	10	52	16	1	14
60–74	27	21	11	10	5	2	21	13	6	2	–	8
Education												
Primary	60	50	29	21	7	3	43	10	19	5	21	23
Secondary	76	65	43	22	7	3	54	12	40	10	12	26
Tertiary	92	85	69	16	5	1	76	14	68	9	1	28
Employment												
Employed	86	78	61	17	5	3	63	9	70	14	–	23
Student	99	93	51	41	5	5	81	4	–	–	92	49
Retired	27	18	8	11	6	1	22	17	–	–	–	9
Other	54	37	15	22	11	2	40	25	–	–	–	28

Annex table 2.7c
Use of computer by individual characteristics. Sweden in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last 3 months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**76**	**70**	**51**	**19**	**4**	**1**	**67**	**15**	**45**	**5**	**17**	**18**
Gender												
Male	78	74	56	18	3	1	70	15	48	4	16	20
Female	74	67	47	20	5	2	63	15	42	6	18	17
Age												
16–29	94	88	63	25	4	1	81	12	34	3	44	40
30–49	88	81	60	20	5	2	79	16	60	5	16	19
50–59	73	69	53	16	3	1	62	13	56	8	8	9
60–74	40	34	20	13	4	2	33	18	16	4	3	5
Education												
Primary	56	50	32	18	5	1	48	14	21	3	18	15
Secondary	79	72	52	21	4	2	68	18	47	6	15	17
Tertiary	93	88	72	16	3	1	85	11	69	5	21	24
Employment												
Employed	84	78	60	18	4	1	73	13	66	7	11	16
Student	98	95	63	32	3	–	88	7	–	–	87	45
Retired	31	24	11	14	4	2	28	22	–	–	1	7
Other	74	63	38	26	7	3	63	32	–	–	15	33

Annex table 2.8a
Use of the Internet by individual characteristics. Denmark in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last 3 months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education[1]	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**64**	**56**	**36**	**20**	**6**	**2**	**49**	**18**	**32**	**9**	**10**	**11**
Gender												
Male	69	62	42	19	6	1	55	18	36	9	9	12
Female	60	51	31	20	7	2	44	17	28	9	10	10
Age												
16–29	85	74	47	28	9	2	60	19	16	5	38	26
30–49	74	65	43	22	7	2	59	20	47	12	2	9
50–59	60	52	37	15	6	2	44	16	41	14	0	5
60–74	23	19	9	10	3	1	20	12	8	1	0	3
Education												
Primary	49	41	23	18	7	1	37	17	9	3	17	10
Secondary	67	58	38	20	7	2	50	19	35	11	7	12
Tertiary	81	75	53	21	5	1	67	16	60	13	2	9
Employment												
Employed	71	62	42	20	7	2	55	18	50	14	–	8
Student	92	83	52	31	8	2	62	12	–	–	71	27
Retired	18	14	5	9	3	1	17	15	–	–	–	3
Other	54	46	25	21	8	–	44	36	–	–	–	19

[1] Students only

Annex table 2.8b
Use of the Internet by individual characteristics. Finland in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last 3 months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**62**	**52**	**29**	**24**	**7**	**3**	**41**	**11**	**31**	**8**	**12**	**20**
Gender												
Male	64	55	31	24	7	2	44	11	33	8	12	20
Female	61	50	26	24	7	4	38	12	28	9	12	19
Age												
16–29	91	77	37	40	10	4	51	9	20	7	46	42
30–49	71	60	35	25	8	3	51	15	47	10	1	18
50–59	51	42	26	16	5	3	34	10	37	13	1	7
60–74	19	15	6	9	3	2	14	9	5	2	–	6
Education												
Primary	49	40	18	22	6	3	32	9	13	4	20	18
Secondary	61	49	25	24	9	3	37	13	27	8	12	19
Tertiary	83	73	48	25	6	3	58	13	60	14	1	22
Employment												
Employed	71	61	37	23	7	3	46	11	54	15	–	17
Student	97	87	40	46	8	3	59	5	–	–	88	40
Retired	18	13	3	10	3	2	15	12	–	–	–	6
Other	43	29	10	19	9	5	29	19	–	–	–	23

Annex table 2.8c
Use of the Internet by individual characteristics. Iceland in 2001

	FREQUENCY OF USE						PLACE OF USE					
	Users in last 3 months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**79**	**70**	**45**	**25**	**5**	**4**	**68**		**46**		**22**	**35**
Gender												
Male	80	74	50	23	4	3	70		49		20	35
Female	78	67	40	26	7	4	66		43		24	34
Age												
16–29	96	86	57	29	5	5	79		44		54	68
30–49	87	77	51	26	7	3	77		58		11	29
50–59	69	60	37	23	5	4	57		47		5	11
60–74	31	28	14	14	2	1	26		13		1	6
Education												
Low	–	–	–	–	–	–	–	–	–	–	–	–
Medium	–	–	–	–	–	–	–	–	–	–	–	–
High	–	–	–	–	–	–	–	–	–	–	–	–
Employment												
Employed	80	70	46	25	6	4	69		54		10	29
Student	99	92	60	32	4	2	87		30		85	73
Retired	20	19	10	9	0	1	18		2		0	3
Other	80	61	39	21	12	0	61		32		14	46

Annex table 2.8d
Use of the Internet by individual characteristics. Sweden in 2002

	FREQUENCY OF USE						PLACE OF USE					
	Users in last months	Frequent users			Monthly users	Less frequent than once a month users	At home		At work		At place of education	Other
		All	Daily users	Users at least once a week			All	At home only	All	At work only		
	%	%	%	%	%	%	%	%	%	%	%	%
All	**71**	**63**	**36**	**27**	**6**	**2**	**59**	**18**	**37**	**6**	**12**	**14**
Gender												
Male	73	67	42	25	4	2	63	18	41	4	11	16
Female	68	58	30	28	7	2	56	18	34	7	13	12
Age												
16–29	94	85	51	34	6	2	75	19	28	3	38	37
30–49	81	72	42	30	7	2	71	20	50	6	8	13
50–59	68	60	35	25	5	2	56	16	48	9	4	5
60–74	30	25	11	14	3	2	25	15	12	4	1	3
Education												
Primary	50	43	22	21	5	2	42	16	15	3	15	13
Secondary	73	65	36	29	6	3	61	21	38	7	10	13
Tertiary	89	81	51	29	6	2	76	16	61	7	12	18
Employment												
Employed	79	70	41	28	7	2	66	19	54	8	4	13
Student	96	91	49	41	4	1	77	11	–	–	81	34
Retired	21	17	6	11	3	2	20	17	–	–	1	4
Other	65	56	32	24	6	2	55	32	–	–	10	28

Annex 2.2 Description of the surveys on the ICT access and use

Description of the surveys on the ICT access and use

In Denmark, Finland and Sweden the data on individuals' access to and use of ICT were gathered by surveys that were based on the harmonised model questionnaires and sampling methodologies developed by Eurostat. The statistical institutes conducted the surveys by telephone interviews. In Norway, the data were collected in connection with a media use survey of Statistics Norway. In Iceland, the data was collected by Gallup Europe. Due to the different data sources, Iceland and Norway were only able to provide data on the selected variables as presented in this report.

DENMARK

Statistics Denmark, Eurostat survey

The data on households' use of the Internet are based on the results of approximately 1 000 telephone interviews completed in each month among a representative section of the Danish population aged 16 to 74 year (excl. Greenland and the Faeroe Islands). The sample was drawn by random selection from the Central Register of Persons. The response rate was 68 per cent. The recall period is one month and the data for three months is calculated by grouping of the data from the three one month's surveys.

ICELAND

Eurobarometer, Gallup Europe

The survey was conducted by Gallup Iceland, 2000 interviews were collected by telephone between November 1st and 19th, 2001.

FINLAND

Statistics Finland, Eurostat survey

The survey was conducted as an annex to the monthly Consumer Survey. The target area was the whole country and the respondents represented the 15 to 74-year-old population in Finland according to age, gender, province, and native language. The survey was conducted during two rounds of the Consumer Survey in April and May 2002. Altogether 3,041 interviews were conducted. The obtained response rate was 74 per cent.

NORWAY

Statistics Norway, Mediabarometer

The Norwegian data on the ICT access of households were collected by Statistics Norway as a part of the 2001 media use survey. This was an interview survey conducted among a nationwide sample of 2 573 persons aged 9 to 79. The interviews took place on all weekdays during four periods of the year: March, June, September and December. The bulk of the interviews were conducted in the first three weeks of the months. The response rate was 70 per cent.

SWEDEN

The survey was part of an omnibus survey conducted in April and May 2002. It was conducted by telephone interviews utilising a computer aided telephone interview (CATI) system. The sample units were individuals and the sample consisted of 4 404 persons aged 16–74 years living throughout Sweden. In total, 3 092 individuals answered the questions of the telephone interviews, i.e. the response rate was 70 per cent.

3 ICT INFRASTRUCTURE

The infrastructure of the information society consists of both a technological base and human resources. The technological factors comprise e.g. telecommunication networks and services, and prices for accessing the networks through different types of connections.

Delineating the relevant educational or occupational groups could basically identify the human potential for ICT. However, there are no internationally agreed classifications for ICT education or ICT occupations. When preparing this book, some Nordic comparisons based on ICT relevant educational groups were also on the agenda. The results were not harmonised to an acceptable extent, and thus a conclusion was made that further consideration is needed before presenting data on ICT education as part of ICT infrastructure.

3.1 Recent trends in telecommunications in the Nordic Countries

Telecommunications services have become an important component of economic activity. The share of the sector in total economies is still small, but its growth rate has been rapid since the beginning of the 1990s.

Here, telecommunications as an infrastructure for the information society is described by a few basic indicators and indicative pieces of information. Not much comparable data on telecommunications are available at the moment. However, it is important to illustrate and compare the infrastructures of telecommunications in the Nordic Countries in the light of the available information, even though it is deficient. This is because telecommunications actually constitute the backbone of the information society.

The telecommunications sector in the Nordic Countries is depicted by the following indicators: number of fixed and mobile subscriptions per 100 capita, frequency of broadband access today, extent of the use of value added services of mobile phones, of which the most common at the moment is short text messages and, finally, the prices of telecommunications services. No suitable comparable data on the infrastructure of IT, e.g. number of computers per 100 capita, or on the Internet, e.g. number of Internet connections, were available for the preparation of this publication. Therefore, these items are excluded here and the text concentrates on the infrastructure of telecommunications only.

It is important, however, that information on the infrastructures of other parts of the ICT sector be available in future. The infrastructures of IT and the Internet are essential parts of the information society. Thus, the need for better statistical data on the ICT infrastructure is obvious and considerable.

It can be stated that telecommunications and information services together comprise the core of the information society. Efficient communication is indisputably the prerequisite for an advanced information society. Technological development and innovations in telecommunications form the basis for the development of new services for consumers. Developments within the field of information and communications technology affect all areas of society and encompass everything from individual and commercial use of ICT to its effects on societal development.

The notable change in telecommunications during the past decade has happened by virtue of the deregulation which lead to competition in the telecom markets. Through competition and innovations, the deregulation has brought about new products and new possibilities for customers to use communication technology. For example, efficient competition is seen as a precondition for the provision of broadband services. First and foremost, however, deregulation of the telecommunication markets has affected the supply side of telecommunications. Whereas earlier there were either monopolies or only a few operators in the Nordic Countries, today there are numerous players within telecommunications; several network and service operators.[1]

In the Nordic Countries the number of operators in fixed telecommunications has increased markedly since the early and mid-1990s. In 1990, there was a monopoly in most Nordic Countries. A notable exception to this was Finland, where there were numerous local operators offering fixed telephony. The monopoly was broken up in all the countries concerned during the 1990s. As a result of the deregulation the number of operators has increased considerably and there are now dozens of operators within fixed telecommunications in the Nordic Countries.

In the mobile markets the development of the number of operators has been quite similar to that in fixed telecommunications. Most Nordic Countries only had one mobile network operator at the beginning of the 1990s. Due to the deregulation process the number of operators in the mobile business has increased so that all five countries today have several operators in mobile telecommunications.

It should be noted that the development of telecommunications as a whole has increased markedly the number of different kinds of business players, such as content and Internet service providers. Together with the service and network operators these have an important role in the provision of new telecommunications services.

Depicting the growth of the telecom markets the turnover of the telecommunications sector has increased in all the Nordic Countries in the past few years, as can be seen from the data on turnover presented later in this publication.

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1 Network operators provide network services by constructing and/or maintaining either fixed or mobile communications networks. Service operators do not own a network but rent the necessary capacity from network operators.

The growth of the mobile markets has generated an increase in the revenue from the mobile business. Mobile revenue has increased especially relative to revenue from fixed voice telephony.

According to OECD statistics,[2] in 1993 the wireless communications market made up less than 7 per cent of all telecommunications revenue in the OECD countries. By 1999, this had increased to 28.7 per cent. At that time, the share of mobile revenue of total revenue was 23.9 per cent in Denmark, 24.2 per cent in Iceland, 27.5 per cent in Norway and 22.2 per cent in Sweden. The share of revenue from the mobile business was the highest in Finland at 39.3 per cent. The proportional shares of mobile revenues of total telecommunications revenues have continued to increase even further in the past few years.

Due to the changes and the development of the telecommunications markets, as well as to the supply of new services, the sources of revenue alter in the course of time. Increasing revenue is today gained from short text messaging markets, Internet business and data transmission, among other things.

3.2 Infrastructure of fixed networks and fixed telecommunications services

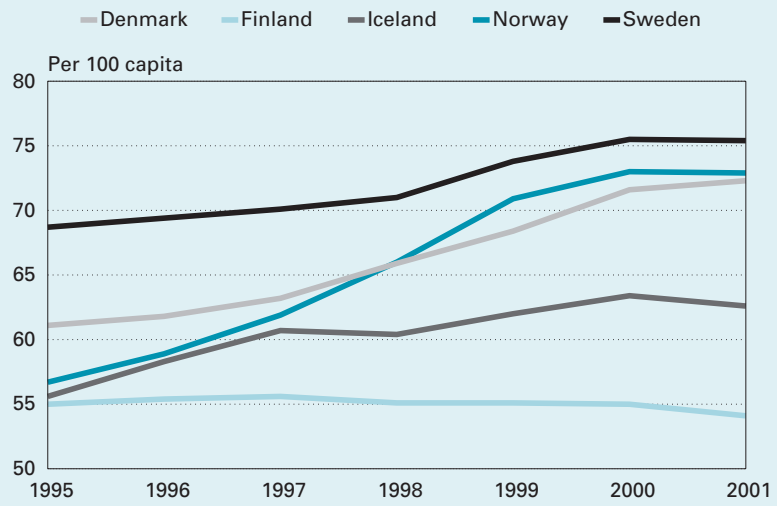
Opening the telecommunications markets to competition has also affected the supply of fixed network services. The number of operators offering different types of calls has increased considerably since the deregulation. At the beginning of the 1990s there was only one operator offering local, long distance and international calls in all the Nordic Countries except Finland. In Finland, several operators offered local calls at that time while long distance and international calls were offered by only one operator. In 2001, the situation was totally different; there were numbers of operators providing both national and international fixed telephony in all the Nordic Countries.

The number of fixed telephone lines per 100 capita is clearly above the OECD average in the Nordic Countries. In the OECD countries the average of 'fixed network penetration' was 39.8 in 1990, while in the Nordic Countries it was over 50, even approaching 70 in Sweden. In the mid-1990s, the OECD average was 45.7 and at that time there were 55 or more fixed lines per 100 capita in the Nordic Countries. In 1999, the OECD average had gone up to 52.8, while the penetration rate in Norway and Sweden had already reached 70, followed by Denmark with about 68 fixed telephone lines per 100 capita and Iceland with 62 fixed lines per 100 capita.[3]

Of the Nordic Countries, Finland has the smallest number of fixed telephone lines relative to population. There were 54 fixed telephone lines per 100 capita in Finland at the end of 2001. In Denmark, Norway and Sweden there were more than 70 fixed lines per 100 capita in 2001. In these countries the number of fixed lines

2 OECD, Communications Outlook 2001
3 OECD, Communications Outlook 2001

Figure 3.1
Number of fixed telephone lines per 100 capita in the Nordic Countries 1995–2001



Source: National data in Annex table 3.1

relative to population has basically increased from year to year but in Finland the number has stayed almost unchanged over the past few years. In Iceland, too, the number of fixed lines relative to population has changed only a little in recent years (Annex table 3.1).

Figure 3.1 illustrates changes in the numbers of fixed lines per 100 capita in the Nordic Countries. (The time series are based on the data in Annex table 3.1). In addition to PSTN subscriber lines,[4] the numbers of fixed telephone lines also include ISDN lines.[5] One basic ISDN subscriber line (2B+D) counts as two conventional lines and one primary ISDN subscriber line (30B+D) as 30 conventional lines. Figure 3.1 indicates that the growth in the number of fixed lines is now moderating.

It may seem that the number of subscriptions decreases while the number of fixed lines is actually growing. This is because the number of PSTN lines may decline while the number of ISDN subscriptions is increasing. Thus, the total number of fixed lines may increase because one ISDN subscription has several lines (channels).

The number of ISDN subscriptions has increased in all the Nordic Countries from one year to the next since the middle of the 1990s as shown in Table 3.1. The growth rate of the number of ISDN subscriptions has, however, been quite

4 PSTN (Public Switched Telephone Network): Voice oriented (conventional) public telephone network

5 ISDN (Integrated Services Digital Network): Digital network integrating several types of services; voice, text, data and video images, accessible to the subscriber through the conventional telephone network

Table 3.1
Number of ISDN subscriptions 1995–2001 and ISDN lines as a percentage of all fixed telephone lines in 2001

	1995	1996	1997	1998	1999	2000	2001	% of ISDN of all fixed lines in 2001
Denmark								
ISDN Basic	..	29,000	56,000	113,000	240,731	368,762	398,671	
ISDN Primary	..	1,000	2,000	4,000	6,015	7,352	9,052	27.5
Finland[1)]								
ISDN Basic	5,962	25,922	54,168	95,064	151,413	199,015	272,013	
ISDN Primary	454	1,278	3,687	4,630	5,484	8,630	4,342	24.0
Iceland[2)]								
ISDN Basic	..	..	..	7,388	12,192	17,018	17,379	
ISDN Primary	..	..	..	336	494	699	749	32.0
Norway[3)]								
ISDN Basic	11,580	41,819	146,005	304,636	524,999	696,289	760,643	
ISDN Primary	734	2,169	3,949	5,324	7,078	7,554	8,165	53.3
Sweden[4)]								
ISDN Basic	12,000	30,000	60,000	114,000	194,000	259,050	270,100	
ISDN Primary	533	1,333	2,667	4,833	8,500	14,216	16,990	15.6

1) Source: Telecommunications Statistics 2002, Ministry of Transport and Communications
The basis for the compilation of the statistics was changed in 1996 and in 2001
The data for 1999 and 2000 are partly estimated
2) Source: Icelandic Post and Telecommunication Administration
3) Source: Norwegian Post and Telecommunication Authority
4) Source: Swedish National Post and Telecom Agency

moderate. In Denmark, ISDN lines accounted for 27.5 per cent of all fixed telephone lines in 2001, in Finland the share of ISDN lines of all fixed lines was 24.0 per cent, in Iceland 32.0 per cent and in Sweden 15.6 per cent. In Norway, more than half of all fixed lines is comprised of ISDN lines, their share being 53.3 per cent. Thus, in all the Nordic Countries ISDN lines constitute quite an important proportion of all fixed network connections at the moment.

Table 3.2
Numbers of ISDN subscriptions per 100 capita in the Nordic Countries in 1999–2001

	ISDN subscriptions per 100 capita 1999		ISDN subscriptions per 100 capita 2000		ISDN subscriptions per 100 capita 2001	
	Basic	Primary	Basic	Primary	Basic	Primary
Denmark	4.5	0.1	6.9	0.1	7.5	0.2
Finland	2.9	0.1	3.8	0.2	5.2	0.1
Iceland	4.4	0.2	6.0	0.2	6.1	0.3
Norway	11.7	0.2	15.5	0.2	16.8	0.2
Sweden	2.2	0.1	2.9	0.2	3.0	0.2

Sources: National data from Table 3.1 and information on population from each country

Table 3.2 depicts the numbers of ISDN subscriptions relative to population. As can be seen from it, the number of primary rate ISDN subscriptions relative to population is quite similar in all the Nordic Countries. The numbers of primary ISDN subscriptions are relatively low, but primary ISDN is basically intended for business use. Contrastingly, there are notable differences between the Nordic Countries in the numbers of basic rate ISDN subscriptions relative to population. The number of basic rate ISDN subscriptions per 100 capita is the highest in Norway where they numbered 16.8 at the end of 2001.

The importance of fixed networks is increasing due to the use of broadband services. The conventional telephone business of fixed networks may decrease but broadband services are a new phase in the development of fixed network services. Availability of broadband access creates possibilities for the development of novel services.

3.3 Broadband access

The development of broadband access to the Internet has gained increasing prominence during recent years. Advanced communication capabilities are a necessary step towards more efficient use of (information) networks. They are also the indisputable prerequisite for an advanced information society. The widening coverage of broadband will not only stimulate growth in the entire communications sector but also drive growth in areas such as electronic commerce, and contribute to overall growth of economies.[6] From the information society development point of view, the aim of governments is to promote the development of broadband and access to it. From the consumer point of view, widespread coverage of broadband infrastructure will create preconditions for the development and use of new services.

There are a number of definitions for "broadband". According to the International Telecommunication Union's (ITU) recommendation, broadband means transmission capacity that is faster than primary rate ISDN (i.e. 1.5 or 2Mbps[7]). In practice, the speed of broadband access (bandwidth) is often notably lower (usually from 200Kbps to 2Mbps). In this text the term broadband refers to cable modems and Digital Subscriber Lines (DSL), the latter meaning collectively all types of digital subscriber lines (ADSL, SDSL, HDSL and VDSL).[8] These are the

6 OECD, The Development of Broadband Access in OECD Countries

7 Mbps = Megabytes per second, used to measure transmission capacity (Kbps = Kilobytes per second)

8 DSL (Digital Subscriber Line): Generic term for technologies that make it possible to increase the capacity in copper access networks, xDSL refers to all kinds of Digital Subscriber Lines
ADSL (Asymmetric Digital Subscriber Line), for high transmission capacity, maximum data transfer speed 2 Mbps, intended for small businesses and private users
SDSL (Symmetric Digital Subscriber Line)
HDSL (High Speed Digital Subscriber Line)

two leading broadband technologies at this moment, but other technologies are also available, such as Lina.Net in Iceland and Ethernet-LAN in Sweden.

Broadband infrastructure paves the way for the development and use of new services. Thus far, broadband has not become as widespread as it was perhaps expected to, but it seems that the number of broadband subscriptions has now begun to grow. According to an OECD report,[9] at the beginning of 2001 just one person per 100 capita, on average, was a subscriber to high speed Internet access in the OECD countries. In June 2001, the average broadband penetration rate in the OECD countries was about 2 (two persons per 100 capita were subscribers to a high speed Internet access).

Table 3.3 illustrates the numbers of DSL and cable modem subscriptions in the Nordic Countries. Sweden has the largest number of DSL and cable modem subscriptions. In addition to these, other kinds of high speed Internet access, mostly Ethernet-LAN, are common among Swedish households.

Table 3.3
Numbers of xDSL and cable modem subscriptions in the Nordic Countries in 2000 and 2001

	xDSL		Cable Modems	
	2000	2001	2000	2001
Denmark[1)]	26,000	152,000	41,000	88,000
Finland[2)]	10,000	61,467	..	25,000
Iceland[3)]	2,358	10,424	..	..
Norway[4)]	..	25,646	..	20,764
Sweden[5)]	26,200	241,000	56,300	115,500

1) DSL subscriptions include ADSL subscriptions
2) The number of DSL subscriptions refers mainly to the number of ADSL subscriptions but also includes other xDSL subscriptions. The number of cable modem subscriptions is an estimate
Source: Ministry of Transport and Communications
3) Total number of xDSL subscriptions
Source: Icelandic Post and Telecommunication Administration
4) Source: Norwegian Post and Telecommunication Authority
5) These figures exclude other fixed access, mainly Ethernet-LAN to households: 66,800 in 2000 and 125,200 in 2001. This is most likely unique for Sweden

Table 3.4
Numbers of xDSL and cable modem subscriptions relative to population in the Nordic Countries in 2000 and 2001

	xDSL subscriptions per 100 capita		Cable modem subscriptions per 100 capita	
	2000	2001	2000	2001
Denmark	0.5	2.8	0.8	1.6
Finland	0.2	1.2	..	0.5
Iceland	0.8	3.6	..	..
Norway	..	0.6	..	0.5
Sweden	0.3	2.7	0.6	1.3

Source: National data in table 3.3 and information on population from each country

9 OECD, The Development of Broadband Access in OECD Countries

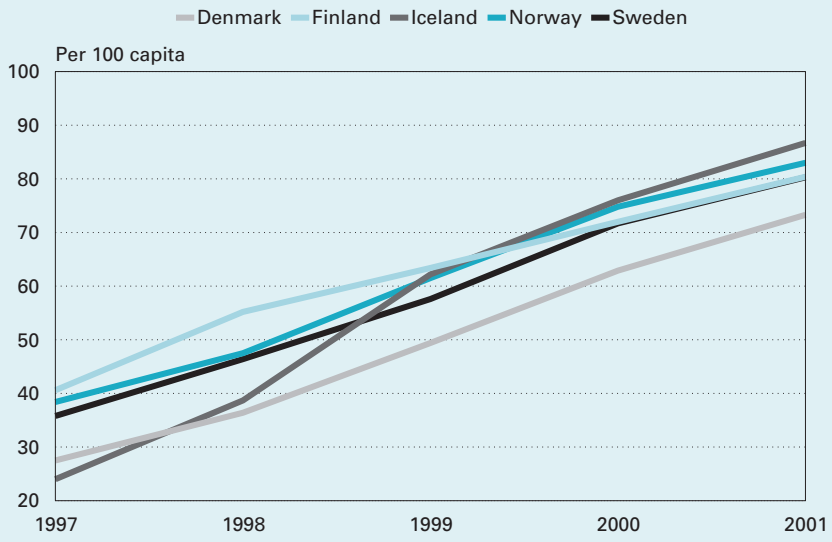
Table 3.4 depicts the numbers of xDSL and cable modem subscriptions relative to population. Table indicates that broadband access is the most common in Denmark and Sweden, where there were close on 3 xDSL subscriptions per 100 capita in 2001. The number of cable modem subscriptions per 100 capita was 1.6 in Denmark and 1.3 in Sweden. Taking the widespread use of Ethernet-LAN among households in Sweden into account would bring the last figure to 2.7. If only the frequency of xDSL subscriptions is considered, Iceland was the leading country in the Nordic area in 2001. In general, however, it can be deduced from these figures that broadband access was still quite rare as recently as at the end of 2001.

Provision and availability of broadband access to services are the fundamental and crucial pillars for the construction of an advanced information society. It is important that broadband access can be reached by all. It is equally important that people adopt the use of new technologies and services, and possibilities for obtaining the required services. However, the very topical question at the moment is how to promote broadband access, even allowing for the fact that broadband access is now growing increasingly more common.

3.4 Mobile telecommunication networks

The number of mobile subscriptions relative to population has increased rapidly in the Nordic Countries. During the past five years the number of subscriptions per 100 capita has at least doubled in all the five countries. An international comparison of "penetration rates" made by the OECD indicates that mobile penetration in the

Figure 3.2
Number of mobile subscriptions per 100 capita in the Nordic Countries in 1997–2001



Nordic Countries is clearly above the OECD average. On average, there were 15.6 subscribers per 100 capita in 1997 and 32.4 subscribers per 100 capita in 1999 in the OECD countries.[10] The numbers of mobile subscriptions per 100 capita in the Nordic Countries are shown in Annex table 3.2. (It should be noted that only a small proportion of all mobile subscriptions are analogous).

In Finland, Iceland, Norway and Sweden there are more than 80 subscriptions per 100 capita at the moment. It is therefore obvious that the Nordic Countries will soon reach the saturation point for mobile phones, even if growth in the mobile markets can be expected to come from new technologies.

Figure 3.2 illustrates the growth rates of the numbers of mobile subscriptions per 100 capita in the Nordic Countries over the past five years. It can be seen that the development has been quite similar in all these countries. The number of mobile subscriptions relative to population has grown most rapidly in Iceland and among the Nordic Countries Iceland today has the highest number of 86.7 mobile subscriptions per 100 capita.

In connection with the growth in the use of mobile phones new systems for the payment of services have also been developed. The use of pre-paid connections has increased during the past few years and they have become quite common nowadays. In Denmark, the share of pre-paid mobile subscriptions is 31 per cent, in Iceland 35 per cent, in Norway 45 per cent and in Sweden 49 per cent. In Finland, pre-paid subscriptions only make up a few per cent of the total number of mobile phone connections.

Mobile communications is expanding from voice transmission to new services. Mobile phones are increasingly also used for a variety of activities other than speech. Today, the most popular and the most common value added service is SMS (Short

Table 3.5
Use of SMS in the Nordic Countries in 1999–2001

	Number of short text messages (1,000)		
	1999	2000	2001
Denmark[1)]	..	752,658	1,334,285
Finland[2)]	705,000	992,000	1,202,000
Iceland[3)]	..	..	90,200
Norway[4)]	515,137	1,237,213	2,070,000
Sweden[5)]	141,000	473,000	1,020,000
Total	**1,361,137**	**3,167,213**	**5,125,200**

1) Source: National IT and Telecom Agency
2) Source: Ministry of Transport and Communications
3) Source: Icelandic Post and Telecommunication Administration
4) Source: Norwegian Post and Telecommunication Authority
5) Number of SMS sent from a mobile phone or alike. Source: Swedish National Post and Telecom Agency

10 OECD, Communications Outlook 2001

Messaging Service). The use of SMS in communication has increased quickly among people owning mobile phones.

The numbers of short messages have increased notably in the past few years. In Norway people sent even more than 2,000 million of them in 2001.

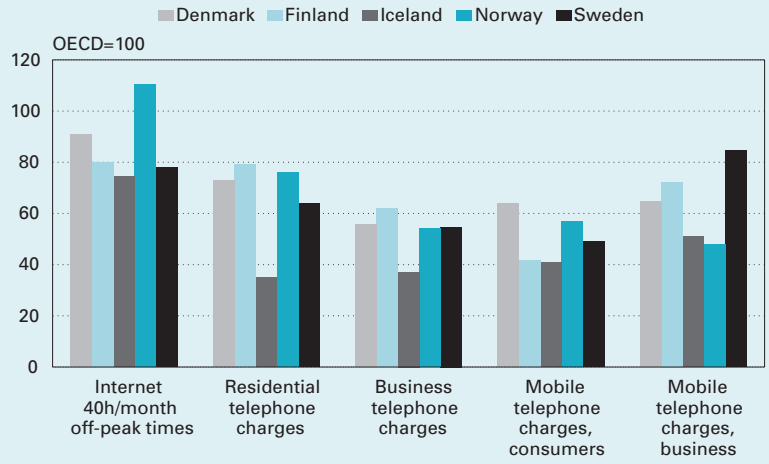
3.5 Prices of services

According to OECD statistics,[11] telecommunications charges in the Nordic Countries were below the OECD average in 2000 (Annex table 3.3). An exception to this was the cost of Internet use in Norway, which was slightly higher than the OECD average.

