

Information society

7





Introduction

Information and communication technologies (ICTs) have now penetrated all areas of economic and social life. ICTs account for a significant increase in productivity and growth of GDP, and are transforming our societies in profound and unprecedented ways. The introduction of the Internet and the World Wide Web have led the development of the so-called information society. With access to the Internet, it is very easy to obtain information on almost anything. Search engines provide fast, easy access to websites and information sources on the World Wide Web. Many activities such as communicating, and selling or buying goods and services, can be done online. These developments have created new ways for people, individually or collectively, to take part in economic, social or political life. Because these activities are not bound to any specific geographical place, they can potentially bridge large distances. Basically, people can carry out these activities anywhere, as long as there is a connection to the Internet. Nowadays, it is possible to keep in touch with family members or friends via social networking sites, to share holiday pictures on the web, or make a video call with a friend via the Internet. Electronic shopping sites enable bargain hunters to buy or sell items via the Internet. ICTs support working from home or from other places outside the office, enabling more flexibility in the way in which work is organised, with benefits for both employers and employees. The ubiquitous presence of information and communication technologies carries the potential for completely new ways of participating in the economy and society.

The basic essential for benefiting from the information society, whether as a private individual, an employer or an employee, is access to information and communication technologies, i.e. electronic devices such as computers, and fast connections to the Internet. The term 'digital divide' refers to the difference between those who have access to the Internet and are able to make use of new services offered on the World Wide Web, and those excluded. The term explicitly includes access to information and communication technologies, as well as the skills needed to take part in the information society. The digital divide can be classified according to criteria that describe differences in participation according to gender, age, education, income, social groups or geographic location. **This chapter puts emphasis on geographical aspects of the digital divide.**

Policies within the European Union at national and European level have recognised the importance of bridging the digital divide to give citizens equal access to information and communication technologies and to enable them to take part in the information society. The Digital Agenda for Europe outlines a number of actions concerning very fast Internet access and a sustainable digital society. The key benchmarking indicators are defined in the European Commission's framework for 'Benchmarking Digital Europe 2011–15' ⁽¹⁾. This will monitor the development of the European information society and success in achieving the policy objectives set out in the Digital Agenda for Europe, which is a flagship initiative under the Europe 2020 strategy for smart, sustainable and inclusive growth ⁽²⁾, to further develop an economy based on knowledge and innovation.

The benchmarking framework distinguishes between annual indicators that monitor:

- basic aspects of the development of the European information society;
- special modules that focus on specific aspects.

The special modules change on an annual basis. For 2009, e-commerce is the topic of a special module on the use of information and communication technologies in households and by individuals. As well as basic indicators of the digital divide, the chapter presents selected results related to e-commerce.

Access to information and communication technologies

Access to information and communication technologies is at the heart of the digital divide. Geographical location are one aspect of that divide. Regional statistical data are available at European level on access to the Internet within households and on availability of broadband for going online. The Digital Agenda for Europe specifies fast Internet access as a specific area for action. New, innovative developments in electronic services need fast wired and wireless Internet access. That is why it is essential to foster and monitor the development of fast Internet access as part of the benchmarking framework.

In contrast to supply-side statistics, the Eurostat figures show the actual uptake of ICTs in households. In 2009, on average, almost two thirds (65 %) of households in Europe with members aged

⁽¹⁾ http://ec.europa.eu/information_society/europe/i2010/docs/benchmarking/benchmarking_digital_europe_2011-2015.pdf

⁽²⁾ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

between 16 and 74 had access to the Internet at home and more than half (56 %) had access to the Internet via broadband. These figures have grown rapidly in recent years, at an annual growth rate of 10 % for Internet access and 30 % for broadband access between 2004 and 2009.

Access to the Internet makes it possible to take part in the information society, but broadband connections enable Internet users to exploit the potential of the Internet to the full. In fact, a broadband connection is essential for many advanced Internet services, such as social networking sites, uploading and downloading of media content (video and audio files) or the use of online maps and satellite images.

Websites are getting richer in content, boosting demand for traffic volumes constantly, even for less advanced services such as e-mail.

There are wide regional differences in broadband access. They range from 84 % in Stockholm (SE11), Utrecht (NL31) and Noord-Holland (NL32) to 20 % in Kentriki Ellada (GR2). The leading regions are in Sweden, the Netherlands, the United Kingdom, Denmark and Finland. At the other end of the spectrum are regions with the lowest share of households with broadband access, in Italy, the Czech Republic, Bulgaria, Romania and Greece.

