Key Figures on the Danish Information Society 2006

International Figures

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Danish Information Society - 2006
International Figures

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Explanation of symbols

0 0,0 }	Less than 0.5 of the unit applied
.	Category not applicable
. .	Data too uncertain
. . .	Data not available
-	Nil

Integration of ICT throughout society ensures competitiveness

ICT plays a key role in a globalised World. Digitalisation helps to facilitate communication and co-operation across countries and continents. It is important that Denmark is among the leading countries in relation to the use of ICT.

Being good at only one thing is not enough. It is when we create coherence in the penetration and use of ICT across society that we obtain the full gains of ICT. Integration of ICT throughout society ensures competitiveness.

The key figures in this publication and the Danish key figures in the publication *Key Figures on the Danish Information Society 2006 - Danish Figures* form the basis of the Government's IT and telecommunications policy 2006.

Helge Sander, Minister of Science, Technology and Innovation

March 2006

Contents

Introduction

New publication with international ICT statistics

Key Figures on the Danish Information Society 2006 - International Figures presents comprehensive statistics on the Danish information society in an international context. The Danish figures are published in *Key Figures on the Danish Information Society 2006 - Danish Figures.*

Sources

The amount of statistical information on the EU and the OECD countries has increased substantially in recent years. This publication primarily includes results from the EU, Norway and Iceland. OECD countries are also included where figures were available.

"Top 15 average"

The publication often uses a top 15 average. This is an average of the 15 countries with the highest ranking in relation to a specific indicator where comparable and updated statistics are available. This average is not weighted in relation to the size of the countries.

Harmonised Danish figures

In a few cases, the Danish figures used in the international context may deviate from corresponding figures published in a Danish context. This is usually due to adjustment of the Danish figures for the sake of comparability.

Structure of the publication

The structure generally follows the structure of the publication with Danish key figures. *The ICT sector* describes the supply side, i.e. the production of ICT products and services. The demand, meaning the use of ICT, is described in *The digital citizen, The digital business sector* and *The digital public sector*.

Cross-sectoral areas

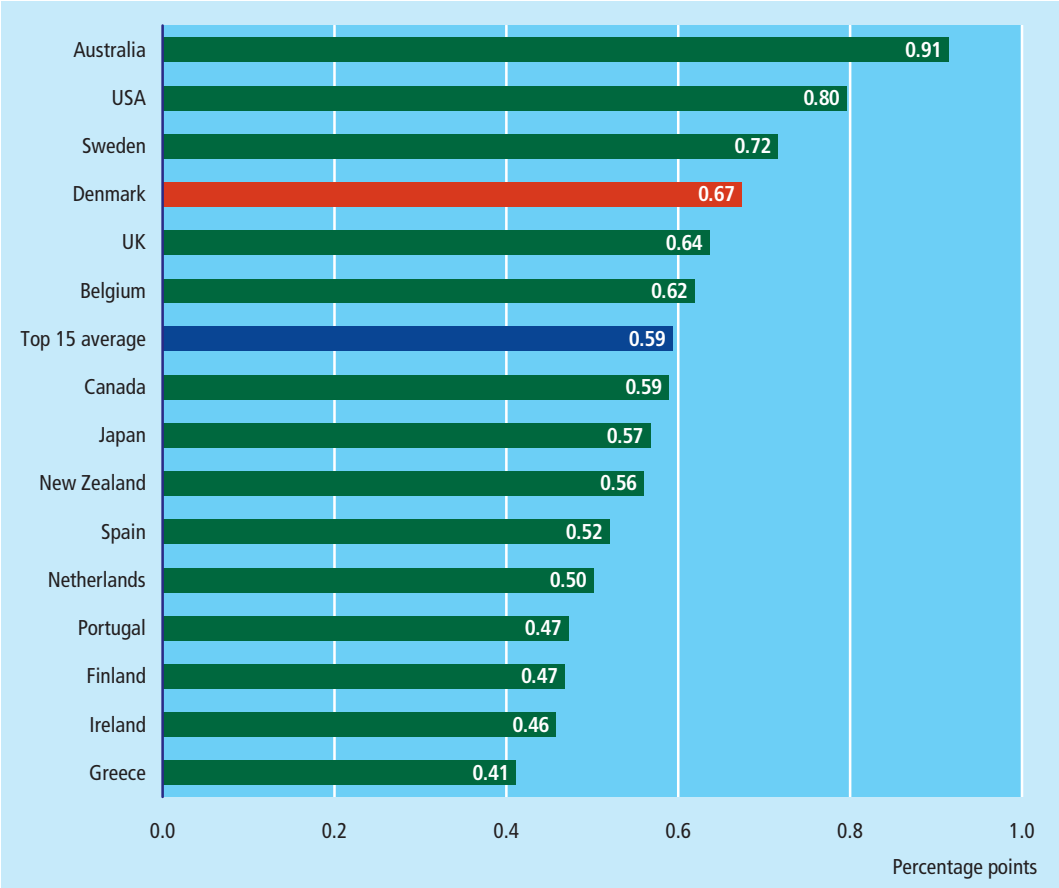
The publication also presents four cross-sectoral areas that are important to all three user groups. *ICT infrastructure* is the precondition for ICT diffusion and adoption, and *ICT security* is central to further integration. The *ICT skills* of the population are a prerequisite for effective utilisation of ICT in society. *ICT research and innovation* describes the efforts of society in relation to new knowledge and development in the field of ICT.

Consequences of ICT

Economic consequences of ICT are described in the first chapter of the publication, illustrating the economic return of the information society. *ICT for all* shows the penetration and use of ICT among different parts of the population.

1. Economic consequences of ICT

Figure 1.1 **Contribution of ICT investments to growth in GDP, 1995-2003**



Note. Top 15 consists of the EU and OECD countries with the highest ranking.
Note. 1995-2002 for Australia, France, Japan, New Zealand and Spain.
Source: OECD Productivity Database, September 2005.

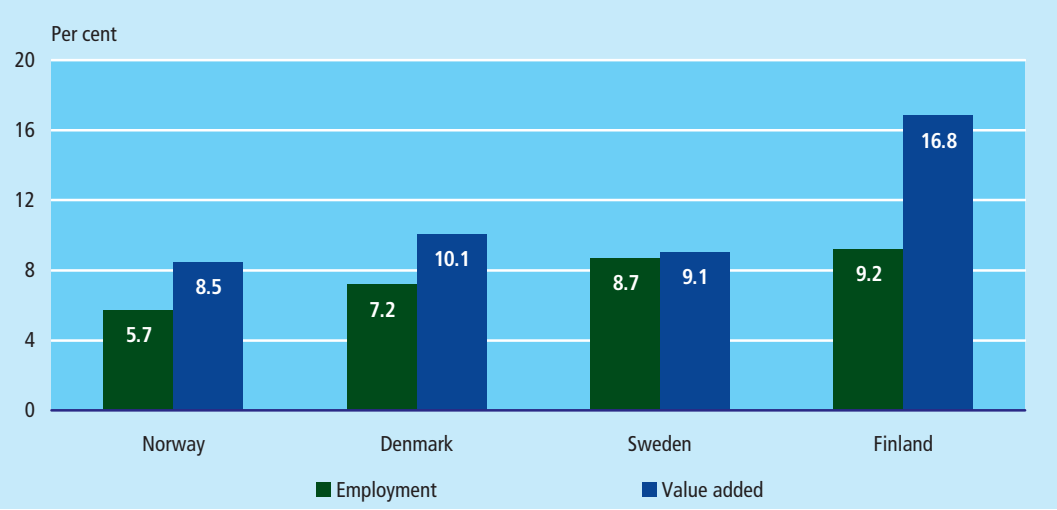
ICT investments affect growth

Investments in ICT account for a substantial part of total investments in many OECD countries. This fact also affects the development in economic growth, including the contribution of ICT investments to growth in the gross domestic product (GDP).

Denmark comes in fourth

Among the countries illustrated in the figure, Denmark ranks fourth in terms of the contribution of ICT investments to GDP growth in the period 1995 to 2003. Thus, only Australia, the USA and Sweden had a higher contribution of ICT investments to economic growth during that period.

Figure 1.2 **Share of ICT employment in private sector employment and value added in the Nordic region, 2003**



Source: Nordic Information Society Statistics 2005.

Larger significance for value added than for employment

The Nordic ICT sector has a larger share of value added than of employment in the private sector. This is due to the fact that employees in the ICT sector create more value added on average than employees in other parts of the private sector.

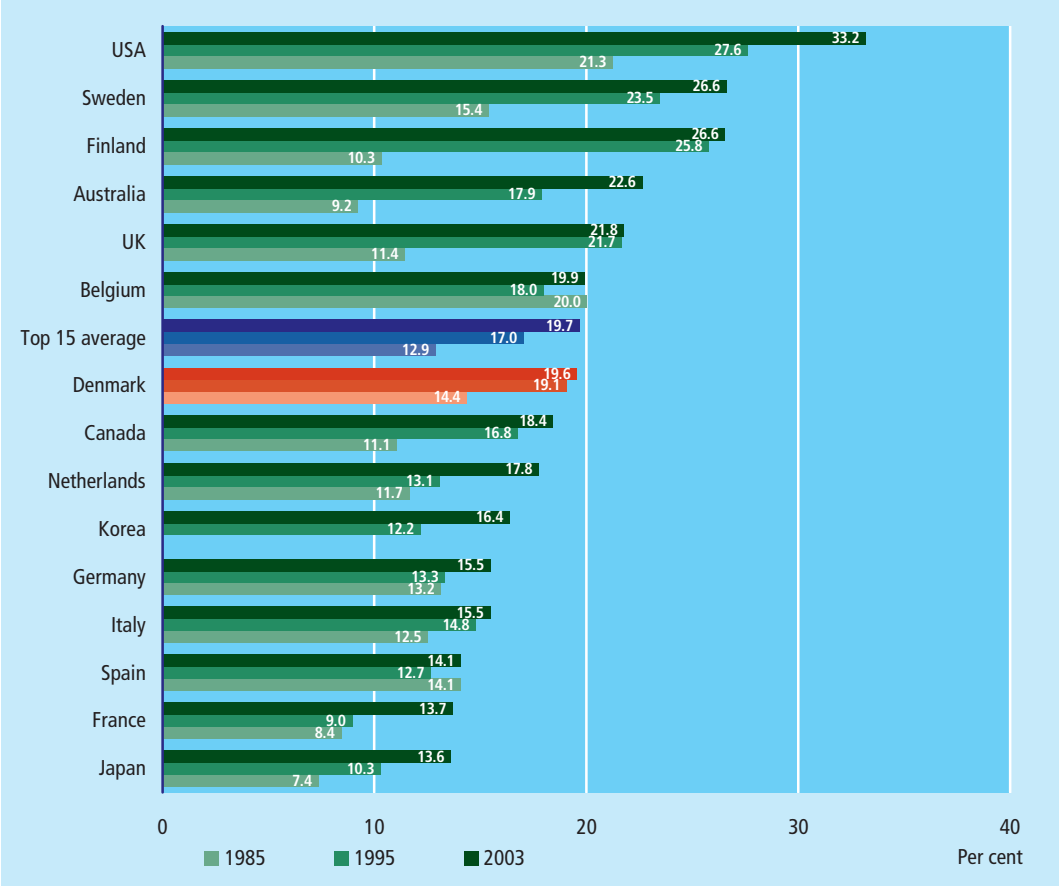
Finland has high ICT value added

Finland's ICT sector has a particularly high influence on value added with 16.8 per cent of total value added in the private sector against a share in employment of 9.2 per cent. Value added is thereby almost twice as high.

Also high influence in Denmark and Norway

The ICT sector's share of value added is also somewhat higher than its share of employment in Denmark and Norway. The ICT sector's share of value added is almost 3 percentage points higher than its share of employment both in Denmark and Norway.

Figure 1.3 **ICT investment percentage of gross fixed investments**



Note. Top 15 consists of the EU and OECD countries with the highest ranking.

Note. ICT investments include investments in purchased software, software developed in-house and ICT equipment. Software investments in Japan are probably underestimated due to methodological differences. 2002 for Australia, France, Japan, New Zealand, Norway and Spain. 2001 for Italy. No data for Korea in 1985.

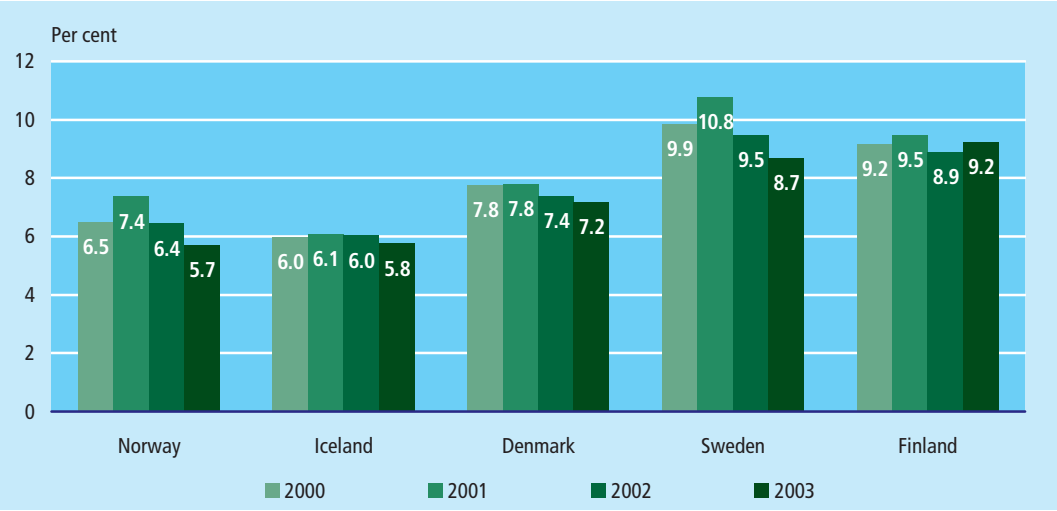
Source: OECD, Capital Services Database, July 2005.

USA in the lead of ICT investments

The figure shows ICT investments in relation to total investments in a number of countries. This calculation is made to compare the level of ICT investments and to measure where the relative effect of ICT investments is largest. Both in 1995 and in 2003, the USA has the largest share of ICT investments of the countries shown. Denmark came in as number 7 with a share of 19.6 per cent in 2003.

2. The ICT sector

Figure 2.1 **Share of ICT employment in private sector employment**



Source: Nordic Information Society Statistics 2005.

Denmark ranks middle

In Denmark, the ICT sector accounted for 7.2 per cent of total employment in the private sector in 2003. This places Denmark at mid-level of the Nordic countries. Finland has the highest share of employment in the ICT sector with 9.2 per cent of total employment.

Highest share in 2001

As regards the Nordic countries in general the share of employment was highest in 2001. Especially Sweden was marked by the consequences of the decline in that the share of employment dropped from 10.8 per cent in 2001 to 8.7 per cent in 2003.

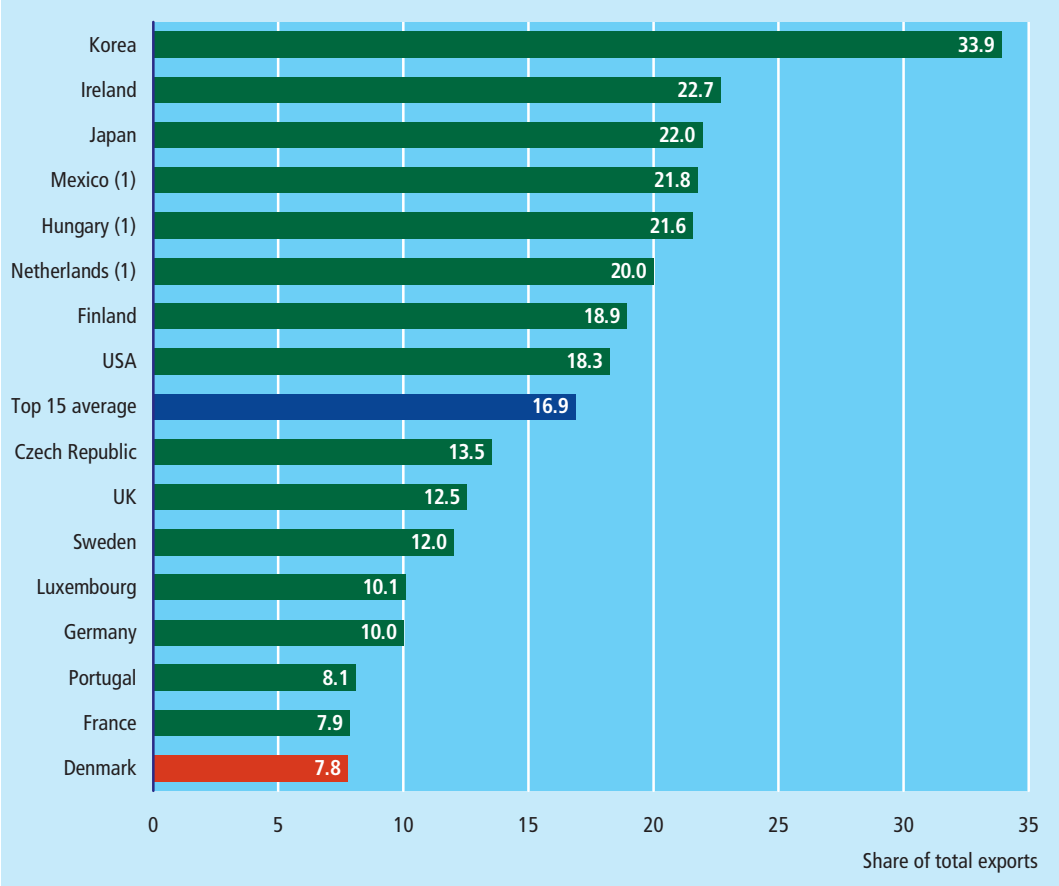
Increasing share of ICT employment in Finland

As the only country, Finland had an increasing share of ICT sector employment between 2002 and 2003 - from 8.9 per cent to 9.2 per cent. The increase especially relates to ICT manufacturing, which produces telecommunications materials.