Generally, the prices of these services vary between the Nordic Countries, but Iceland is the country with the lowest charges by far. It should be noted, however, that the data on telecommunications charges are quite difficult to compare due, among other things, to different compositions of the charges.

According to the information in Figure 3.3, in the Nordic Countries the use of Internet has been the most expensive in Norway, followed by Denmark. In the other countries the charges for Internet use were lower in 2000. Charges for the use of residential telephones as well as business telephone charges were the lowest in Iceland. Mobile telephone charges also seemed to be relatively low in Iceland. Mobile charges for consumers in Finland were at the same level as in Iceland, whereas business mobile charges in Finland were higher than in Iceland. In comparison, business mobile charges were the lowest in Norway and the most expensive in Sweden.

Figure 3.3
Telecommunications charges in the Nordic Countries as compared to the OECD average in 2000, OECD=100



Source: OECD Communications Outlook, 2001

11 OECD, Communications Outlook 2001

It should be noted here that the information on charges presented is quite old, even out-of-date, as the figures are for the year 2000. The pricing of services may have change since then. Nevertheless, the figures reveal that the prices of telecommunications services have been below the OECD average in the Nordic Countries.

Annex 3

Annex 3.1 Statistical tables

Annex table 3.1	Numbers of fixed telephone lines (fixed channels) per 100 capita 1995–2001 and total numbers of fixed lines in 2001 (1000). The figures include ISDN connections measured as channels
Annex table 3.2	Numbers of mobile subscriptions per 100 capita 1997–2001 and total numbers of mobile subscriptions at the end of 2001, including NMT and GSM.
Annex table 3.3	Telecommunications charges in the Nordic Countries as compared to the OECD average, OECD=100

Annex 3.2 Sources

Annex 3.1 Statistical tables

Annex table 3.1
Numbers of fixed telephone lines (fixed channels) per 100 capita 1995–2001 and total numbers of fixed lines in 2001 (1,000). The figures include ISDN connections measured as channels

	1995	1996	1997	1998	1999	2000	2001	Total number of fixed lines in 2001 (1,000)
Denmark[1)]	61.1	61.8	63.2	65.9	68.4	71.6	72.3	3,882
Finland[2)]	55.0	55.4	55.6	55.1	55.1	55.0	54.1	2,806
Iceland[3)]	55.6	58.3	60.7	60.4	62.0	63.4	62.6	179
Norway[4)]	56.7	58.9	61.9	66.0	70.9	73.0	72.9	3,314
Sweden[5)]	68.7	69.4	70.1	71.0	73.8	75.5	75.4	6,718

[1)] Source: National IT and Telecom Agency
[2)] Source: Telecommunications Statistics 2002, Ministry of Transport and Communications
The basis for the compilation of the statistics was changed in 1996
[3)] Source: Icelandic Post and Telecommunication Administration
[4)] Source: Norwegian Post and Telecommunication Authority
[5)] Source: Swedish National Post and Telecom Agency

Annex table 3.2
Numbers of mobile subscriptions per 100 capita 1997–2001 and total numbers of mobile subscriptions at the end of 2001, including NMT and GSM

	1997	1998	1999	2000	2001	Total number of subscriptions 31.12.2001 (1,000)
Denmark[1)]	27.5	36.4	49.4	62.9	73.3	3,954
Finland[2)]	40.6	55.2	63.4	72.0	80.4	4,176
Iceland[3)]	24.0	38.7	62.2	76.0	86.7	248
Norway[4)]	38.4	47.5	61.5	74.8	83.0	3,689
Sweden[5)]	35.8	46.4	57.6	71.7	80.3	7,158

[1)] Source: National IT and Telecom Agency
[2)] Source: Telecommunications Statistics 2002, Ministry of Transport and Communications
[3)] Source: Icelandic Post and Telecommunication Administration
[4)] Source: Norwegian Post and Telecommunication Authority
[5)] Source: Swedish National Post and Telecom Agency

Annex table 3.3
Telecommunications charges in the Nordic Countries as compared to the OECD average, OECD=100

	Internet 40 h/month off-peak times[1)]	Residential telephone charges[2)]	Business telephone charges[3)]	Mobile telephone charges, consumers[4)]	Mobile telephone charges, business[5)]
Denmark	90.9	72.8	55.7	63.8	64.8
Finland	80.0	79.2	61.8	41.7	72.3
Iceland	74.5	34.9	37.1	40.9	51.1
Norway	110.5	76.0	54.1	56.8	47.8
Sweden	77.9	64.0	54.7	49.0	84.7

Source: OECD, Communications Outlook 2001
1) Internet, 40 h/month, off-peak times = OECD Internet access basket for 40 hours at off-peak times using discounted PSTN rates, September 2000, including VAT
2) Residential telephone charges = OECD basket of residential telephone charges, August 2000
3) Business telephone charges = OECD basket of business telephone charges, August 2000.
4) Mobile telephone charges, consumers = OECD basket of consumer mobile telephone charges, August 2000, including tax
5) Mobile telephone charges, business = OECD basket of business mobile telephone charges, August 2000, excluding tax

Annex 3.2 Sources

National IT and Telecom Agency, Denmark
Ministry of Transport and Communications, Finland
Icelandic Post and Telecommunication Administration
Norwegian Post and Telecommunications Authority
Swedish National Post and Telecom Agency

OECD, Communications Outlook 2001, Paris 2001
OECD, The Development of Broadband Access in OECD Countries, Working Party on Telecommunication and Information Services Policies, October 2001, Paris 2001

4 THE ICT SECTOR IN THE NORDIC COUNTRIES

4.1 Introduction

The Information and Communication Technology sector (hereafter referred to as the ICT sector) can be characterised as constituting the focal point for economic and social development in the Nordic Countries as well as in other parts of the developed world. The importance of the ICT sector can be analysed from two aspects; first by adopting the traditional supply–side approach where the performance of the ICT sector is analysed in terms of employment, production of goods and services and creation of value added. Second, due to the all-embracing nature of the commodities produced by the ICT sector, the sector is of importance to the performance of the remaining sectors of economy by virtue of use of computers for production and administrative purposes, e-commerce, etc., and to the organisation of the daily life of ordinary people in the Nordic Countries through the use of mobile phones, watching television or use of the Internet via a PC. Howevere, this chapter describes the structure of the ICT sector from the supply-side perspective.

Because of the importance of the ICT sector, the statistical offices in the Nordic Countries as well as in other parts of the world have been confronted by needs for statistical information on the ICT sector and its activities. The first step towards meeting these needs has been the elaboration of a definition for the ICT sector. This work has mainly been carried out in the context of the OECD Working Party on Indicators for the Information Society (WPIIS), and as a result of discussions in this group an agreement about a definition was reached in 1998.

The principles underlying the definition of the ICT sector are the following:[1]

For *manufacturing* industries, the products of a candidate industry:

- Must be intended to fulfil the function of information processing and communication, including transmission and display.
- Must use electronic processing to detect, measure and/or record physical phenomena or control a physical process.

For *service* industries, the products of a candidate industry:

- Must be intended to enable the function of information processing and communication by electronic means.

Because of the need for international comparability across countries it was agreed that the definition should be applied at the level of the classes of the International

1 OECD: Measuring the ICT Sector, Paris 2000

Standard Industrial Classification (ISIC rev. 3), including 11 ISIC classes. However, this publication uses a more precise delineation of the ICT sector, as certain wholesale activities are left out of the definition.[2] Also, instead of ISIC the corresponding NACE[3] codes are used in this publication. See Annex 4.2 for more details.

The following groups of economic activities within the ICT sector are applied in this publication:

- *ICT Manufacturing Industry*
- *ICT Services, of which*
  - *Wholesale Trade*
  - *Telecommunications*
  - *Consultancy Services*

The optimal procedure for defining the ICT sector would have been to start by specifying ICT products, and by subsequently identifying the enterprises producing these goods and services. However, due to the restricted feasibility to collect data and produce statistics complying with internationally harmonised definitions and concepts at the product level, priority has here been given to the activity approach. Thus, this chapter describes the overall economic importance of the ICT sector in the Nordic Countries when measured in terms of number of employees, turnover, value added and wages. As regards employment, different national definitions should be allowed for. In Denmark and Sweden employment is calculated as number of full-time employees, i.e. exclusive of private owners of enterprises. Finnish employment data are calculated as persons employed full-time, including private owners of enterprises, whereas employment in the cases of Iceland and Norway is calculated as number of employed persons. While acknowledging the differences, for reasons of simplicity the common words employees and employment are used throughout this Chapter.

The structure of the ICT sector is described by the following indicators:

- *Employment information*
  - Number of persons employed (employees)
  - Persons employed by gender
  - Persons employed by age
  - Persons employed by level of education

2 Paper on the definition of the ICT wholesale activities was presented by the Nordic statistical offices at the WPIIS meeting in April 2000

3 NACE, Rev. 1: Statistical classification of Economic Activities in the European Community

- *Economic information*
  - Turnover
  - Gross value added
  - Wages and salaries

The definitions of the chosen variables are closely related to the definitions that are used by Eurostat and provided in the Methodological Manual of Business Statistics,[4] but as existing national statistics are used there are national differences in the definitions of the variables. Consequently, these differences have to be accepted under the presumption that the results are not misleading in comparisons across countries. However, it is important to underline that the statistical information in this publication should mainly be interpreted as reflecting national structures within the ICT sector.

As for the time series, a restriction is set to the earliest year to be covered by the year of introduction of the harmonised European activity nomenclature, NACE. In Finland, Iceland, Norway and Sweden this took place as of reference year 1993 and in Denmark as of 1992. Most of the structural data are from the year 2000 but for some variables they relate to 2001. For Denmark some of the structural indicators were not available for the year 2000, for which reason data from 1999 has been used. This affects the comparisons between the countries and also on the Nordic totals, which are based on 1999 data for these indicators.

One of the main objectives is to present comparable data on all the Nordic Countries. In order to profile the ICT sector, efforts have been made to also establish comparable data on the total private sector.[5]

Given the rather short period of time covered by the tables it was decided that adjustments for inflation would not be made but values reported at current prices would be used.

4.2 Structure and scope of the ICT sector in the Nordic Countries

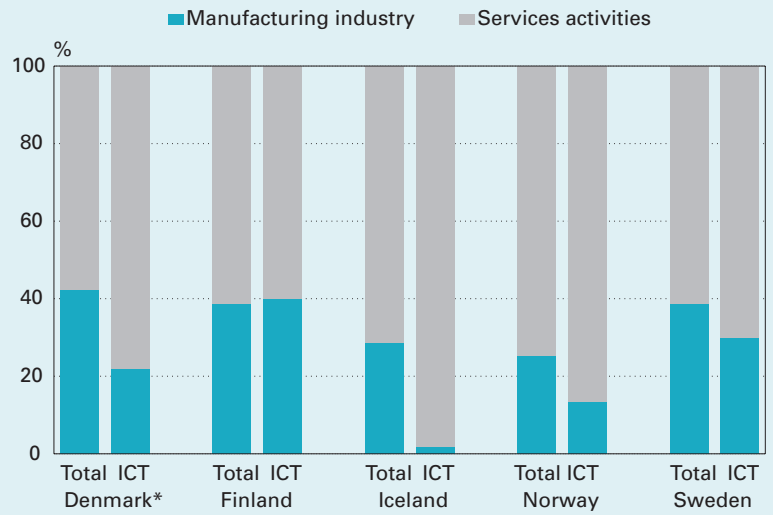
In terms of employment, the combined size of the ICT sector in the five Nordic Countries can be estimated to have amounted to 510,000 employees in 2000,[6] or 8.8 per cent of total employment in the private sector. Comparing this to the corresponding figure of 7.1 per cent in 1994 shows that the sector has grown at a relatively faster rate than the private sector in general since 1994. Of the total number of persons employed within the ICT sector, 35 per cent were employed

4 Eurostat Units D1–D2: Methodological Manual of Business Statistics, Chapter "General Framework" (Annex 1: Definition of variables), 1996

5 NACE rev. 1 Groups 15–37 (Manufacturing industry), 45 (Construction), 50–74 (Distributive trade, hotels and restaurants, transportation, business services), 92 (Entertainment) and 93 (Other service activities)

6 Data for Denmark 1999

Figure 4.1
Distribution of employment between manufacturing and services in general and between ICT manufacturing and services in 2000



* Denmark: 1999

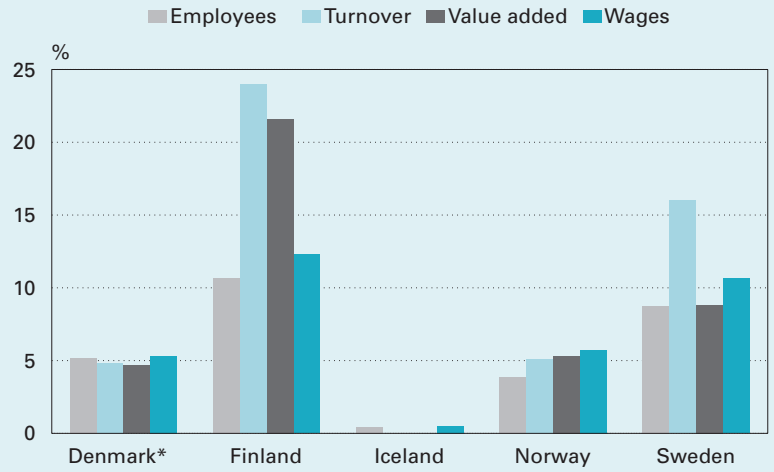
within ICT consultancy services, 28 per cent in ICT manufacturing, 20 per cent in wholesale trade and 17 per cent in telecommunications. From 1999 to 2000 the share of consultancy services has grown and that of wholesale trade decreased.

An indication of the structure of the ICT sector is given by the distribution of employment between manufacturing and services in general on the one hand, and the corresponding distribution of employment between manufacturing and services within the ICT sector, on the other (Figure 4.1). In Finland the share of manufacturing in both total and ICT sector employment is about 40 per cent. In Denmark and Sweden the proportions of manufacturing in total employment are also about 40 per cent, but in the ICT sector the proportions of manufacturing are 30 per cent in Sweden and 22 per cent in Denmark. In Iceland and Norway, where manufacturing industries are of minor importance in employment compared to service activities, ICT manufacturing is of even less importance than ICT services.

Especially in Finland and Sweden, the ICT manufacturing sector is of major economic importance, as it accounted for about 10 per cent of whole manufacturing employment and 16 to 24 per cent of turnover in 2000 (Figure 4.2). In the three other Nordic Countries the ICT manufacturing sector is of less importance, representing 5 per cent or less of employment and turnover in total manufacturing. One explanation of the pattern is that large multinational companies have an important role in the Finnish and Swedish ICT manufacturing sectors.

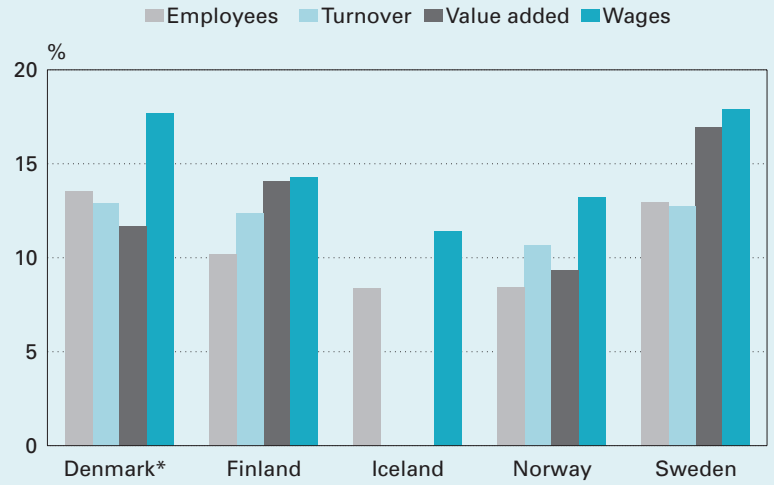
When examined from the national perspective, the importance of the ICT services sector shows a somewhat different picture with less significant differences between the countries (Figure 4.3). Especially in Denmark and Sweden the ICT services sector is important, employing 13 to 14 per cent of the total labour force in the service sector and

Figure 4.2
ICT manufacturing industry as proportion of total manufacturing industry in 2000



* Denmark: 1999

Figure 4.3
ICT service activities as proportion of total service activities in 2000



* Denmark: 1999

accounting for about a similar shares of the total turnover. In Finland the ICT services sector represents 10 per cent of total employment and 12 per cent of total turnover in the service sector, whereas the Norwegian ICT services sector employs 8 per cent of the total labour force and accounts for 11 per cent of total turnover. In Iceland the ICT services sector accounted for 8 per cent of service sector employment in 2000.

The overall pattern shows that the ICT sector, including both manufacturing and services, is of the largest economic importance in Finland, generating 16 per cent of the total turnover of the private sector, and in Sweden where its corresponding share is 13 per cent. Measured by share of employment, the ICT sector is the most important in Sweden, accounting for 10 per cent of total employment, followed closely by Finland and Denmark with about 9 per cent shares.

4.3 Employment in the ICT sector

This section analyses employment within the ICT sector in more detail, breaking it down into detailed groups of activities so as to draw more comprehensive pictures of the national structures of the sector and possible differences between them.

Compared to the economy in general, the ICT sector was characterised by rapid growth in employment during the second half of the 1990s (Table 4.1). Job creation

Table 4.1
Employment in the ICT sector 1995–2000, index figures[7]

	ICT manu-facturing industry	ICT services			Total ICT services	Total private sector*
		Whole-sale	Telecommu-nications 1995=100	Consultancy services		
Denmark						
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
1999	110	116	133	164	135	108
Finland						
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
1999	142	126	119	163	136	116
2000	146	126	116	208	151	119
Norway						
1995	100	100	100	100	100	100
1996	103	104	104	113	107	102
1997	110	97	107	150	115	107
1998	111	100	107	180	126	110
1999	120	107	110	209	139	111
2000	122	104	126	238	150	111
Sweden						
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
1999	126	122	100	183	139	112
2000	113	114	105	220	152	116

Iceland: Data only available for the years 1998–2000
* NACE 15–37,45, 50–74, 92, 93

7 It should be stressed that changes in the classification of enterprises from one year to the next may influence the observed figures in the time series

within the sector was largely due to growth in ICT services, but in Finland ICT manufacturing also showed fast growth in employment. In Denmark the ICT manufacturing industry has grown at the same rate as the total private sector. Until 1999, employment in Swedish ICT manufacturing increased faster than in the economy as a whole, but there was a sudden change in this between 1999 and 2000 as employment in ICT manufacturing fell by 10 per cent.

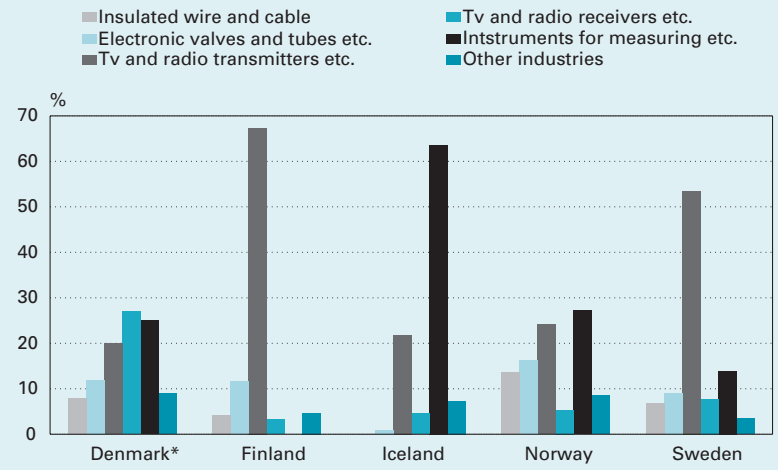
In all the Nordic Countries the ICT services sector has shown a more rapid increase in employment than the private sector overall, largely thanks to high growth rate of employment in ICT consultancy services. The telecommunications sector has had a rapid growth rate in Denmark and Norway. Except for Finland, growth in employment in ICT wholesale trade has been rather modest.

4.3.1 Manufacturing

Of all the persons employed in ICT manufacturing in the Nordic Countries in 1999, 48 per cent were employed in the Swedish ICT manufacturing industry. The corresponding shares for the other Nordic Countries were 30 per cent for Finland, 14 per cent for Denmark, 8 per cent for Norway and 0.1 per cent for Iceland.

At the Nordic level, manufacture of television and radio transmitters and telecommunications equipment is by far the largest ICT industry (50 per cent of ICT manufacturing employees in 1999). The second largest industry is manufacture of instruments and appliances for measuring (20 per cent of ICT manufacturing employees in 1999).

Figure 4.4
Employment in ICT manufacturing industries (NACE classes) in 2000



* Denmark: 1999

At the national level there are significant differences in this between the countries (Figure 4.4). In Denmark (data from 1999) nearly one third (27 per cent) of the employees in the ICT manufacturing sector are employed within the manufacture of television and radio receivers. The manufacture of instruments is the second largest Danish ICT industry, employing 25 per cent of the employees within ICT manufacturing. In all, employment within the Danish ICT manufacturing sector is less concentrated than in Sweden, Iceland or Finland.

In Finland employment in the ICT manufacturing industry concentrates strongly in the manufacture of telecommunications equipment, the proportion of which was as high as 67 per cent in 2000. As a consequence, all the other industries are of minor importance, with manufacture of electronic valves and tubes as the second largest industry, representing 12 per cent of total employment in ICT manufacturing.

Iceland's ICT manufacturing industry is dominated by manufacture of instruments, which accounts for 64 per cent of total employment in ICT manufacturing. Thereby Iceland's ICT manufacturing industry is nearly as concentrated within one single industry as the Finnish ICT manufacturing industry is. The second largest industry in this respect in Iceland is manufacture of telecommunications equipment, covering 22 per cent of employment in ICT manufacturing.

In Norway manufacture of instruments is the largest industry, accounting for 27 per cent of employment in ICT manufacturing. Like in Denmark, there is no single dominating industry. The two next largest industries are manufacture of television and radio transmitters with its 24 per cent share and manufacture of electronic valves and tubes, accounting for 16 per cent. Manufacture of insulated wire and cable plays a larger role in the Norwegian ICT manufacturing sector than in any other Nordic Country as the industry accounts for 14 per cent of total employment in ICT manufacturing.

In Sweden the ICT manufacturing sector is by far the largest in the Nordic Countries with its 62,200 employees in 2000. Manufacture of telecommunication equipment is almost as dominant as in Finland, as 54 per cent of the people employed in ICT manufacturing are employed by this industry. The second largest industry in this respect is manufacture of instruments, with its 14 per cent share of the employment.

4.3.2 Services

Of the total number of persons employed in the ICT services sector in the Nordic Countries in 1999, 39 per cent were employed in Sweden, 22 per cent in Denmark, 20 per cent in Norway, 18 per cent in Finland and the remaining 1 per cent in Iceland.

Like the ICT manufacturing sector, the ICT services sector shows a somewhat different structure from one country to the next, although variations between the Nordic Countries are less significant in this sector than in ICT manufacturing. As a

rule, ICT consultancy services constitutes the largest service sub-sector in the Nordic Countries with its 44 per cent share of total employment in the ICT services sector in 1999.

In Denmark, ICT consultancy services (38 per cent) and ICT wholesale trade activities (37 per cent) accounted for the largest shares of employment in the ICT services sector in 1999. Telecommunications represented the remaining 26 per cent of employment in ICT services. The share of ICT consultancy services of all employment in ICT services was lower in Denmark than in the other Nordic Countries (Figure 4.5). None of the sub-sectors of ICT services is especially dominant within the Danish ICT services sector.

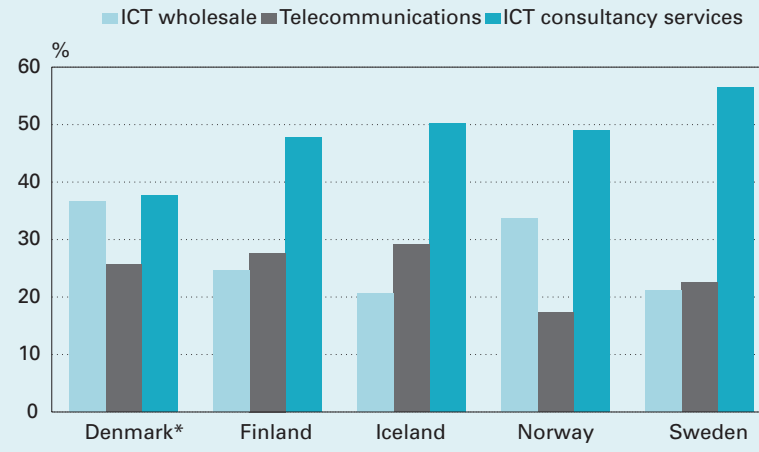
In Finland ICT consultancy services is also the largest ICT services sub-sector, and accounted for 48 per cent of employment in ICT services 2000. Telecommunications is the second largest sub-sector with 18,800, or 28 per cent, of ICT services sector employees.

Iceland is characterised by having a distribution of employment between the sub-sectors which is more or less identical to the distribution in the Finnish ICT services sector. The consultancy services sector plays a slightly more significant role, though, accounting for half of the employment in ICT services.

In Norway, too, ICT consultancy services is the largest sector supplying half of the jobs in ICT services. On the other hand, telecommunications accounts for the lowest share of employment in ICT services of all the Nordic Countries, as only 17 per cent 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 its employment represented 56 per cent of all

Figure 4.5
Employment in ICT services in 2000



* Denmark: 1999

employment in the ICT services sector in 2000. ICT wholesale trade and telecommunications account for 21 per cent and 23 per cent of the employment, respectively.

4.4 Economic information

In this section a number of economic indicators, such as turnover, gross value added and wages and salaries, are presented in order to supplement the data on employment structure described in the previous section. For details, see the Annex tables 4.3–4.5.

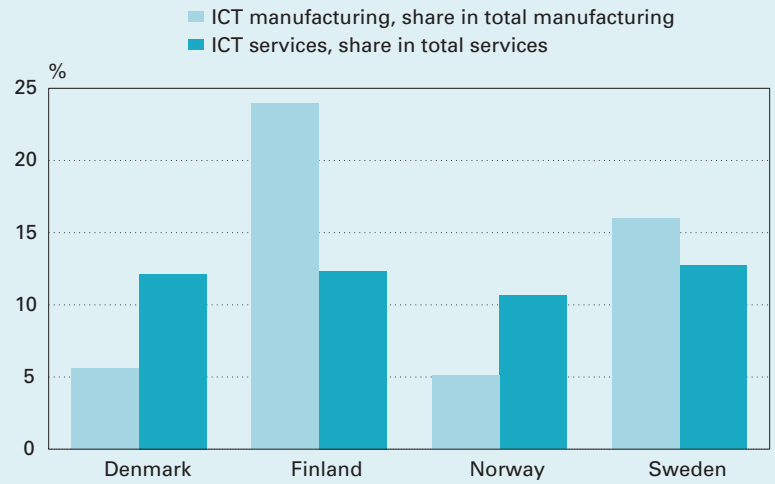
4.4.1 Turnover

The total turnover of the ICT manufacturing industries of the Nordic Countries is estimated to have amounted to EUR 59 billion in 2000, of which the ICT manufacturing industry in Sweden accounted for 46 per cent, followed by Finland's 41 per cent, Denmark's 7 per cent, Norway's 5 per cent and Iceland's 0.03 per cent.

The national shares of the turnover of the ICT manufacturing industry in all manufacturing turnover indicate a pattern similar to that in employment: the ICT manufacturing industry in Finland shows the relatively largest share, 24 per cent of the total turnover of manufacturing industry, compared to those of 16 per cent in Sweden and 5–6 per cent in Denmark and Norway (Figure 4.6).

Compared to the shares of total employment, the figures show two tendencies: for Sweden and Finland – the two countries with the largest ICT manufacturing sectors – ICT manufacturing generates a share of turnover exceeding that of employment. With Denmark and Norway the two shares are about equal.

Figure 4.6
Shares of total turnover generated by ICT manufacturing industry and by ICT services sector in 2000



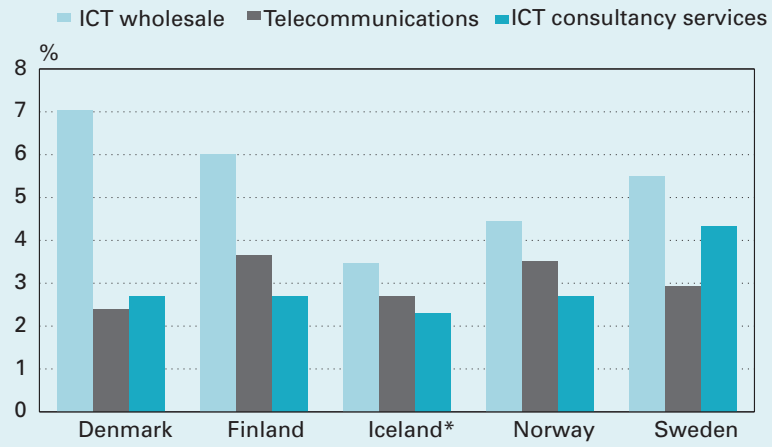
The total turnover of the ICT services sector in the five Nordic Countries is estimated to have amounted to EUR 97 billion in 2000. The distribution across the countries is dissimilar to that in ICT manufacturing. Sweden still represents the largest share of 38 per cent, but is here followed by Denmark (23 per cent), Norway (21 per cent), Finland (17 per cent) and finally Iceland (0.8 per cent).

Measured by its share of the total turnover of all service activities, the ICT sector is of almost equal importance in all the Nordic Countries, accounting for 11 to13 per cent.

Not surprisingly, ICT wholesale trade is by far the largest sub-sector of ICT services in all the Nordic Countries as measured by turnover (Figure 4.7). ICT wholesale trade generated an approximately from 5 to 7 per cent of the total turnover of the service sectors in Denmark, Finland, Norway and Sweden in 2000. There are no data for 2000 for Iceland, but in 1999 the corresponding proportion there was 3 per cent. In Finland, Iceland and Norway, telecommunications represent the second largest ICT service sub-sector in terms of turnover, while Sweden is characterised by a relatively large importance of ICT consultancy services.

The analysis of the development of employment in the ICT sector in the Nordic Countries showed that the sector was characterised by considerable growth (Table 4.1). An examination of the development of the turnover of the ICT sector at current prices since the mid-1990s shows an even more rapid rate of growth (Table 4.2). This is especially the case with the ICT manufacturing industry in Finland, where the turnover in nominal terms grew four-fold from 1995 to 2000, and in Sweden where the turnover in ICT manufacturing more than doubled in the same period. These are also the countries with the largest ICT manufacturing industries.