It is also possible to analyse regional differences in broadband access within a country. This enables consumers within a country to evaluate how 'connected' their region is relative to others, irrespective of the picture at European level. The lowest interregional differences at national level can be observed in Romania, Slovakia, Poland and Sweden, with differences of less than 10 percentage points. The highest differences are in Germany, Greece, the Czech Republic, Spain and the United Kingdom.

Map 7.1 shows the share of households with broadband connections in Europe. A closer look at the map reveals three different patterns of digital divide. First, there is a north-south gradient. The regions with the highest share of households benefiting from broadband access are in the Nordic countries, the United Kingdom and the Netherlands, while regions in southern Europe tend to have lower penetration rates.

The second pattern is longitudinal. Regions in the west and east of the European Union have lower Internet penetration rates than regions in its centre.

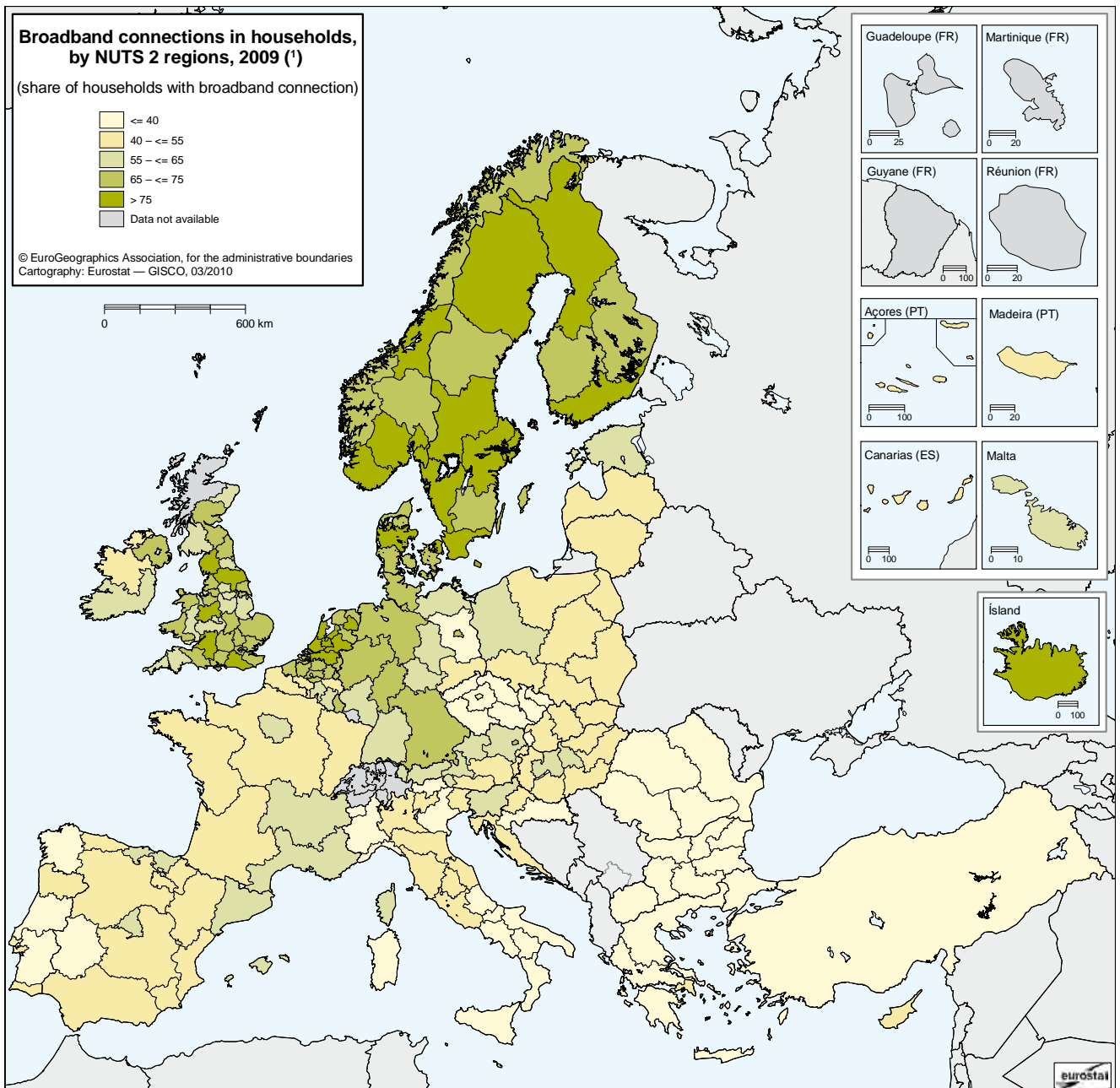
Lastly, households in urban regions tend to have higher broadband access rates than those in rural regions. At EU-27 level, 61 % of households in densely populated areas have access to the Internet via broadband, while only 46 % of households in thinly populated areas have a broadband connection. Depending on the structure and size of the regions within a country, this is the pattern for some regions on Map 7.1. In general, regions with big cities, e.g. Lisboa (PT17), Madrid (ES30) and Barcelona (ES51), Île de France (FR01), Wien (AT13), Attiki (GR3), Praha (CZ01) or Berlin (DE3), show up as islands within their regions because of their higher levels of broadband access. The effect is even more pronounced if the region is covered entirely by the conurbation. Exceptions to this rule are Brussels (BE10) and Bratislavský kraj (SK01), where neighbouring regions have higher broadband Internet access rates than the cities.