Differences in composition of employment within the ICT sector

The composition of employment varies in the Nordic countries. In Sweden, ICT consultant firms account for 47 per cent of full-time employees in the ICT sector and thereby constitute the most important industry within the ICT sector. In Finland ICT manufacturing is the major industry within the ICT sector with 41 per cent of employees.

Figure 2.2 **ICT exports as share of total exports, 2004**



[1] Data for 2003. Top 15 consists of the EU and OECD countries with the highest ranking. Denmark ranks as number 16 in this indicator.
Source: OECD KEY ICT Indicators (www.oecd.org/sti/ICTindicators).

Denmark not in top 15

Denmark is not placed among the top 15 countries in relation to share of ICT exports of total exports. ICT exports accounted for 7.8 per cent of total Danish exports in 2004, which places Denmark as number 16. The average for top 15 is 16.9 per cent.

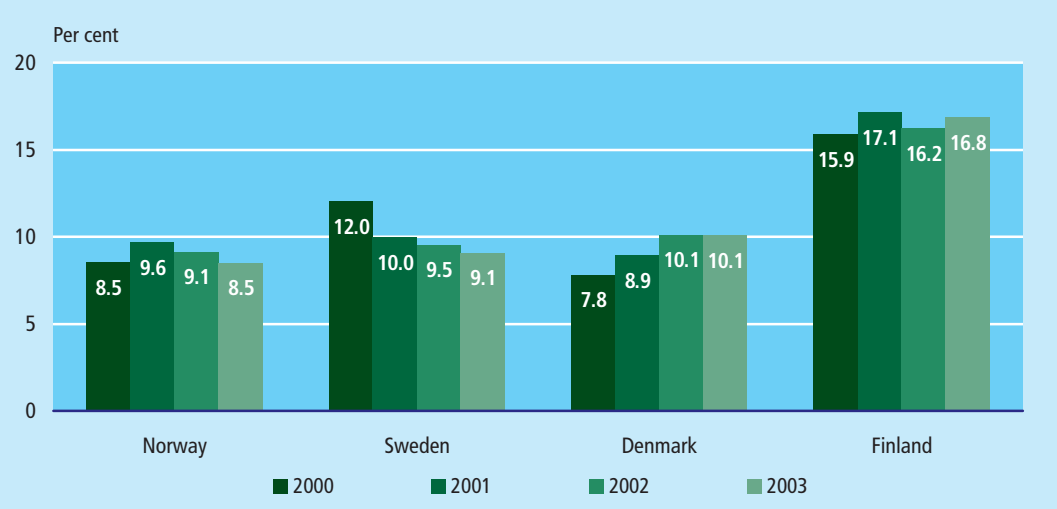
Korea a sovereign first place - Mexico surprisingly number 4

Korea has by far the largest share of ICT exports with 34 per cent of total exports. In comparison, Ireland has a share of 22 per cent as the country ranking second-best. Normally Mexico is not among the top 15 countries in other ICT sector indicators. However, in relation to the share of ICT exports of total exports Mexico ranks as number 4 with a share of almost 22 per cent.

Finland and Sweden around average

The other two Nordic countries in the survey - Finland and Sweden - are around average with shares of 19 per cent and 12 per cent respectively.

Figure 2.3 **ICT sector's share of total value added in the private sector**



Note. No calculation for ICT sector value added for Iceland.
Source: Nordic Information Society Statistics 2005.

Value added accounted for 10.1 per cent in Denmark

In 2003, value added of the Danish ICT sector accounted for 10.1 per cent of total value added in the private sector in Denmark. This made Denmark the Nordic country with the second-highest share of value added, only surpassed by Finland with 16.8 per cent in 2003.

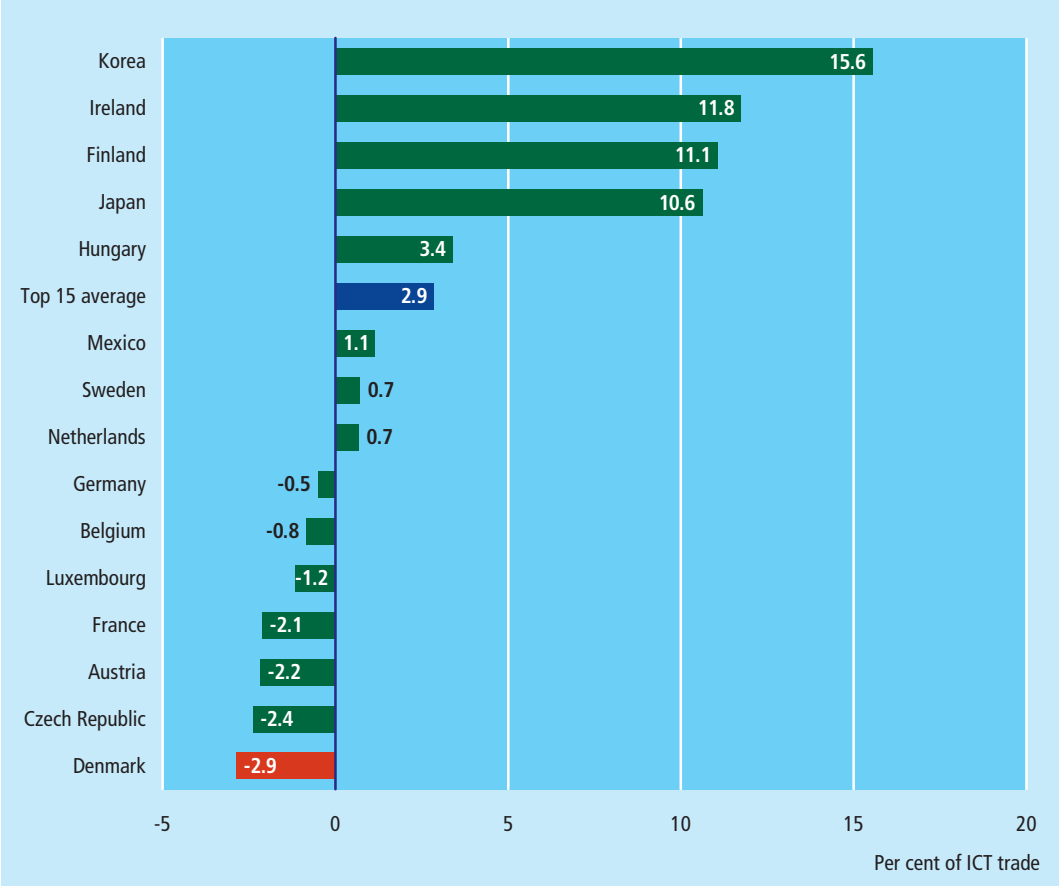
Denmark the only country with increasing share

The development in the share of total value added has varied greatly in the four Nordic countries. As the only country, Denmark had an increasing share of ICT sector value added - from 7.8 per cent in 2000 to 10.1 per cent in 2003. Conversely, Sweden experienced a decreasing share from 12.0 per cent in 2000 to 9.1 per cent in 2003.

Larger share of value added than of employment

However, all the countries are characterised by having a larger share of value added than of employment in the private sector. The difference is largest in Finland, as ICT employment accounted for 9.2 per cent of private sector employment, but value added of the ICT sector accounted for 16.8 per cent in 2003.

Figure 2.4 **Balance of trade for ICT goods as share of total trade in ICT goods, 2003**



Note. Top 15 consists of the EU and OECD countries with the highest ranking.
Source: OECD, ITCS and STAN databases, May 2005. (www.oecg.org/sti/stan).

Trade plays an important part

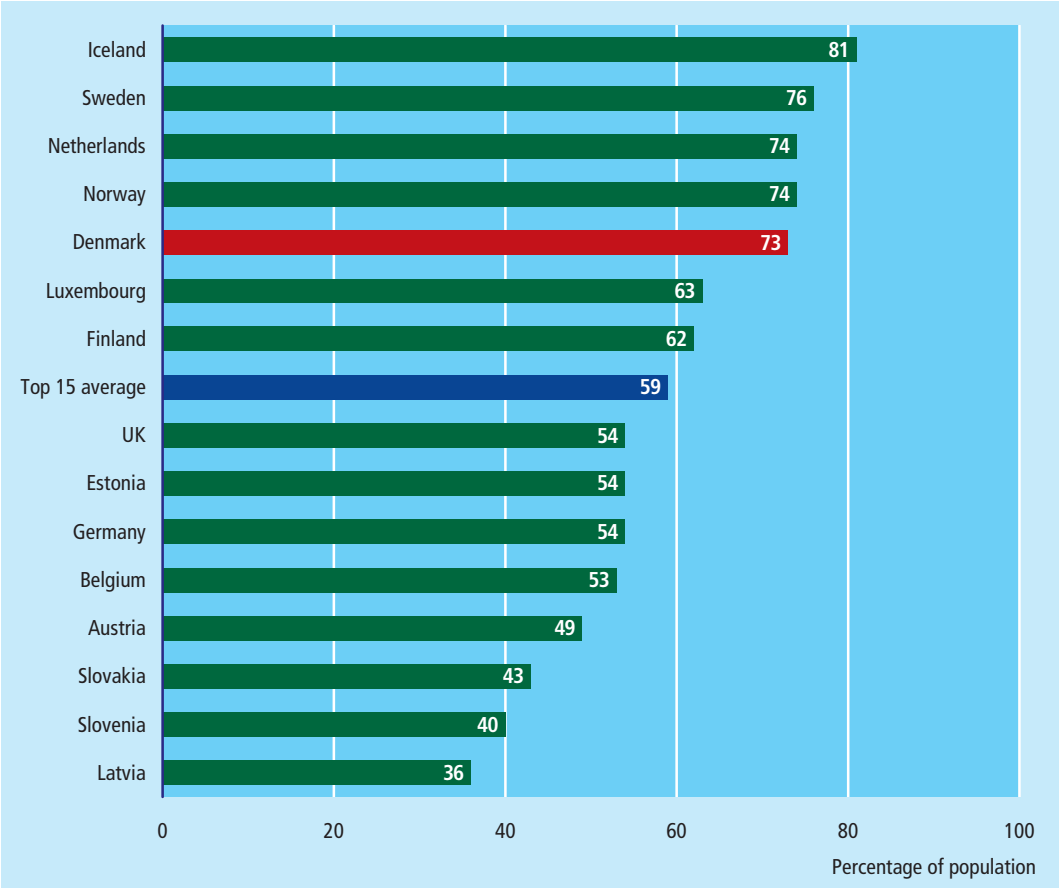
The significance of trade in ICT goods in relation to domestic trade can be measured by looking at the share of net balance of trade of total ICT trade. Denmark has a trade deficit on ICT goods corresponding to 2.9 per cent of the total trade in ICT goods. The top 15 average of the countries with the largest significance of ICT balance of trade is a trade surplus of 2.9 per cent.

Korea has a large trade surplus

The countries with large ICT exports also have a large ICT trade surplus, which accounts for a significant share of the countries' ICT trade. Korea's ICT trade surplus thus corresponds to 13 per cent of total trade in ICT goods in Korea.

3. The digital citizen

Figure 3.1 **Internet use by the population, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

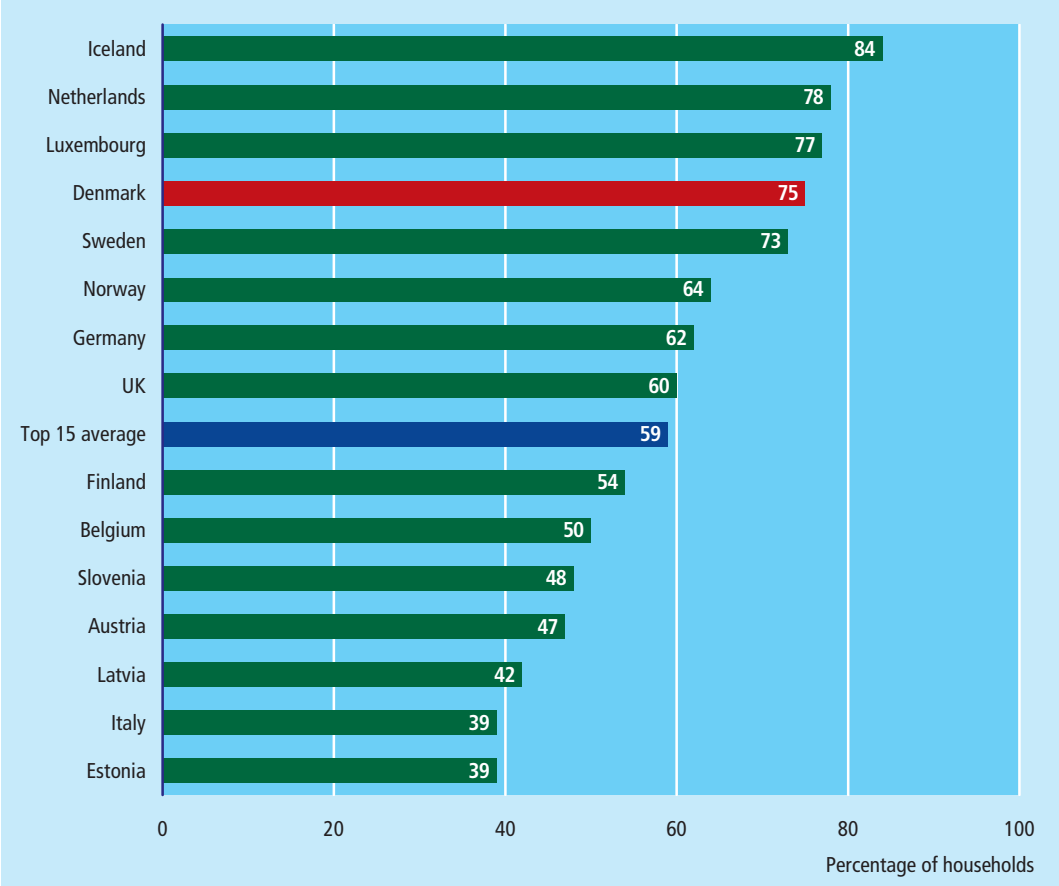
Danes often on the Internet

In 2005, 73 per cent of the Danish population used the Internet at least once a week. Thus, of the countries included in the survey, Denmark is only surpassed by Iceland, Sweden, the Netherlands and Norway where the shares were 81 per cent, 76 per cent, 74 per cent and 74 per cent, respectively.

Nordic countries in the lead

Internet use by individuals still varies considerably within the European Union. In the Nordic countries, over 60 per cent used the Internet at least once a week in 2005, while countries such as Italy, Poland, Portugal and Spain were not part of top 15 and far below the top 15 average of 59 per cent.