Figure 4.7
Share of turnover of ICT services of the turnover of total service activities in 2000



* Iceland: 1999

The ICT services sector also grew noticeably in turnover since the mid-1990s, exceeding the rate of growth in the total private sector in the Nordic Countries. However, the growth was slower than in ICT manufacturing. Within the sub-sectors of ICT services, the increase in turnover is generally the largest in ICT consultancy services, where turnover more than doubled from 1995 to 2000, with the strongest growth in Norway. In Finland the telecommunications sector also showed large growth in turnover from 1995 to 2000.

4.4.2 Value added

Gross value added indicates the profitability of the sector, as it shows the earnings that are left to pay the production factors of labour and fixed capital. Basing on 1999 figures, Sweden generates 41 per cent of the gross value added of the ICT manufacturing sector in the Nordic Countries, Finland 40 per cent,[8] Denmark 11 per cent and Norway 7 per cent.[9]

Table 4.2
Turnover at current prices, index figures

	ICT manu-facturing industry	ICT services			Total ICT services	Total private sector*
		Whole-sale	Telecommu-nications 1995=100	Consultancy services		
Denmark						
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
1999	142	142	124	182	146	117
2000	182	162	155	184	165	136
Finland						
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
1999	286	175	207	196	187	137
2000	426	191	272	234	219	159
Norway						
1995	100	100	100	100	100	100
1996	112	105	112	116	109	106
1997	126	111	128	155	123	116
1998	128	119	143	195	138	125
1999	155	126	155	233	151	131
2000	183	121	172	266	158	141
Sweden						
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
1999	188	131	127	197	146	124
2000	221	135	138	232	158	137

* NACE 15–37,45, 50–74, 92, 93

8 Value added at factor costs
9 No data on value added are available from Iceland

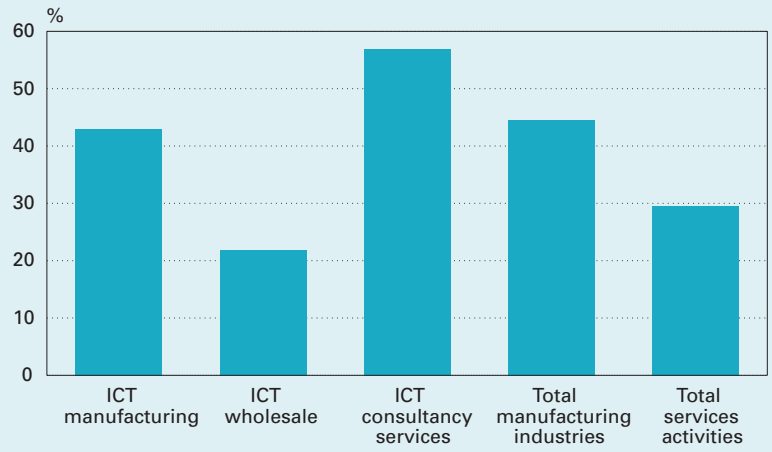
In ICT services the shares of gross value added are very similar to those of turnover. Here, too, the latest Nordic totals are available from 1999. Sweden generates 41 per cent of the gross value added in ICT services at the Nordic level, which is slightly more than its respective share of 36 per cent of the turnover. Norway accounts for 22 per cent of the total gross value added (share of turnover 26 per cent), Denmark 20 per cent[10] (share of turnover 22 per cent) and Finland 17 per cent (share of turnover 15 per cent).

In Denmark the ICT manufacturing industry generates almost the same share of gross value added compared to turnover as manufacturing industry in general (Figure 4.8). ICT consultancy services generate a relatively high gross value added compared to both ICT manufacturing industry and the services sector as a total, while the opposite situation prevails in ICT wholesale trade. Gross value added compared to turnover is higher in Denmark than in the other Nordic Countries.

In 2000, gross value added in proportion to turnover was slightly lower in the ICT manufacturing industry than in the manufacturing industry as a whole in Finland. Telecommunications and ICT consultancy services both generate a gross value added in proportion to turnover that is almost twice the figure for total service activities (Figure 4.9).

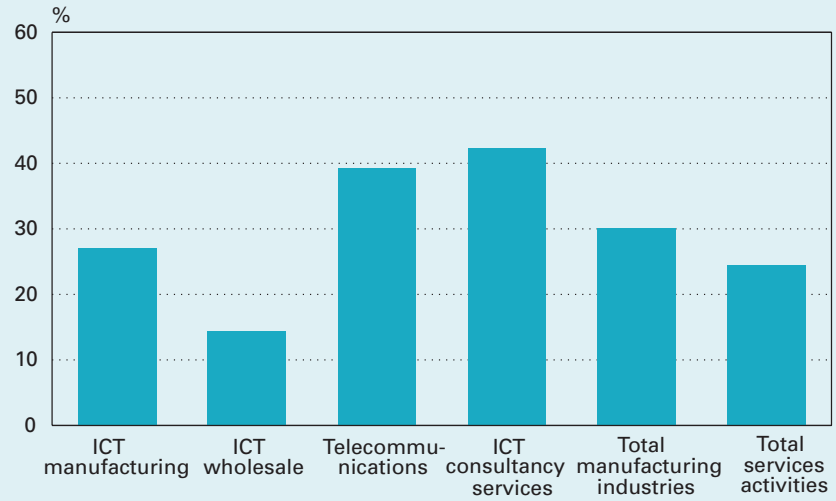
In Norway (Figure 4.10) the proportions of gross value added do not differ quite as much between the sectors as in Denmark and Finland although the overall pattern is quite similar in all the three countries. ICT manufacturing generates the

Figure 4.8
Gross value added as proportion of turnover. Denmark 1999



10 No figures are available for value added in the Danish telecommunications sector

Figure 4.9
Gross value added as proportion of turnover. Finland 2000



same share of gross value added as manufacturing industry as a whole. ICT consultancy services is the ICT sub-sector generating the highest share of gross value added in proportion to turnover, while the share of value added in ICT wholesale trade is the lowest of the sectors compared.

In Sweden a somewhat different pattern emerges as the ICT manufacturing industry generates less gross value added compared to turnover than the manufacturing industry as a whole (Figure 4.11). Within the ICT services sector,

Figure 4.10
Gross value added as proportion of turnover. Norway 2000

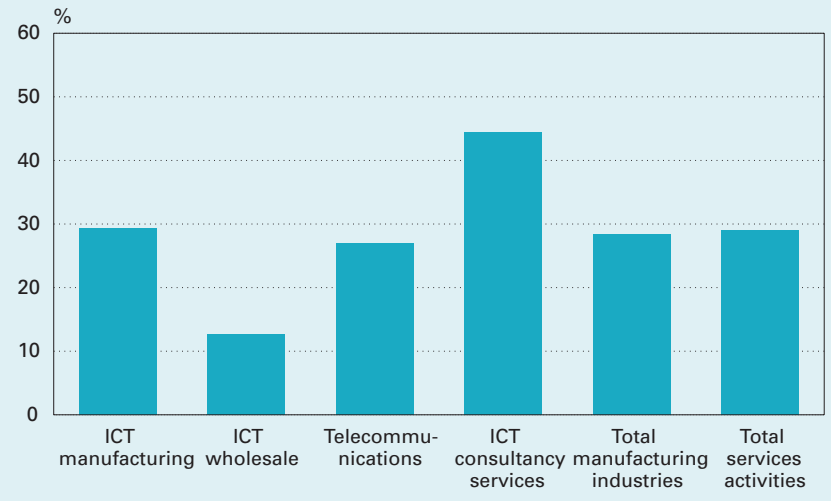
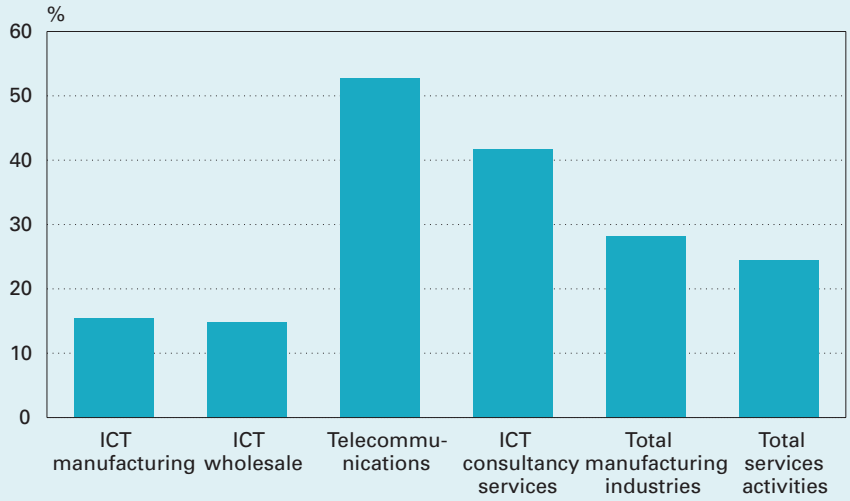


Figure 4.11
Gross value added as proportion of turnover. Sweden 2000



the highest share is found in telecommunications, followed closely by ICT consultancy services, both creating a clearly larger share than services in general.

4.4.3 Wages and salaries

Wages and salaries are difficult to compare across countries as the actual levels of taxation, other personnel costs, general living costs, etc., influence the purchasing power of paid wages. Thus, wages and salaries are only analysed in relation to their share of employment at the level of each sub-sector.

Due to lack of fresh data on wages and salaries, the overall structure can only be presented for 1999. Sweden accounted for 45 per cent of the wages and salaries in ICT manufacturing at the Nordic level, which nearly equals its share of employment, which was 48 per cent. The same pattern applied to the Finnish ICT manufacturing industry. The Danish and Norwegian ICT manufacturing industries, on the other hand, accounted for slightly higher shares of wages and salaries (16 per cent and 12 per cent, respectively) than of employment (15 per cent and 8 per cent, respectively).

The ICT manufacturing industry is characterised by the fact that in all the Nordic Countries its relative share of total wages and salaries is higher than its share of total employment, albeit the difference in Denmark and Iceland is negligible (Figure 4.12). This indicates that the average wage per employee is higher in ICT manufacturing than in the manufacturing industry as a whole.

The ICT services sector is characterised by the fact that it accounts for a larger proportion of wages and salaries relative to employment than the services sector as a whole does, (Figures 4.13–4.15). The differences are larger than in the case of the ICT manufacturing industry.

Figure 4.12
Share of ICT manufacturing industry of total wages and salaries and of employment in manufacturing industry as a whole

In the ICT wholesale trade the discrepancy in favour of wages and salaries is the largest in Denmark (5 per cent of employment against 6.5 per cent of wages) and Finland (2.5 per cent as against 3.8 per cent).

In telecommunications the relative share of wages and salaries compared to the share of employment shows minor differences between the Nordic Countries,

Figure 4.13
Share of ICT wholesale trade of total wages and salaries and of employment of service activities as a whole

Figure 4.14
Share of telecommunications of total wages and salaries and of employment of service activities as a whole

except for Norway, where the share of the wages is almost twice the size of the share of employment (Figure 4.14).

In ICT consultancy services the gaps between the shares of employment and those of wages and salaries are greater than in the two other sub-sectors of ICT services (Figure 4.15). The gap is the largest in Sweden where the share of ICT

Figure 4.15
Share of ICT consultancy services of total wages and salaries and of employment of service activities as a whole

consultancy services of total service sector wages and salaries is 3 percentage points greater than the sub-sector's share of employment in services overall.

4.5 A profile of employees in the ICT sector

To understand the skills requirements and the job creation process within the ICT sector, detailed information is necessary on the demographic background of its employees, such as gender, age, occupation, education and work experience. Especially the issue of educational qualification requirements has received much attention in ongoing debates about the future growth possibilities of the ICT sector in the Nordic Countries.

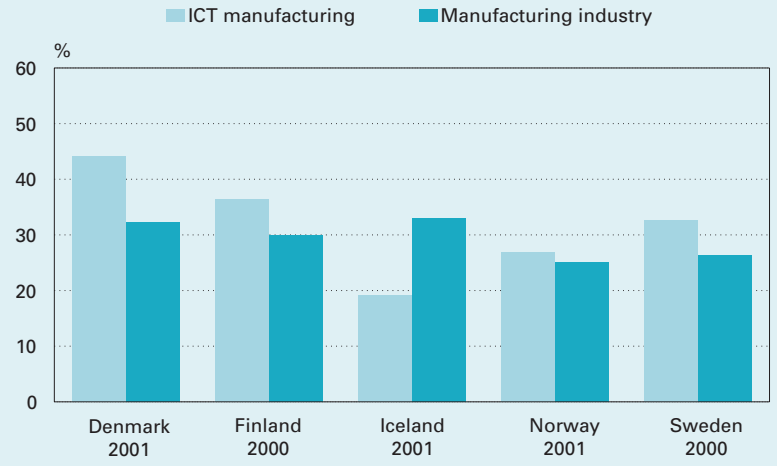
This sub-chapter focuses on the gender, age and educational level of the persons employed in the ICT sector, with the aim of identifying the characteristics of these employees compared to those of employed persons in general.

4.5.1 Gender structure in the Nordic ICT sector

Relatively large proportions of women are on the labour market in the Nordic Countries, and in 2000 the overall employment rates for women in the Nordic Countries ranged from 64 per cent (Finland), as the lowest, to 83 per cent (Iceland), as the highest.[11]

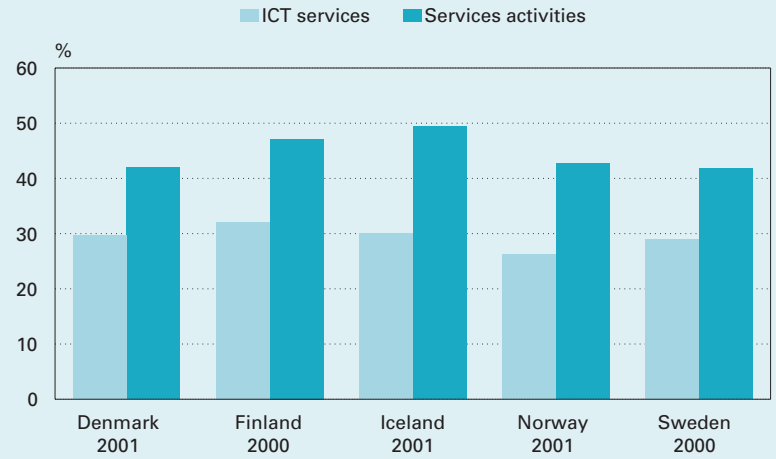
At the Nordic level the share of female employees in manufacturing is 28 per cent, but in ICT manufacturing the proportion is 35 per cent.[12] In the ICT manufacturing industries the female share exceeds the average share in

Figure 4.16
Share of female employees in ICT manufacturing and in manufacturing industries as a whole in the Nordic Countries



11 Nordic Council of Ministers: Nordic Statistical Yearbook 2001
12 Denmark, Iceland, Norway 2001
Finland, Sweden 2000

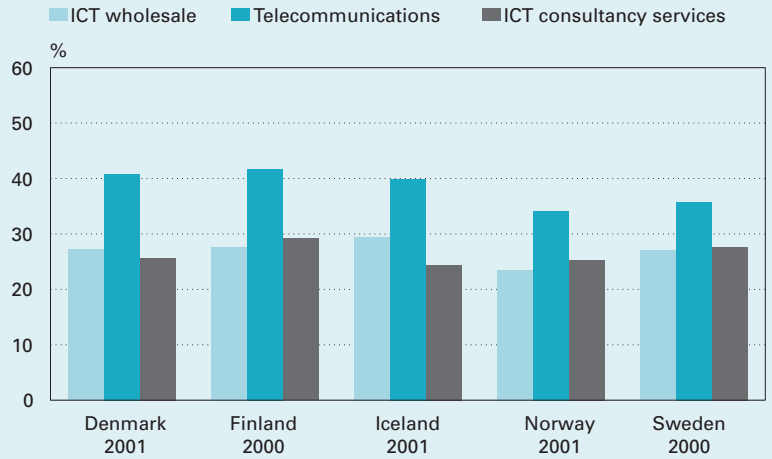
Figure 4.17
Share of female employees in ICT services and in service activities as a whole in the Nordic Countries



manufacturing industries, especially in Denmark but also in Finland and Sweden, while in Norway the gender structures in ICT manufacturing and manufacturing as a whole are almost identical. Iceland is the only country employing relatively fewer women in ICT manufacturing than in manufacturing as a whole.

In contrast to ICT manufacturing ICT service activities in the Nordic Countries are characterised by having lower proportions of female employees (29 per cent)

Figure 4.18
Share of female employees in the ICT services sub-sectors in the Nordic Countries



than in service activities as a whole, 43 per cent (Figure 4.17). The discrepancy is the highest in Iceland, where the share of women in service activities overall is 50 per cent but in ICT services only 30 per cent.

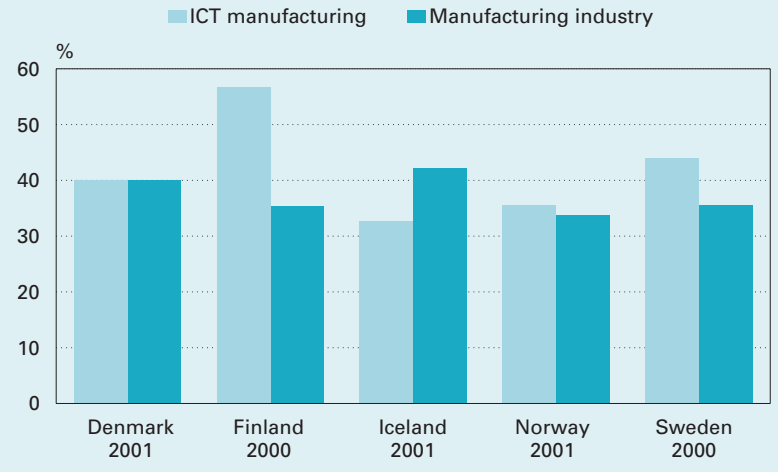
The sub-sector of ICT services shows some differences (Figure 4.18). In every country the proportion of female employees is the highest in telecommunications, ranging from 34 per cent in Norway to 42 per cent in Finland. Compared to telecommunications the ICT wholesale trade and ICT consultancy services sub-sectors both have lower female representations, with the proportions of female employees ranging from 24 to 29 per cent in all the countries.

4.5.2 Age structure in the Nordic ICT sector

This section presents data on the age structure of employment in the ICT sector. Young employed persons are defined as being under 35 years of age. At the Nordic level, the persons employed in the ICT sector are generally younger than those employed by the private sector as a whole. In ICT manufacturing, 47 per cent of employees are aged under 35 and in ICT services their share is 46 per cent, whereas their average share of private sector employees is 39 per cent.[13]

In Finland, and to a lesser extent in Sweden, too, the share of young persons employed is larger in ICT manufacturing than in manufacturing as a whole (Figure 4.19). In Denmark and Norway the proportions are equal whereas in Iceland there are relatively fewer young employees in ICT manufacturing than in manufacturing as a whole.

Figure 4.19
Share of persons aged under 35 employed in ICT manufacturing and in manufacturing as a whole



13 Denmark, Iceland, Norway 2001
Finland, Sweden 2000

Figure 4.20
Share of persons aged under 35 employed in ICT services and in service activities as a whole

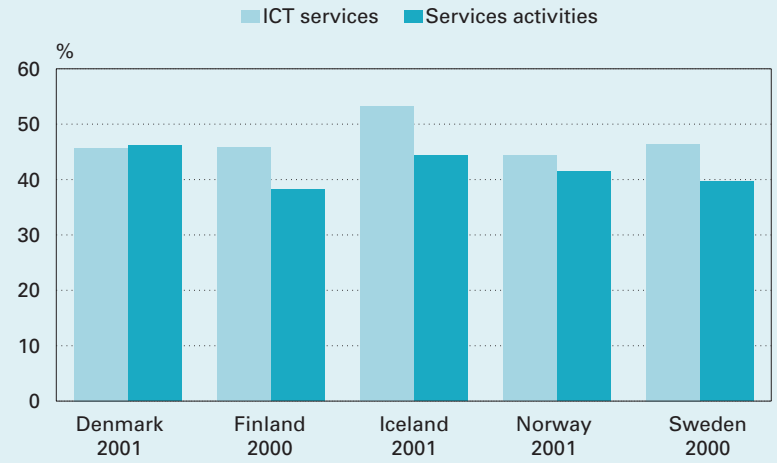
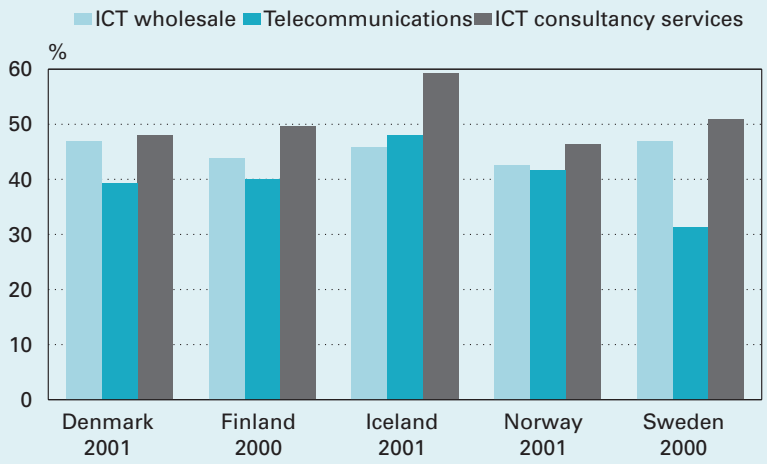


Figure 4.21
Share of persons aged under 35 employed in ICT services sub-sectors



In ICT services, too, the share of young persons employed generally exceeds that in service activities as a whole (Figure 4.20). However, Denmark makes an exception to this by having equal shares of young employees in ICT services and in service activities as a whole.

A closer look at the ICT services sub-sectors reveals that the proportion of young employees tends to be the highest in ICT consultancy services, where roughly half

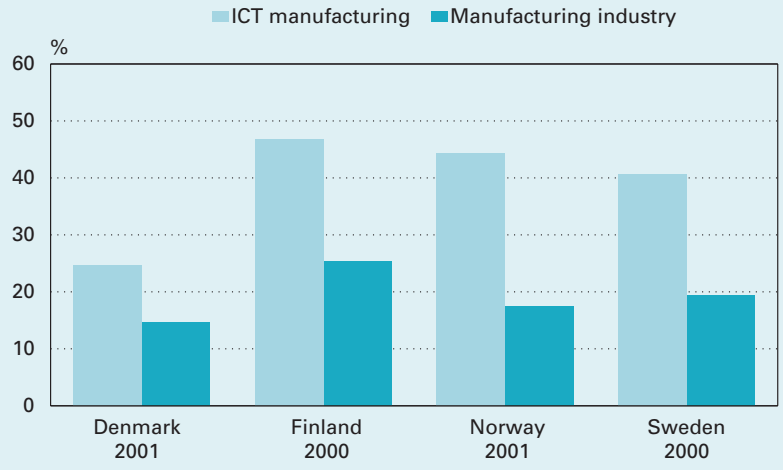
of the employees are under 35 years of age. The telecommunications sector shows a distinctively different pattern, as the proportion of young employees is 40 per cent in Denmark, Finland and Norway, and as low as 31 per cent in Sweden. An exception is Iceland where the corresponding figure is almost 50 per cent. The proportion of young employees in the ICT wholesale trade varies from 43 per cent in Norway to 48 per cent in Sweden.

4.5.3 Educational structure in the Nordic ICT sector

The demand for qualified persons with high-level education has posed one of the main challenges to the ICT sector in recent years, and the educational structure of the sector's employment is analysed in this section. The common nomenclature used for this purpose is ISCED.[14] The educational levels refer to the public educational system, but it is important to bear in mind that national differences in educational systems complicate comparisons across the Nordic Countries.[15] It is also important to note that only formal qualifications are dealt with, that is on-the-job-training or learning-by-doing is not captured in this section. Highly educated employees are defined as those with at least tertiary level education.[16] Their proportion is high in both the ICT manufacturing industry and in the ICT services sector, thus reflecting the knowledge-intensive character of the ICT sector and its employment.

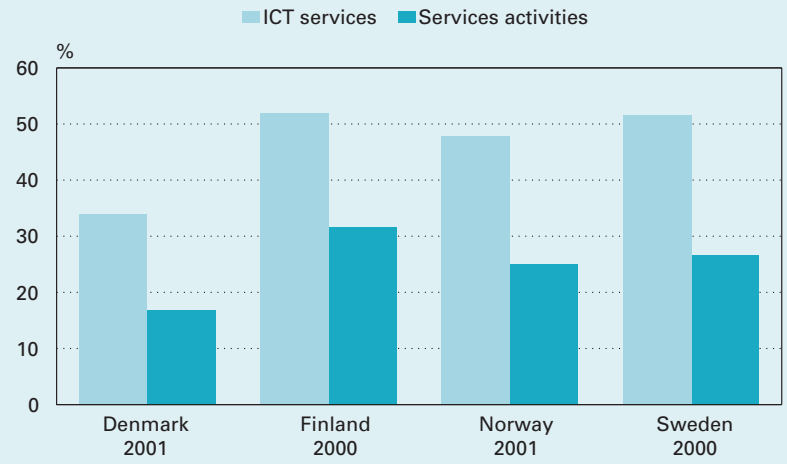
The share of highly educated persons employed is clearly higher in ICT manufacturing than in manufacturing as a whole in all the Nordic Countries

Figure 4.22
Share of persons with tertiary level education employed in ICT manufacturing and in manufacturing as a whole



14 OECD: International Standard Classification of Education
15 Iceland is not included in this section
16 See Annex 4.2 for definition of educational levels

Figure 4.23
Share of persons with tertiary level education employed in ICT services and in service activities as a whole



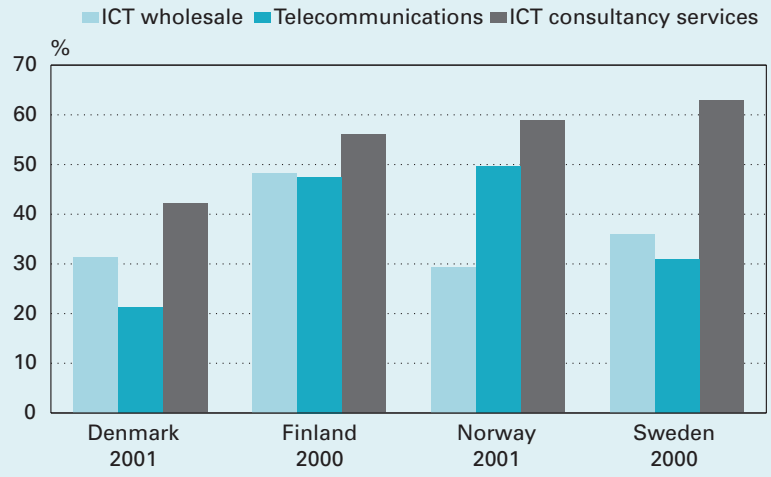
(Figure 4.22. The shares of persons with tertiary education employed in both ICT manufacturing and in manufacturing as a whole are the highest in Finland (47 per cent and 26 per cent, respectively). Norway has the highest relative share of employees with tertiary level education in ICT manufacturing as compared to the manufacturing total. On the other hand, both the overall proportion (15 per cent) of highly educated employees as well as their share in ICT manufacturing (25 per cent) is the lowest in Denmark.

The educational structure of employment in ICT services and in service activities as a whole is similar to that in manufacturing (Figure 4.23). Also in services, Finland has the largest share of highly educated employees (52 per cent in the ICT sector and 32 per cent in services overall). Altogether, the shares of persons with tertiary level education employed in ICT services are also higher than those in ICT manufacturing in all the countries.

A more detailed analysis of the sub-sectors of ICT services reveals evident differences. In all the countries, the shares of persons with tertiary level education employed are the highest in ICT consultancy services where they range from 42 per cent in Denmark, as the lowest, to 63 per cent in Sweden, as the highest (Figure 4.24).

In the telecommunications sector, there are visible variations in the shares of highly educated employees. In Denmark the share is 21 per cent, whereas close on half of the persons employed in the Finnish and in the Norwegian telecommunications sectors have tertiary level education. As for ICT wholesale trade, there are two distinct groups, Finland with proportion of highly educated workforce approaching 50 per cent, and Denmark, Norway and Sweden with corresponding figures of around 30 per cent.

Figure 4.24
Share of persons with tertiary level education employed in ICT services



4.6 Research and development

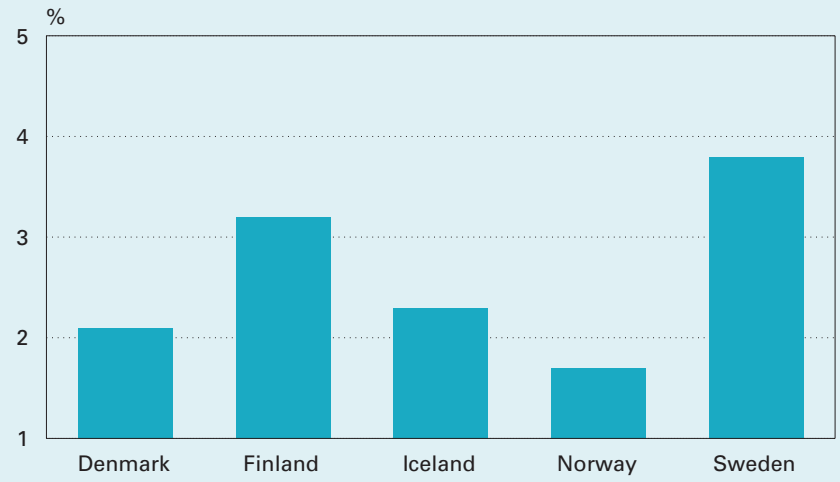
The importance of science and technology to economic development as well as to society in general has long been recognised. Academic research and constant product and process development by business enterprises have produced innovations and contributed to the real competitiveness of national economies. R&D is also an integral part of the ICT sector. For example, the industries producing ICT goods, such as computers or telecommunication equipment, are among the most R&D intensive sectors as measured by the proportion of R&D investments of turnover.

R&D statistics are compiled by the national statistical offices according to OECD guidelines.[17] The most recent year on which data are available for all the Nordic Countries is 1999. This sub-chapter presents a brief overview of R&D in the Nordic Countries along with the role of the ICT sector in it.

The proportion of the Nordic Countries of the total R&D expenditure in the OECD area is about 3 per cent. However, measured by the proportion of R&D expenditure in GDP, Sweden is actually the leading OECD country with its figure of 3.8 per cent in 1999.[18] Finland (3.2 per cent) is also well above the OECD average (2.2 per cent). Denmark and Iceland spend about the OECD average of their GDP on R&D, but R&D intensity is clearly lower in Norway at 1.7 per cent. R&D intensity reflects the industrial structure of a country. In Sweden and Finland, R&D intensive multinational companies have an important role whereas in Norway the low R&D intensity of the oil industry has a dominating role.

17 OECD, Frascati Manual
18 Main Science and Technology Indicators, 2002:1. OECD

Figure 4.25
Gross domestic expenditure on R&D as a percentage of GDP in 1999



The different structures of R&D intensity are also manifested in the business enterprise sector's proportions of total R&D activity. In Sweden, enterprises account for 75 per cent of R&D, while the corresponding proportions in Finland and Denmark are about two-thirds (68 per cent and 63 per cent, respectively). In Norway the share of enterprises is 56 per cent and in Iceland 47 per cent.

The proportion of Sweden of the total business enterprise R&D expenditure in the Nordic Countries is about 50 per cent. However, the Swedish proportion of the ICT sector's R&D spending is slightly lower at 44 per cent (Figure 4.26). In Finland the situation is reverse, the Finnish share of the total R&D expenditure of Nordic enterprises is 23 per cent, but in the ICT sector the corresponding share is 35 per cent. The Danish proportion of Nordic R&D expenditure is about 17 per cent and that of the ICT sector's R&D expenditure 10 per cent. With Norway, both figures are around 11 per cent.[19]

The importance and structure of the R&D of the ICT sector varies between the Nordic Countries. In Finland, over half of the business enterprise sector's R&D is performed in the ICT sector. Moreover, an overwhelming majority of this is performed in the ICT manufacturing sector. In Sweden, too, manufacturing dominates in the ICT sector's R&D activities. In Norway, well over half of the ICT sector's R&D is conducted by the services sector. The

19 Proportions are calculated at current PPP in USD. Source: national statistical offices and OECD, Main Science and Technology Indicators 2002:1. Iceland is not included

Figure 4.26
R&D expenditure of the ICT sector in the Nordic Countries by country in 1999

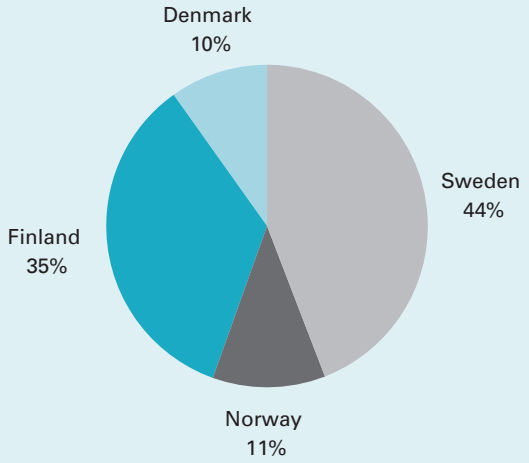
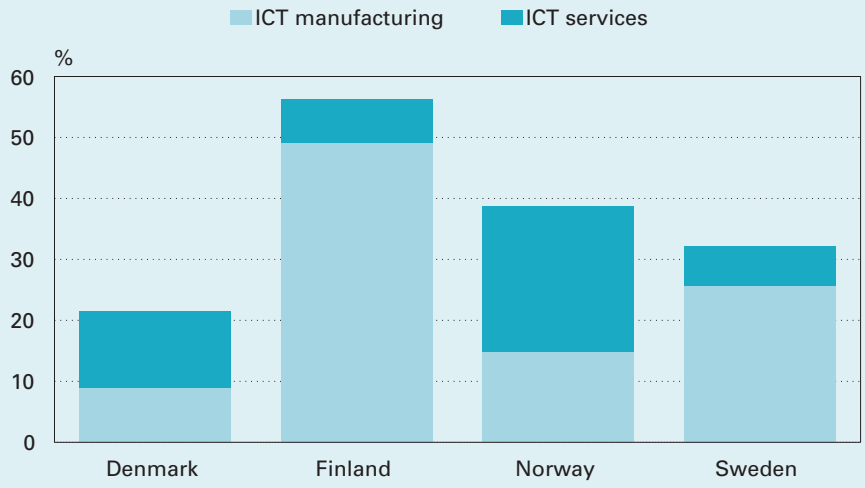


Figure 4.27
Proportions of ICT manufacturing and ICT services of total R&D expenditure of business enterprises in 1999



proportion of the ICT sector of business enterprises' R&D activity is the lowest in Denmark at 22 per cent (Figure 4.27).

Promoting science and technology has been in the interest of national policy makers and thus governments have granted subsidies for enterprises' R&D. In the Nordic Countries the proportion of R&D subsidies is generally lower in the ICT sector than in other industries (Table 4.4). In Finland, Denmark and Norway public

Table 4.3
R&D expenditure by country and sector in 1999

	R&D expenditure (mill. nat. currency)
Denmark	
All sectors	16,054
ICT sectors	3,466
ICT Manufacturing	1,448
ICT Services	2,018
ICT Telecommunications	..
ICT Consultancy services	..
Other sectors	12,589
Finland	
All sectors	2,644
ICT sectors	1,489
ICT Manufacturing	1,302
ICT Services	187
ICT Telecommunications	93
ICT Consultancy services	94
Other sectors	1,155
Norway	
All sectors	9,540
ICT sectors	3,700
ICT Manufacturing	1,421
ICT Services	2,279
ICT Telecommunications	719
ICT Consultancy services	1,560
Other sectors	5,840
Sweden	
All sectors	56,954
ICT sectors	18,304
ICT Manufacturing	14,660
ICT Services	3,645
ICT Telecommunications	..
ICT Consultancy services	3,645
Other sectors	38,649

Table 4.4
Public funding of the R&D as a percentage of the total R&D expenditure by country and sector

	ICT sectors %	Other sectors %	In all %
Denmark	1.2	5.2	4.4
Finland	2.4	6.5	4.2
Norway	2.6	6.7	5.1
Sweden	6.8	8.3	7.8

funding of R&D in the ICT sector is 1–3 per cent and in Sweden 7 per cent. However, the different institutional arrangements have an impact on the figures. For example government supported VTT Technical Research Centre of Finland, which has quite high volume of R&D, is classified into public sector, thus lowering the proportion of the public R&D funding in the business enterprise sector. On the other hand in Sweden, due to significant defence-related R&D, much more public R&D funding is classified into business enterprise sector.

Annex 4

Annex 4.1 Statistical tables

Annex 4.2 Definitions of ICT sector, wholesale activities and education and data sources

Annex 4.1 Statistical tables

Annex table 4.1
Employment number of employees

	ICT manu-facturing industry	ICT services			Total ICT services	Total manu-facturing industry	Total services activities	Total private sector[2]
		Whole-sale	Tele-commu-nications	Con-sultancy services				
Denmark								
1993	18,325	21,237	12,698	21,166	55,101	390,917	458,251	965,504
1994	18,215	22,147	14,597	16,490	53,234	401,564	463,477	990,407
1995	19,104	23,617	14,567	17,332	55,516	415,283	482,060	1,028,023
1996	19,434	23,314	16,876	18,713	58,903	410,633	499,576	1,040,307
1997	19,358	25,092	15,242	20,280	60,614	407,589	511,475	1,055,983
1998	18,819	26,963	18,489	23,477	68,929	413,404	533,765	1,088,901
1999	21,087	27,478	19,306	28,370	75,154	407,636	554,120	1,106,741
Finland								
1994	24,374	11,682	15,354	13,910	40,946	376,127	529,725	985,548
1995	30,824	13,244	16,152	15,552	44,948	391,281	551,179	1,029,461
1996	33,588	14,437	16,489	16,623	47,549	397,392	567,455	1,060,494
1997	36,761	15,790	17,314	17,969	51,073	409,938	594,843	1,109,758
1998	40,084	16,105	18,639	22,292	57,036	417,721	623,317	1,159,352
1999	43,800	16,634	19,294	25,357	61,285	419,889	647,998	1,192,352
2000	45,123	16,703	18,775	32,376	67,854	423,492	666,562	1,222,549
Iceland[1]								
1998	126	1,091	1,214	1,155	3,460	25,398	50,893	84,208
1999	108	1,106	1,405	1,587	4,098	25,223	50,822	84,449
2000	110	1,130	1,598	2,744	5,472	26,499	65,369	106,492
2001	104	1,094	1,563	2,646	5,303	24,568	60,816	93,899
Norway[1]								
1995	9,641	24,251	10,271	15,375	49,897	299,700	774,100	1,187,800
1996	9,902	25,258	10,688	17,386	53,332	304,400	791,700	1,216,100
1997	10,597	23,457	10,996	23,060	57,513	317,400	820,500	1,267,200
1998	10,704	24,279	11,040	27,662	62,981	321,200	852,100	1,309,100
1999	11,569	25,913	11,300	32,071	69,284	308,500	869,700	1,314,100
2000	11,715	25,106	12,912	36,585	74,603	301,100	881,800	1,320,900
Sweden								
1993	49,731	23,978	32,980	30,331	87,289	625,437	811,666	1,620,072
1994	51,768	24,970	33,121	32,481	90,572	636,294	877,638	1,689,411
1995	55,122	26,823	31,265	37,311	95,399	662,920	898,933	1,743,409
1996	55,919	27,451	34,655	42,776	104,882	675,339	919,271	1,772,136
1997	59,160	31,095	36,296	48,470	115,861	702,648	1,013,582	1,889,337
1998	65,761	32,636	33,056	57,066	122,758	720,843	1,063,876	1,960,404
1999	69,187	32,611	31,274	68,283	132,168	708,715	1,062,953	1,949,795
2000	62,227	30,692	32,726	82,020	145,438	709,227	1,124,835	2,023,698

[1] Persons employed
[2] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.2
Number of enterprises

		Denmark 1999	Finland 2000	Iceland 2000	Norway[1] 2000	Sweden 2000
ICT manufacturing industry, total		**874**	**687**	**23**	**216**	**1,390**
3001	Manufacture of office machinery	10	3	0	3	43
3002	Manufacture of computers and other information processing equipment	176	48	1	13	272
3130	Manufacture of insulated wire and cable	33	33	0	21	63
3210	Manufacture of electronic valves and tubes and other electronic components	143	220	1	44	258
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	46	58	5	19	117
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	142	49	2	16	119
3320	Manufacture of instruments and appliances for measuring, checking, testing, navigating etc.equipment	210	208	12	86	380
3330	Manufacture of industrial process control equipment	114	68	2	14	138
ICT services activities, total		**13,258**	**5,804**	**353**	**11,173**	**17,090**
of which:						
Wholesale of ICT products:		**2,618**	**1,688**	**139**	**4,321**	**3,852**
5143	Wholesale of electrical household appliances and radio and television goods	240	160	20	182	286
5164	Wholesale of office machinery and equipment	1,623	865	21	2,086	2,352
5165	Wholesale of other machinery for use in industry, trade and navigation	755	663	98	1,301	1,214
Telecommunications:		**184**	**246**	**14**	**301**	**323**
6420	Telecommunications	184	246	14	301	323
ICT Consultancy services, renting of machinery:		**10,456**	**3,870**	**200**	**6,551**	**12,915**
7133	Renting of office machinery and equipment, including computers	298	28	0	59	186
7210	Hardware consultancy	528	266	5	102	553
7220	Software consultancy and supply	7,520	2,910	153	5,028	11,177
7230	Data processing	908	211	8	272	449
7240	Database activities	218	193	4	765	129
7250	Maintenance and repair of office, accounting and computing machinery	329	234	8	199	176
7260	Other computer related activities	655	28	22	126	245
Manufacturing industry, total		27,211	25,687	n.a.	11,394	33,208
Services activities, total		165,457	131,574	n.a.	n.a.	209,511
Total private sector[2]		**233,593**	**197,589**	**n.a.**	**n.a.**	**272,925**

[1] Norway: Establishments
[2] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.3
Turnover in million national currencies

	ICT manu-facturing industry	ICT services			Total ICT services	Total manu-facturing industry	Total services activities	Total private sector[1)]
		Whole-sale	Tele-commu-nications	Con-sultancy services				
Denmark								
1993	16,314	45,823	16,941	14,565	77,329	418,298	818,780	1,324,474
1994	17,128	55,599	19,943	17,267	92,809	455,858	895,292	1,449,220
1995	17,169	59,722	21,210	20,115	101,047	474,138	944,924	1,523,667
1996	18,883	66,696	20,481	18,450	105,627	468,919	981,473	1,563,957
1997	20,252	76,617	22,849	24,488	123,954	488,258	1,055,165	1,666,537
1998	21,070	85,842	25,869	30,680	142,391	495,368	1,100,347	1,725,946
1999	24,336	84,694	26,220	36,678	147,592	503,100	1,146,000	1,787,000
2000	31,231	96,518	32,913	36,953	166,384	555,314	1,371,398	2,074,769
2001	31,063	84,399	33,249	43,031	160,679	583,706	1,406,681	2,144,837
Finland								
1994	4,360	3,310	1,623	1,400	6,333	59,079	79,059	145,735
1995	5,751	4,149	1,777	1,521	7,446	63,905	84,675	157,018
1996	6,756	5,081	2,139	1,726	8,946	66,857	91,694	167,810
1997	8,924	6,120	2,610	1,806	10,536	75,499	101,397	187,519
1998	12,073	6,669	3,439	2,695	12,804	79,059	110,650	201,914
1999	16,459	7,268	3,678	2,986	13,933	83,484	118,009	215,332
2000	24,491	7,913	4,824	3,553	16,290	102,233	131,818	249,581
Iceland								
1998	886	19,266	12,326	7,609	39,201	247,783	508,726	820,795
1999	983	19,804	15,447	13,184	48,435	255,529	571,659	896,377
2000	1,179	22,685	19,161	16,431	58,277	n.a.	n.a.	n.a.
2001	1,312	22,131	19,645	20,083	61,859	n.a.	n.a.	n.a.
Norway								
1995	13,356	57,029	31,506	15,620	104,155	366,144	1,075,098	1,548,288
1996	14,977	60,161	35,172	18,079	113,412	384,981	1,148,021	1,648,580
1997	16,864	63,071	40,484	24,216	127,771	421,618	1,250,861	1,800,312
1998	17,145	67,837	45,024	30,534	143,395	454,232	1,335,774	1,927,672
1999	20,690	71,917	48,785	36,462	157,164	460,946	1,420,097	2,024,150
2000	24,436	68,814	54,183	41,558	164,555	479,155	1,547,128	2,178,346
Sweden								
1993	61,159	62,296	23,249	31,878	117,424	799,925	1,374,151	2,354,685
1994	84,877	71,595	48,420	40,289	160,304	948,548	1,551,646	2,678,677
1995	105,038	100,656	52,288	46,258	199,201	1,103,045	1,753,572	3,040,641
1996	122,676	98,326	47,835	51,743	197,904	1,106,880	1,771,619	3,065,726
1997	143,232	112,504	55,498	57,290	225,292	1,184,118	2,001,014	3,364,775
1998	169,634	131,311	64,179	72,156	267,645	1,261,757	2,127,743	3,572,954
1999	197,362	132,326	66,459	91,271	290,056	1,313,969	2,260,363	3,773,316
2000	232,381	136,197	72,262	107,088	315,547	1,452,443	2,475,945	4,166,008

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.4
Gross value added in million national currencies

	ICT manu-facturing industry	ICT services			Total ICT services	Total manu-facturing industry	Total services activities	Total private sector[2]
		Whole-sale	Tele-commu-nications	Con-sultancy services				
Denmark								
1993	8,004	12,657	n.a.	9,385	22,042	177,908	256,698	475,801
1994	8,482	13,910	n.a.	10,741	24,651	190,718	265,464	501,354
1995	8,675	15,500	n.a.	12,513	28,013	201,023	280,562	529,852
1996	8,856	15,924	n.a.	12,531	28,455	198,836	298,667	548,069
1997	9,970	18,363	n.a.	17,134	35,497	211,304	306,286	573,450
1998	10,113	20,276	n.a.	20,293	40,569	216,626	319,505	595,999
1999	10,461	18,544	n.a.	20,886	39,430	224,303	337,820	626,283
Finland[1]								
1997	2,948	920	1,392	976	3,288	24,066	24,288	52,208
1998	4,145	993	1,639	1,299	3,931	26,304	27,127	57,841
1999	5,066	1,045	1,886	1,496	4,427	26,064	27,426	58,178
2000	6,650	1,142	1,896	1,506	4,545	30,775	32,272	68,153
Norway								
1995	4,528	n.a.	10,658	n.a.	n.a.	111,264	302,484	451,192
1996	4,923	8,343	11,648	8,592	28,583	112,603	319,316	472,184
1997	5,445	10,621	12,184	10,011	32,816	121,906	350,696	518,508
1998	5,654	10,954	13,463	12,205	36,622	130,531	379,784	561,451
1999	7,322	11,879	14,552	16,053	42,484	135,733	404,851	591,718
2000	7,177	8,689	14,645	18,488	41,822	135,670	448,193	639,240
Sweden								
1993	19,344	11,691	16,353	13,964	42,008	243,065	280,657	578,916
1994	23,591	13,704	21,991	16,078	51,773	289,245	328,598	672,182
1995	26,892	15,896	20,709	19,528	56,133	329,877	351,735	741,968
1996	29,131	14,906	24,746	22,750	62,399	313,861	366,179	741,594
1997	41,822	17,621	28,694	27,356	73,671	358,862	487,213	906,742
1998	41,606	19,152	27,922	33,821	80,896	387,175	528,887	985,802
1999	45,662	19,885	32,519	41,639	94,043	394,033	560,279	1,033,802
2000	36,049	20,125	38,112	44,664	102,901	409,699	606,716	1,094,035

[1] Value added at factor costs
[2] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.5
Wages and salaries in million national currencies

	ICT manu-facturing industry	ICT services			Total ICT services	Total manu-facturing industry	Total services activities	Total private sector[1)]
		Whole-sale	Tele-commu-nications	Con-sultancy services				
Denmark								
1993	4,523	6,512	3,037	6,998	16,547	90,088	107,278	222,498
1994	4,564	7,012	3,612	5,600	16,224	94,934	112,678	235,578
1995	4,831	7,548	3,703	5,967	17,218	100,611	119,354	249,631
1996	5,022	7,608	4,671	6,612	18,891	102,533	127,494	259,967
1997	5,113	8,539	5,190	7,435	21,164	105,084	135,377	272,782
1998	5,415	9,631	5,759	9,156	24,546	109,850	146,511	290,724
1999	5,954	10,208	6,133	11,501	27,842	112,200	157,200	305,800
Finland								
1994	539	340	376	398	1,114	8,214	10,500	19,979
1995	691	390	392	424	1,206	9,043	11,120	21,664
1996	797	435	422	464	1,322	9,479	11,763	22,903
1997	961	492	470	512	1,474	10,129	12,617	24,617
1998	1,143	525	521	731	1,778	10,888	13,873	26,932
1999	1,319	589	529	878	1,995	11,131	14,919	28,508
2000	1,455	620	556	1,148	2,323	11,844	16,269	30,873
Iceland								
1998	241	2,167	2,753	3,681	8,601	46,662	96,843	163,301
1999	243	2,416	3,484	5,215	11,115	49,688	111,844	183,427
2000	269	2,962	4,129	7,797	14,888	54,719	130,367	211,646
2001	272	3,062	4,507	9,630	17,199	58,926	139,369	226,629
Norway								
1995	3,289	7,153	3,584	5,578	16,315	75,780	170,746	271,105
1996	3,701	7,493	4,044	6,203	17,740	79,788	184,294	291,399
1997	4,005	8,002	4,603	8,636	21,241	86,884	201,452	320,249
1998	4,149	8,654	4,992	11,482	25,128	93,484	224,231	354,069
1999	5,035	9,127	5,351	13,742	28,220	95,387	242,649	377,262
2000	5,525	10,161	6,761	17,249	34,171	96,592	258,955	397,109
Sweden								
1993	10,286	6,113	7,824	7,833	21,770	121,441	150,270	304,364
1994	11,338	6,711	7,708	8,713	23,132	128,991	166,988	327,682
1995	12,941	7,135	7,632	10,484	25,251	143,015	179,871	356,833
1996	14,164	7,438	9,374	12,484	29,296	153,685	192,410	380,903
1997	15,800	8,715	8,700	14,819	32,234	165,767	220,028	420,569
1998	18,504	9,898	9,768	18,977	38,643	175,190	245,549	458,347
1999	19,847	10,425	9,821	23,600	43,846	177,856	257,975	476,676
2000	19,810	10,549	10,740	29,715	51,004	186,154	284,794	516,164

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.6a
Number of employed persons by gender. Denmark 2001

	Persons employed		Total	Persons employed		Total
	Male	Female		Male	Female	
				%		
ICT manufacturing industry, total	12,711	10,027	22,738	56	44	100
ICT services activities, total	65,310	27,546	92,856	70	30	100
of which:						
Wholesale of ICT products	21,122	7,893	29,015	73	27	100
Telecommunications	12,805	8,810	21,615	59	41	100
Consultancy services, renting of machinery	31,383	10,843	42,226	74	26	100
Manufacturing industry, total	314,297	149,801	464,098	68	32	100
Services activities, total	635,026	459,133	1,094,159	58	42	100
Total private sector[1)]	1,111,759	642,836	1,754,595	63	37	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.6b
Number of employed persons by gender. Finland 2000

	Persons employed		Total	Persons employed		Total
	Male	Female		Male	Female	
				%		
ICT manufacturing industry, total	29,776	17,028	46,804	64	36	100
ICT services activities, total	46,973	22,223	69,196	68	32	100
of which:						
Wholesale of ICT products	11,909	4,531	16,440	72	28	100
Telecommunications	10,675	7,624	18,299	58	42	100
Consultancy services, renting of machinery	24,389	10,068	34,457	71	29	100
Manufacturing industry, total	309,125	131,963	441,088	70	30	100
Services activities, total	442,577	393,349	835,926	53	47	100
Total private sector[1)]	878,495	553,517	1,432,012	61	39	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.6c
Number of employed persons by gender. Iceland 2001

	Persons employed		Total	Persons employed		Total
	Male	Female		Male	Female	
				%		
ICT manufacturing industry, total	84	20	104	81	19	100
ICT services activities, total	3,712	1,591	5,303	70	30	100
of which:						
Wholesale of ICT products	772	322	1,094	71	29	100
Telecommunications	940	623	1,563	60	40	100
Consultancy services, renting of machinery	2,000	646	2,646	76	24	100
Manufacturing industry, total	16,452	8,116	24,568	67	33	100
Services activities, total	30,772	30,044	60,816	51	49	100
Total private sector[1)]	53,718	40,181	93,899	57	43	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.6d
Number of employed persons by gender. Norway 2001

	Persons employed		Total	Persons employed		Total
	Male	Female		Male	Female	
				%		
ICT manufacturing industry, total	8,857	3,235	12,092	73	27	100
ICT services activities, total	52,956	18,809	71,765	74	26	100
of which:						
Wholesale of ICT products	17,474	5,374	22,848	76	24	100
Telecommunications	8,052	4,163	12,215	66	34	100
Consultancy services, renting of machinery	27,430	9,272	36,702	75	25	100
Manufacturing industry, total	206,612	68,801	275,413	75	25	100
Services activities, total	470,747	351,039	821,786	57	43	100
Total private sector[1)]	814,049	449,192	1,263,241	64	36	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.6e
Number of employed persons by gender. Sweden 2000

	Persons employed		Total	Persons employed		Total
	Male	Female		Male	Female	
				%		
ICT manufacturing industry, total	47,923	23,253	71,176	67	33	100
ICT services activities, total	106,098	43,385	149,483	71	29	100
of which:						
Wholesale of ICT products	20,335	7,281	27,616	74	26	100
Telecommunications	19,334	10,799	30,133	64	36	100
Consultancy services, renting of machinery	66,429	25,305	91,734	72	28	100
Manufacturing industry, total	565,786	202,803	768,589	74	26	100
Services activities, total	885,520	637,048	1,522,568	58	42	100
Total private sector[1)]	1,668,543	878,894	2,547,437	65	35	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.7a
Number of employed persons by age. Denmark 2001

	Persons employed						Total
	<25 year	25–34 years	35–44 years	45–54 years	55–64 years	>64 years	
	%						
ICT manufacturing industry, total	10	30	30	21	8	1	100
ICT services activities, total	10	36	30	18	7	0	100
of which:							
Wholesale of ICT products	10	37	28	17	7	1	100
Telecommunications	11	28	29	23	9	0	100
Consultancy services, renting of machinery	9	39	31	15	5	0	100
Manufacturing industry, total	14	26	26	21	11	1	100
Services activities, total	21	25	22	19	11	2	100
Total private sector[1)]	19	25	23	20	11	2	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.7b
Number of employed persons by age. Finland 2000

	Persons employed						Total
	<25 year	25–34 years	35–44 years	45–54 years	55–64 years	>64 years	
	%						
ICT manufacturing industry, total	13	44	26	14	3	0	100
ICT services activities, total	11	34	30	20	5	0	100
of which:							
Wholesale of ICT products	10	33	32	19	5	0	100
Telecommunications	9	31	28	25	7	0	100
Consultancy services, renting of machinery	13	37	29	17	3	0	100
Manufacturing industry, total	11	25	27	28	9	0	100
Services activities, total	14	24	26	26	10	0	100
Total private sector[1)]	13	24	27	27	10	0	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.7c
Number of employed persons by age. Iceland 2001

	Persons employed						Total
	<25 year	25–34 years	35–44 years	45–54 years	55–64 years	>64 years	
	%						
ICT manufacturing industry, total	11	22	30	26	7	5	100
ICT services activities, total	16	37	25	13	7	2	100
of which:							
Wholesale of ICT products	20	26	24	18	8	4	100
Telecommunications	17	31	20	15	13	4	100
Consultancy services, renting of machinery	14	45	29	9	2	0	100
Manufacturing industry, total	21	21	24	18	11	5	100
Services activities, total	22	22	23	19	11	3	100
Total private sector[1)]	22	24	24	18	10	2	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.7d
Number of employed persons by age. Norway 2001

	Persons employed						Total
	<25 year	25–34 years	35–44 years	45–54 years	55–64 years	>64 years	
	%						
ICT manufacturing industry, total	5	31	30	22	12	1	100
ICT services activities, total	7	37	30	17	8	1	100
of which:							
Wholesale of ICT products	9	34	29	18	9	1	100
Telecommunications	6	36	28	20	10	0	100
Consultancy services, renting of machinery	6	40	31	16	6	0	100
Manufacturing industry, total	9	24	27	23	15	1	100
Services activities, total	15	26	25	20	12	2	100
Total private sector[6)]	14	26	25	21	13	2	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.7b
Number of employed persons by age. Sweden 2000

	Persons employed						Total
	<25 year	25–34 years	35–44 years	45–54 years	55–64 years	>64 years	
	%						
ICT manufacturing industry, total	9	35	27	19	10	0	100
ICT services activities, total	8	38	28	18	8	0	100
of which:							
Wholesale of ICT products	9	38	28	17	8	1	100
Telecommunications	8	24	27	29	13	0	100
Consultancy services, renting of machinery	8	43	28	15	6	0	100
Manufacturing industry, total	10	26	26	23	15	1	100
Services activities, total	13	26	24	21	14	1	100
Total private sector[1)]	12	26	24	22	15	1	100

[1)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.8a
Number of employed persons by level of education. Denmark 2001

	Below upper secondary education[1)]	Upper secondary education[2)]	Non-university tertiary education and university level education[3)]	Total
	%			
ICT manufacturing industry, total	35	40	25	100
ICT services activities, total	16	51	34	100
of which:				
Wholesale of ICT products	16	52	31	100
Telecommunications	21	58	21	100
Consultancy services, renting of machinery	12	46	42	100
Manufacturing industry, total	38	48	15	100
Services activities, total	32	51	17	100
Total private sector[4)]	34	51	15	100

[1)] ISCED 97, 0/1/2 + no information (ISCED 9)
[2)] ISCED 97, 3/4
[3)] ISCED 97, 5/6
[4)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.8b
Number of employed persons by level of education. Finland 2000

	Below upper secondary education[1)]	Upper secondary educa-tion[2)]	Non-univer-sity tertiary education[3)]	University level educa-tion[4)]	Total[5)]
	%				
ICT manufacturing industry, total	14	39	15	32	100
ICT services activities, total	12	36	25	27	100
of which:					
Wholesale of ICT products	16	36	26	22	100
Telecommunications	15	38	25	22	100
Consultancy services, renting of machinery	9	35	24	32	100
Manufacturing industry, total	25	49	13	13	100
Services activities, total	26	42	18	14	100
Total private sector[6)]	26	46	16	12	100

[1)] ISCED 97, 0/1/2 + no information (ISCED 9)
[2)] ISCED 97, 3
[3)] ISCED 97, 5
[4)] ISCED 97, 6
[5)] All ISCED levels. ISCED 4 is not implemented in Finland
[6)] NACE 15–37, 45, 50–74. 92. 93

Annex table 4.8c
Number of employed persons by level of education. Norway 2001

	Below upper secondary education and upper secondary education[1)]	Non-university tertiary education and university level education [2)]	Total
	%		
ICT manufacturing industry, total	56	44	100
ICT services activities, total	52	48	100
of which:			
Wholesale of ICT products	71	29	100
Telecommunications	50	50	100
Consultancy services, renting of machinery	41	59	100
Manufacturing industry, total	82	18	100
Services activities, total	75	25	100
Total private sector[3)]	79	21	100

[1)] ISCED 97, 0/1/2/3/4+ no information (ISCED 9)
[2)] ISCED 97, 5/6
[3)] NACE 15–37, 45, 50–74, 92, 93

Annex table 4.8d
Number of employed persons by level of education. Sweden 2000

	Below upper secondary education[1)]	Upper secondary education[2)]	Non-university tertiary education[3)]	University level education[4)]	Total
	%				
ICT manufacturing industry, total	13	46	18	23	100
ICT services activities, total	6	42	24	28	100
of which:					
Wholesale of ICT products	9	55	21	15	100
Telecommunications	7	62	17	14	100
Consultancy services, renting of machinery	5	32	27	36	100
Manufacturing industry, total	25	55	11	9	100
Services activities, total	20	53	13	14	100
Total private sector[5)]	22	55	12	11	100

[1)] ISCED 97, 0/1/2 + no information (ISCED 9)
[2)] ISCED 97, 3/4
[3)] ISCED 97, 5
[4)] ISCED 97, 6
[5)] NACE 15–37, 45, 50–74, 92, 93

Annex 4.2 Definitions of ICT sector, wholesale activities and education and data sources

Definition of ICT sector

ICT manufacturing industry:

NACE[1] code	
3001	Manufacture of office machinery
3002	Manufacture of computers and other information processing equipment
3130	Manufacture of insulated wire and cable
3210	Manufacture of electronic valves and tubes and other electronic components
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
3320	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
3330	Manufacture of industrial process control equipment

ICT services:

Wholesale	
5143	Wholesale of electrical household appliances and radio and television goods
5164	Wholesale of office machinery and equipment
5165	Wholesale of other machinery for use in industry, trade and navigation
Telecommunications	
6420	Telecommunications
Consultancy services	
7133	Renting of office machinery and equipment, including computers
7210	Hardware consultancy
7220	Software consultancy and supply
7230	Data processing
7240	Database activities
7250	Maintenance and repair of office, accounting and computing machinery
7260	Other computer related activities

[1] NACE, Rev. 1: Statistical classification of Economic Activities in the European Community