Figure 3.2 **Percentage of households with Internet access at home, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

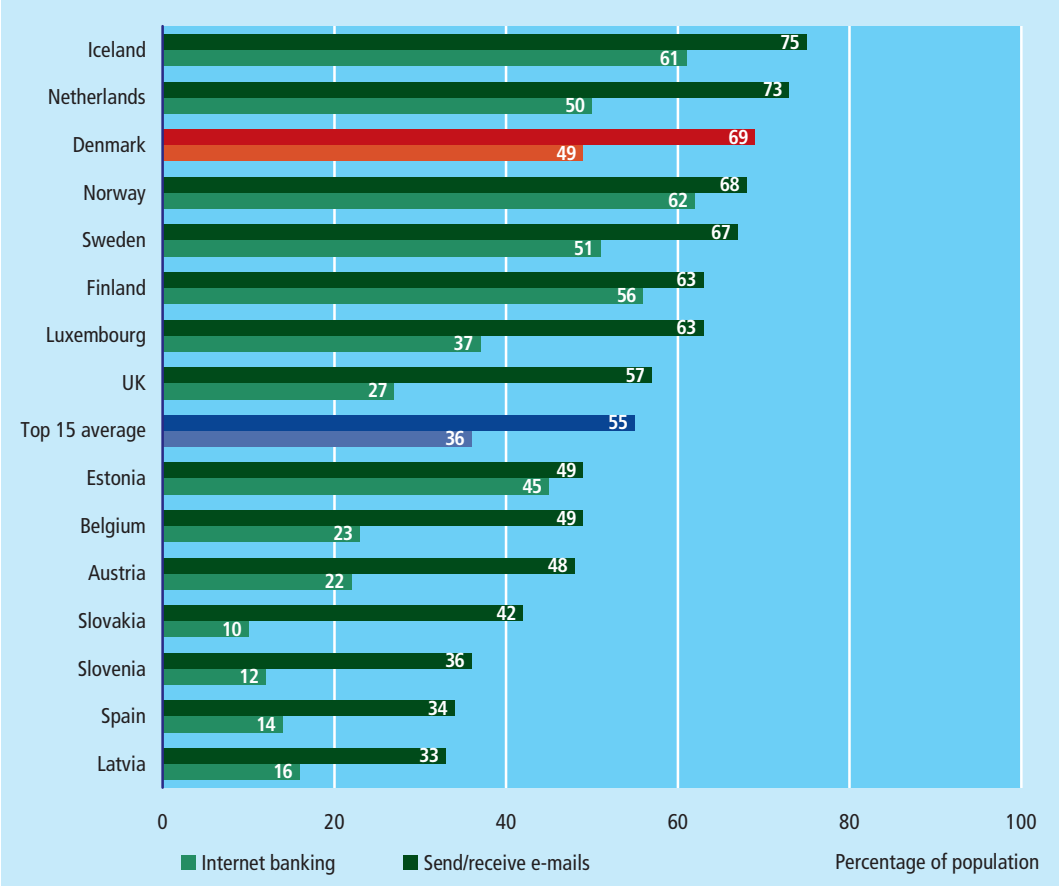
Three of four Danish households have Internet access

In 2005, 75 per cent of all Danish households had access to the Internet at home. Only Iceland, the Netherlands and Luxembourg ranked higher with shares of 84 per cent, 78 per cent and 77 per cent respectively. Denmark was significantly above the top 15 average of 59 per cent.

Penetration of Internet access highest in Northern Europe

Similar to the situation for Internet use by the population, the percentage of households who have Internet access at home varies considerably among the countries in the survey. Over half of the households in Finland, Norway, Sweden and Germany, for instance, had Internet access at home in 2005, while the shares in the Southern European countries were far below the top 15 average.

Figure 3.3 **Private purposes for using the Internet, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

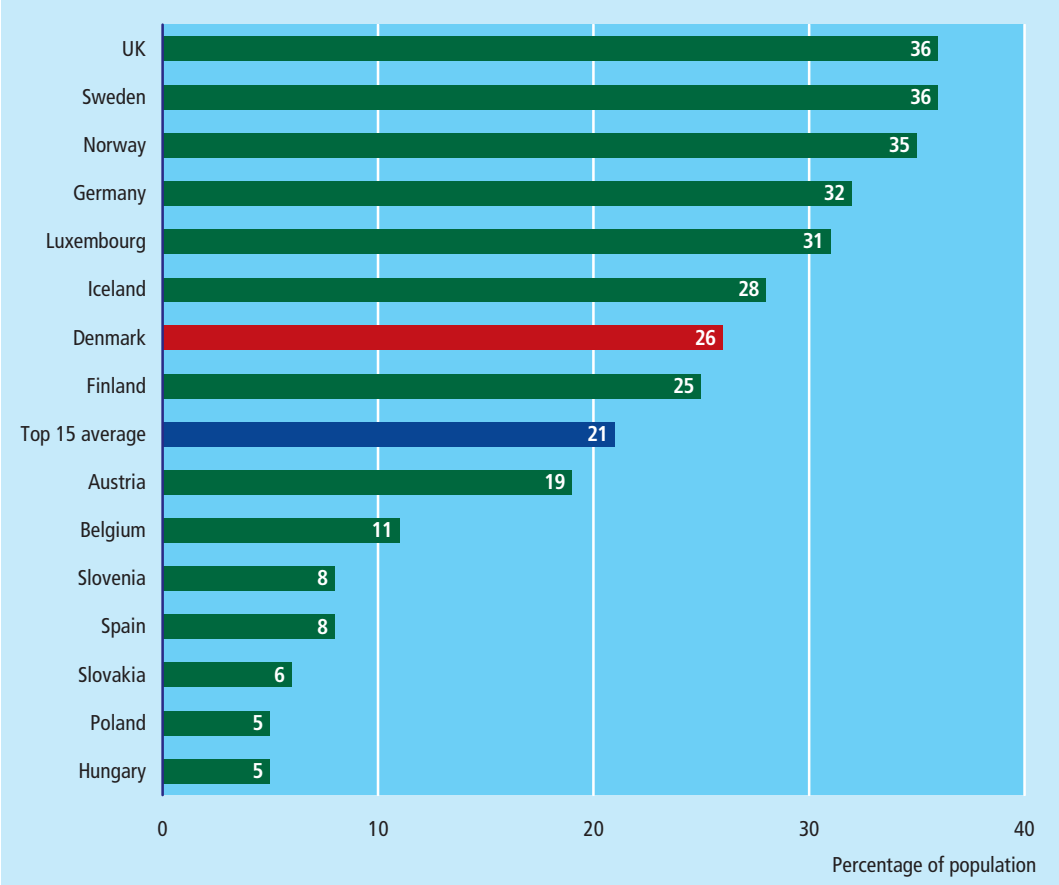
Nordic citizens frequently send and receive e-mails

In 2005, 69 per cent of the Danes used the Internet to send and receive e-mails, which is exceeded only by Iceland and the Netherlands with 75 per cent and 73 per cent, respectively. The Nordic countries are leading in Europe with more than six in ten people using the Internet for that purpose. On average, almost six in ten people in the top 15 countries used the Internet to send and receive e-mails.

Danes use Internet banking the least in the Nordic countries

Turning to a more advanced form of Internet use such as Internet banking, this is less frequent in the countries included in the survey. Here, Denmark came in sixth with 49 per cent after Norway, Iceland, Finland, the Netherlands and Sweden, but well above the top 15 average of 36 per cent.

Figure 3.4 **Share of individuals having ordered/bought goods or services on the Internet within the last three months, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

Denmark is above the top 15 average

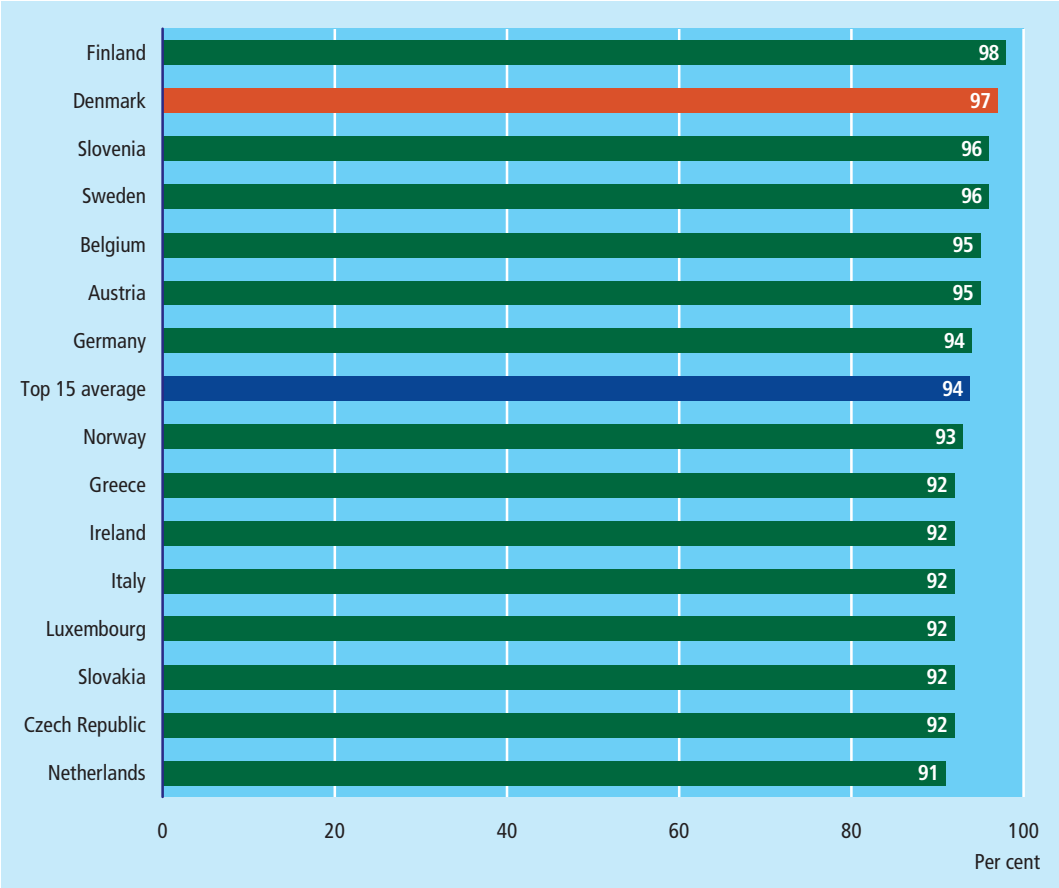
The above figure shows the share of individuals in each country in 2005 who ordered or bought goods or services on the Internet for private use in the last three months. With a share of 26 per cent, Denmark is down to number 7, but above the top 15 average of 21 per cent.

Sweden and the UK rank highest

It further shows that Sweden, Norway and Iceland had higher shares than Denmark in 2005. Together with Sweden, the UK leads with a share of 36 per cent.

4. The digital business sector

Figure 4.1 **Share of enterprises having access to the Internet, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

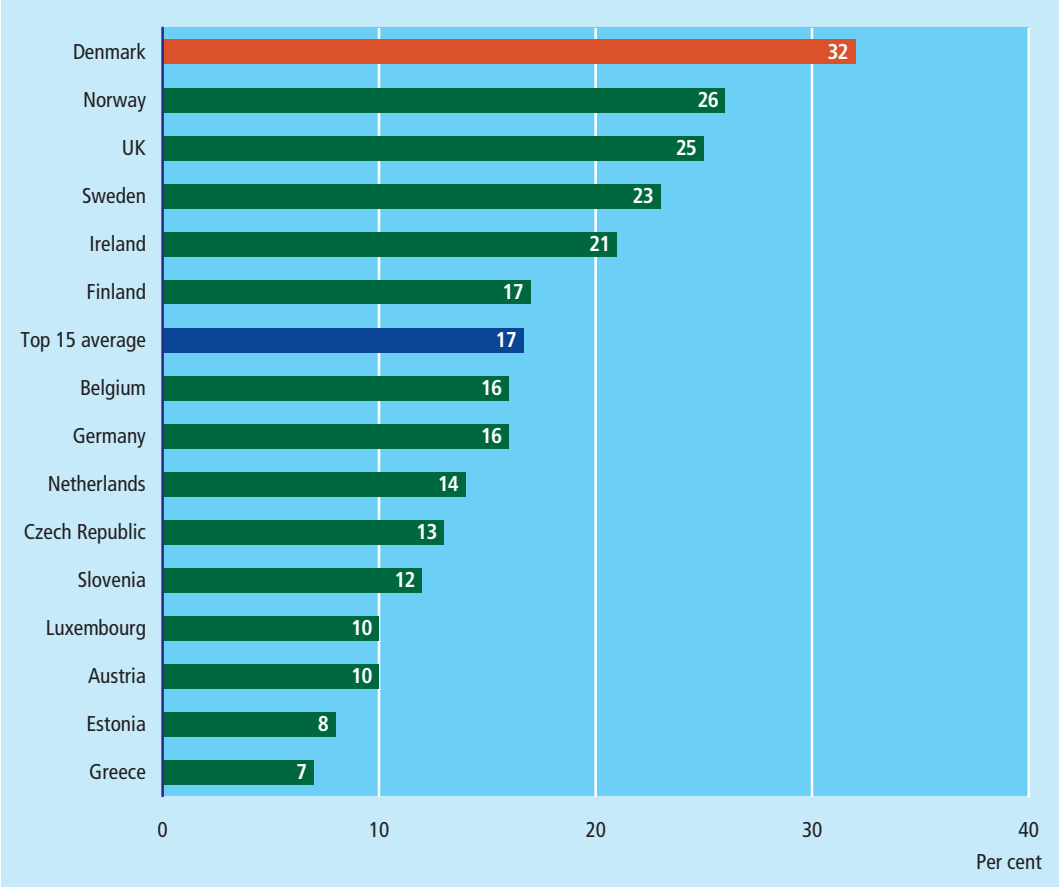
Danish enterprises in the lead regarding Internet access

Except Norway, the Nordic countries are in the lead regarding the penetration of Internet access in Europe. In these countries, and in Slovenia, less than 5 per cent of enterprises have no Internet access.

Growth in penetration of Internet access near saturation point

The average among the 15 EU countries with the highest ranking is 94 per cent. Thus, there are no major differences in this group when it comes to penetration of Internet access. The generally high level of Internet access has reduced the differences between the countries, and no large growth rates are expected in future regarding penetration.

Figure 4.2 **Share of enterprises having received orders online (min. 1 per cent) within the last 12 months, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

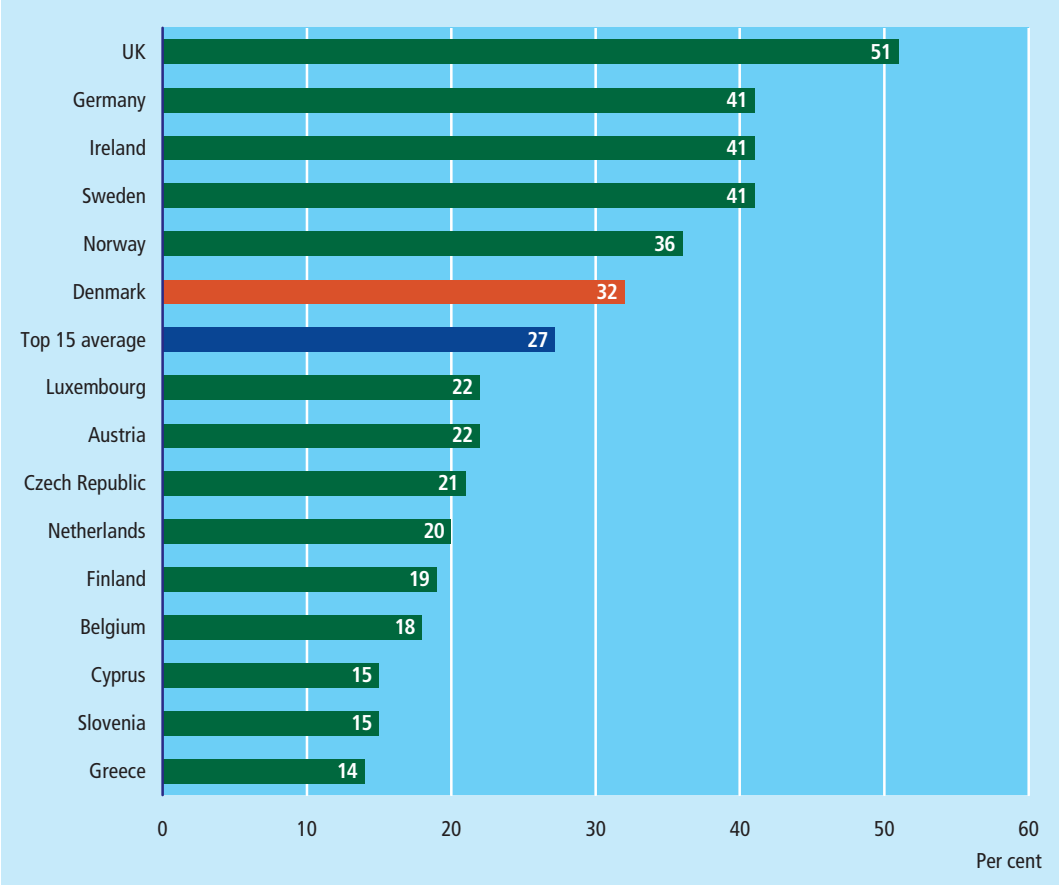
Sales over the Internet most frequent in Denmark

In the course of 2004, 32 per cent of Danish enterprises received orders over the Internet. The other Nordic countries are slightly below Denmark: Norway with 26 per cent, Sweden with 23 per cent and Finland with 17 per cent. The UK and Ireland also have a good ranking with 25 per cent and 21 per cent respectively.

New EU countries in top 15

Among the 15 EU countries with the highest ranking, the average is 17 per cent. Three of the ten new EU countries of 1 May 2004, the Czech Republic, Slovenia and Estonia, are among the top 15 countries, although in the lower half.

Figure 4.3 **Share of enterprises having ordered/bought goods or services online (min. 1 per cent) within the last 12 months, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking. Only enterprises who can estimate the scope of their purchases and whose estimated purchases account for at least 1 per cent of total purchases are included. This level is well below the total number of enterprises who have bought goods online. 'Online' includes other external networks than the Internet.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

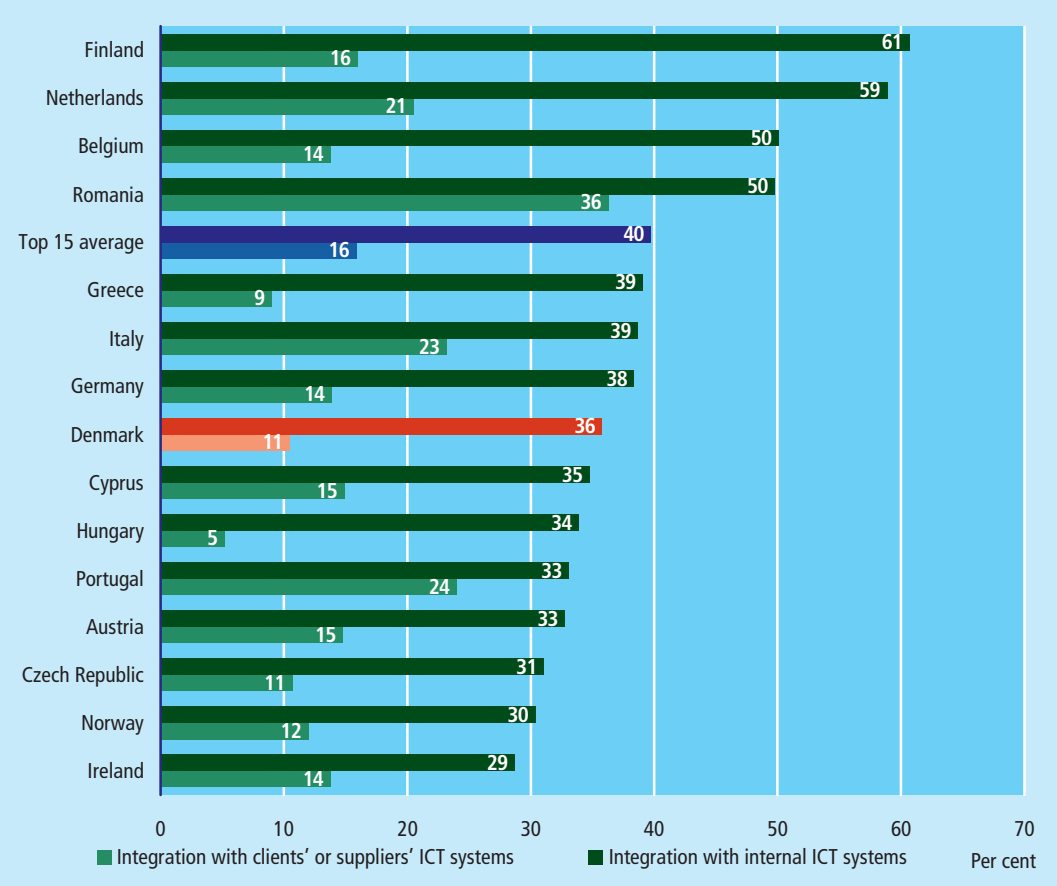
One in three Danish enterprises have bought goods online

In the course of 2004, slightly less than one in three Danish enterprises has bought goods online accounting for at least 1 per cent of total purchases. This is slightly above the top 15 average of 27 per cent among the European countries.

The UK in the lead

The UK is in lead with one in two enterprises buying goods online for a minimum of 1 per cent of total purchases. Germany, Ireland, Sweden and Norway are also ahead of Denmark.

Figure 4.4 **Share of enterprises having integrated order system, 2004**



Note. Top 15 consists of Norway and the EU countries with the highest ranking, selected according to integration with internal systems.
Source: European Commission, DG Joint Research Centre, 'The 2005 European e-Business Readiness Index', 2005

Internal integration more frequent than external integration

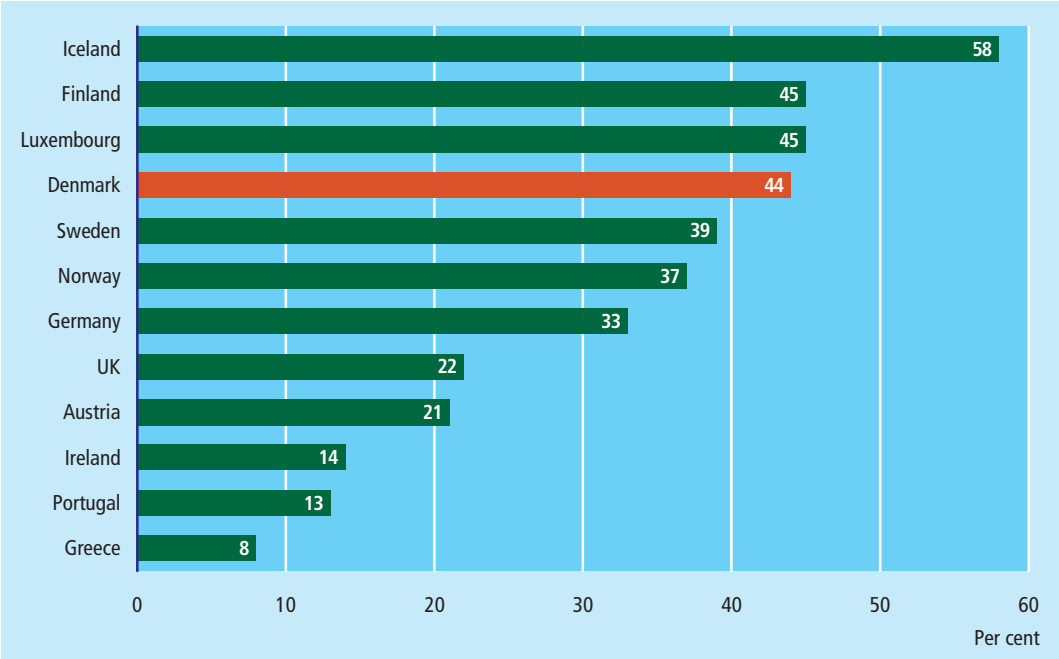
In 2004, 40 per cent of the 15 EU countries with the highest ranking had order management systems that were integrated with internal ICT systems. A somewhat lower share, 16 per cent, had order systems that were integrated with clients' or suppliers' ICT systems.

Denmark slightly below average

Denmark is slightly below, but close to the top 15 average, which is influenced especially by high-ranking countries such as Finland and the Netherlands. Nordic countries such as Sweden and Norway rank lower than Denmark and are outside top 15.

5. The digital public sector

Figure 5.1 **Share of individuals using public digital services, 2004**



Source: Eurostat, February 2006 (http://europa.eu.int/comm/eurostat/).

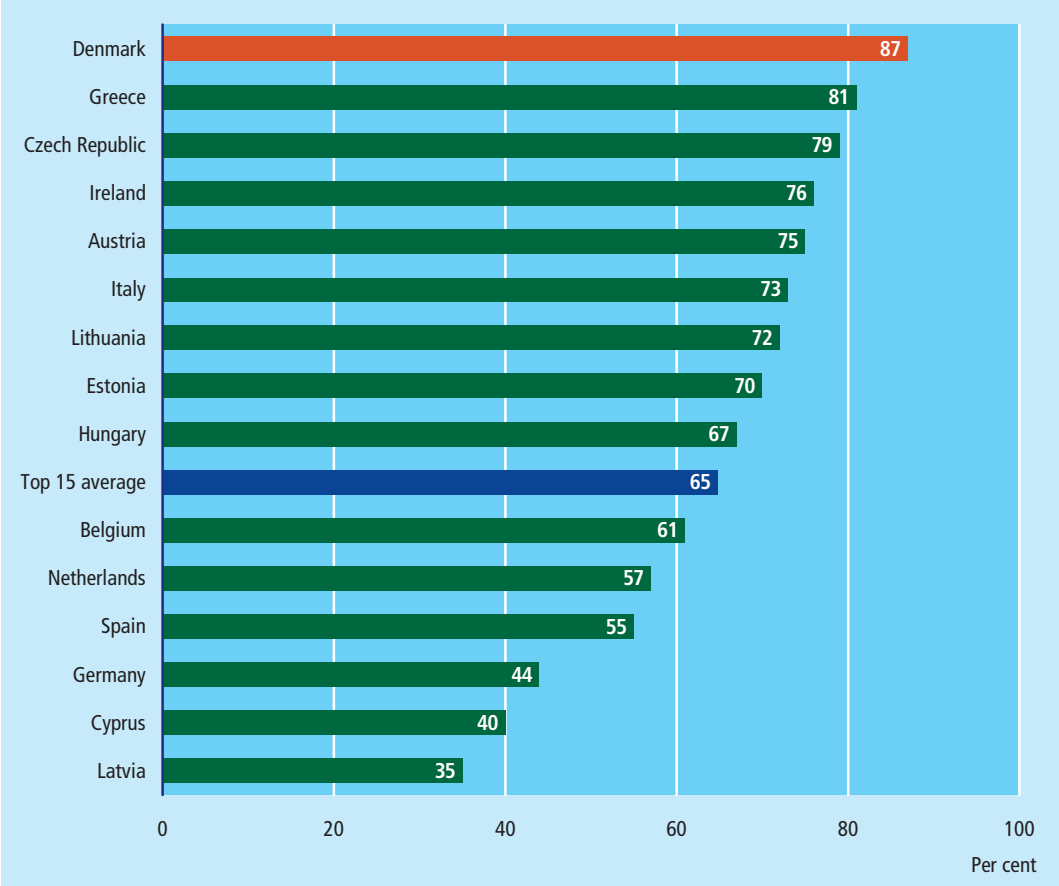
Four in ten Danes interacted with public authorities over the Internet

Of the Danish citizens, 44 per cent used the Internet in 2004 to interact with public authorities, i.e., to search for information, download forms or submit information. Only Iceland, Finland and Luxembourg had larger shares of their citizens using the Internet for those purposes.

Primarily a Nordic phenomenon

The figure shows that primarily Nordic citizens used the Internet for interacting with public authorities in 2004. No less than six in ten Icelandic citizens used public digital services over the Internet.

Figure 5.2 **Share of enterprises using public digital services, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

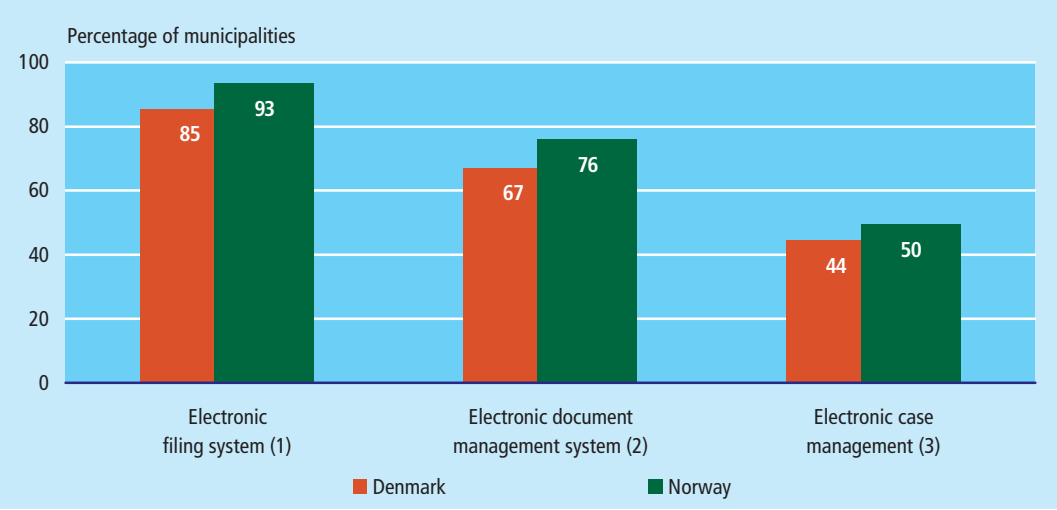
Danish enterprises in the lead

87 per cent of Danish enterprises used web sites of public authorities in 2005, thereby placing Denmark as number one among the 15 European countries with the highest ranking followed by Greece and the Czech Republic.

Large variations between the countries

There are relatively large mutual variations, and the majority of countries are above the top 15 average, which is 65 per cent of enterprises.

Figure 5.3 **Share of case and document management in Norwegian and Danish municipalities, 2004**



[1] Case and document information registered electronically (e.g. date of receipt, sender, etc).
[2] Documents and document information registered and stored electronically. Incl. filing.
[3] System supporting the specific case documents between caseworkers. Incl. filing and document management.
Source: Statistics Denmark, ICT use by the public sector, 2004. Statistics Norway, 2004.

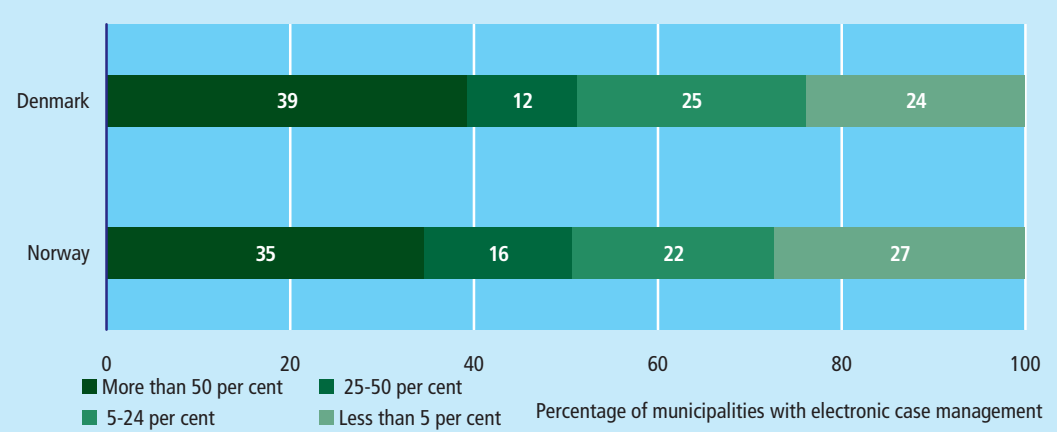
Case and document management most frequent in Norway

In 2004, case and document management was more frequent in Norwegian municipalities compared with Danish. Electronic filing was used most frequent in both countries, as it was used by almost all municipalities - 85 per cent in Denmark and 93 per cent in Norway.

Almost one in two municipalities used electronic case management

The share of electronic case management is lower in both countries: 44 per cent of Danish municipalities and 50 per cent of Norwegian municipalities. New Danish figures show some increase in 2005, in that 89 per cent, 75 per cent and 60 per cent, respectively, of the Danish municipalities have the three types of case and document management.

Figure 5.4 **Cases handled exclusively electronically in Norwegian and Danish municipalities, 2004**



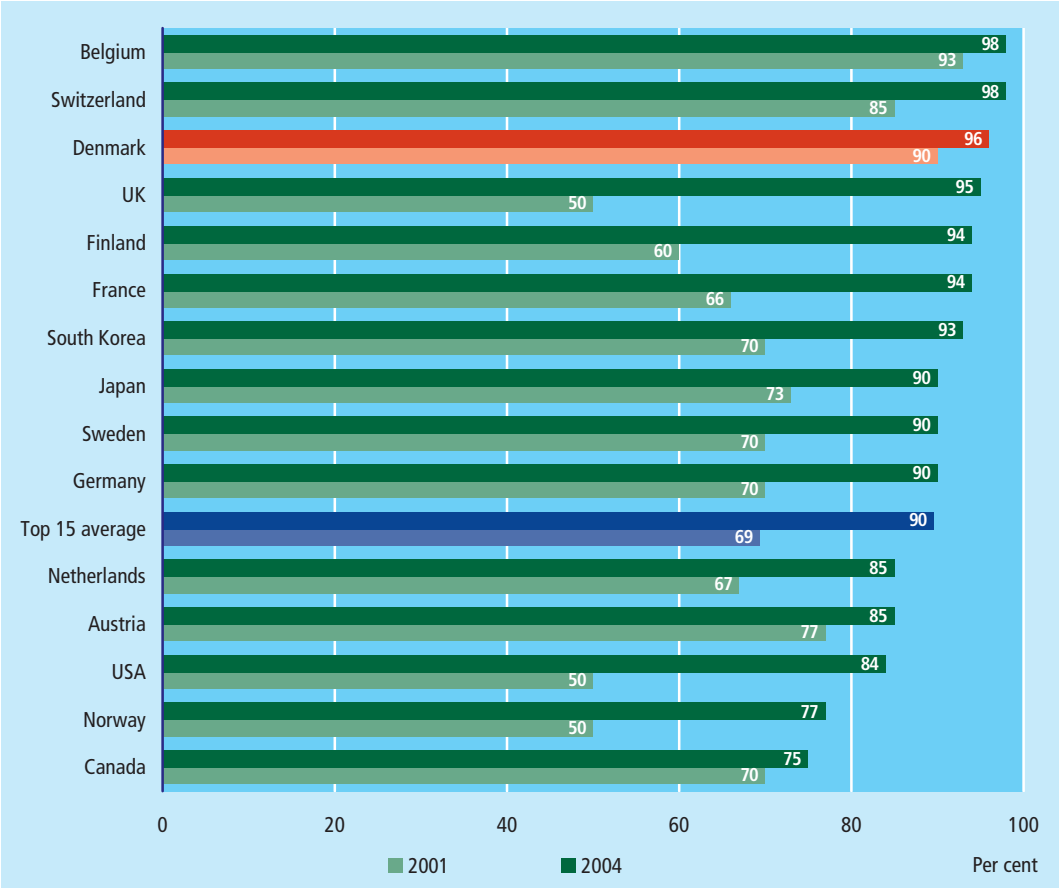
Source: Statistics Denmark, ICT use by the public sector, 2004. Statistics Norway, 2004.