Definition of wholesale activities

Wholesale of electrical household appliances and radio and television goods

	Including:	Leaving out:
Denmark	Wholesale of radio and television goods	Wholesale of electrical household appliances Wholesale of grammophone records, recorded and unrecorded videos Wholesale of white goods
Finland	Wholesale of radio and television goods	Wholesale of electrical household appliances
Norway	Wholesale of radio and television goods Wholesale of grammophone records, recorded and unrecorded videos Retail sale of photographic equipment; photography services	Wholesale of electrical household appliances Wholesale, lightning equipment
Sweden	Wholesale of radio and television goods	Wholesale of electrical household appliances Wholesale of grammophone records, tapes, CDs and video tapes

Wholesale of office machinery and equipment

	Including	Leaving out
Denmark	Wholesale of office machinery, computers and equipment	Wholesale of office furniture and office supplies
Finland	Wholesale of computer hardware Wholesale of office Wholesale of machinery for industry, trade and navigation	Wholesale of office furniture
Iceland	Wholesale of computers, typewriters etc.	Wholesale of office equipment

Wholesale of other machinery for use in industry, trade and navigation

	Including:	Leaving out
Denmark	Wholesale of electrical materials Wholesale of electronic components	Wholesale of other machinery, equipment and accessories
Finland	Wholesale of electrical equipment and supplies Wholesale of telecommunication equipment and electronic components	Wholesale of machinery for industry, trade and navigation
Iceland	Wholesale of other machinery for use in industry, trade and navigation	Wholesale of fishing gear and fishprocessing industry
Norway	Wholesale of machinery/equipment for trade, transport and services	Wholesale of machinery/equipment for power production Wholesale of equipment for ships and fishing gear Wholesale of machinery/equipment for oil, gas, quarrying
Sweden	Wholesale of computerized materials handling equipment Wholesale of telecommunication equipment and electronic components	Wholesale of measuring and precision instruments Wholesale of machinery for industry, trade and navigation

ISCED levels of education

	ISCED 97	
Tertiary education	Level 6	Second stage of tertiary education
	Level 5	First stage of tertiary education
		5B-programmes
		5A-programmes
Upper secondary education	Level 4	Post-secondary non-tertiary education
	Level 3	Upper secondary education
Other education	Level 2	Lower secondary education
	Level 1	Primary education
	Level 0	Pre-preminary education
	Level 9	Level unspecified or unknown

Data sources
Denmark

Variable	Source	Further information
Number of employees	Statistics of employment and establishments	Statistics Denmark
Persons employed	Statistics of employment and establishments	Statistics Denmark
Turnover	Statistics of turnover in industries	Statistics Denmark
Gross value added	General accounts statistics for nonagricultural industries	Statistics Denmark
Wages and salaries	Statistics of employment and establishments	Statistics Denmark
Number of enterprises	Statistics on enterprises	Statistics Denmark
Persons employed, by gender	Statistics on education and labour market	Statistics Denmark
Persons employed, by age	Statistics on education and labour market	Statistics Denmark
Persons employed, by education	Statistics on education and labour market	Statistics Denmark
Research and development	R&D statistics	Analyseinstitut for Forskning

Finland

Variable	Source	Further information
Number of persons employed	Business Register	Statistics Finland
Turnover	Business Register	Statistics Finland
Gross value added (Value added at factor costs).	Structural Business Statistics	Statistics Finland
Wages and salaries	Business Register	Statistics Finland
Number of enterprises	Business Register	Statistics Finland
Persons employed by gender	Regional Employment Statistics	Statistics Finland
Persons employed by age	Regional Employment Statistics	Statistics Finland
Persons employed by education	Regional Employment Statistics	Statistics Finland
Research and development	R&D statistics	Statistics Finland

Iceland

Variable	Source	Further information
Number of employees	Administrative sources	Statistics Iceland
Number of persons employed	Administrative sources	Statistics Iceland
Turnover	Administrative sources	Statistics Iceland
Gross value added (Value added at basic prices)	N/A.	
Wages and salaries	Administrative sources	Statistics Iceland
Number of enterprises	Register of Enterprises and Value Added Tax Register	Statistics Iceland
Persons employed, by gender	Administrative sources	Statistics Iceland
Persons employed, by age	Administrative sources	Statistics Iceland
Persons employed, by education	Administrative sources	Statistics Iceland

Norway

Variable	Source	Further information
Number of persons employed	Structural Statistics and National Accounts	Statistics Norway
Turnover	Structural Statistics and National Accounts	Statistics Norway
Gross value added (Value added at basic prices)	Structural Statistics and National Accounts	Statistics Norway
Wages and salaries	Structural Statistics and National Accounts	Statistics Norway
Number of establishments[1)]	Structural Statistics	Statistics Norway
Persons employed, by gender	Labour market statistics	Statistics Norway
Persons employed, by age	Labour market statistics	Statistics Norway
Persons employed, by education	Labour market statistics	Statistics Norway
Research and development	R&D statistics	Statistics Norway

[1)] For Norway number of establishments is used, except for telecommunication where figures are enterprises.

Sweden

Variable	Source	Further information
Number of employees. Fulltime equivalents	Business statistics	Statistics Sweden
Number of persons employed	Labour statistics based on administrative sources	Statistics Sweden
Turnover	Business Statistics	Statistics Sweden
Gross value added (value added at basic prices	Business Statistics	Statistics Sweden
Wages and salaries	Business Statistics	Statistics Sweden
Number of enterprises	Business Statistics	Statistics Sweden
Persons employed by gender	Labour statistics based on administrative sources	Statistics Sweden
Persons employed by age	Labour statistics based on administrative sources	Statistics Sweden
Persons employed by education	Labour statistics based on administrative sources	Statistics Sweden
Research and development	R&D statistics	Statistics Sweden

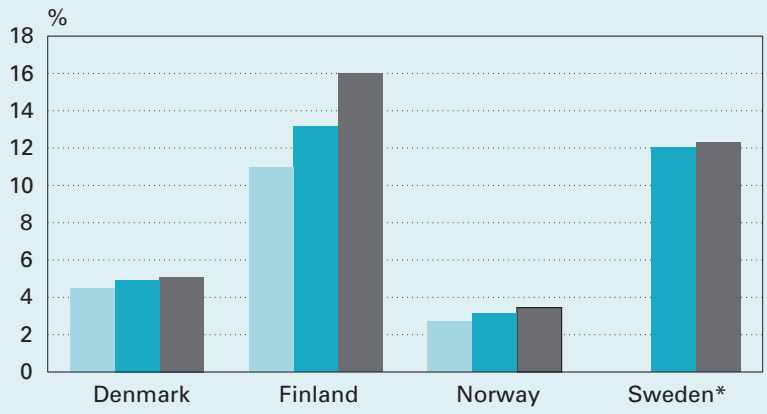
5 PRODUCTION AND FOREIGN TRADE OF ICT GOODS

There is no international agreement or recommendation about the definition of ICT products. Eurostat has drawn up a preliminary list of products, which has been used in this publication. The product group categories are telecommunications equipment, consumer electronics, computers, electronic components, office machinery, instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes (see detailed list in Annex 5.2). The preliminary list of Eurostat contains the ICT products defined in PRODCOM(98)[1] as well as a conversion key to the HS[2] and CPC[3] classifications.[4] Section 5.1 presents data on the production, and Section 5.2 on the foreign trade of ICT products.

5.1 Production of ICT goods

Of the Nordic Countries Finland and Sweden have clearly the highest proportions of ICT production of their total manufacturing production (Figure 5.1). During the 1998 to 2000 period, growth in ICT production in Finland was rapid and the proportion of ICT products of all manufacturing production rose from 11 to 16 per

Figure 5.1
ICT production as a proportion of total manufacturing production in 1998–2000



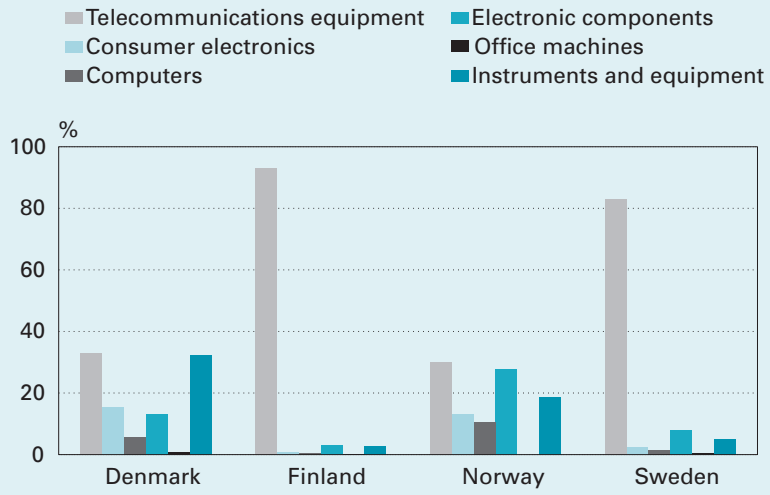
* Sweden: 1998 n.a.
No data for Iceland

1 Production Communautaire, Eurostat
2 The Harmonised Commodity Description and Coding System
3 Central Product Classification
4 The keys to the HS and CPC classification can be provided by the national statistical agencies

cent. In Sweden (1999–2000) the corresponding proportion has been around 12 per cent. In both Denmark and Norway ICT production is of minor importance when compared to the value of total manufacturing production. The proportion of their ICT production was of the magnitude of 3 to 5 per cent during the 1998 to 2000 period. Obviously, the differences between ICT production in Finland and Sweden, on the one hand, and Denmark and Norway, on the other, follow from the structure of the ICT manufacturing sector (see Chapter 4.).

The underlying reason for the volume of Finnish and Swedish ICT production becomes clearly visible from Figure 5.2. As is well known, the production of telecommunications equipment has a pivotal role in both economies. In Finland 93 per cent of ICT production consists of telecommunications equipment. The dominance of this product group is also very evident in Swedish ICT production, its corresponding proportion being 83 per cent. Although telecommunications equipment also has the highest share of the production of ICT products in Denmark and Norway, their distributions across the product groups are much more even than in Finland or Sweden. In Denmark, instruments and equipment and in Norway electronic components make up about equal proportions to those of telecommunications equipment in ICT production.

Figure 5.2
Production of ICT products by product group in 2000

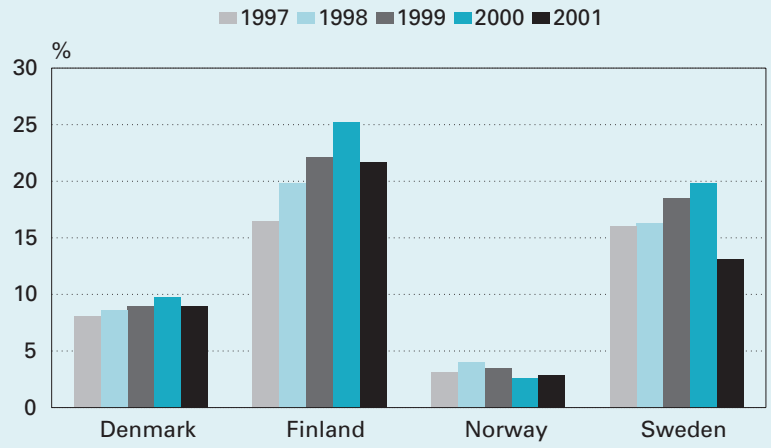


5.2 ICT exports and imports

The volumes and trends of exports and imports of information and communications technology (ICT) products describe a country's competitive edge in these strategic branches. The same pattern as in ICT production also emerges in ICT exports and imports. That is, Finland and Sweden are the countries where information and communications technology plays a significant role in economic performance, also as measured by foreign trade. Oil and natural gas are pivotal in the Norwegian economy and their importance is reflected in the country's foreign trade as well. Fish-related industries have a dominant role in Iceland. According to general foreign trade figures for Denmark, no dominant industry can be identified.

The volume of exports of ICT products increased in all the Nordic Countries in the second half of the 1990s. ICT exports as a proportion of total exports and imports also increased in all the countries, except for Norway where, as already pointed out, fluctuations in the oil trade carry a significant weight. However, year 2001 marked a turning point, as the volumes and proportions of the ICT products started to fall. The most visible change took place in Sweden, where SEK 50 billion, or one third of the volume, of ICT exports vanished in 2001 (Annex table 5.4 and Figure 5.3). Finland also faced a clear decline as the proportion dropped from 25 to 22 per cent and the volume fell by EUR 2.1 billion. Growth of ICT exports halted in Denmark, too, but the downturn was modest, as the proportion of ICT exports of total exports fell by one percentage point only. The situation was different in Norway and Iceland, which even managed to increase slightly their ICT exports.

Figure 5.3
Exports of ICT products as a proportion of total exports in 1997–2001



Iceland is not included as the proportions are 0.1-0.2 per cent

Despite the downward trend, ICT products still had the highest proportion of total exports in Finland (22 per cent) and Sweden (13 per cent) in 2001. Denmark came closer to Sweden with its 9 per cent figure. The proportion in Norway has been rather stable at around 3 per cent and in Iceland the share of ICT exports of total exports is 0.1–0.2 per cent.

As to the proportion of imports of ICT products of total imports the differences between the countries are smaller, although the proportion is somewhat higher in Finland and Sweden than in the other countries (Figure 5.4). The main reason seems to be electronic components, which are imported and then used in the manufacturing of telecommunications equipment (see Annex tables 5.9).

The total volume of foreign trade (summing up exports and imports) in ICT products in 2001 was still the largest by far in Sweden at EUR 21,712 million, or 39 per cent of the total ICT foreign trade of the Nordic Countries. However, in 2000 the corresponding figure for Sweden was EUR 32,274 million (see Annex table 5.6). In Finland, the total volume of foreign trade in ICT products decreased from EUR 19,369 million in 2000 to EUR 16,553 million in 2001. Compared to the drastic declines in Sweden and Finland, the volumes of foreign trade in ICT products remained more or less stable in the other Nordic Countries.

The balance between ICT imports and exports in 1997–2001 has indicated the greatest surplus in Finland, where the exports/imports ratio was 1.7 in 2001. Despite a decrease in the surplus in 2001, Sweden remained as the other Nordic Country to have exported more ICT products than imported them (Figure 5.5 and

Figure 5.4
Imports of ICT products as a proportion of total imports in 1997–2001

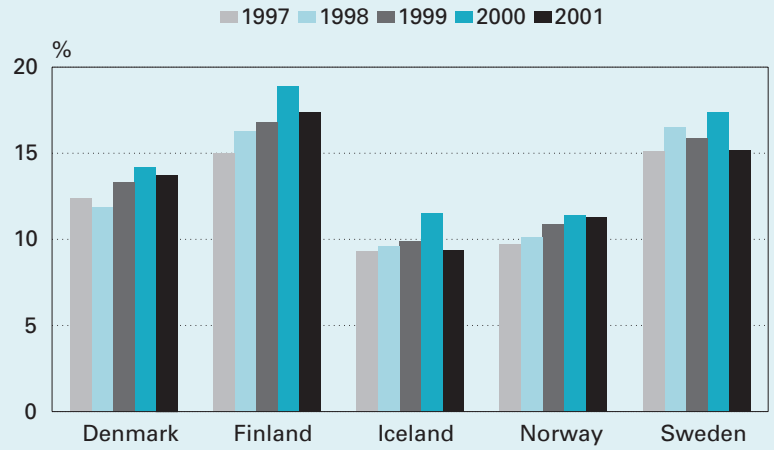


table 5.1). In fact, the exports/imports ratio in Sweden had been 1.2–1.4, but in 2001 it was about 1.0, denoting balance in the country's ICT trade. The other Nordic Countries import more ICT goods than export them, and their ratios have been very stable during the past few years. Iceland is a country with very little exports as compared to imports of ICT goods. The exports/imports ratio of ICT products seldom reaches 1.00, but in countries like Japan and Korea the ratio has traditionally been high.

A look at the long-term development in ICT trade (Annex table 5.7) shows that the growth in Iceland has been significant especially in exports but, as already mentioned, in absolute terms the total volume is low. Sweden still indicates growth for the 1996 to 2001 period, even accounting for the setbacks during 2000–2001. In all, the year 2000 stands out as one of rapid growth in the ICT trade of the Nordic Countries.

As to trade by product group (see detailed figures by country in Annex tables 5.9), the largest export group in Denmark is telecommunications equipment, which accounted for 24 per cent of the total value of ICT exports in 1996, and for 34 per cent in 2001. Denmark's exports of ICT products are more evenly distributed than Finland's or Sweden's. The second largest category, instruments and equipment, scored 20 per cent in 2001. The largest product groups in Denmark's ICT imports were computers and telecommunications equipment. The negative balance in the country's ICT products trade is mainly attributable to a large deficit in the category of computers. Instruments and equipment show a positive balance, however. The

Figure 5.5
Exports/imports ratio of foreign trade in ICT products in 1997–2001

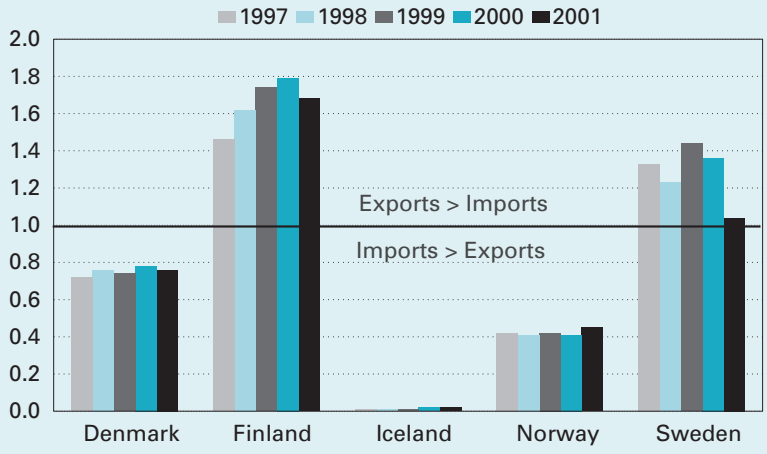


Table 5.1
Foreign trade in ICT products in 1996–2001, in 1,000 Euro (mean value of the year)

	Denmark	Finland	Iceland	Norway	Sweden
1996					
Exports	2,942,203	4,489,017	1,062	1,124,756	9,675,537
Imports	4,386,964	3,374,902	135,202	2,752,317	7,634,466
1997					
Exports	3,502,814	5,921,573	1,725	1,345,069	11,676,714
Imports	4,891,630	4,063,235	152,282	3,228,340	8,781,525
1998					
Exports	3,704,673	7,668,825	2,290	1,453,136	12,343,767
Imports	4,896,597	4,746,010	194,874	3,503,905	10,060,822
1999					
Exports	4,178,175	8,679,819	2,347	1,508,664	14,732,466
Imports	5,589,412	4,981,605	214,650	3,608,664	10,254,167
2000					
Exports	5,260,709	12,475,149	4,997	1,717,935	18,653,348
Imports	6,708,090	6,951,727	296,263	4,225,425	13,720,869
2001					
Exports	5,091,223	10,369,019	4,458	1,891,556	11,050,711
Imports	6,672,119	6,183,945	217,595	4,249,789	10,661,206

Exchange rates in Annex table 5.8

total balance of Danish foreign trade has been positive throughout the 1996 to 2001 period.

In Finland, the largest export group is telecommunications equipment, which accounted for 67 per cent of the total value of Finland's ICT exports in 1996, and for as much as 83 per cent in 2001. Some 18 per cent of the total Finnish exports were due to telecommunications equipment in 2001. The largest product groups in Finnish ICT imports were telecommunications equipment, electronic components, and computers, making the distribution of import figures much more even when compared to the dominance of telecommunications equipment in exports. In addition to telecommunications equipment, instruments and equipment show a surplus as well, while all the other categories are imported more than exported. The total balance of Finnish foreign trade has been positive and grew continuously up to 2000, after which there was a slight decrease.

Iceland's largest ICT exports group is instruments and equipment, which accounted for 53–54 per cent of the total value of Iceland's ICT exports both in 1996 and 2001. The second largest category, computers, scored 22 per cent in 2001. The largest product groups among Iceland's ICT imports were computers and telecommunications equipment. Iceland's negative balance of trade in ICT products is mainly attributable to large deficits in the categories of computers and telecommunications equipment, but there is no surplus in any category of ICT products. The total balance of the country's foreign trade turned negative in 1997.

With Norway, the largest ICT exports product group is telecommunications equipment, which accounted for 38 per cent of the total value of Norway's ICT exports in 1996, and for 34 per cent in 2001. The second largest category is instruments, which increased its share in 2001, passing computers and reaching the proportion of 21 per cent.

The largest product groups in Norwegian ICT imports were computers and telecommunications equipment. The negative balance in Norway's ICT products trade is mainly attributable to a large deficit in the category of computers. There is only one category of ICT products, that is, instruments and equipment, with surplus. In fact, as far as the 1996 to 2001 period is concerned, this is the first time that any ICT product group has exports exceeding imports in Norway. As the role of the oil industry is so dominant, there are great fluctuations in the total balance of trade. However, the total balance of trade has been positive during the examined period.

Sweden's largest ICT exports product group is telecommunications equipment, which accounted for 71 per cent of the total value of Sweden's ICT exports in 1996, and for 66 per cent in 2001. About 9 per cent of the total Swedish exports come from telecommunications equipment in 2001. The largest product groups in Swedish ICT imports are computers, telecommunications equipment and electronic components. As in the case of Finland, Sweden's ICT imports are not dependent on the largest product group to the same extent as exports.

The positive balance of Sweden's trade in ICT products is mainly attributable to a large surplus in the category of telecommunications equipment. Swedish ICT trade has shown a surplus during the 1996 to 2001 period, but the drastic downward turn in 2001 is reflected in a fall in the surplus from SEK 42 billion to SEK 3.6 billion in 2001. The total balance of trade has been positive throughout the examined period.

Annex 5

Annex 5.1 Statistical tables

Data sources

Production: Statistical offices

Foreign trade: Finland, National Board of Customs other countries, statistical offices

Annex 5.2 Definition of ICT products

Annex 5.1 Statistical tables

Annex table 5.1
Production of information technology goods by product group

	Telecommunications equipment	Consumer electronics	Computers	Electronic components	Office machinery	Instruments for measuring etc.[1]	Information technology products total	Other products	Production total
	mill. national currencies								
Denmark									
1996	4,709	3,077	1,315	2,506	60	4,090	15,757	357,701	373,458
1997	5,304	3,375	708	2,887	61	4,402	16,737	380,720	397,457
1998	6,392	3,388	781	2,861	83	4,704	18,209	387,229	405,438
1999	7,728	3,092	841	3,295	105	5,368	20,429	394,250	414,679
2000	7,542	3,540	1,327	2,988	161	7,410	22,968	428,554	451,522
2001	8,017	3,548	1,371	2,795	175	7,309	23,215	430,503	453,718
Finland									
1996	4,705	119	863	617	3	272	6,579	66,596	73,175
1997	5,880	160	537	328	6	291	7,200	72,394	79,594
1998	8,066	138	544	359	6	261	9,374	75,967	85,341
1999	10,153	106	591	397	4	386	11,636	76,838	88,474
2000	13,634	100	67	470	7	379	14,657	77,088	91,745
Norway[2]									
1996									
1997	4,082	153	1,392	2,913	0	2,033	10,574	312,287	322,861
1998	1,884	152	1,801	2,363	0	2,552	8,751	330,545	339,296
1999	3,260	178	2,070	3,218	0	2,292	11,018	340,735	351,753
2000	3,883	1,675	1,353	3,604	0	2,417	12,932	361,708	374,640
Sweden									
1996	84,481	337	1,824	8,025	560	n.a.	95,227	n.a.	941,562
1997	114,956	316	1,647	8,422	587	n.a.	125,927	n.a.	1,172,835
1998	114,619	214	2,668	11,027	1,137	n.a.	129,663	n.a.	1,240,462
1999	128,639	2,220	2,422	11,580	632	10,399	155,892	1,141,736	1,297,628
2000	144,326	4,254	2,395	13,522	917	8,732	174,148	1,241,186	1,415,334

[1] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes
[2] The commodity figures are based on information from the 2 500 largest enterprises classified under manufacturing and mining and quarrying. These enterprises accounted for just about 90 per cent of the total industrial output in 2000.

Annex table 5.2
ICT products as a proportion of total exports in 1996–2001

	1996 %	1997 %	1998 %	1999 %	2000 %	2001 %
Denmark	7.2	8.1	8.6	9.0	9.8	9.0
Finland	14.3	16.5	19.8	22.1	25.2	21.7
Iceland	0.1	0.1	0.1	0.1	0.2	0.2
Norway	2.9	3.1	4.0	3.5	2.6	2.9
Sweden	14.3	16.0	16.3	18.5	19.8	13.1

Annex table 5.3
ICT products as a proportion of total imports in 1996–2001

	1996 %	1997 %	1998 %	1999 %	2000 %	2001 %
Denmark	12.2	12.4	11.9	13.3	14.2	13.7
Finland	14.2	15	16.3	16.8	18.9	17.4
Iceland	9.0	9.3	9.6	9.9	11.5	9.4
Norway	9.3	9.7	10.1	10.9	11.4	11.3
Sweden	14.3	15.1	16.5	15.9	17.4	15.2

Annex table 5.4
Foreign trade in ICT products in 1996–2001, in 1,000 national currency

		Denmark	Finland	Iceland	Norway	Sweden
1996	Exports	21,367,455	4,489,017	88,718	9,223,000	81,270,644
	Imports	31,859,884	3,374,901	11,294,745	22,569,000	64,126,461
1997	Exports	26,140,103	5,921,574	138,328	10,774,000	100,943,443
	Imports	36,504,279	4,063,235	12,209,995	25,859,000	75,914,967
1998	Exports	27,835,798	7,668,824	182,913	12,279,000	110,215,521
	Imports	36,791,563	4,746,010	15,564,607	29,608,000	89,831,471
1999	Exports	31,067,239	8,679,819	181,064	12,537,000	129,758,260
	Imports	41,560,631	4,981,605	16,562,389	29,988,000	90,315,008
2000	Exports	39,116,525	12,475,149	363,929	13,934,000	157,555,507
	Imports	49,878,671	6,951,727	21,576,843	34,272,000	115,893,320
2001	Exports	37,940,305	10,369,019	389,709	15,224,000	102,275,431
	Imports	49,721,295	6,183,945	19,022,130	34,204,000	98,670,530

Annex table 5.5
Foreign trade (exports/imports) in ICT products in 1996–2001, in 1,000 national currency

	Exports/imports 1996	1997	1998	1999	2000	2001
Denmark	0.7	0.7	0.8	0.7	0.8	0.8
Finland	1.3	1.5	1.6	1.7	1.8	1.7
Iceland	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.4	0.4	0.4	0.4	0.4	0.4
Sweden	1.3	1.3	1.2	1.4	1.4	1.0

Annex table 5.6
Foreign trade in ICT products in 1996–2001, in 1,000 Euro (mean value of the year)

		Denmark	Finland	Iceland	Norway	Sweden
1996	Exports	2,942,203	4,489,017	1,062	1,124,756	9,675,537
	Imports	4,386,964	3,374,902	135,202	2,752,317	7,634,466
	Exports/ imports	0.67	1.33	0.01	0.41	1.27
1997	Exports	3,502,814	5,921,573	1,725	1,345,069	11,676,714
	Imports	4,891,630	4,063,235	152,282	3,228,340	8,781,525
	Exports/ imports	0.72	1.46	0.01	0.42	1.33
1998	Exports	3,704,673	7,668,825	2,290	1,453,136	12,343,767
	Imports	4,896,597	4,746,010	194,874	3,503,905	10,060,822
	Exports/ imports	0.76	1.62	0.01	0.41	1.23
1999	Exports	4,178,175	8,679,819	2,347	1,508,664	14,732,466
	Imports	5,589,412	4,981,605	214,650	3,608,664	10,254,167
	Exports/ imports	0.74	1.74	0.01	0.42	1.44
2000	Exports	5,260,709	12,475,149	4,997	1,717,935	18,653,348
	Imports	6,708,090	6,951,727	296,263	4,225,425	13,720,869
	Exports/ imports	0.78	1.79	0.02	0.41	1.36
2001	Exports	5,091,223	10,369,019	4,458	1,891,556	11,050,711
	Imports	6,672,119	6,183,945	217,595	4,249,789	10,661,206
	Exports/ imports	0.76	1.68	0.02	0.45	1.04

Exhange rates in Annex table 5.8

Annex table 5.7
Nominal growth rates of foreign trade in ICT products in 1996–2001, in 1,000 Euro (mean value of the year)

	Exports growth in per cent						Imports growth in per cent					
	96–97	97–98	98–99	99–00	00–01	96–01	96–97	97–98	98–99	99–00	00–01	96–01
Denmark	19.1	5.8	12.8	25.9	–3.2	73.0	11.5	0.1	14.1	20.0	–0.5	52.1
Finland	31.9	29.5	13.2	43.7	–16.9	131.0	20.4	16.8	5.0	39.5	–11.0	83.2
Iceland	62.4	32.8	2.5	112.9	–10.8	319.8	12.6	28.0	10.1	38.0	–26.6	60.9
Norway	19.6	8.0	3.8	13.9	10.1	68.2	17.3	8.5	3.0	17.1	0.6	54.4
Sweden	20.7	5.7	19.3	26.6	–40.8	14.2	15.0	14.6	1.8	34.0	–22.3	39.6

Annex table 5.8
Nominal growth of foreign trade in ICT products in 1996–2001, and exchange rates for Euro (mean value of the year)

	Exports growth in %	Imports growth in %	Exchange rate for Euro					
	1996–2001	1996–2001	1996	1997	1998	1999	2000	2001
Denmark	73.0	52.1	7.26240	7.46260	7.51370	7.43560	7.43560	7.45210
Finland[1)]	131.0	83.2	5.94573	5.94573	5.94573	5.94573	5.94573	5.94573
Iceland	319.8	60.9	83.54000	80.18000	79.87000	77.16000	72.83000	87.42000
Norway	68.2	54.4	8.20000	8.01000	8.45000	8.31000	8.11090	8.04840
Sweden	14.2	39.6	8.39960	8.64485	8.92884	8.80764	8.44650	9.25510