Danish municipalities slightly ahead of Norway in relation to share of cases handled without the use of paper

Norwegian and Danish municipalities with electronic case management have estimated the share of cases that are exclusively handled electronically. There are few differences between the countries, in which approx. half of the municipalities estimated that the share of electronic case management was 25 per cent in 2004. However, cases handled electronically accounted for more than 50 per cent in slightly more Danish municipalities than Norwegian.

6. ICT infrastructure

Figure 6.1 **Availability of ADSL**



Note. Top 15 consists of the EU and OECD countries with the highest ranking. Availability covers whether households and enterprises have the option to acquire a broadband Internet connection.
Source: OECD, June 2005.

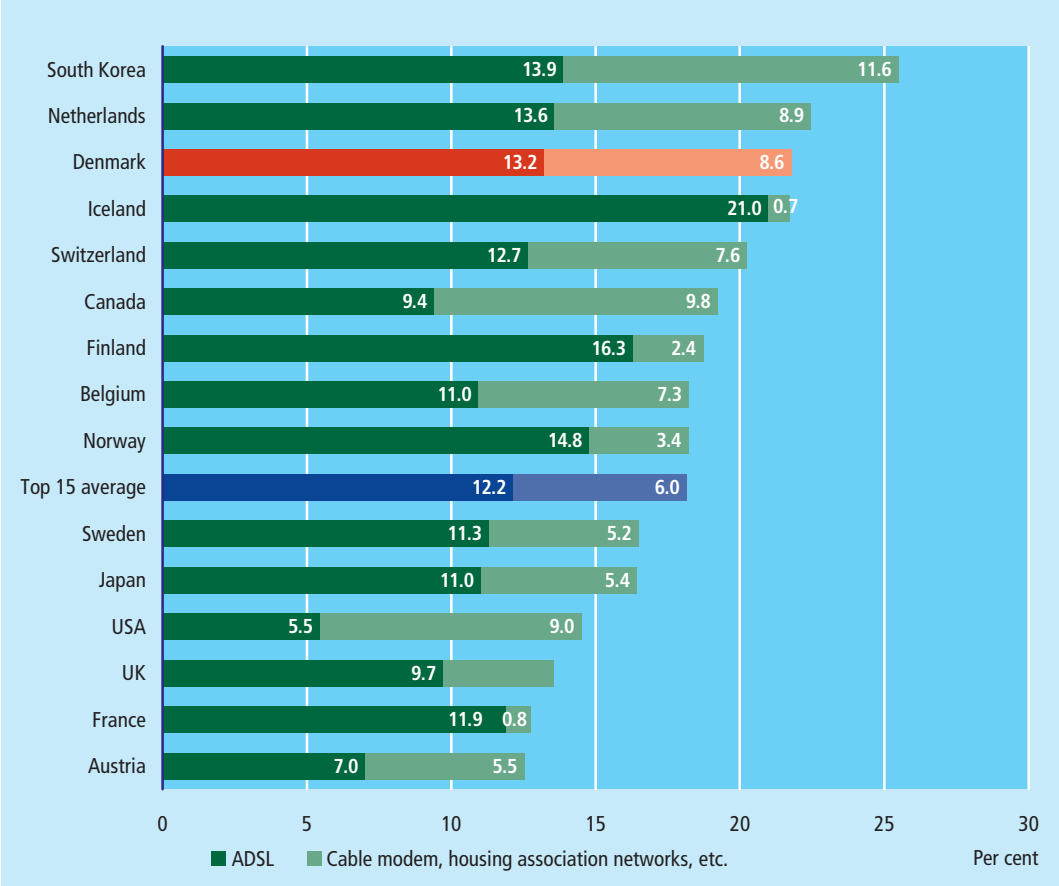
Denmark in the lead of broadband coverage

Availability of ADSL for enterprises and households is high in Denmark compared with many other OECD countries. At the end of 2004, availability was 96 per cent in Denmark. In 2005, availability increased to more than 98 per cent.

Denmark is a 'fibre intensive' nation

A survey from January 2006 shows that Denmark is among the most 'fibre intensive' countries in Europe - especially as a consequence of the increasing number of housing association networks in city areas (source: www.idate.fr). The power utility companies' ongoing roll-out of optic fibres will support the development further.

Figure 6.2 **Broadband penetration per 100 inhabitants, June 2005**

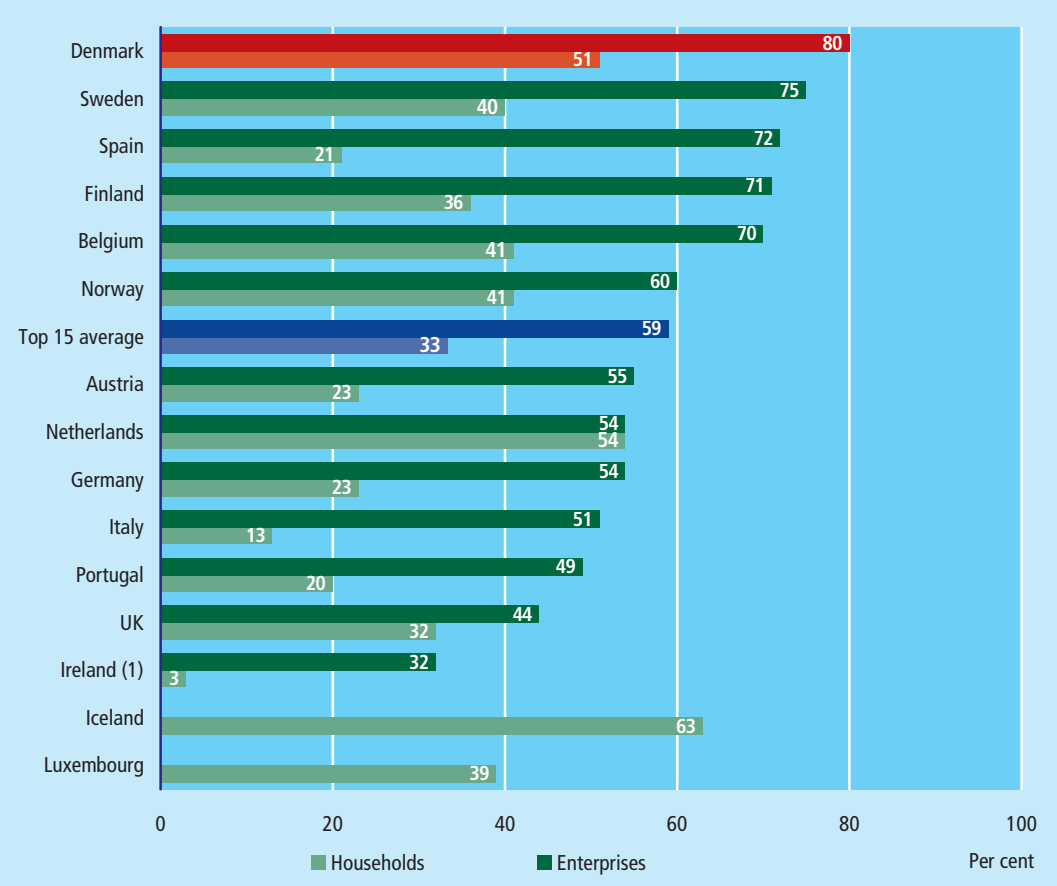


Note. Top 15 consists of the EU and OECD countries with the highest ranking. Penetration generally concerns the number of broadband subscriptions for both households and enterprises. Thus, the figures do not relate to the number of users or who can gain access, but rather the numbers of connections established.
Source: OECD, October 2005.

Denmark ranks as number three in penetration of broadband within OECD

With almost 22 broadband connections per 100 inhabitants at mid-2005, Denmark is among the leading countries in the OECD in terms of broadband use by enterprises and the population. The penetration of broadband connections continues to increase in Denmark and had risen to almost 25 connections per 100 inhabitants at the end of 2005.

Figure 6.3 **Broadband in enterprises and in households, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking. For enterprises, broadband means ADSL and the like, or other cable-based Internet connection. For enterprises, no data are available for Iceland and Luxembourg. For households, broadband means ADSL and other fast fixed-line connections (e.g., cable modem).
Source: Eurostat, February 2005 (http://europa.eu.int/comm/eurostat/).

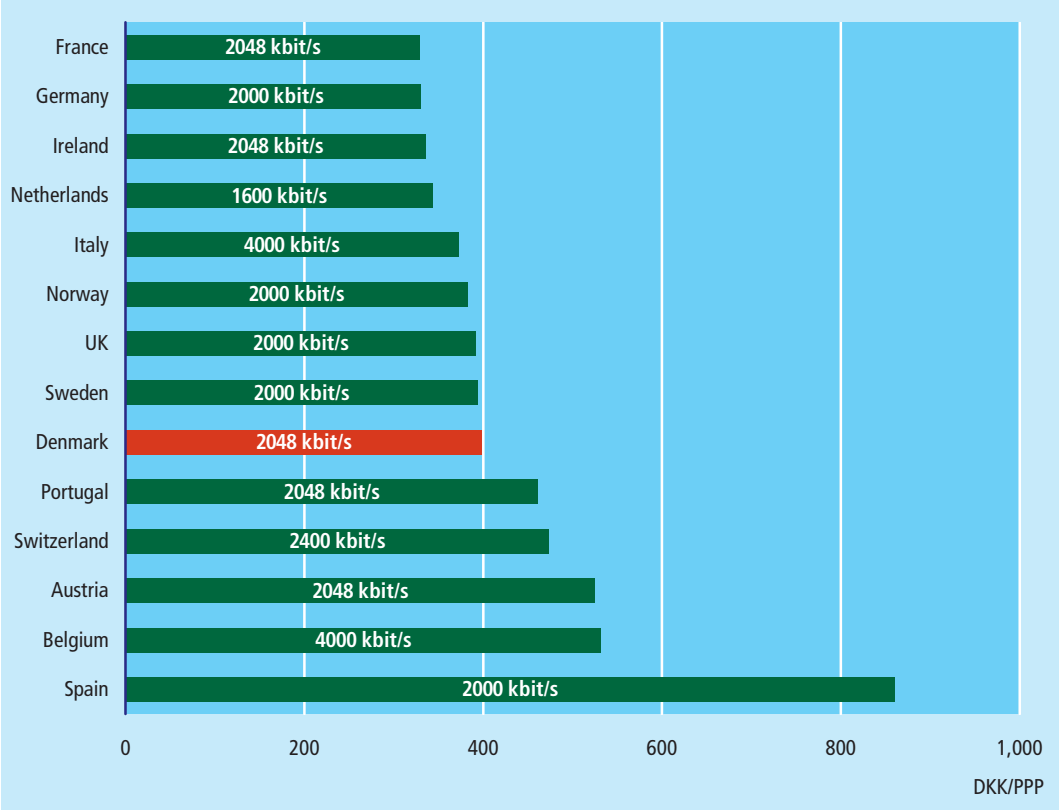
Danish enterprises in the lead internationally

In 2005, 80 per cent of all Danish enterprises with 10 or more employees had a broadband connection to the Internet. This is the highest share among the countries included in the figure. Only countries such as Sweden, Spain and Finland came close to the share in Denmark.

Only Iceland has more households with broadband

The share of households in Denmark with broadband connections in 2005 was high compared to the other countries. Of all Danish households, 51 per cent had broadband connections and only the Netherlands and Iceland, with 54 per cent and 63 per cent respectively, had a higher share.

Figure 6.4 ADSL prices. 2 Mbit/s capacity, September 2005



Note. Prices are inclusive of VAT and calculated in DKK per month. Prices only include the monthly subscription fee and establishment costs are thus not included. Prices are adjusted for mutual purchasing power differences between the countries, based on the latest OECD report on purchasing power parities (PPP). The survey only includes the former sole ISP in each country, i.e. TDC in Denmark. The capacity offered varies from country to country. The figure shows products with a capacity of 2 Mbit/s for each country. The survey is based on ADSL products without prices for traffic or use per minute. In Ireland, Portugal and Austria, the price becomes variable if the subscriber exceeds a fixed monthly consumption. In Belgium, the speed is reduced to 64 kbit/s for the rest of the month if the subscriber exceeds a fixed volume of traffic of 400 MB (512 kbit/s) and 30 GB (4 Mbit/s), respectively. The survey does not take into account any differences in upstream speed or whether the speed offered is based on 'best effort' or a guaranteed band width.
Source: National IT and Telecom Agency, based on information from the websites of the providers.

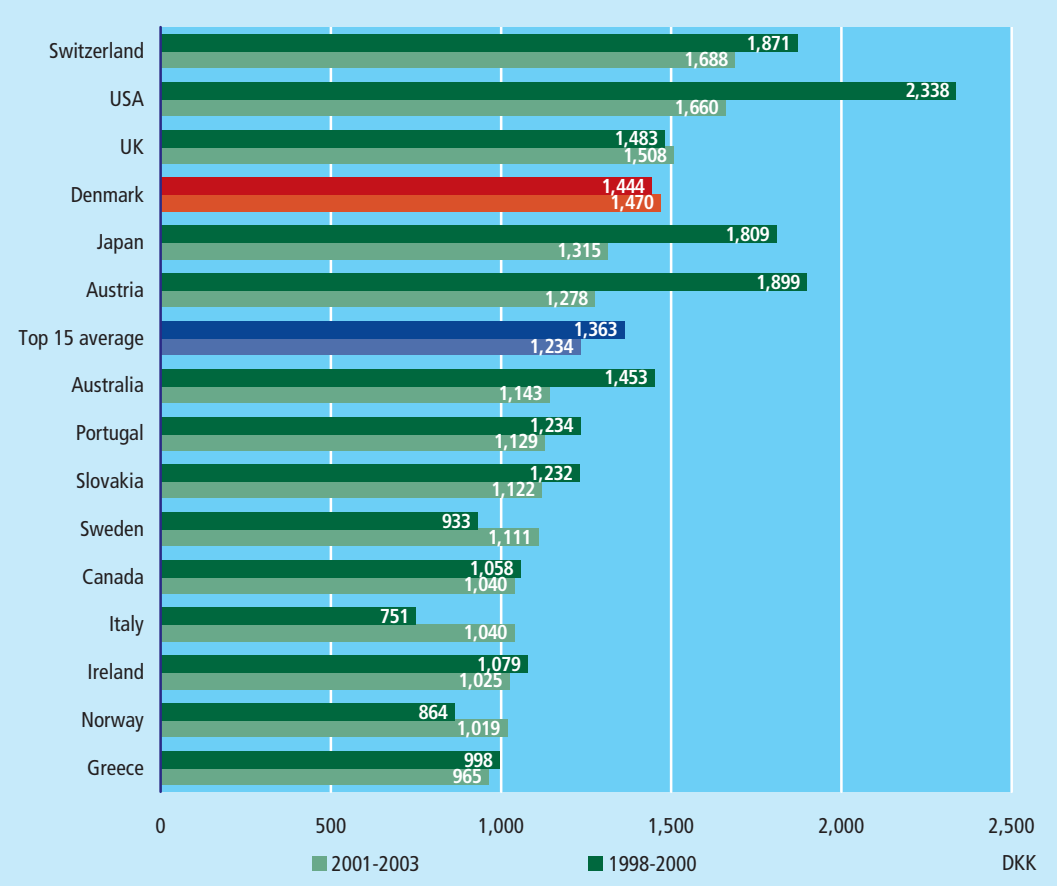
Denmark has some of the lowest telecom prices within OECD

The latest OECD price survey from November 2005 shows that Denmark has some of the lowest prices within OECD. This applies to traditional telephony, mobile telephony and fixed circuits to enterprises.

Denmark is not among the cheapest countries in ADSL prices

With respect to the price level of ADSL, Denmark is not among the cheapest countries. On 2 Mbit/s connections Denmark takes a medium position. Increasingly, alternative broadband solutions provide access to lower broadband prices over cable television networks, fibre-based housing association networks and direct fibre connections (power utility companies) as well as wireless broadband solutions based on WiFi and WiMAX.

Figure 6.5 **Annual telecom investments in the OECD countries per inhabitant**



Note. Top 15 consists of the EU and OECD countries with the highest ranking.
Source: OECD Communications Outlook 2005.

Denmark has the fourth-highest investment level among OECD countries

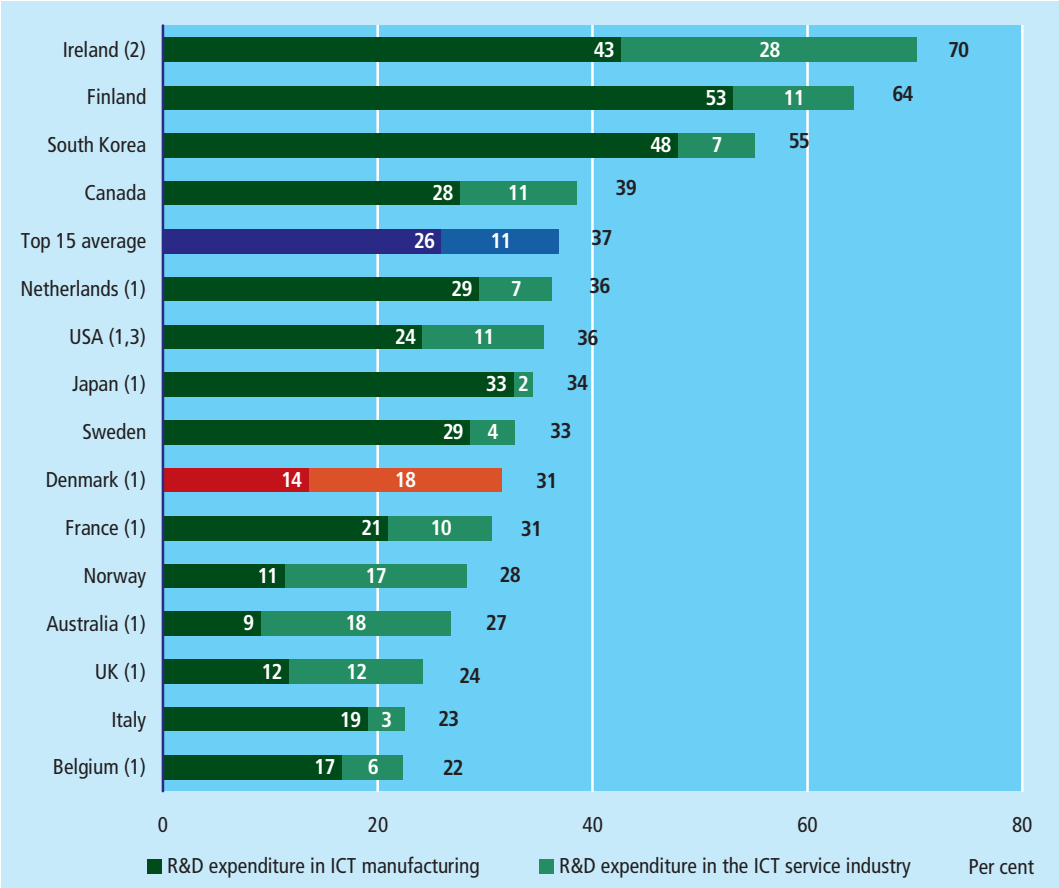
Denmark is one of the countries in the OECD that invest the most in telecommunications per inhabitant. Thus, Denmark was only exceeded by Switzerland, USA and the UK during the period 2001 to 2003 with average telecom investments amounting to DKK 1,470 per inhabitant, corresponding to 20 per cent above the top 15 average.

Lower position in 1998-2000

In the preceding period, from 1998 to 2000, Denmark ranked number seven among the countries included.

7 ICT research and innovation

Figure 7.1 **ICT sector's share of total private sector R&D expenditure, 2003**



Note. Top 15 consists of the EU and OECD countries with the highest ranking. NACE 64, Telecommunications include mail and telecommunication.
1) 2002 data 2) 2001 data 3) Only telecommunication included in NACE 64.
Source: OECD, ANBERD database, March 2005.

Denmark spends 31 per cent of private R&D expenditure in the ICT sector

The share of expenditure on research and development (R&D) in selected ICT industries accounts for 31 per cent of private sector R&D expenditure in Denmark. This figure is below the top 15 average of 37 per cent. The figures illustrate the distribution of resources within R&D, but not the magnitude of the R&D of the individual countries.

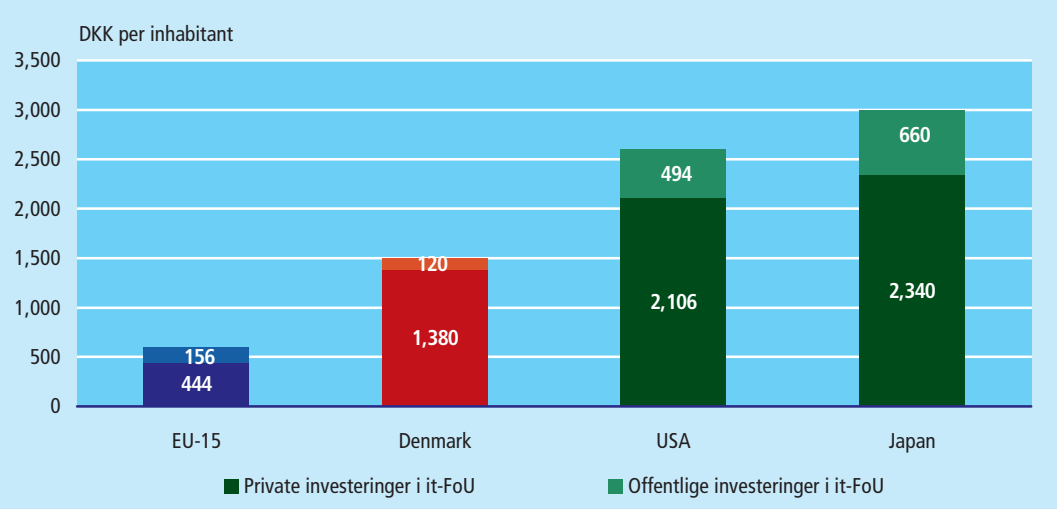
Ireland and Finland spend over 60 per cent of R&D expenditure on ICT

The ICT sectors in Ireland and Finland account for particularly large shares of private sector R&D in these countries, namely 70 per cent and 64 per cent, respectively, of total R&D expenditure.

High R&D activity in the ICT service industry

R&D activity is very high in ICT service enterprises in Denmark. R&D expenditure in the ICT service industry accounts for 18 per cent of total private sector R&D expenditure.

Figure 7.2 **ICT R&D investments in the public and private sector, 2002**



Note. The figure uses estimates in euro converted to DKK. Danish figures from 2003.
Source: International figures: Communication from the Commission reg. 'i2010 - A European Information Society for growth and employment'. (COM(2005)229).
Danish figures: Danish Centre for Studies in Research and Research Policy. ICT research in Denmark.

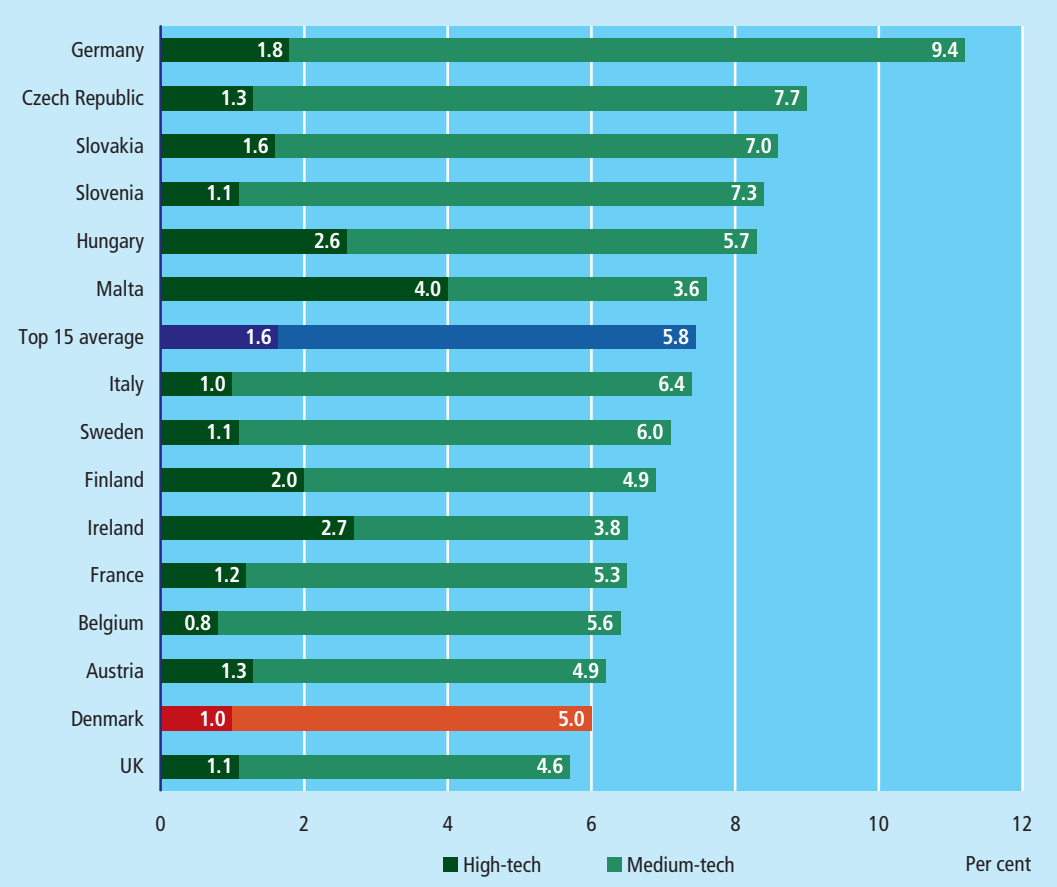
Higher ICT R&D expenditure in Denmark than in EU 15

An international comparative survey of R&D expenditure per inhabitant shows that Denmark has significantly higher R&D expenditure within ICT than the EU15 countries. Overall, the level of investments is DKK 1,500 per inhabitant in Denmark, against DKK 600 per inhabitant in EU15.

USA and Japan have higher levels of investment

The level of investment per inhabitant is far higher in USA and Japan with DKK 2,600 and DKK 3,000, respectively. The level of public investments is generally much lower than private investments. EU15 has the largest share of public ICT investments with 26 per cent.

Figure 7.3 **Share of employees in high-tech and medium-tech manufacturing industry in EU, 2004**



Note. Top 15 consists of the EU countries with the highest ranking.
Source: Eurostat, Statistics in focus, 1/2006, *Employment in high technology, 2006*.

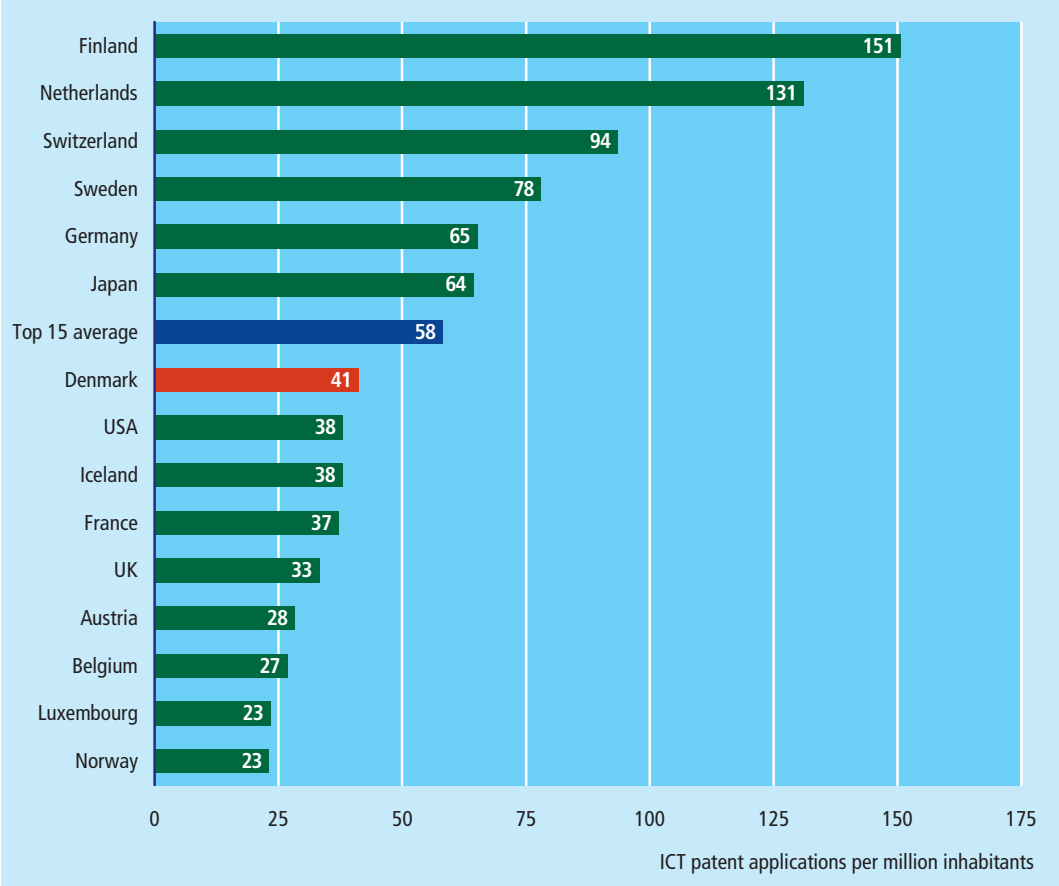
Denmark ranks low

Denmark's share of employment in high-tech positions is low compared to the other EU countries. High-tech enterprises account for 6 per cent of private sector employment in Denmark, while the top 15 average is 7 per cent.

Germany has the largest share of high-tech positions

Germany has the highest share of employment in high-tech positions with 11 per cent of total private sector employment. In general, the manufacturing industry is of greater importance in Germany than in Denmark, where the service sector employs more people.

Figure 7.4 **ICT patent applications per million inhabitants, 2001**



Note. Top 15 consists of the EU and OECD countries with the highest ranking.
Source: OECD, Patent Database, and OECD, Main Science and technology indicator 2005/2.

Denmark No. 7

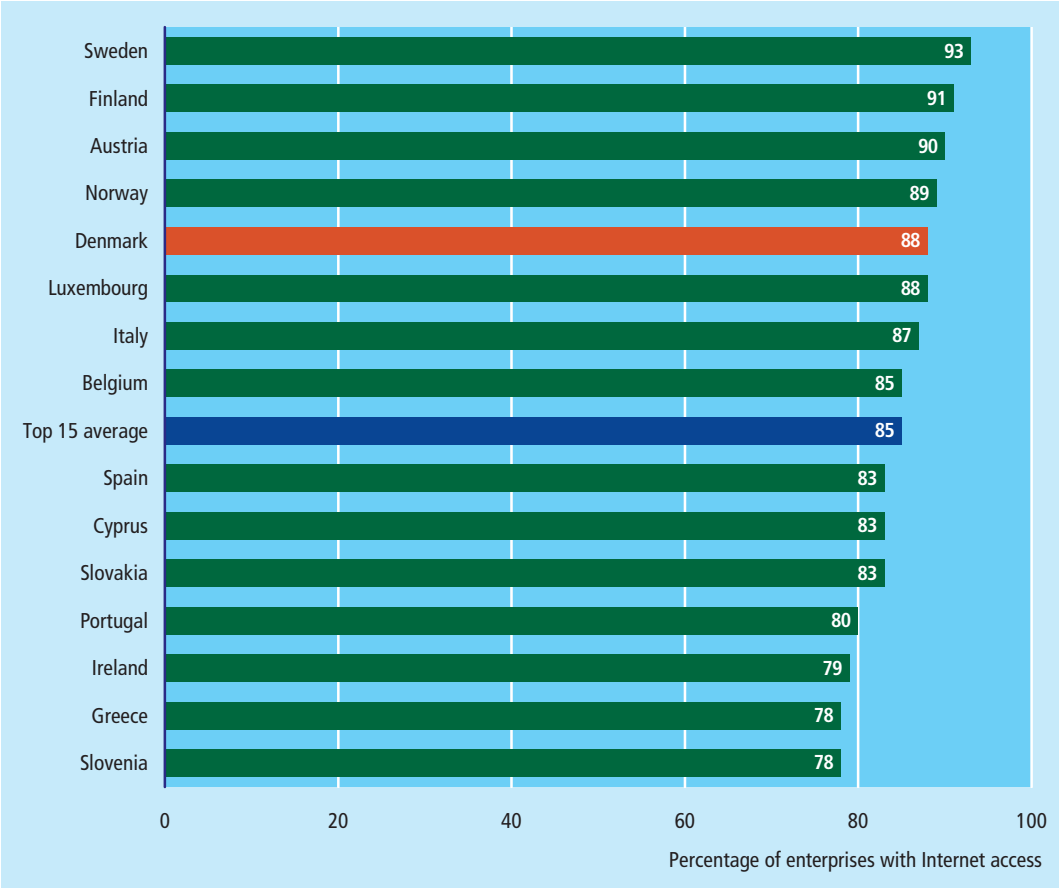
In Denmark, the number of ICT patent applications amounted to 41 per million inhabitants in 2001. This places Denmark just below the top 15 average of 58 applications per million inhabitants.