[1)] FIM

Annex table 5.9a
ICT exports and imports in 1996–2001 by product groups. Denmark

Product class	1996	1997	1998	1999	2000	2001
	1,000 DKK					
Telecommunications equipment						
Exports	5,005,595	7,430,994	9,351,875	11,170,161	13,252,511	13,081,679
Imports	6,083,704	7,670,278	9,355,242	10,986,487	14,761,560	14,793,777
Balance	–1,078,109	–239,284	–3,367	183,674	–1,509,049	–1,712,098
Consumer electronics						
Exports	4,275,310	4,878,088	4,791,530	5,048,891	5,602,361	6,085,162
Imports	5,233,109	5,491,780	5,065,774	4,814,022	5,424,984	5,647,134
Balance	–957,799	–613,692	–274,244	234,869	177,377	438,028
Computers						
Exports	5,809,923	6,187,727	5,777,722	6,447,035	7,671,215	7,259,682
Imports	13,598,451	14,736,243	12,895,007	16,721,473	17,335,980	16,483,910
Balance	–7,788,528	–8,548,516	–7,117,285	–10,274,438	–9,664,765	–9,224,228
Electronic components						
Exports	1,969,282	2,609,603	2,644,342	2,590,135	3,821,599	3,304,555
Imports	3,589,807	4,651,413	5,309,579	4,942,789	7,803,669	7,626,253
Balance	–1,620,525	–2,041,810	–2,665,237	–2,352,654	–3,982,070	–4,321,698
Office machinery						
Exports	284,461	299,268	319,897	275,637	591,718	467,784
Imports	1,066,435	1,279,822	1,361,613	1,297,252	1,133,198	1,272,229
Balance	–781,974	–980,554	–1,041,716	–1,021,615	–541,480	–804,445
Instruments for measuring etc.[1)]						
Exports	4,022,884	4,734,423	4,950,432	5,535,380	8,177,121	7,741,443
Imports	2,288,378	2,674,743	2,804,348	2,798,608	3,419,280	3,897,992
Balance	1,734,506	2,059,680	2,146,084	2,736,772	4,757,841	3,843,451
ICT Foreign trade, total						
Exports	21,367,455	26,140,103	27,835,798	31,067,239	39,116,525	37,940,305
Imports	31,859,884	36,504,279	36,791,563	41,560,631	49,878,671	49,721,295
Balance	–10,492,429	–10,364,176	–8,955,765	–10,493,392	–10,762,146	–11,780,990
Foreign trade, total						
Exports	295,884,500	321,185,500	322,797,100	346,438,400	400,832,000	420,065,000
Imports	260,847,800	293,522,100	308,816,800	311,583,400	351,796,000	362,945,000
Balance	35,036,700	27,663,400	13,980,300	34,855,000	49,036,000	57,120,000

[1)] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes

Annex table 5.9b
ICT exports and imports in 1996–2001 by product groups. Finland

Product class	1996	1997	1998	1999	2000	2001
	1,000 EUR					
Telecommunications equipment						
Exports	3,013,452	3,974,401	5,522,865	6,664,887	10,513,094	8,622,173
Imports	570,531	676,868	864,121	1,070,555	2,300,594	2,043,332
Balance	2,442,920	3,297,533	4,658,745	5,594,332	8,212,500	6,578,841
Consumer electronics						
Exports	159,090	219,474	225,527	121,522	114,511	136,912
Imports	244,958	251,143	340,888	345,322	476,410	368,379
Balance	–85,868	–31,668	–115,361	–223,800	–361,899	–231,467
Computers						
Exports	752,232	975,575	918,061	801,222	440,897	363,271
Imports	1,057,675	1,268,872	1,535,821	1,511,634	1,406,293	1,366,783
Balance	–305,443	–293,297	–617,760	–710,412	–965,396	–1,003,512
Electronic components						
Exports	175,376	232,593	423,943	461,694	689,017	481,710
Imports	1,056,136	1,350,605	1,460,148	1,508,988	2,180,386	1,772,324
Balance	–880,760	–1,118,012	–1,036,205	–1,047,295	–1,491,370	–1,290,614
Office machinery						
Exports	18,930	26,769	37,295	23,014	19,029	23,963
Imports	91,925	122,146	136,211	139,377	122,243	143,134
Balance	–72,995	–95,378	–98,916	–116,363	–103,214	–119,171
Instruments for measuring etc.[1)]						
Exports	369,938	492,762	541,134	607,480	698,600	740,990
Imports	353,676	393,601	408,821	405,728	465,800	489,993
Balance	16,261	99,161	132,313	201,752	232,800	250,997
ICT Foreign trade, total						
Exports	4,489,017	5,921,573	7,668,825	8,679,819	12,475,149	10,369,019
Imports	3,374,902	4,063,235	4,746,010	4,981,605	6,951,727	6,183,945
Balance	1,114,115	1,858,338	2,922,815	3,698,214	5,523,422	4,185,074
Foreign trade, total						
Exports	31,339,164	35,797,180	38,778,867	39,245,523	49,484,343	47,681,302
Imports	23,835,572	27,077,357	29,066,095	29,691,157	36,837,421	35,639,928
Balance	7,503,591	8,719,823	9,712,772	9,554,366	12,646,921	12,041,374

[1)] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes

Annex table 5.9c
ICT exports and imports in 1996–2001 by product groups. Iceland

Product class	1996	1997	1998	1999	2000	2001
	1,000 ISK					
Telecommunications equipment						
Exports	661	2,826	8,127	29,034	56,962	53,945
Imports	2,410,679	2,805,639	3,732,592	4,012,184	5,809,547	4,673,220
Balance	–2,410,018	–2,802,813	–3,724,465	–3,983,150	–5,752,585	–4,619,275
Consumer electronics						
Exports	2,216	1,946	4,590	6,290	14,481	11,370
Imports	1,818,869	1,995,199	2,644,423	2,708,536	3,273,907	2,651,823
Balance	–1,816,653	–1,993,254	–2,639,833	–2,702,246	–3,259,426	–2,640,453
Computers						
Exports	36,833	15,535	76,127	22,462	83,827	88,468
Imports	4,221,149	4,417,728	5,577,981	6,366,888	7,688,496	7,060,033
Balance	–4,184,317	–4,402,193	–5,501,855	–6,344,426	–7,604,669	–6,971,565
Electronic components						
Exports	313	1,285	2,349	2,289	11,177	14,742
Imports	864,873	1,276,529	1,207,938	1,162,739	1,435,153	1,647,032
Balance	–864,56	–1,275,244	–1,205,588	–1,160,450	–1,423,976	–1,632,290
Office machinery						
Exports	0	81	2	390	1,615	14,544
Imports	316,219	268,590	324,403	375,847	324,032	294,933
Balance	–316,219	–268,509	–324,401	–375,457	–322,418	–280,389
Instruments for measuring etc.[1)]						
Exports	48,696	116,656	91,718	120,599	195,867	206,640
Imports	1,662,955	1,446,310	2,077,270	1,936,194	3,045,708	2,695,089
Balance	–1,614,259	–1,329,654	–1,985,552	–1,815,595	–2,849,841	–2,488,449
ICT Foreign trade, total						
Exports	88,718	138,328	182,913	181,064	363,929	389,709
Imports	11,294,745	12,209,995	15,564,607	16,562,389	21,576,843	19,022,130
Balance	–11,206,023	–12,071,667	–15,381,694	–16,381,325	–21,212,914	–18,632,421
Foreign trade, total						
Exports	125,689,779	131,213,245	136,591,964	144,928,114	149,272,774	196,393,629
Imports	124,836,067	131,325,744	162,061,593	167,778,015	187,276,007	203,083,237
Balance	853,712	–112,499	–25,469,629	–22,849,901	–38,003,233	–6,689,608

[1)] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes

Annex table 5.9d
ICT exports and imports in 1996–2001 by product groups. Norway

Product class	1996	1997	1998	1999	2000	2001
	1,000 NOK					
Telecommunications equipment						
Exports	3,501,800	4,606,319	5,017,025	4,736,476	5,276,358	5,160,000
Imports	5,323,538	5,794,009	7,358,955	7,599,794	9,252,238	8,240,000
Balance	–1,821,738	–1,187,690	–2,341,930	–2,879,979	–3,975,880	–3,080,000
Consumer electronics						
Exports	262,179	384,171	468,765	436,474	658,656	1,438,000
Imports	2,493,770	2,724,472	3,049,556	3,123,832	3,818,889	4,334,000
Balance	–2,231,591	–2,340,301	–2,580,791	–2,687,358	–3,160,233	–2,896,000
Computers						
Exports	2,241,056	2,723,165	3,108,880	3,514,696	3,480,459	2,814,000
Imports	9,005,840	11,017,391	12,288,164	12,586,727	13,745,792	13,889,000
Balance	–6,764,784	–8,294,226	–9,179,284	–9,072,031	–10,265,333	–11,075,000
Electronic components						
Exports	1,228,759	892,682	954,291	1,040,291	1,380,841	2,126,000
Imports	2,475,080	2,824,329	3,019,000	2,914,623	3,717,525	3,696,000
Balance	–1,246,321	–1,931,647	–2,064,709	–1,874,332	–2,336,684	–1,570,000
Office machinery						
Exports	190,520	130,084	295,466	357,903	505,194	413,000
Imports	921,314	945,772	1,055,168	972,003	1,046,548	1,101,000
Balance	–730,794	–815,688	–759,702	–614,100	–541,354	–688,000
Instruments for measuring etc.[1)]						
Exports	1,797,697	2,038,110	2,435,147	2,461,368	2,633,286	3,273,000
Imports	2,349,199	2,554,155	2,837,493	2,790,073	2,690,429	2,944,000
Balance	–551,502	–516,045	–402,346	–328,705	–57,143	329,000
ICT Foreign trade, total						
Exports	9,222,011	10,774,531	12,279,574	12,537,656	13,934,794	15,224,000
Imports	22,568,741	25,860,129	29,608,335	29,987,051	34,271,420	34,204,000
Balance	–13,346,730	–15,085,598	–17,328,761	–17,449,395	–20,336,626	–18,980,000
Foreign trade, total						
Exports	321,876,000	346,579,000	306,628,000	359,438,000	531,215,000	533,991,000
Imports	242,561,000	266,894,000	293,907,000	276,291,000	301,620,000	302,459,000
Balance	79,315,000	79,685,000	12,721,000	83,147,000	229,595,000	231,532,000

[1)] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes

Annex table 5.9e
ICT exports and imports in 1996–2001 by product groups. Sweden

Product class	1996	1997	1998	1999	2000	2001
	1,000 SEK					
Telecommunications equipment						
Exports	57,462,548	75,222,117	82,306,429	100,521,259	120,107,221	67,841,504
Imports	14,752,227	20,197,986	26,581,481	25,281,201	34,625,954	27,082,677
Balance	42,710,321	55,024,131	55,724,948	75,240,058	85,481,267	40,758,827
Consumer electronics						
Exports	2,102,243	2,163,474	3,923,037	5,183,324	7,034,031	5,163,222
Imports	5,725,585	6,312,467	7,149,248	8,201,360	10,538,387	10,806,051
Balance	–3,623,342	–4,148,993	–3,226,211	–3,018,036	–3,504,356	–5,642,829
Computers						
Exports	5,260,153	5,491,398	4,989,032	4,768,364	5,198,578	6,616,937
Imports	21,705,710	23,219,813	28,926,250	26,143,780	28,437,582	27,903,577
Balance	–16,445,557	–17,728,415	–23,937,218	–21,375,416	–23,239,004	–21,286,640
Electronic components						
Exports	8,378,218	9,585,000	9,975,259	9,968,955	14,774,947	9,881,017
Imports	12,945,092	16,618,747	17,057,300	20,534,423	30,074,616	19,748,492
Balance	–4,566,874	–7,033,747	–7,082,041	–10,565,468	–15,299,669	–9,867,475
Office machinery						
Exports	898,200	956,992	960,229	720,102	728,468	1,038,717
Imports	1,453,141	1,710,160	1,660,834	1,464,970	1,773,814	1,731,113
Balance	–554,941	–753,168	–700,605	–744,868	–1,045,346	–692,396
Instruments for measuring etc.[1)]						
Exports	7,169,282	7,524,462	8,061,535	8,596,256	9,712,262	11,734,034
Imports	7,544,706	7,855,794	8,456,358	8,689,274	10,442,967	11,398,620
Balance	–375,424	–331,332	–394,823	–93,018	–730,705	335,414
ICT Foreign trade, total						
Exports	81,270,644	100,943,443	110,215,521	129,758,260	157,555,507	102,275,431
Imports	64,126,461	75,914,967	89,831,471	90,315,008	115,893,320	98,670,530
Balance	17,144,183	25,028,476	20,384,050	39,443,252	41,862,187	3,604,901
Foreign trade, total						
Exports	569,200,000	632,800,000	675,300,000	700,800,000	796,600,000	781,000,000
Imports	448,700,000	501,100,000	545,300,000	568,100,000	666,900,000	649,600,000
Balance	120,500,000	131,700,000	130,000,000	132,700,000	129,700,000	131,400,000

[1)] Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes

Annex 5.2 Definition of ICT products

Definition of ICT products by PRODCOM

Prodcom(98)	Description
	Telecommunications equipment
32201150	Radio/tv transmission apparatus without reception apparatus
32201170	Radio transmission apparatus with reception apparatus
32201290	Television cameras (incl. closed circuit TV cameras) (excl. camcorders)
32202020	Telephone sets (incl. line telephone sets with cordless handsets, videophones) (excl. telephone answering machines not an integral part of the set)
32202030	Teleprinters
32202040	Telephonic or telegraphic switching apparatus (excl. relays and switching equipment such as selectors for automatic telephone exchangers)
32202050	Telephonic/telegraphic apparatus for carrier-current line systems, n.e.c.
32202060	Electrical telephonic and telegraphic apparatus, n.e.c.
32202075	Facsimile machines
32305220	Telescopic and whip-type aerials for portable apparatus or for apparatus for fitting in motor vehicles
32305235	Outside aerials for radio or television reception via satellite (incl. rotor systems) (excl. aerial amplifiers and radio frequency oscillator units)
32305239	Outside aerials for radio or television reception (incl. rotor systems) (excl. for reception via satellite, aerial amplifiers and radio frequency oscillator units)
32305250	Inside aerials for radio or television reception (incl. built-in types) (excl. aerial amplifiers and radio frequency oscillator units)
32305270	Other aerials and parts
33202030	Radar apparatus
33202050	Radio navigational aid apparatus (incl. radio beacons and radio buoys, receivers, radio compasses equipped with multiple aerials or with a directional frame aerial)
33202070	Radio remote control apparatus (incl. for ships, pilotless aircraft, rockets, missiles, toys, and model ships or aircraft, for machines, for the detonation of mines)
33204400	Instruments and apparatus, for telecommunications
35304000	Spacecraft, satellites and launch vehicles
	Consumer electronics
24651000	Prepared unrecorded media for sound recording or similar recording (excl. photographic or cinematographic products)
32301155	Radio receivers, portable, sound recording or reproducing apparatus
32301159	Radio receivers, portable, n.e.c.
32301175	Radio receivers, with sound recording or reproducing apparatus
32301177	Other radio receivers not combined with sound recording or reproducing apparatus but combined with a clock
32301179	Radio receivers, n.e.c.
32301270	Radio receivers motor vehicles with sound recording or reproducing apparatus
32301290	Radio receivers for motor vehicles, n.e.c.
32302020	Colour television projection equipment and videoprojectors
32302030	Colour televisions with a video recorder or player
32302045	Colour video monitors with cathode-ray tube
32302049	Flat panel video monitor, LCD or plasma, etc., without tuner (colour video monitors) (excl. with cathode-ray tube)
32302050	Colour television receivers with integral tube (excl. television projection equipment, apparatus with a video recorder or player, video monitors)
32302060	Colour television receivers with other screens
32302075	Tuner blocks for CTV/VCR and cable TV receiver units (colour video tuners) (excl. those which isolate high-frequency television signals)

Prodcom(98)	Description
32302079	Satellite TV Receiver/Decoder (colour television receivers) (excl. with a screen, video tuners, video monitors, television projection equipment, with integral tube)
32302083	Black and white or other monochrome video monitors
32302085	Black and white or other monochrome television receivers (excl. video monitors)
32303135	Jukeboxes and the like (coin or discoperated record-players)
32303139	Record-players and turntables (record decks) (excl. coin or disc-operated record-players)
32303150	Transcribing machines
32303175	Sound reproducing apparatus, cassette type, unable to record
32303179	Other sound reproducing apparatus
32303230	Dictating machines operated by an external source of power
32303250	Telephone answering machines with sound recording apparatus (excl. those forming an integral part of a telephone set)
32303275	Cassette recorders (cassette player/recorders) (incl. recording personal stereos) (excl. those combined with a radio or television receiver, dictating machines, etc.)
32303279	Other tape recorders (magnetic tape player/recorders) (excl. those combined with a radio or television receiver, dictating machines, telephone answering machines, cassette-type)
32303290	Sound recording apparatus (incl. digital disc audio recorders) (excl. dictating machines, tele-phone answering machines, magnetic tape player/recorders)
32303335	Electronic stills cameras and video camcorders (still image video cameras and other video camera recorders) (excl. closed circuit TV cameras)
32303339	Other video apparatus (+ video tuner) with tapes <= 1.3 cm, speed <= 50 mm/s
32303350	Other magnetic tape-types video apparatus (incl. or not video tuner)
32303370	Video recorders or player/recorders (incl. laser or digital video disc players/recorders) (excl. those combined with a television, for magnetic tape)
32304100	Microphones and their stands (excl. cordless microphones with a transmitter)
32304235	Single loudspeakers mounted in their enclosures (incl. frames or cabinets mainly designed for mounting loudspeakers)
32304237	Multiple loudspeakers mounted in the same enclosure (incl. frames or cabinets mainly designed for mounting loudspeakers)
32304239	Loudspeakers (incl. speaker drive units, frames or cabinets mainly designed for mounting loud-speakers) (excl. those mounted in their enclosures)
32304270	Headphones, earphones and combined microphone/speaker sets (excl. airmen's headgear with headphones, telephone sets, cordless microphones with a transmitter, hearing aids)
32304355	Telephonic and measurement amplifiers (excl. high or intermediate frequency amplifiers)
32304359	Audio-frequency electric amplifiers (incl. hi-fi amplifiers) (excl. high or intermediate frequency amplifiers, telephonic and measurement amplifiers)
32304370	Electric sound amplifier sets (incl. public address systems with microphone and speaker)
323044Z0	Portable receivers
32305130	Pick-up cartridges for discs or mechanically recorded sound films
	Computers
30021100	Analogue or hybrid automatic data processing machines
30021200	Laptop PCs and palm-top organisers
30021300	Desk top PCs
30021400	Digital data processing machines: presented in the form of systems
30021500	Other digital automatic data processing machines whether or not containing in the same housing 1 or 2 of the following units: storage units, input/output units
30021630	Printers and plotters
30021650	Keyboards and scanners
30021670	Input or output units whether or not containing storage units in the same housing (incl. mouses) (excl. printers, plotters, keyboards, scanners)
30021730	Central storage units
30021755	CD-ROM drives
30021757	Hard and floppy disk drives
30021770	Magnetic tape storage units

Prodcom(98)	Description
30021790	Storage units (excl. central storage units, disk storage units and magnetic tape storage units)
30021800	Other machines for processing data, n.e.c.
30021900	Parts & access. of machines of HS 8471, incl. parts & access. equally suitable for use with >= 2 machines of HS 8469 to 8472 (excl. mouses & hard disk drives)
	Electronic components
31301200	Insulated coaxial cables and other coaxial electric conductors for data and control purposes whether or not fitted with connectors
31301330	Electrics conductors used for telecommunications whether or not fitted with connectors, for a voltage <= 80 V
31301350	Other electric conductors for data & control purposes whether or not fitted with connectors, voltage <= 80 V
31301370	Insulated electric conductors whether or not fitted with connectors, for a voltage > 80 V but <= 1
31301500	Optical fibre cables made up of individually sheathed fibres whether or not assembled with elec-tric conductors or fitted with connectors
32101100	Fixed power capacitors with a power handling capacity of > 0.5 kVAr
32101230	Fixed tantalum capacitors
32101250	Fixed aluminium capacitors
32101273	Fixed single layer ceramic capacitors
32101275	Fixed multilayer ceramic capacitors
32101277	Fixed metallised paper or plastic capacitors
32101279	Other fixed capacitors (excl. tantalum, aluminium, single or multilayer ceramic, metallised paper or plastic)
32101300	Variable capacitors (incl. pre-sets)
32102020	Fixed carbon or metal film resistors
32102035	Other fixed resistors for a power handling capacity <= 20 W (excl. heating resistors, light dependent resistors)
32102037	Other fixed electrical resistors for a power handling capacity > 20 W (excl. heating resistors, light dependent resistors)
32102055	Wirewound variable resistors for a power handling capacity <= 20 W
32102057	Wirewound variable resistors for a power handling capacity > 20 W
32102070	Non wirewound variable resistors (incl. rheostats, potentiometers and trimmers)
32103050	Bare multilayer printed circuit boards
32103070	Bare printed circuit boards other than multilayer
32103090	Passive networks (incl. networks of resistors and/or capacitors) (excl. resistor chip arrays, capacitor chip arrays, boards containing active components, hybrids)
32104135	Colour TV tubes
32104137	Black and white, monochrome TV tubes
32104139	Monitor tubes (with a phosphor dot screen pitch < 0.4 mm)
32104150	Television camera tubes, image converters and intensifiers and other photo-cathode tubes
32104200	Magnetrons, klystrons, microwave tubes, valves and tubes
32105120	Semiconductor diodes
32105130	Semiconductor power rectifier diodes
32105155	Semiconductor small signal transistors with a dissipation rate < 1 W
32105157	Semiconductor power transistors with a dissipation rate >= 1 W
32105170	Semiconductor thyristors, diacs and triacs
32105235	Semiconductor light emitting diodes (LEDs)
32105237	Photosensitive semiconductor devices; solar cells, photo-diodes, photo-transistors, etc.
32105250	Semiconductor devices (excl. photosensitive semiconductor devices, photovoltaic cells, thyris-tors, diacs and triacs, transistors, diodes, and light-emitting diodes)
32105270	Mounted piezo-electric crystals (incl. quartz, oscillator and resonators)
32106015	Digital MOS integrated circuits (ICs): wafers not yet cut into chips
32106017	Digital MOS integrated circuits (ICs): chips

Prodcom(98)	Description
32106025	Digital MOS integrated circuits (ICs), DRAM (incl. modules) with a capacity <= 4 Mbits
32106027	Digital MOS integrated circuits (ICs), DRAM (incl. modules) with a capacity > 4 Mbits
32106033	Digital MOS integrated circuits (ICs), SRAM (incl. modules) with a capacity <= 256 Kbits
32106035	Digital MOS integrated circuits (ICs), SRAM (incl. modules) with a capacity > 256 Kbits but <= 1 Mbit
32106037	Digital MOS integrated circuits (ICs), SRAM (incl. modules) with a capacity > 1 Mbit
32106053	MOS UV erasable, programmable, read only memories: EPROMs: storage cap. <= 1 Mbit
32106055	MOS UV erasable, programmable, read only memories: EPROMs: 1 Mbit < storage cap. <= 4 Mbit
32106057	MOS UV erasable, programmable, read only memories: EPROMs: storage cap. > 4 Mbit
32106065	Digital MOS integrated circuits (ICs) EEPROMS and flash EEPROMS
32106069	Digital MOS integrated circuits (ICs) memories (incl. ROM, FIFO, LILO (excl. circuits consisting solely of passive elements, DRAMS, SRAMS, Cache-RAMS, [E]EPROMS)
32106070	Digital MOS integrated circuits (ICs), (CPUs and MPUs)
32106093	Other digital MOS integrated circuits (ICs) (incl. MPR, MCU, ASIC, standard logic, PLD and other logic)
32106095	Linear (analogue) integrated circuits (ICs)
32106097	Hybrid integrated circuits (excl. circuits consisting solely of passive elements)
32106099	Electronic microassemblies (excl. circuits consisting solely of passive elements, assemblies formed by mounting one or more discrete components on a support)
	Office machinery
30011100	Word-processors (incl. automatic typewriters)
30011320	Calculating machines
30011350	Cash registers
30011370	Postage-franking machines, ticket-issuing machines and similar machines incorporating a cal-culating device
30011430	Parts and accessories of the machines of HS 8469
30011450	Parts and accessories of the electronic calculating of HS 8470
30012150	Blueprint and diazocopiers (excl. ordinary photographic printing frames)
30012170	Electrostatic photocopiers
30012190	Photocopiers incorporating an optical system, thermocopiers and contact type photocopiers (excl. electrostatic photocopiers, blueprinters and diazocopiers)
30012400	Parts and accessories of the machines of HS 8472
	Instruments and equipment for detecting, measuring, checking and controlling physical phenomena or processes
33201130	Direction finding compasses (incl. magnetic, gyroscopic, binnacle and position finding)
33201155	Instruments and appliances for aeronautical or space navigation (excl. compasses)
33201159	Instruments and appliances for navigation (incl. for marine or river navigation) (excl. for aeronau-tical or space navigation, compasses)
33201215	Electronic surveying and hydrographic instruments and appliances (incl. rangefinders, levels, theodolites and tacheometers, photogrammetrical instruments and appliances) (excl. comp
33201219	Other rangefinders, theodolites and tacheometers, levels, photogrammetrical applications
33201235	Other electronic instruments for meteorological purposes
33201239	Other electronic instruments, n.e.c.
33201253	Instruments and appliances used in geodesy, topography, surveying...
33201255	Other meteorological, hydrological and geophysical instruments and apparatus
33201257	Other surveying, hydrographic... geophysical instruments and appliances
33204100	Instruments and apparatus for measuring or detecting ionising radiations
33204200	Cathode-ray oscilloscopes and cathode-ray oscillographs

Prodcom(98)	Description
33204310	Multimeters
33204330	Instruments and apparatus, for measuring or checking voltage... : electronic
33204355	Voltmeters
33204359	Non-electronic instruments and apparatus, for measuring or checking voltage, current, resis-tance or power, without a recording device (excl. multimeters, voltmeters)
33204520	Instruments and apparatus for measuring or checking semiconductor wafers or devices
33204530	Instruments and apparatus, with a recording device, for measuring or checking electric gains (excl. gas, liquid or electricity supply or production meters)
33204555	Electronic instruments and apparatus, WITHOUT a recording device, for measuring or checking electric gains (excl. gas, liquid or electricity supply or production meters)
33204559	Non-electronic instruments and apparatus, without a recording device, for measuring or check-ing electrical gains (excl. multimeters, voltmeters)
33205150	Barometers, not combined with other instruments (incl. barometric altimeters, sympiesometers)
33205175	Electronic hydrometers, hygrometers and psychrometers
33205179	Hydrometers, pyrometers, hygrometers and psychrometers : others
33205271	Instruments... for measuring or checking pressure : electronic
33205273	Non-electronic spiral or metal diaphragm type pressure gauges for measuring and non-automatically regulating tyre pressure
33205275	Instruments for measuring or checking: spiral or metal diaphragm type pressure gauges, others
33205279	Other instruments for measuring or checking pressure: others
33205283	Other electronic instruments and apparatus
33205289	Non-electronic instruments for measuring or checking variables of liquids or gases (incl. heat meters) (excl. for measuring or checking pressure or the flow or level of liquids)
33205313	Electronic gas or smoke analysers
33205319	Non-electronic gas or smoke analysers
33205323	Chromatographs
33205329	Electrophoresis instruments
33205330	Spectrometers, spectrophotometers... using optical radiations
33205340	Exposure meters
33205350	Instruments and apparatus using optical radiations, n.e.c.
33205381	Electronic pH and rH meters and other apparatus for measuring conductivity
33205383	Other electronic instruments and apparatus
33205385	Viscometers, porosimeters and expansion meters
33205389	Other instruments and apparatus for physical and chemical analysis
33206100	Microscopes and diffraction apparatus (excl. optical microscopes)
33206210	Electronic machines and appliances for testing the mechanical properties of metals (excl. met-allographic machines or appliances, instruments for detecting defects)
33206233	Non-electronic universal and tensile testing machines and appliances for metals
33206235	Non-electronic hardness testing machines and appliances for metals
33206239	Other machines and appliances for testing metals
33206255	Electronic machines and appliances for testing the properties of materials (excl. for metals)
33206259	Other machines and appliances for testing materials (excl. metals)
33206330	Gas supply or production meters (incl. calibrated)
33206350	Liquid supply or production meters (incl. calibrated) (excl. pumps)
33206370	Electricity supply or production meters (incl. calibrated) (excl. voltmeters, ammeters, wattmeters and the like)
33206430	Revolution counters, production counters, taximeters, mileometers
33206453	Vehicle speed indicators
33206455	Tachometers
33206470	Stroboscopes (incl. photographic or cinematographic cameras permanently incorporated in stroboscopes)
33206510	Machines for balancing mechanical parts
33206520	Test benches

Prodcom(98)	Description
33206530	Profile projectors
33206540	Optical instruments and appliances for measuring or checking, n.e.c.
33206550	Electronic instruments, appliances and machines for measuring or checking geometrical quanti-ties (incl. comparators, coordinate measuring machines (CMMs))
33206570	Other electronic instruments, appliances,... for measuring or checking
33206583	Other instruments, appliances,... for measuring or checking geometrical quantities
33206589	Other instruments, appliances and machines for measuring or checking
33207015	Electronic thermostats
33207019	Non-electronic thermostats
33207030	Manostats
33207050	Hydraulic or pneumatic automatic regulating or controlling instruments and apparatus
33207090	Instruments and apparatus, regulating or controlling, n.e.c.
33208190	Parts and accessories, nes, for machines, appliances, etc, of HS 90
33402115	Image conductor cables
33402119	Optical fibres, optical fibre bundles and cables (excl. image conductor cables, optical fibre cables made up of individually sheathed fibres)
33402153	Prisms, mirrors and other optical elements, n.e.c.
33402155	Mounted lenses, prisms, mirrors, etc, of any material, n.e.c.
33402310	Telescopic sights for fitting to arms; periscopes; telescopes...
33402330	Lasers (excl. laser diodes, machines and appliances incorporating lasers)
33402355	Liquid crystal devices (incl. active matrix liquid crystal devices)
33402359	Optical devices, appliances and instruments, nes : others
33403250	Cameras of a kind used for recording documents on microfilm, microfiche or other microforms
33403270	Cameras for underwater use, for aerial survey or for medical or surgical examination of internal organs, comparison cameras for forensic or criminological purposes
33403390	Photographic apparatus (excl. still image video camera's)
33403430	Cinematographic cameras for film of a width < 16 mm or for double 8 mm film
33403450	Cinematographic cameras (excl. for film of a width < 16 mm wide or for double 8 mm film)
33403530	Cinematographic projectors

6 USE OF ICT IN ENTERPRISES

6.1 Introduction

The use of ICT in enterprises is expected to exert a major impact on profitability, productivity and employment levels. International comparisons have become important as ICT usage is generally considered to be a critical factor contributing to national performance on both micro and macro economic level.

This chapter contains information about the use of the Information and Communication Technology (ICT) in Nordic enterprises in 2001. This year this information gathered in enterprise surveys is given in this larger publication. Earlier the data on ICT in Nordic enterprises have been presented in a separate publication for the years 1999 and 2000.[1]

The reference year of the chapter on ICT in enterprises is 2001. The expectations of enterprises for 2002 are mentioned a few times in this chapter. These expectations only show the assessments of the enterprises and should in no way be interpreted as a prognosis issued by the national statistical institutes. Even though a largely harmonised questionnaire was applied, some of the national differences might be explained by the different coverage of the surveys and dissimilar linguistic interpretations.