Finland in the lead

Finland has the highest number by far of applications per million inhabitants than the other countries in the survey. In 2001, Finland had a total of 151 ICT patent applications per million inhabitants, while the Netherlands had 131 ICT patent applications as the country with the second-highest ranking.

8. ICT security

Figure 8.1 **Enterprises with updated ICT security measures, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking. Security measures mean at least one measure. The updating must have been made within the last three months (including automatic updating of anti-virus programmes).
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

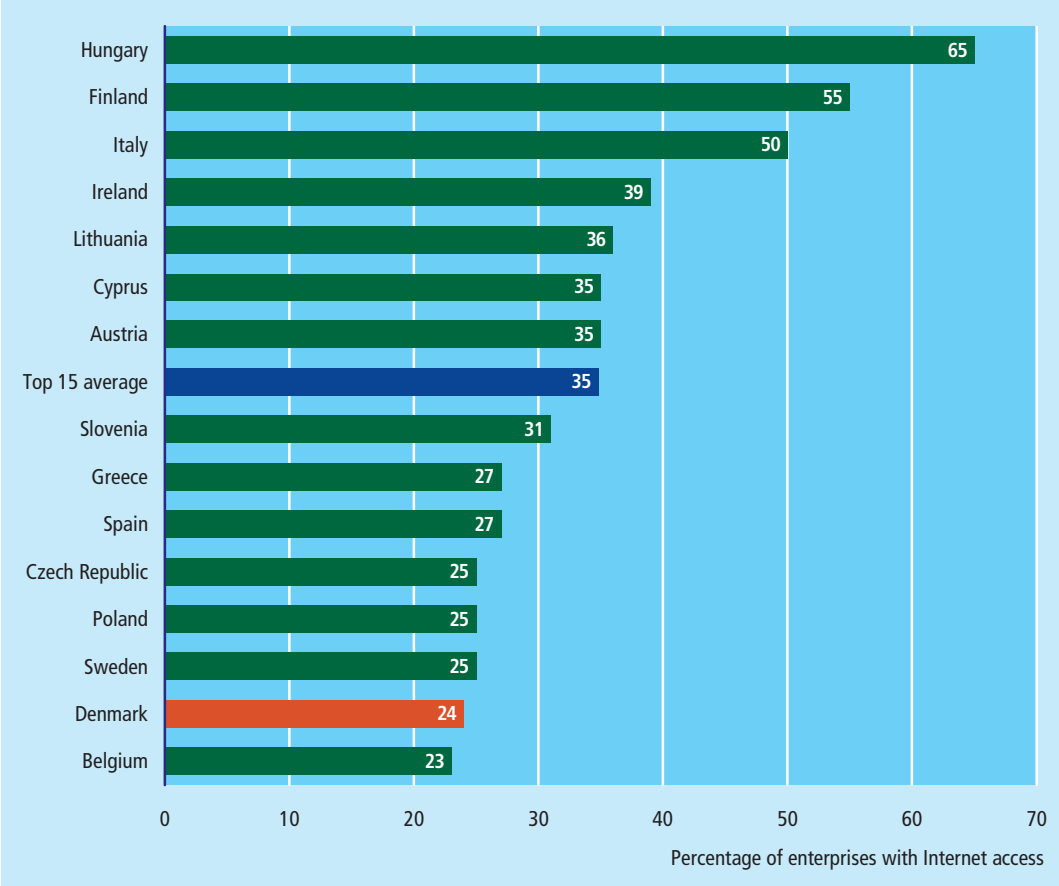
Danish ICT security above average

The vast majority of enterprises in the 15 EU countries with the highest ranking had updated their ICT security measures within the last three months in 2005. The percentage for Danish enterprises with Internet access is 88 per cent, only exceeded by Sweden with 93 per cent and Finland with 91 per cent.

Nearly all enterprises have ICT security measures

In this field there are no major variations between the European countries, and a large majority of the enterprises outside 'top 15' have updated security measures.

Figure 8.2 **Share of enterprises having encountered virus attacks, 2005**



Note. Top 15 consists of Norway and the EU countries with the highest ranking. Computer virus causing loss of information or time within the last 12 months.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

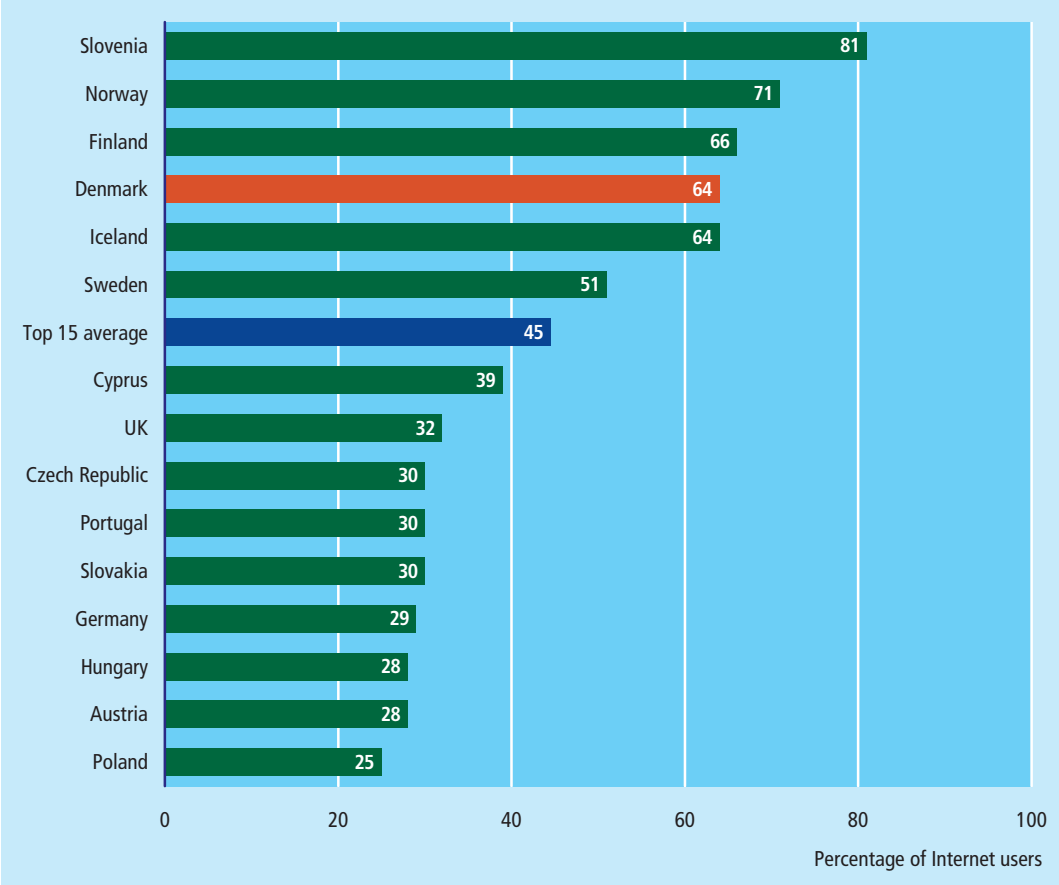
Disruptive virus attacks on nearly one in three enterprises

In 2005, 24 per cent of Danish enterprises had experienced virus attacks causing loss of data or working hours. In this respect, Denmark is well below the top 15 average of 35 per cent. Few countries are much above the average, namely Hungary with 65 per cent, Finland with 55 per cent and Italy with 50 per cent.

International phenomenon

The generally small difference between the countries could be due to the international character of computer viruses. The mutual differences that exist nevertheless may be due to several factors: The preparedness and size of the enterprises, their behaviour and the intensity of their use of ICT and networking. Therefore, no clear-cut conclusion can be drawn on the basis of either a high or a low position.

Figure 8.3 **Citizens who have used access codes or digital signature on the Internet within the last 3 months, 2004**

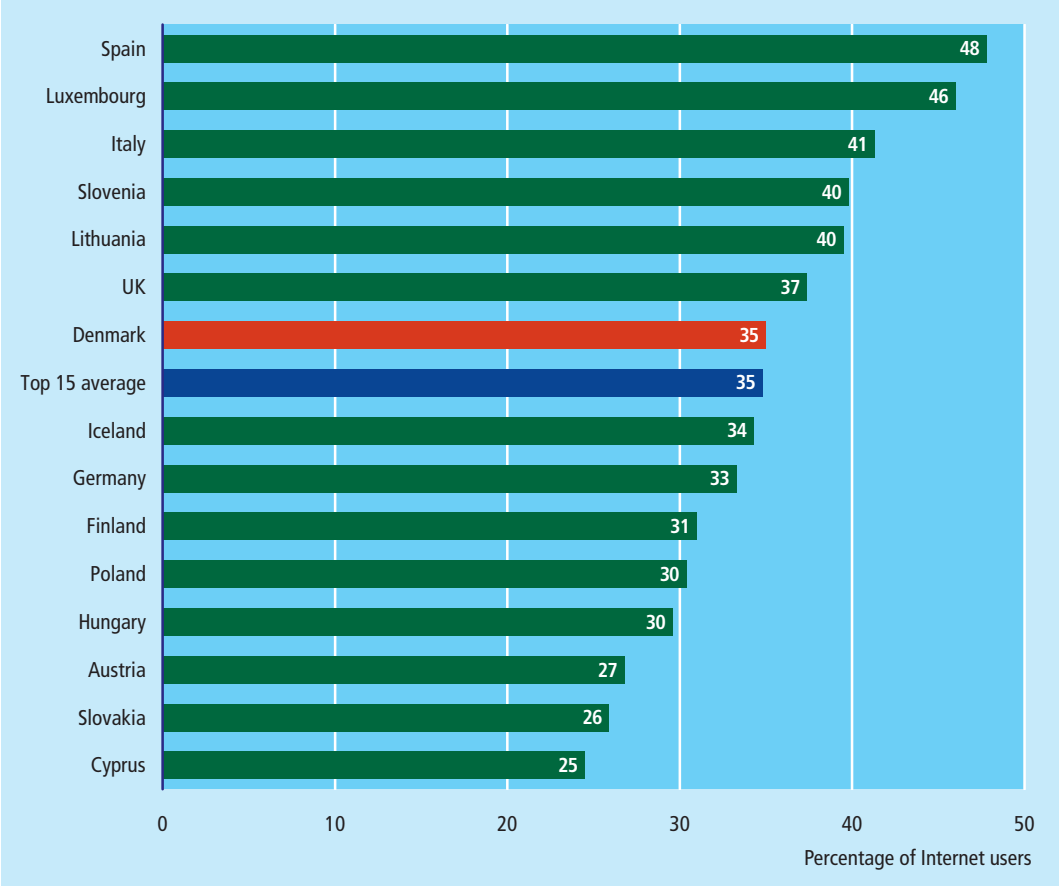


Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

Nordic countries rank high in terms of digital security

In 2004, 64 per cent of Danish Internet users made use of access codes or digital signature on the Internet within the last three months. This is somewhat above the top 15 average of 45 per cent. Countries ahead of Denmark are Slovenia with 81 per cent, followed by Norway with 71 per cent and Finland with 66 per cent.

Figure 8.4 **Share of citizens having encountered virus attacks, 2005**



Note. Computer virus causing loss of data or time within the last 12 months.
Note: Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, February 2006 (http://epp.eurostat.cec.eu.int).

One in three Danes experienced virus attacks

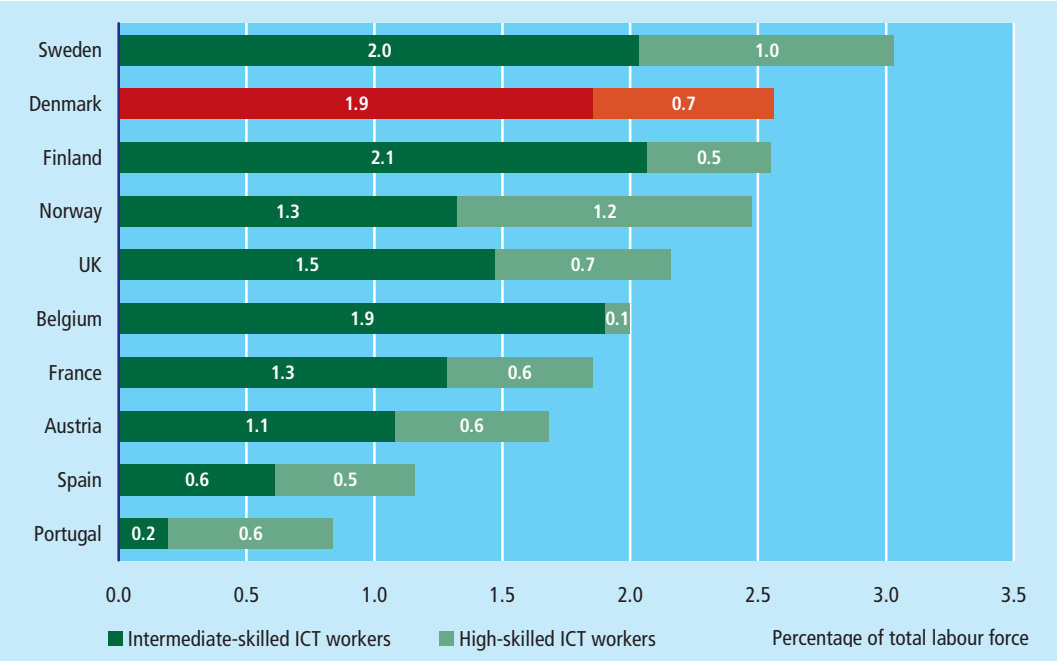
Denmark is among the countries in which a marked share of the population in 2005 experienced virus attacks in the form of loss of data or time. Thus, 35 per cent of Danish Internet users experienced virus attacks in 2005.

One in two experienced virus attacks in Spain

Compared to the other Nordic countries, the citizens of Denmark were the most exposed to virus attacks in 2005. With a share of 48 per cent, Spain had the highest exposure to virus attacks.

9. E-skills

Figure 9.1 **Share of high-skilled ICT workers, 2004**



Note. The definition of high-skilled ICT workers is based on occupational categories and includes ISCO-88, minor group 213. 213 comprises computing professionals, including computer system designers, analysts and programmers. Intermediate-skilled ICT workers include ISCO-88, minor group 312, who are computer associate professionals, including computer assistants, computer equipment operators and industrial robot controllers.
Source: Special extract from Eurostat, Labour Force Survey Database, 2004.

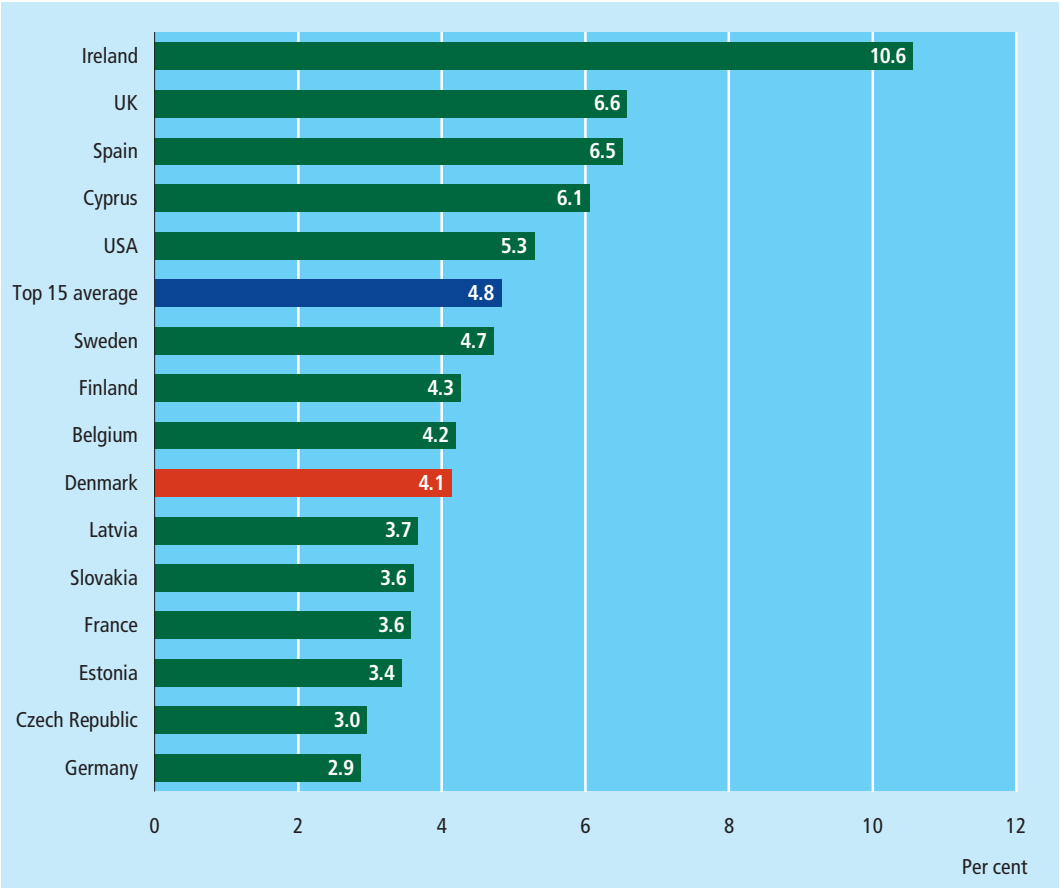
Denmark has the second-largest share of ICT jobs that require high skills

Of the countries included in the figure, Denmark has the second-largest share of workers in ICT jobs that require an intermediate or high level of skills. Altogether, 2.6 per cent of the labour force in Denmark has jobs that require at least intermediate e-skills, such as computer equipment operators.