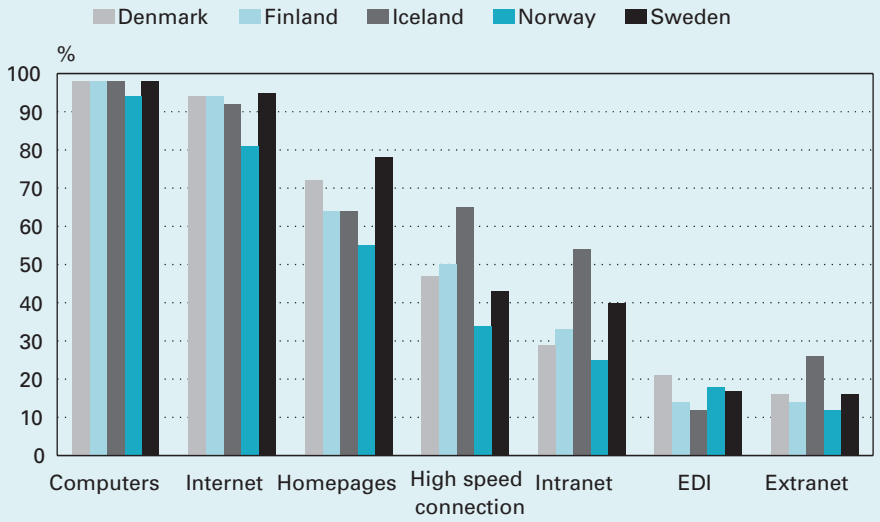
Nationally published results on the use of ICT in enterprises may differ from the results presented in this publication, as another framework may be used. In this report some further harmonisation of the national surveys has been done to make benchmarking possible. Most of the data here are on all private enterprises in the national populations[2] with at least 10 employees. Denmark, Finland and Norway also provide data on some indicators for enterprises employing 5 to 9 employees but these are not counted to the totals in this publication.

6.2 Overview on the use of some ICT technologies in Nordic enterprises

This subchapter presents the prevalence of some basic ICT technologies in Nordic enterprises. The pattern in the prevalence of distinct technologies is quite similar in all countries. An exception is Iceland in case of high-speed connections, Intranets and Extranets that are clearly more common than in other countries. In Denmark, Finland, Norway and Sweden the pattern seen in Figure 6.1 is clearly a downward

1 Use of ICT in Nordic enterprises 1999/2000 and Use of ICT in Nordic enterprises 2000/2001
2 Some industries in the original national samples were not included in the harmonised samples, see sub-chapter 6.8 Description of data

Figure 6.1
Use of ICT in Nordic enterprises in 2001.
Proportion of enterprises with at least 10 employees



trend from left to right. In Iceland the prevalence of high-speed connections[3] and Intranets[4] is close to that of homepages, and Extranets[5] are much more common than EDI.[6]

In contemporary society computers have become basic tools, which are used in almost all enterprises (Figure 6.1, Table 6.1). In all Nordic Countries only the smaller enterprises might not have a computer but even in these the lowest number is 91 per cent in Norwegian enterprises of 10 to 19 employees while it is 96 to 97 per cent in the other Nordic Countries in enterprises of this size (Annex table 6.1). When the review is extended to enterprises of 5 to 9 employees, the penetration rate drops in Norway to 84 per cent and in Finland and Denmark to 91 to 92 per cent.

In addition, the Internet has become very widespread in Nordic enterprises by the end of 2001. Figure 6.1 and Table 6.1 show that Internet access was most common in Sweden, Denmark and Finland, Iceland following closely. Norwegian

3 In this chapter the term 'high-speed connection' is used for xDSL (ADSL, SDSL etc.) and other broadband connections
4 A Protected Network service utilising Internet technology and bound to the use by enterprises' staff
5 A Closed Network service utilising Internet technology and bound to use by enterprises' customers or co-operation partners
6 EDI (Electronic Data Interchange) is a procedure where a document is replaced by a specified form produced from the information in the enterprise's computer system and relayed electronically to the receiving enterprise and transformed automatically and directly into the computer system (for example, an order, assignment into the bank, price list, or catalogue)

Table 6.1
Use of ICT in Nordic enterprises in 2001. Proportion of enterprises with at least 10 employees

	Denmark	Finland	Iceland	Norway	Sweden
	%	%	%	%	%
Computers	98	98	98	94	98
Internet	94	94	92	81	95
Homepages	72	64	64	55	78
High speed connection	47	50	65	34	43
Intranet	29	33	54	25	40
EDI	21	14	12	18	17
Extranet	16	14	26	12	16

enterprises had Internet access least often. Homepages were clearly most frequent in Sweden, Denmark following not far behind. Finland and Iceland are in the middle group while Norwegian enterprises have clearly seldom homepages. A high-speed connection to the Internet has become quite common in Nordic enterprises. It is most common in Iceland where about two out of three enterprises have such a connection. In Finland and Denmark about half of the enterprises, in Sweden 43 per cent and in Norway one third of the enterprises have a high-speed connection. The Internet, homepages and types of access will be treated in detail in the following sub-chapters.

The Intranet is also becoming a popular tool in Nordic enterprises. It is already quite widely used in Iceland where more than half of the enterprises had an Intranet by the end of 2001. In other Nordic Countries the prevalence of the Intranet varies from Norway's one fourth of the enterprises to Sweden's two out of five enterprises.

The relative number of enterprises with the Intranet was much higher in the largest enterprises than among smaller ones in all countries (see Annex table 6.1). The penetration rate varies in enterprises with at least 100 persons from Denmark's 63 per cent to Iceland's 87 per cent and in enterprises with 10 to 19 employees from Norway's 17 per cent to Iceland's 43 per cent. When reviewed by industry, all countries share a somewhat similar pattern. In all countries the Intranet was most common in business services and least often used in construction.[7]

In all countries but Iceland the Extranet was the least common of the technologies reviewed here. In Iceland one fourth of the enterprises had the Extranet but in all other countries the penetration rate was 12 to 16 per cent.

The pattern in the prevalence of the Extranet is very similar to that of the Intranet, the Extranet being more common among the largest enterprises than among smaller ones in all countries (see Annex table 6.1). In the largest enterprises with more than 100 employees the penetration rate was in Iceland 58 per cent and varied in other countries from Norway's 28 per cent to Sweden's 39 per cent. In

7 Except for Iceland where the construction industry was not included in the sample

enterprises with 10 to 19 employees the penetration rate was in Iceland 19 per cent and ranged in other countries from 8 per cent in Finland to 13 per cent in Denmark. The pattern in the penetration rate by economic activity was also similar to that of the Intranets, being highest in business services and lowest in construction in all countries.

EDI was most common in Danish enterprises of which one fifth were using it. In other countries the penetration rate varied between Iceland's 12 per cent and Norway's 18 per cent. Iceland is the only country where EDI was the least common technology of the ones reviewed here.

In addition, the penetration rate of EDI rose by enterprise size. In enterprises with 10 to 19 employees the penetration rate varied from Iceland's 7 per cent to Denmark's 15 per cent. Among the largest enterprises employing at least 100 employees about 40 per cent used EDI in all Nordic Countries. Examined by economic activity, EDI was least often used in construction and business services. In other industries there is some variation between the countries. Trade, hotels and restaurants and transport and telecommunications had most often EDI in Denmark and Iceland. In Sweden manufacturing had the highest penetration rate together with trade, hotels and restaurants. Transport and telecommunications had clearly the highest penetration rate of EDI in Norway. In Finland trade, hotels and restaurants had the highest penetration rate followed by manufacturing. Electronic commerce via EDI is reviewed in sub-chapter 6.6.

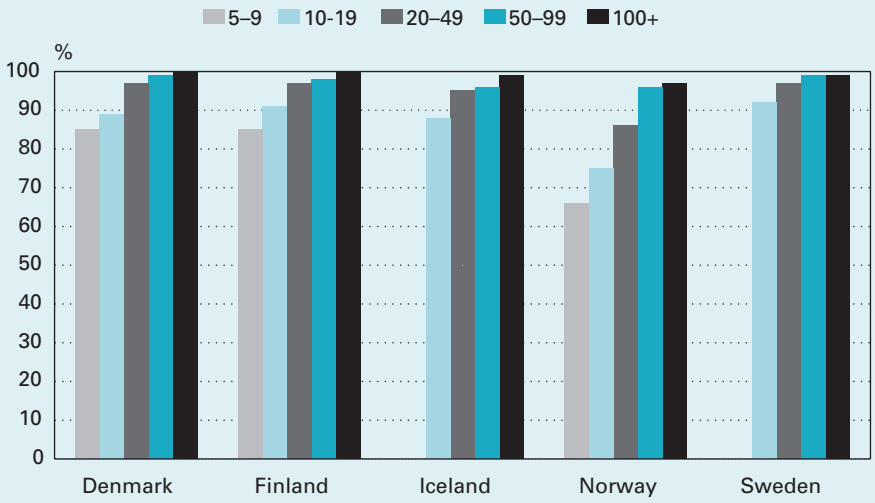
6.3 Access to and use of the Internet

6.3.1 Internet access

The Internet penetration rate among Nordic enterprises with at least 10 employees was quite high by the end of 2001, being more than 90 per cent in all countries but Norway. The distributions of Internet access by size of enterprises follow the same pattern in all countries; it rises by enterprise size (Figure 6.2 and Annex table 6.1). In all countries virtually all enterprises in the two groups of the largest enterprises with 50 to 99 employees and at least 100 employees have Internet access and even the enterprises with 20 to 49 employees are close to that in Denmark, Finland and Sweden. Differences by size are largest in Norwegian enterprises where the small enterprises with 10 to 19 employees had the penetration rate of 75 while it was 97 in enterprises with at least 100 employees. When the review is extended to enterprises with 5 to 9 employees, the penetration rate drops in Norway to 66 per cent and in Finland and Denmark to 85 per cent.

Reviewed by economic activity, the differences inside one country between industries are generally smaller than by size (Figure 6.3 and Annex table 6.1). In Sweden the differences by industry are small. In Denmark, Finland and Iceland the differences between most of the industries are not very large. The largest differences by industry are in Norway, similarly as by size.

Figure 6.2
Internet penetration by enterprise size in 2001



The Internet penetration rate has clearly grown in all countries from 1999 to 2001 (Figure 6.4 and Annex table 6.2). Some growth in penetration rate in 2002 is still expected in all countries by enterprises' own estimates. It must be noted that as the penetration rate of computers is in most countries 98 per cent and is possibly not rising, the Internet penetration rate is also reaching its limit. In Sweden the prevalence of computers in 2001 was already the same as the expectations for Internet penetration for 2002. There is, of course, some room for growth in smaller enterprises and in industries with lower prevalence of the Internet. Norway is still

Figure 6.3
Internet penetration by economic activity in 2001. Proportion of enterprises with at least 10 employees

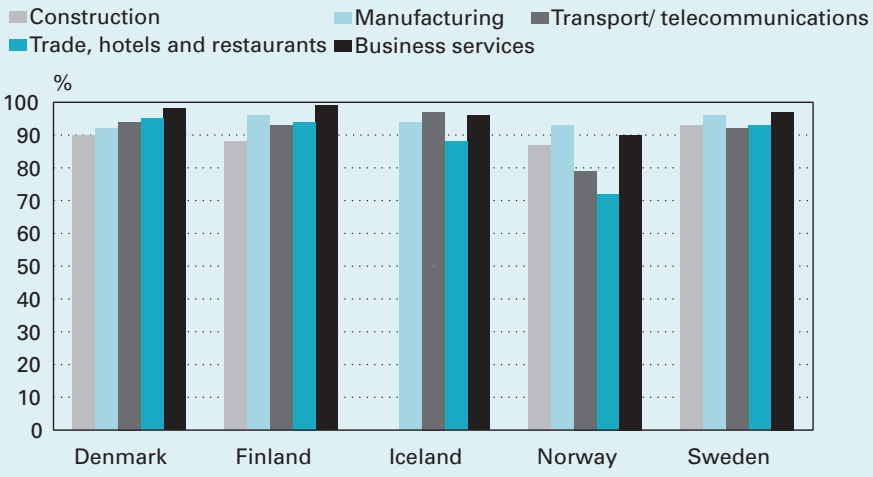
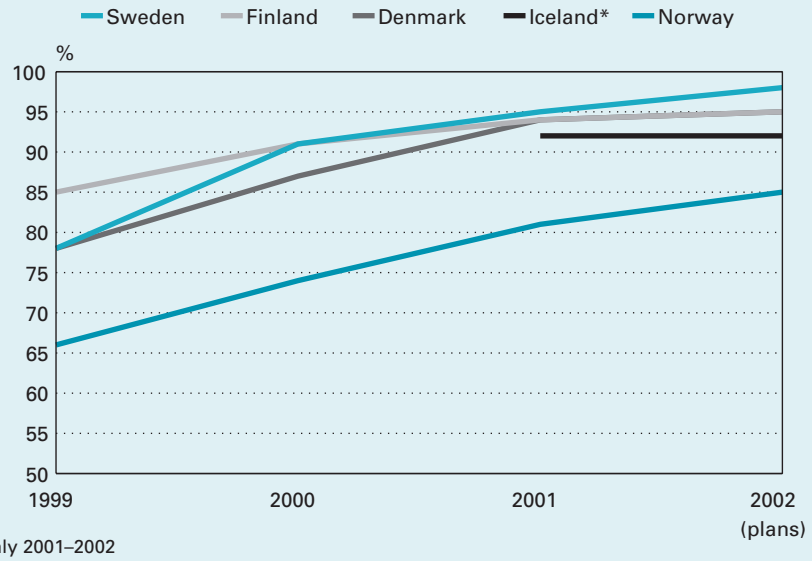


Figure 6.4
Internet penetration in enterprises with at least 10 employees in 1999–2002



* Iceland only 2001–2002

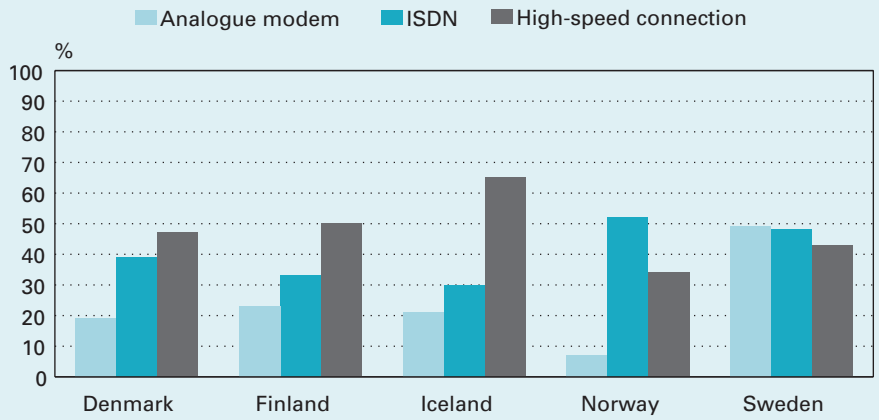
somewhat behind the other Nordic Countries in Internet penetration and there is still more space for growth there.

Nordic enterprises have also been implementing modern technology in types of Internet connections (Figure 6.5). Analogue modems are already the most rare type of access as ISDN[8] and high-speed connections have taken their place. As one enterprise may have several types of connections, some of the enterprises having been counted in the prevalence of modems do actually have more advanced technologies as well. High-speed connections are most frequent in Iceland with two out of three enterprises having one and least common in Norway with one third of enterprises having a high-speed connection. On the other hand, ISDN is most frequent in Norway where more than half of the enterprises had ISDN. When comparing the penetration rates of ISDN and high-speed connections between the countries, it can be seen that the order in the prevalence of these techniques is the reverse. The more high-speed connections, the fewer ISDN connections.

In all countries high-speed connections are more common in larger enterprises than in smaller ones. The lowest penetration rate of 25 per cent is in Norwegian enterprises with 10 to 19 employees and highest of 88 per cent in Finnish enterprises with at least 100 employees (Annex table 6.3). Also in all countries the high-speed connections are clearly most common in business services and least

8 ISDN (Integrated Services Digital Network): A digital network integrating several types of services; voice, text, data and video images, accessible to the subscriber through the conventional telephone network

Figure 6.5
Internet access by type. Proportion of enterprises with at least 10 employees in 2001



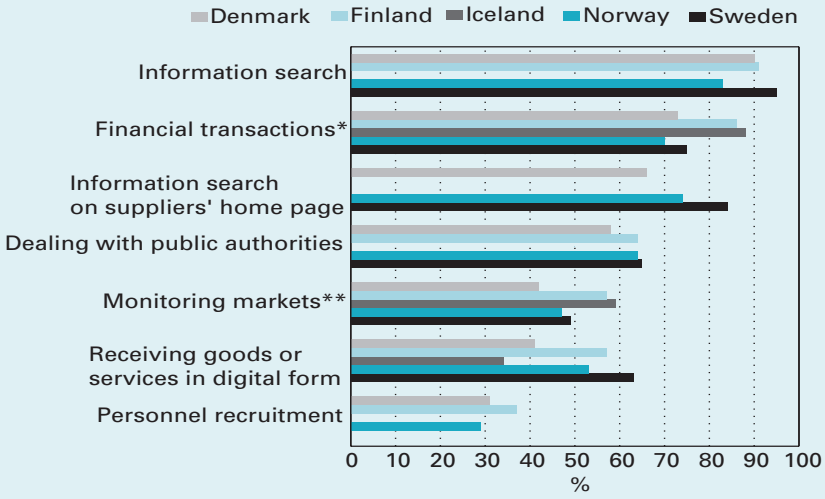
Note: one enterprise may have several connections

common in construction. The highest penetration rate by industry is in business services in Iceland with 88 per cent and the smallest rate is the Norwegian construction industry with 16 per cent.

6.3.2 Use of the Internet

The pattern of Internet use looks relatively similar in all five countries (Figure 6.6). Quite naturally, general information search was the most common task in all countries. About nine out of ten enterprises in Denmark, Finland and Sweden and

Figure 6.6
Use of the Internet in 2001. Proportion of enterprises with at least 10 employees having Internet access



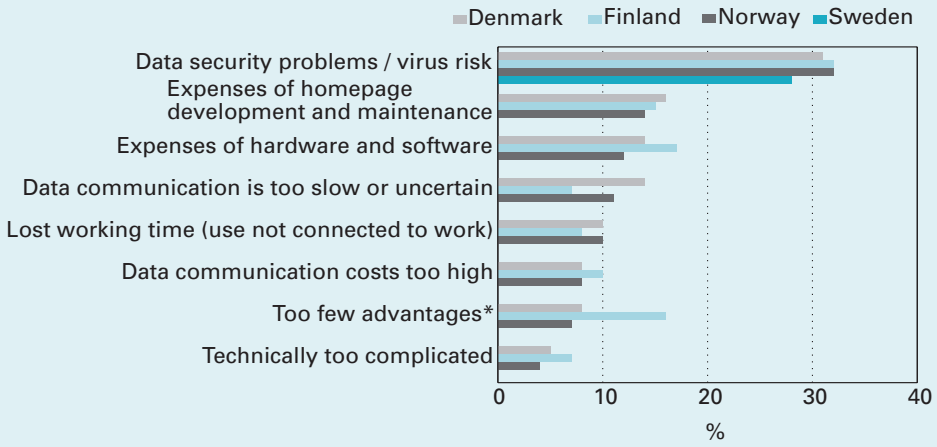
* Finnish formulation: 'bank transactions'
** Swedish formulation: 'analysis of competitors'

more than eight out of ten enterprises in Norway used the Internet for this purpose. Financial transactions via the Internet were more common in Iceland and Finland than in the other countries. While 70 to 75 per cent of the Danish, Norwegian and Swedish enterprises conducted financial transactions via the Internet this was done in 86 and 88 per cent of Finnish and Icelandic enterprises, respectively. Market monitoring was also clearly more common in Iceland and Finland than in the other countries. Enterprises receiving goods or services in digital form were fewer in Denmark and Iceland than in the rest of the countries.

6.3.3 Perceived problems in Internet use

The pattern in perceived problems is very similar in all countries (Figure 6.7). Data security was regarded as a serious problem in Nordic enterprises. About one third of the enterprises considered this a constraint with much significance. The second important problem group was expenses. Both the expenses of developing and maintaining homepages and the expenses of hardware and software were considered a significant problem in around 15 per cent of the enterprises in Denmark, Finland and Norway.

Figure 6.7
Perceived problems in Internet use in 2001. Proportion of enterprises with at least 10 employees having Internet access and regarding the item as having much significance



* Finnish formulation: 'too little benefit to be expected'

6.4 Homepages

6.4.1 Prevalence of homepages

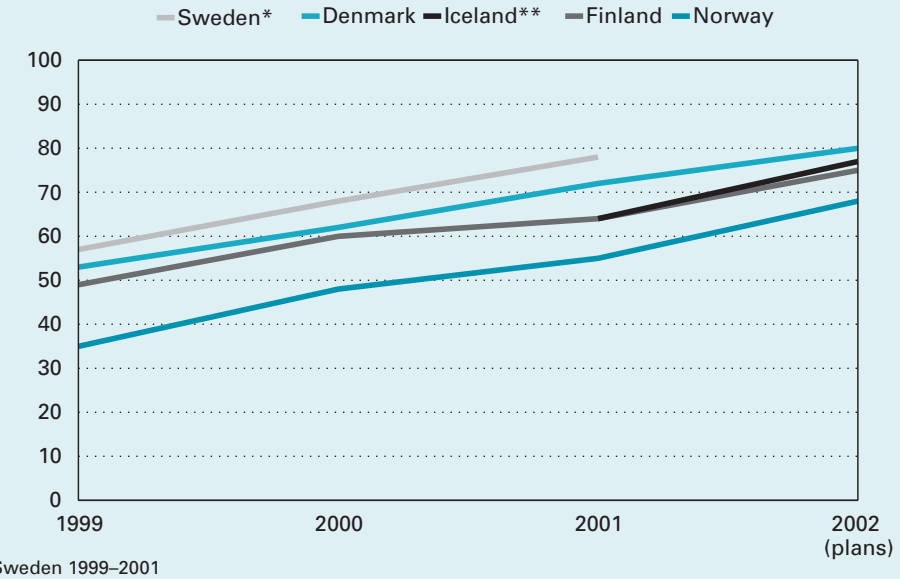
By the end of 2001 homepages were most common in Swedish enterprises where almost four out of five enterprises had a homepage (Figure 6.8 and Annex table 6.6). In Denmark almost three out of four enterprises and in Finland and Iceland about two out of three enterprises had a homepage. Norwegian enterprises had least often homepages in the Nordic Countries. Even then more than half of the enterprises in Norway had established homepages.

The density of homepages in enterprises has been growing quite steadily from 1999 to 2001, and according to the enterprises' own estimates it seems that this growth is going to continue in 2002.

In all countries large enterprises operated homepages more often than small ones (Figure 6.9 and Annex table 6.1). When in small enterprises with 10 to 19 employees the proportion of homepages ranged from 46 per cent in Norway to 69 per cent in Sweden, it varied in the enterprises with at least 100 employees from 81 per cent in Norway to 94 per cent in Sweden. When the smallest enterprises with 5 to 9 employees are reviewed, the prevalence drops to 35 per cent in Norway, to 38 per cent in Finland and to 51 per cent in Denmark.

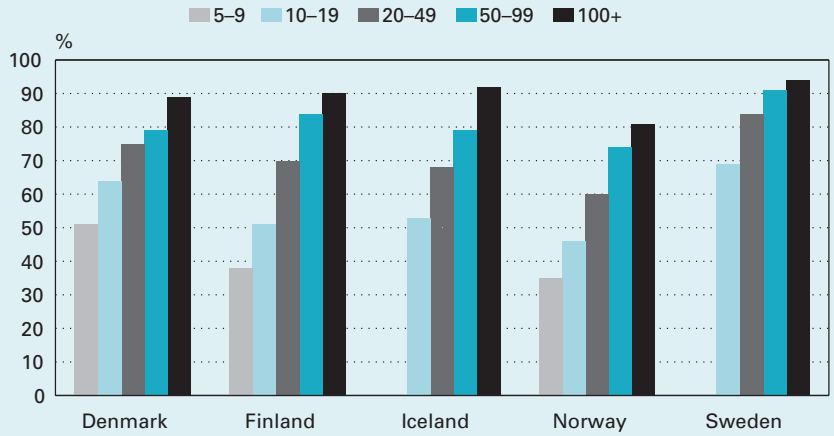
The pattern in distribution of homepages by industry is similar in all countries in that the highest share of homepages is in business services (Figure 6.10 and Annex table 6.1). The lowest share is in construction in Denmark, Finland and Sweden. In

Figure 6.8
Proportion of enterprises with at least 10 employees having homepages, 1999–2002



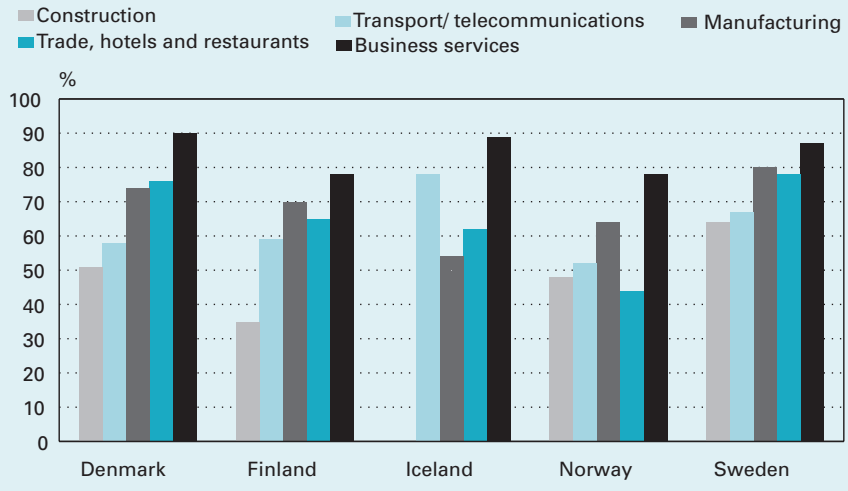
* Sweden 1999–2001
** Iceland only 2001–2002

Figure 6.9
Proportion of enterprises with homepages by size in 2001



Norway trade, hotels and restaurants had least often homepages, followed by construction. Iceland did not survey the construction sector and there enterprises in manufacturing had least often homepages. In Nordic Countries, the smallest share by industry was in the Finnish construction industry where only about one third of the enterprises had homepages. The proportion was highest in Danish business services where nine out of ten enterprises had a homepage.

Figure 6.10
Proportion of enterprises with homepages by economic activity in enterprises with at least 10 employees in 2001

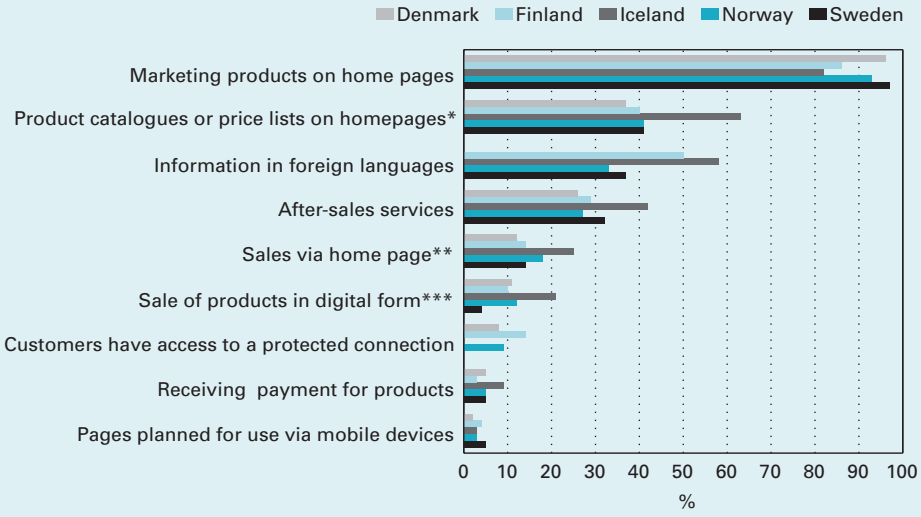


6.4.2 Use of homepages

The pattern in use for homepages was very similar in all countries (Figure 6.11 and Annex table 6.7). In all countries the most important area of use was marketing of products. By the end of 2001, between 82 and 97 per cent of the enterprises with homepages in the Nordic Countries used their homepages for this purpose. Enterprises in Iceland seem to use homepages for several purposes more often than enterprises in the other countries. In Finland it is common in relation to the overall pattern to give information in foreign languages on homepages.

Enterprises provide after-sales services in the homepages quite often as 26 to 42 per cent of Nordic enterprises in different countries give this opportunity. Calculated as a share of enterprises with homepages it is fairly often that enterprises have sales via the Internet as the frequency varies from Denmark's 12 per cent to Iceland's 25 per cent. It is still not very common to receive payments via homepages and pages planned for use via mobile devices were still rare.

Figure 6.11
Use of homepages in enterprises with at least 10 employees in 2001. Proportion of enterprises having a homepage



* Swedish formulation: 'provide customers with access to databases'
** Selling at least 1% from turnover via Internet
*** Finnish and Icelandic formulation: 'delivery of goods in electronic form'

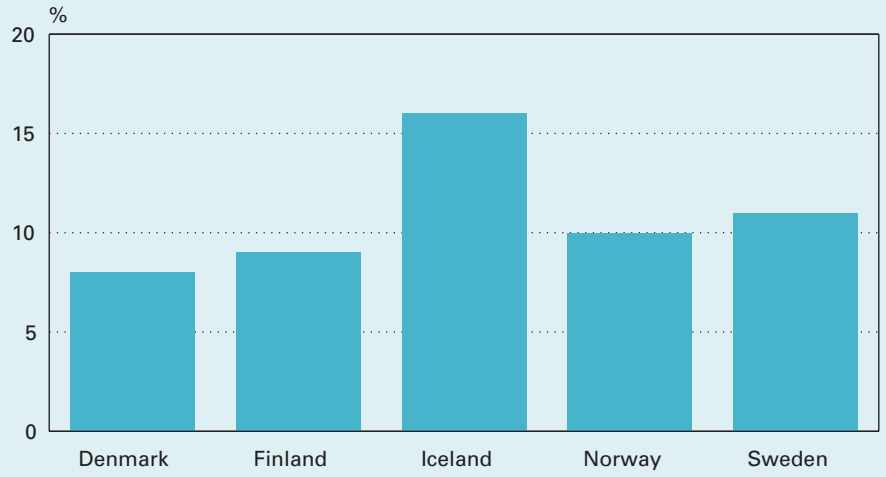
6.5 Electronic commerce via the Internet

6.5.1 Prevalence of Internet sales[9]

By the end of 2001, Internet sales were not very common among Nordic enterprises. Internet sales were most common in Icelandic enterprises, where 16 per cent of enterprises with at least 10 employees had Internet sales. In other countries the frequency varied between 8 and 11 per cent (Figure 6.12).

The proportion of enterprises with Internet sales is dependent on the size of the enterprise (Annex table 6.8). The relative number of enterprises with Internet sales was higher among large enterprises than among smaller ones in all countries. The proportion of enterprises having sales in the largest enterprises with at least 100 employees varied in Denmark, Finland, Norway and Sweden from 11 to 18 per cent, but in Iceland 28 per cent of enterprises of this size had Internet sales. Among small enterprises with 10 to 19 persons employed the relative number of enterprises with Internet sales varied from 8 to 12 per cent in all countries.

Figure 6.12
Enterprises having Internet sales in 2001. Proportion of enterprises with at least 10 employees



*An enterprise is regarded as having Internet sales when at least 1 per cent of total turnover is received via Internet sales

9 In this publication sales via the Internet are limited to orders received via homepages. Enterprises with at least one per cent of total turnover from orders received via homepages are regarded as having Internet sales.

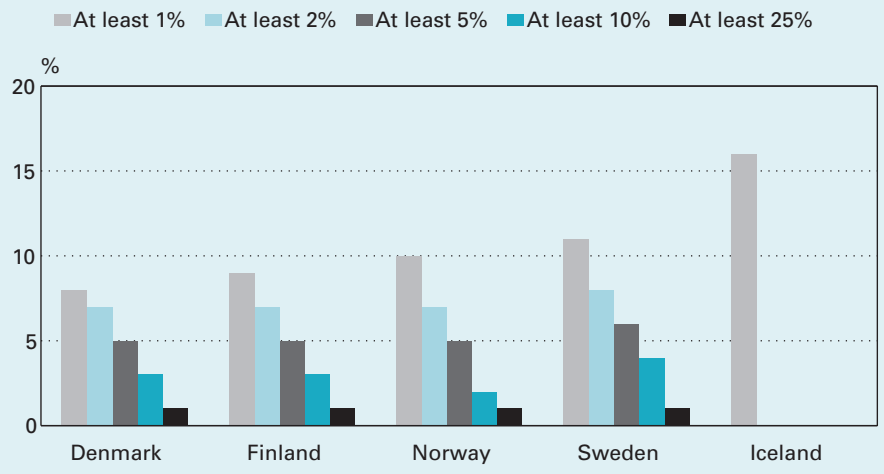
When examined by industry, some common patterns can be seen (Annex table 6.8). Construction has least often sales in all countries and trade, hotels and restaurants and business services have quite often Internet sales in all countries. In manufacturing Icelandic and Norwegian enterprises have more often sales via the Internet than other countries. The highest proportion of enterprises selling via the Internet is in the Icelandic transport and telecommunications sector, where 38 per cent of the enterprises have Internet sales.

6.5.2 Volume of Internet sales

The pattern of distribution of sales by share on turnover is very similar in all countries with Iceland as an exception (Figure 6.13 and Annex table 6.9). The distribution is even more similar in enterprises receiving more than two per cent of their turnover from Internet sales.[10] Internet sales made up a considerable share of total turnover in a few enterprises. Only 2 to 4 per cent of enterprises received 10 per cent or more of total turnover from Internet sales by the end of 2001.

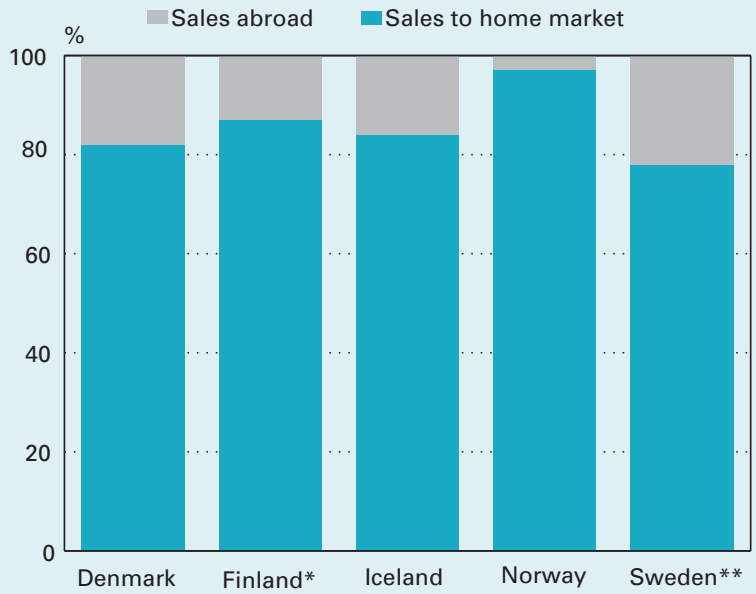
There is much uncertainty involved in the data on the volumes of Internet sales as a result of difficulties to gather information. The volumes presented here should rather be understood as indicative than as definite.

Figure 6.13
Internet sales 2001. Proportion of enterprises with at least 10 employees receiving at least 1, 2, 5, 10 or 25 per cent of their turnover from Internet sales



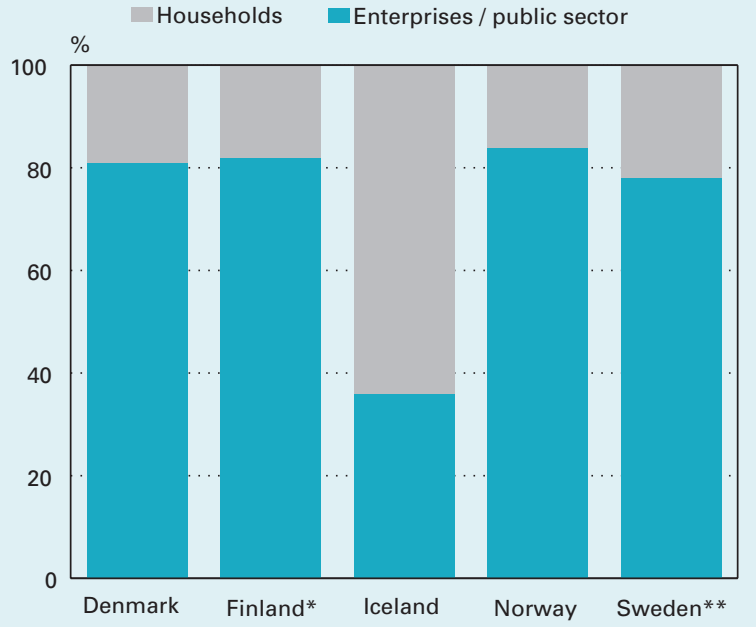
10 Iceland could not provide data on larger shares of sales

Figure 6.14
Proportion of Internet sales to home market and abroad in Nordic enterprises with at least 10 employees in 2001



* Finnish data refer to Internet sales without xml-EDI
** Swedish data refer to Internet sales including sales via EDI-browser

Figure 6.15
Proportion of Internet sales to households and enterprises / the public sector in Nordic enterprises with at least 10 employees in 2001



* Finnish data refer to Internet sales without xml-EDI
** Swedish data refer to Internet sales including sales via EDI-browser

Internet sales of Nordic enterprises totalled about EUR 15 billion.[11] About half of the volume was created by Swedish enterprises. In Sweden the value of Internet sales was EUR 7.6 billion. In Norway, Finland and Denmark the value of Internet sales was EUR 3.3, 2.1 and 1.8 billion, respectively (Annex table 6.10).[12]

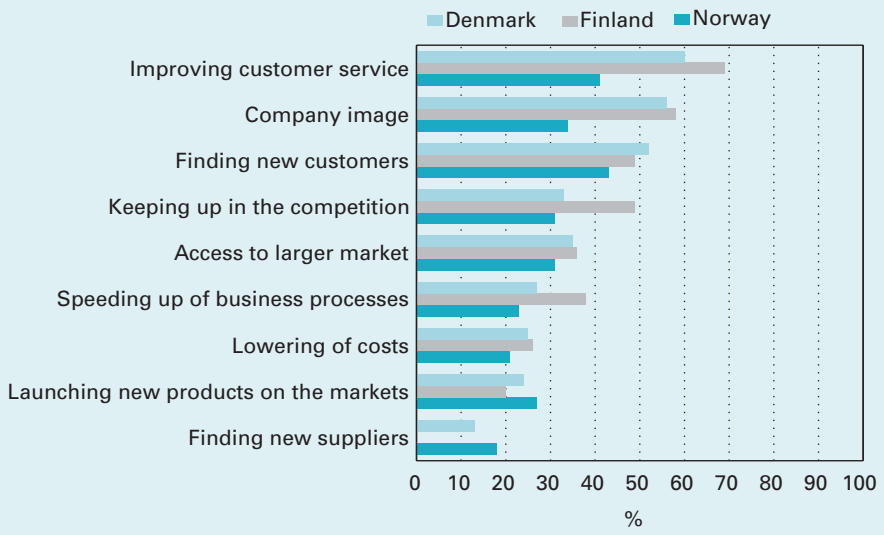
In all Nordic Countries most of the Internet sales of enterprises with at least 10 employees was created in their home market. Sweden had the largest share of sales abroad with 22 per cent. Norwegian enterprises had very little Internet sales abroad as the share of the home market was 97 per cent of all Internet sales (Figure 6.14).

Distribution of Internet sales between households and enterprises / the public sector is strikingly different and actually the reverse in Iceland compared to the other Nordic Countries (Figure 6.15). In Iceland most of the sales are to households while in other countries to enterprises / the public sector.

6.5.3 Motivations for Internet sales

The pattern in motivations for Internet sales is quite similar in all three countries having asked the motivations of the enterprises (Figure 6.16). Some differences exist, however. For Finnish and Danish enterprises the most common motivation for sales is to improve customer service. For Norwegian enterprises this is the

Figure 6.16
Motivations for Internet sales. Proportion of enterprises with at least 10 employees receiving orders by homepage*



* Data on Denmark are on the enterprises receiving at least 1% of turnover via Internet sales.

11 Internet sales also include sales via xml-EDI, except for Sweden where Internet sales include sales via EDI-browser. Only sales of enterprises with at least one per cent of total turnover received from orders via the Internet are counted.

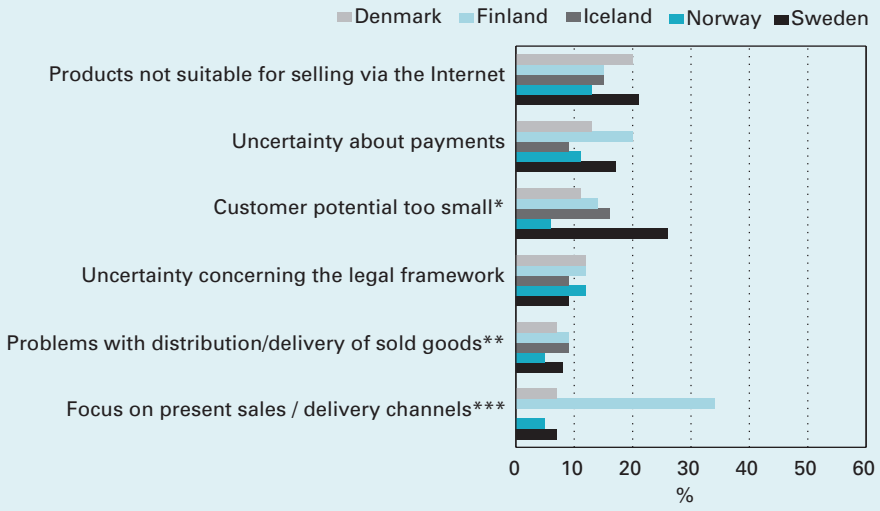
12 The exchange rates to the euro: DKK 7.4521, ISK 87.42, NOK 8.0484, SEK 9.2551

second most common motivation and on a much lower level. Also, company image, which is the second most common motivation for Finland and Denmark, has a much lower position for Norway. For Finnish enterprises keeping up in the competition and speeding up the business processes seem to be more common motivations than for enterprises in the two other countries.

6.5.4 Problems and constraints in electronic commerce via the Internet

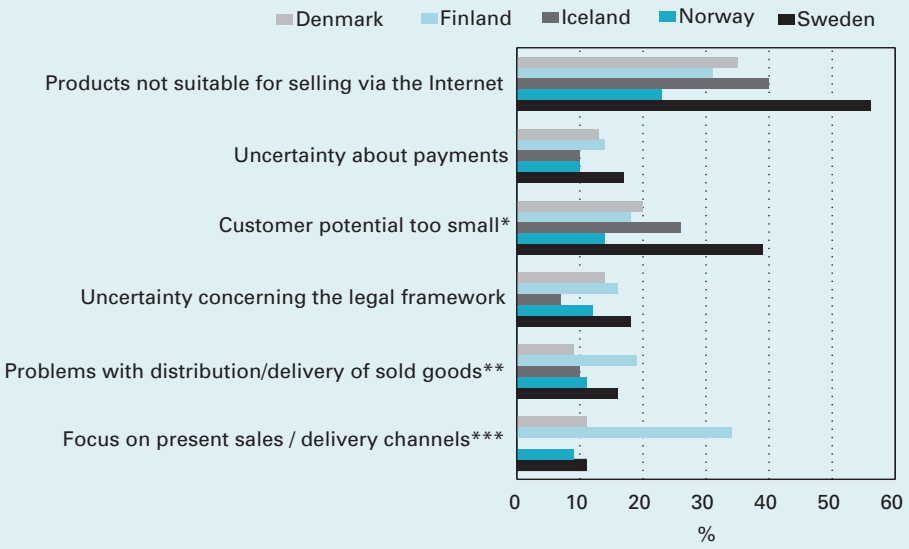
Problems and constraints have been analysed here for two separate groups of enterprises: those that receive orders via homepages and those that do not receive orders via homepages. In both groups there is some variation between the countries and common patterns are not as clear as it is in many other points in this chapter. In the group of enterprises receiving orders Finnish enterprises regarded "focus on present sales/delivery channels" most often as significant problems while Swedish enterprises considered "customer potential too small" and Danish enterprises "products not suitable for selling via the Internet" most often as being significant problems (Figure 6.17). When examination is moved to the group of enterprises that do not receive orders via homepages the pattern becomes somewhat clearer, however. In this group "products not suitable for selling via the Internet" becomes clearly the most common constraint and "customer potential too small" as the second most common constraint (Figure 6.18 and Annex table 6.11).

Figure 6.17
Perceived problems in Internet sales. Proportion of enterprises with at least 10 employees having Internet sales



* Icelandic formulation: 'customers are not ready for Internet commerce'
** Finnish formulation: 'problems connected with logistics'
*** Swedish formulation: 'considerations of existing retailers'

Figure 6.18
Perceived problems in Internet sales. Proportion of enterprises with at least 10 employees not having Internet sales

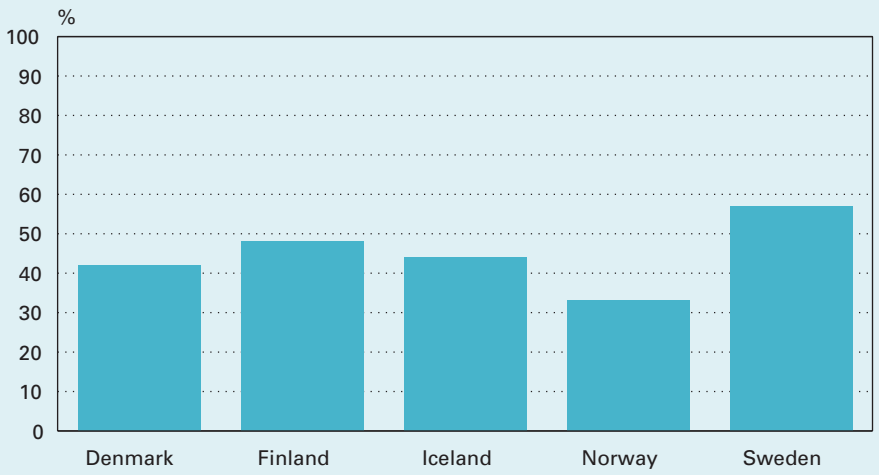


* Icelandic formulation: 'customers are not ready for Internet commerce'
** Finnish formulation: 'problems connected with logistics'
*** Swedish formulation: 'considerations of existing retailers'

6.5.5 Purchases via the Internet

Making purchases via the Internet was fairly common in the Nordic enterprises. By the end of 2001, more than half of the enterprises with at least 10 employees in Sweden, almost half in Finland, more than two out of five enterprises in Denmark and Iceland and about one third of the enterprises in Norway had made purchases

Figure 6.19
Internet purchases in 2001. Proportion of enterprises with at least 10 employees having made purchases on the Internet



via the Internet (Figure 6.19). It must be noted, however, that in many cases the value of purchases can be very small. There was no value limit by which enterprises are calculated as having made purchases.

6.6 Electronic commerce via EDI

In 2001, EDI sales were not very common when related to all Nordic enterprises with at least 10 employees. The proportion of enterprises having EDI sales is 4 to 5 per cent in all countries. In this publication an enterprise is regarded as having EDI sales when at least one per cent of its total turnover comes from orders received via EDI. The pattern in EDI sales is very similar in all Nordic Countries regarding the proportion of enterprises having sales (Table 6.2). The differences between countries is no more than one percentage point in all 'proportion of sales' categories. This is such a small difference that one should not make any conclusions on differences between the countries in this respect. It could be approximated that the distribution of EDI sales related to enterprises' turnover is identical in all Nordic Countries.

Table 6.2
Proportion of enterprises with at least 10 employees receiving at least 1, 2, 5, 10, 25 and 50 per cent of their turnover from EDI sales

	At least 1%	At least 2%	At least 5%	At least 10%	At least 25%	At least 50%
Denmark	5	5	5	4	3	1
Finland	5	5	4	4	2	1
Norway	4	4	4	4	2	2
Sweden	5	5	4	4	2	1

Most of the enterprises having EDI sales made up at least 5 to 10 per cent of their total turnover via EDI. One to two per cent of enterprises in all countries received 50 per cent or more of the total turnover from EDI sales. The total EDI sales of Nordic enterprises amounted about EUR 69 billion.[13] The volumes of Swedish, Finnish, Norwegian and Danish EDI sales were EUR 27, 20, 12 and 10 billion, respectively. The EDI sales of Nordic enterprises accounted for more than four times the volume of their Internet sales. As in the value of Internet sales there is much uncertainty involved in the data on the volumes of EDI sales as a result of data collection difficulties. The volumes presented here should rather be understood as indicative than as definite.

13 Volumes of EDI sales exclude sales via xml-EDI (EDI-browser in Sweden). Only sales of enterprises with at least one per cent of total turnover received from orders via EDI are counted.

6.7 Digital divide in enterprises?

If the digital divide in enterprises is understood simply as differences in the prevalence of various information and communication technologies used in separate groups of enterprises, some differences can certainly be pointed out. It must be noted, however, that in many enterprises some forms of ICT can be unnecessary and therefore not in use. It does not mean that these enterprises are behind the times or marginalised. It is obvious that enterprises in different industries and of different sizes need different ICT solutions.

With these reservations the clearest differences between the enterprises inside all Nordic Countries are that the smaller enterprises use ICT less often than the larger enterprises (Annex table 6.1). For instance, in Sweden 69 per cent of the enterprises with 10 to 19 employees have homepages while 94 per cent of the enterprises with at least 100 employees have them. The same pattern applies to all countries (Figure 6.9). A similar pattern can also be seen in Figure 6.2 regarding Internet access.

There are also differences between the industries, but the general pattern is not as clear as there is variation between the countries. Generally it can be said, however, that enterprises in the construction sector often seem to be using less ICT and that business services enterprises often appear to use ICT more than other industries.

Annex 6

Annex 6.1 Statistical tables

Annex 6.2 Description of data

Annex 6.1 Statistical tables

Annex table 6.1
Use of ICT in Nordic enterprises in 2001. Proportion of all enterprises in class

		Economic activity						Enterprise size			
	All enterprises with at least 10 employees	Manufacturing	Construction	Trade, hotels and restaurants	Transport/ telecommunications	Business services	10–19 employees	20–49 employees	50–99 employees	At least 100 employees	5–9 employees
	%	%	%	%	%	%	%	%	%	%	%
Denmark											
Computers	98	97	98	98	96	100	96	99	100	100	92
Internet	94	92	90	95	94	98	89	97	99	100	85
Homepages	72	74	51	76	58	90	64	75	79	89	51
Intranet	29	23	7	38	23	51	21	28	43	63	18
Extranet	16	12	3	21	11	29	13	15	18	32	9
EDI	21	20	11	27	27	18	15	21	29	43	14
Finland											
Computers	98	98	96	98	99	100	97	99	100	100	91
Internet	94	96	88	94	93	99	91	97	98	100	85
Homepages	64	70	35	65	59	78	51	70	84	90	38
Intranet	33	34	22	30	24	49	20	36	46	70	14
Extranet	14	12	5	15	10	24	8	13	24	36	6
EDI	14	15	9	18	10	10	9	11	24	37	5
Iceland											
Computers	98	100	..	96	99	99	96	99	100	100	..
Internet	92	94	..	88	97	96	88	95	96	99	..
Homepages	64	54	..	62	78	89	53	68	79	92	..
Intranet	54	49	..	47	67	81	43	56	73	87	..
Extranet	26	18	..	21	40	58	19	24	44	58	..
EDI	12	10	..	17	16	5	7	11	23	38	..
Norway											
Computers	94	99	94	91	90	97	91	96	100	100	84
Internet	81	93	87	72	79	90	75	86	96	97	66
Homepages	55	64	48	44	52	78	46	60	74	81	35
Intranet	25	20	15	24	25	43	17	28	39	65	11
Extranet	12	9	5	10	11	25	9	12	16	28	7
EDI	18	17	10	20	27	11	14	16	28	41	9
Sweden											
Computers	98	99	97	97	94	100	97	99	100	100	..
Internet	95	96	93	93	92	97	92	97	99	99	..
Homepages	78	80	64	78	67	87	69	84	91	94	..
Intranet	40	35	21	42	27	62	30	42	63	74	..
Extranet	16	12	4	15	12	33	10	17	26	39	..
EDI	17	21	6	20	14	11	12	17	18	42	..

Annex table 6.2
Internet penetration in enterprises with at least 10 employees in 1999–2002

	1999 %	2000 %	2001 %	2002 (plans) %
Denmark	78	87	94	95
Finland	85	91	94	95
Iceland	..	..	92	92
Norway	66	74	81	85
Sweden	78	91	95	98

Annex table 6.3
Internet access by type in 2001. Proportion of all enterprises in class

		Economic activity					Enterprise size				
	All enterprises with at least 10 employees	Manufacturing	Construction	Trade, hotels and restaurants	Transport/ telecommunications	Business services	10–19 employees	20–49 employees	50–99 employees	At least 100 employees	5–9 employees
	%	%	%	%	%	%	%	%	%	%	%
Denmark											
Analogue modem	19	18	28	19	23	10	23	16	16	13	26
ISDN	39	42	46	37	45	27	38	44	37	27	35
High-speed connection	47	45	22	52	37	75	36	50	63	83	30
Finland											
Analogue modem	23	18	36	23	29	16	30	17	13	10	32
ISDN	33	35	33	39	27	26	35	37	30	19	37
High-speed connection	50	53	27	49	46	67	36	53	72	88	27
Iceland											
Analogue modem	21	25	..	17	18	19	21	19	19	26	..
ISDN	30	33	..	26	36	31	25	29	41	45	..
High-speed connection	65	54	..	65	77	88	57	69	73	86	..
Norway											
Analogue modem	7	9	8	8	3	2	8	7	4	3	8
ISDN	52	65	73	48	41	35	56	55	42	24	54
High-speed connection	34	36	16	28	40	61	25	35	58	77	20
Sweden											
Analogue modem	49	48	61	50	53	39	51	50	42	41	..
ISDN	48	48	43	53	36	45	42	56	56	45	..
High-speed connection	43	38	22	38	34	72	34	43	57	85	..

Annex table 6.4
Use of the Internet in 2001. Proportion of enterprises with at least 10 employees having Internet access

	Denmark	Finland	Iceland	Norway	Sweden
	%	%	%	%	%
Information search	90	91	..	83	95
Financial transactions *	73	86	88	70	75
Information search on suppliers' homepage	66	..	..	74	84
Dealing with public authorities	58	64	..	64	65
Monitoring markets **	42	57	59	47	49
Receiving goods or services in digital form	41	57	34	53	63
Personnel recruitment	31	37	..	29	..
Use of after-sales services	..	32	..	..	69

* Finnish formulation: 'bank transactions'
** Swedish formulation: 'analysis of competitors'

Annex table 6.5
Perceived problems in Internet use in 2001. Proportion of enterprises with at least 10 employees having Internet access and regarding the item as having much significance

	Denmark	Finland	Norway	Sweden
	%	%	%	%
Data security problems / virus risk	31	32	32	28
Expenses of homepage development and maintenance	16	15	14	..
Expenses of hardware and software	14	17	12	..
Data communication is too slow or uncertain	14	7	11	..
Lost working time (use not connected to work)	10	8	10	..
Data communication costs too high	8	10	8	..
Too few advantages *	8	16	7	..
Technically too complicated	5	7	4	..

* Finnish formulation: 'too little benefit to be expected'

Annex table 6.6
Proportion of enterprises with at least 10 employees having homepages, 1999–2002

	1999	2000	2001	2002 (plans)
	%	%	%	%
Denmark	53	62	72	80
Finland	49	60	64	75
Iceland	..	..	64	77
Norway	35	48	55	68
Sweden	57	68	78	..

Annex table 6.7
Use of homepages in enterprises with at least 10 employees in 2001. Proportion of enterprises having a homepage

	Denmark	Finland	Iceland	Norway	Sweden
	%	%	%	%	%
Marketing products on homepages	96	86	82	93	97
Product catalogues or price lists on homepages *	37	40	63	41	41
Information in foreign languages	..	50	58	33	37
After-sales services	26	29	42	27	32
Sale of products in digital form **	11	10	21	12	4
Customers have access to a protected connection	8	14	..	9	..
Receiving payment for products	5	3	9	5	5
Pages planned for use via mobile devices	2	4	3	3	5
Personalised homepage	9	..	..	12	..

* Swedish formulation: 'provide customers with access to databases'
** Finnish and Icelandic formulation: 'delivery of goods in electronic form'

Annex table 6.8
Enterprises having Internet sales in 2001. Proportion of all enterprises in class

		Economic activity					Enterprise size				
	All enterprises with at least 10 employees	Manufacturing	Construction	Trade, hotels and restaurants	Transport and telecommunications	Business services	10–19 employees	20–49 employees	50–99 employees	At least 100 employees	5–9 employees
	%	%	%	%	%	%	%	%	%	%	%
Denmark	8	5	4	13	7	11	8	9	7	11	6
Finland	9	6	3	12	11	12	8	9	10	12	6
Iceland	16	12	..	16	38	19	12	17	20	28	..
Norway	10	12	4	11	11	9	10	9	13	15	7
Sweden	11	8	3	16	13	12	10	10	14	18	..

Annex table 6.9
Proportion of enterprises with at least 10 employees receiving at least 1, 2, 5, 10 or 25 per cent of their turnover from Internet sales in 2001

	At least 1%	At least 2%	At least 5%	At least 10%	At least 25%
Denmark	8	7	5	3	1
Finland	9	7	5	3	1
Iceland	16	..	..	..	..
Norway	10	7	5	2	1
Sweden	11	8	6	4	1

Annex table 6.10
Value of Internet and EDI sales in Nordic enterprises with at least 10 employees in 2001, EUR billion

	Internet EUR billion	EDI EUR billion
Denmark	1.8	10
Finland	2.1	20
Norway	3.3	12
Sweden	7.6	27

Annex table 6.11
Perceived problems in Internet sales. Proportion of enterprises with at least 10 employees having or not having Internet sales

	Enterprises having Internet sales					Enterprises not having Internet sales				
	Denmark	Finland	Iceland	Norway	Sweden	Denmark	Finland	Iceland	Norway	Sweden
	%	%	%	%	%	%	%	%	%	%
Products not suitable for selling via the Internet	20	15	15	13	21	35	31	40	23	56
Uncertainty about payments	13	20	9	11	17	13	14	10	10	17
Customer potential too small	11	14	..	6	26	20	18	..	14	39
Customers are not ready for Internet commerce	..	27	16	..	..	..	27	26	..	..
Uncertainty concerning the legal framework	12	12	9	12	9	14	16	7	12	18
Problems with distribution/ delivery of sold goods*	7	9	9	5	8	9	19	10	11	16
Focus on present sales / delivery channels**	7	34	..	5	7	11	34	..	9	11
Too high implementation / maintenance costs	..	11	..	..	..	..	18	..	..	..
Problems with work arrangements	9	..	..	4	..	8	..	..	7	..

* Finnish formulation: 'problems connected with logistics'
** Swedish formulation: 'considerations of existing retailers'

Annex 6.2 Description of data

The data collection of the ICT usage in enterprises was carried out as postal surveys on a voluntary basis. The survey was launched in Denmark in November 2001, in Norway in December 2001, in Finland in February 2002, in Sweden in March 2002 and in Iceland in June 2002.

The original samples in each country differed somewhat in terms of the activities and size classes covered. In order to make country comparisons all countries provided a sub-sample in accordance with the agreed criteria. The industry cut-off in some of the five countries was extraction of crude petroleum and natural gas, mining, electricity supply, the financial sector, and other service activities. The size cut-off was made to cover only enterprises employing 10 or more persons in totals. For some indicators data on smaller enterprises employing 5 to 9 employees are presented for Denmark, Finland and Norway but not counted to totals. The data given in this publication should not be directly compared with the statistical results presented nationally because of the cut-offs and since this publication uses somewhat different classifications than those used in the national publications.

Weighting of the results has been necessary for making valid comparable figures across the five countries both cross-sectionally and over time, since the sampling profile and the response rates vary between the countries. This has been achieved by giving each enterprise answering the survey a specific weight on the basis of the total number of enterprises or the total turnover in the population of each sub-sample and size class. Each enterprise thereby represents a number of enterprises, which makes it possible to calculate estimates for the whole private sector, as accounted for in this chapter, in the different Nordic Countries.

Annex table 6.12
Number of responses and total response rates

	Denmark	Finland	Iceland	Norway	Sweden
Total number of responses for enterprises with at least 10 employees	2,721	2,392	1,007	2,715	2,685
Industry					
Manufacturing	1,006	997	384	750	1,068
Construction	232	179	..	295	202
Trade, hotels and restaurants	794	592	404	973	544
Transport/ telecommunications	214	244	67	262	434
Business services	475	380	152	435	437
Size					
5–9	579	567	..	729	..
10–19	588	483	489	641	976
20–49	703	551	323	695	644
50–99	524	456	94	595	219
100+	906	902	101	784	846
Total response rate for enterprises with at least 10 employees, %	66	65	88	77	73

The sub-samples consisted of the following NACE Rev. 1 activities:
Manufacturing (15–37) (Exception: Denmark 15–36)
Construction (45) (Exception: Iceland did not include 45)
Trade, hotels, restaurants and catering (50–52 and 55)
Transport/telecommunications (60–64)
Business services (70–74)

The distribution of the final sample across industries and size classes is presented in Annex table 6.12 together with the total response rates. As the table shows, there are some differences both in the number of responses and the response rates. The reader should bear in mind that the differences in response rates may influence the figures reported in this publication.

There are several sources of uncertainty in the data. In country comparisons one should consider that the surveys were not carried out at the same time. Variations in the response rates between the industries create uncertainty in the data by industry. The data on volumes of sales via the Internet and EDI are not easy to collect and these data should therefore be taken as indicative rather than as definite.