Nordic countries at the top

The four Nordic countries have the largest shares of high-skilled ICT workers. The average share in the Nordic countries measured is 0.6 percentage points above the average for the EU countries measured.

Figure 9.2 **Share of persons with newly completed ICT education, 2003**



Note. Top 15 consists of the EU and OECD countries with the highest ranking. Persons with ICT education is calculated of the *computing* education group.
Source. Eurostat, 2005.

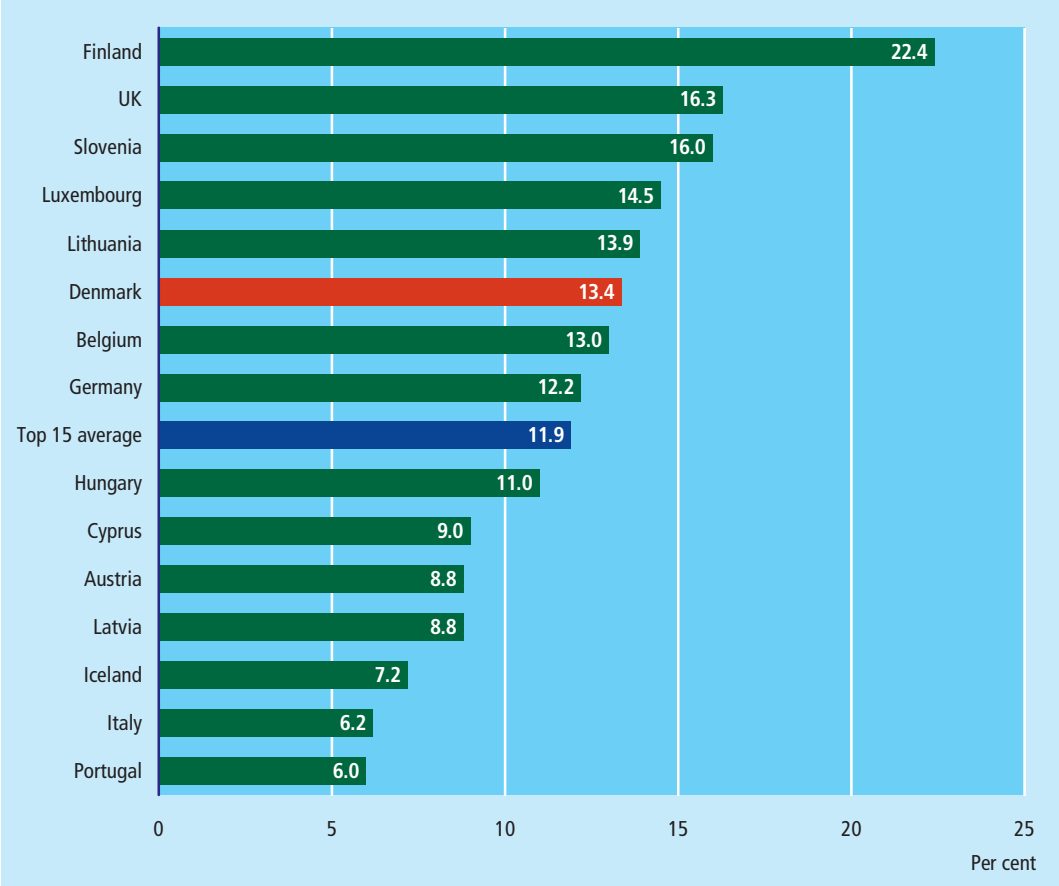
Denmark below average

In 2003, 4 per cent of graduates in Denmark completed an ICT education. This places Denmark below the top 15 average of 5 per cent. Ireland had the largest share by far of 11 per cent, which is 4 percentage points higher than the second-best country, the UK.

Nordic countries have low ranking

The Nordic countries generally rank low in relation to this indicator, as both Sweden and Finland have a smaller share of ICT graduates than the average with 4.7 per cent and 4.3 per cent, respectively.

Figure 9.3 **Internet use by the population for formal education, 2005**



Note. Top 15 consists of Iceland and the EU countries with the highest ranking.
Note. Formal education means the educational activities going on at primary schools, lower secondary schools, upper secondary schools, universities, etc.
Source: Eurostat, 2005.

13 per cent in Denmark use e-learning in connection with school

Danes have the sixth-highest use of e-learning for formal education of the countries in the comparative survey. The statistics include e-learning at all levels of education at the formal educational institutions, from primary schools to universities.

Top 15 average of 12 per cent

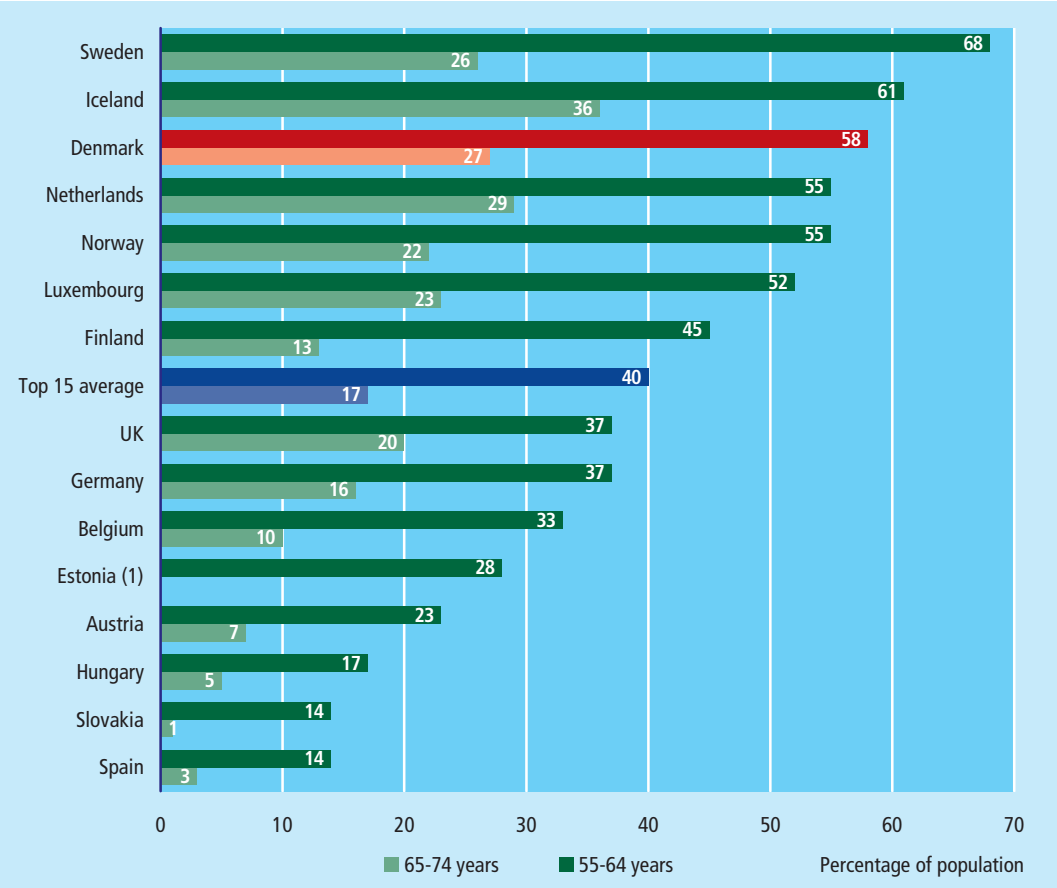
Finland has the highest share of e-learning in connection with education with 22 per cent; this is nearly 6 percentage points higher than in the UK, which comes in second. The top 15 average is 12 per cent for the countries measured.

Good Eastern European results

The Eastern European countries show relatively high use of e-learning in connection with formal education. Slovenia and Lithuania both rank higher than Denmark with 16 and 14 per cent, respectively.

10. ICT for all

Figure 10.1 **Internet use by the population aged 55 to 74 years, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.

[1] No data for 65-74-year-olds.

Source: Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

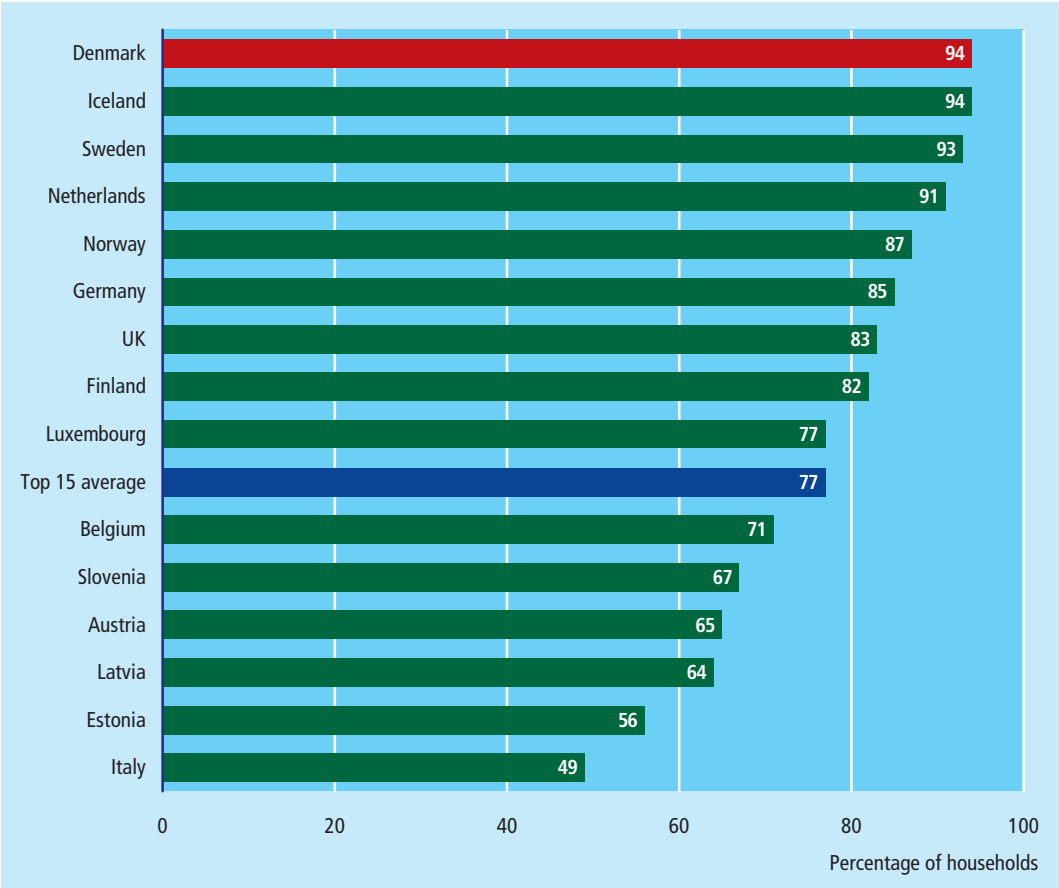
One in four 65 to 74-year-old Danes is on the Internet

Denmark ranks high in the EU regarding 55 to 74-year-olds that use the Internet at least once a week. As regards the 55 to 64-year-olds, Denmark has a share of 58 per cent, which is only exceeded by Sweden and Iceland. Similarly, the share for persons aged 65 to 74 years is 27 per cent in Denmark, which is the third largest share of the countries illustrated.

Few elderly persons on the Internet in Finland

Except for Finland, the Nordic countries rank highest in respect of the age group 55-64 years. In Finland, only one in eight 65-74-year-olds uses the Internet at least once a week. This share is below the average for the top 15 countries.

Figure 10.2 **Household access to the Internet - couples with children, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.
Source: Eurostat, January 2006 (http://europa.eu.int/comm/eurostat/).

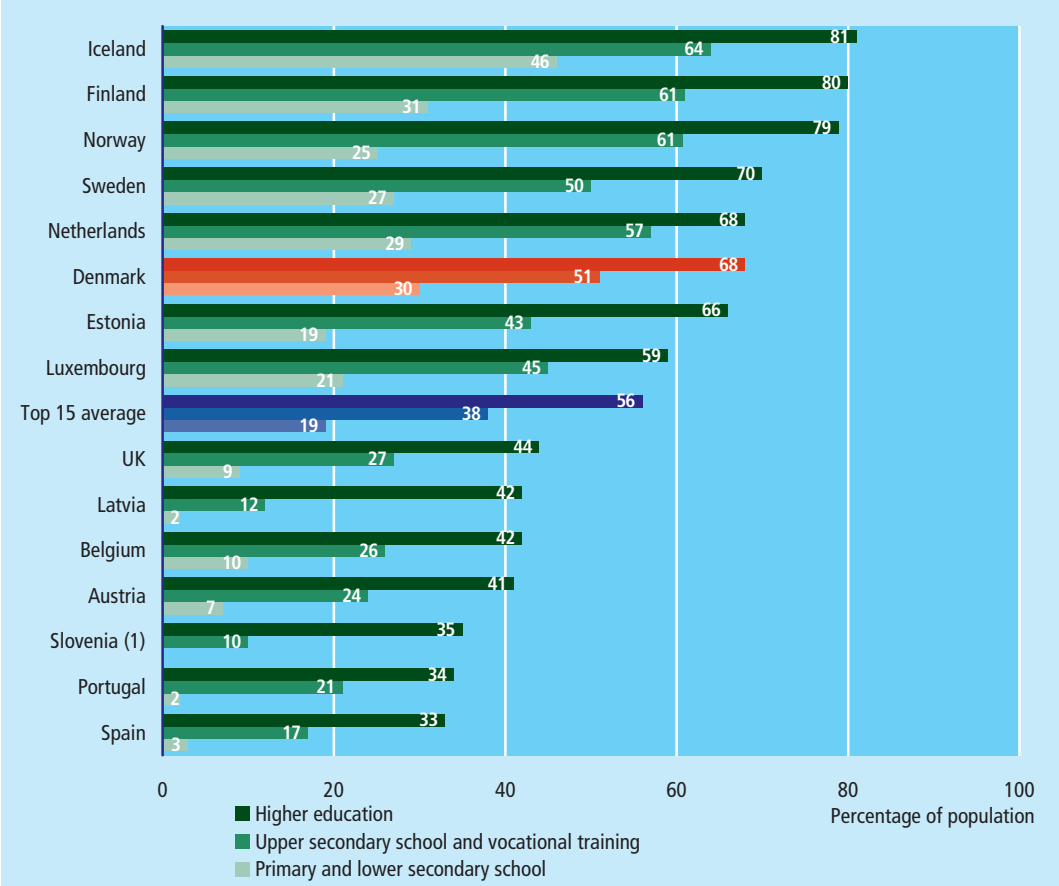
Danish couples with children are on the Internet at home

In Denmark, 94 per cent of couples with children had Internet access at home in 2005. Together with Iceland, Denmark ranked as number one among the countries in the survey.

Large spread in the EU

In terms of couples with children that had Internet access at home, the spread between the countries in the European Union was still large in 2005. In the Nordic countries, over 80 per cent of couples with children had access, while the shares in several Southern European countries were considerably below the top 15 average of 77 per cent.

Figure 10.3 **Internet bank use by the population, by educational background, 2005**



Note. Top 15 consists of Norway, Iceland and the EU countries with the highest ranking.

[1] No data for primary and lower secondary school.

Source: Eurostat, February 2006 (http://europa.eu.int/comm/eurostat/).

Denmark comes in third for persons with basic school education

The figure shows that 68 per cent of Danes with higher education used the Internet for Internet banking. The corresponding shares for primary and elementary school as well as upper secondary school and vocational training were 30 per cent and 51 per cent, respectively. In a European context, Denmark ranked as number three with respect to persons with basic school education, number five with respect to persons with upper secondary education or vocational training and number five with respect to persons with higher education.

Nordic phenomenon, but Estonia is doing well too

Use of Internet banking by the population is most frequent in the Nordic countries and in the Netherlands and Luxembourg. Estonia also has a high share of Internet bank use.