Figure 7.1 illustrates differences in the share of households with Internet access and broadband connections. Instead of showing divergences in percentage shares, they show how far a country is ahead or behind the average in the EU-27 in terms of time. So, for instance, the level of Internet access in Hungary for 2009 corresponds to the average the EU reached in 2007. In other words, Hungary is lagging two years behind. Denmark, on the other hand, is four years ahead of the EU average. The general trend of Internet and broadband access at EU level is calculated, including a forecast based on the current trend. The national figures are then compared to the European trend. In general, time lags for Internet access are higher than those for broadband connections. This is because take-up of broadband connections has shown an average increase of 30 % over the last five years, while the average increase in Internet access has been 10 % over the same time span.

In terms of Internet access, the Netherlands, Luxembourg, Sweden and Denmark are more than four years ahead of the EU average, while Greece, Romania and Bulgaria are more than four years behind. The maximum time difference between the slowest and fastest EU country amounts to 13 years. For household broadband connections, the leaders are Sweden, the Netherlands, Denmark and Finland with an advantage of more than two years, whereas Italy, Greece, Bulgaria and Romania are lagging behind the EU average by more than two years. The maximum time lag between EU countries for broadband connections is 4.5 years.



Map 7.1: Broadband connections in households, by NUTS 2 regions, 2009 ⁽¹⁾
(share of households with broadband connection)



⁽¹⁾ Germany, Greece, France, Poland and Romania, by NUTS 1 regions; Slovenia, national level; Czech Republic, 2008; Turkey, 2007 and national level; Finland, Åland (F120) combined with Länsi-Suomi (F19).

Source: Eurostat ([isoc_r_broad_h](#)).

Regular use of the Internet

The share of households with Internet access or broadband connections shows the potential for private use of the Internet from home. Map 7.2 provides an overview of the geographic distribution of regions according to actual use of the Internet in 2009. Regular users of the Internet are defined as those who use it at least once a week, regardless of location. For 2009, the average share of regular Internet users is 60 % of the target population. Access is correlated to regular use. More than 70 % of the population in regions in Scandinavia, Germany, the Netherlands, the United Kingdom and Luxembourg use the Internet at least once a week.

More people living in densely populated areas (66 %) regularly use the Internet compared to those living in thinly populated areas (51 %). As in Map 7.1, there is a latitudinal gradient in the share of regular Internet users. Regions in the east and west of the EU-27 have lower shares. For 2009, the share of regular users in almost all regions in Portugal, southern Italy, Greece, Bulgaria and Romania was below 40 %.

So far, the regional trends, i.e. the north–south trend and the latitudinal trend from centre to west and east, have been expressed in qualitative terms. To quantify this subjective observation, two approximation lines were calculated to express the level of regular Internet users depending on location. The location of each region is represented by its geographic centre. As statistics are based on population, the centres were calculated, taking into account the distribution of the population within each region. The trend in Figure 7.2 illustrates the latitudinal trend. To express a linear trend, a centre line has been assumed, passing through the Netherlands, close to the German–French and French–Italian borders. Distances are expressed in km from the assumed centre to the east and west.

Figure 7.3 shows the meridional, i.e. the south–north trend. Again, distances are expressed in km from south to north. Figures 7.2 and 7.3 show both statistically significant linear trends. Going from south to north, a distance of 100 km coincides with an increase of 1.9 % points in regular Internet usage. For the latitudinal trend, with every 100 km distance from the centre, the share of regular Internet users decreases by 2.5 % points. These trends describe an existing spatial

phenomenon in a quantitative way, but do not necessarily describe a causal relationship between the location of a region and the percentage of regular Internet users. Further analysis would be needed to describe and analyse suitable explanatory variables for these phenomena.

Online shopping: e-commerce attracts customers

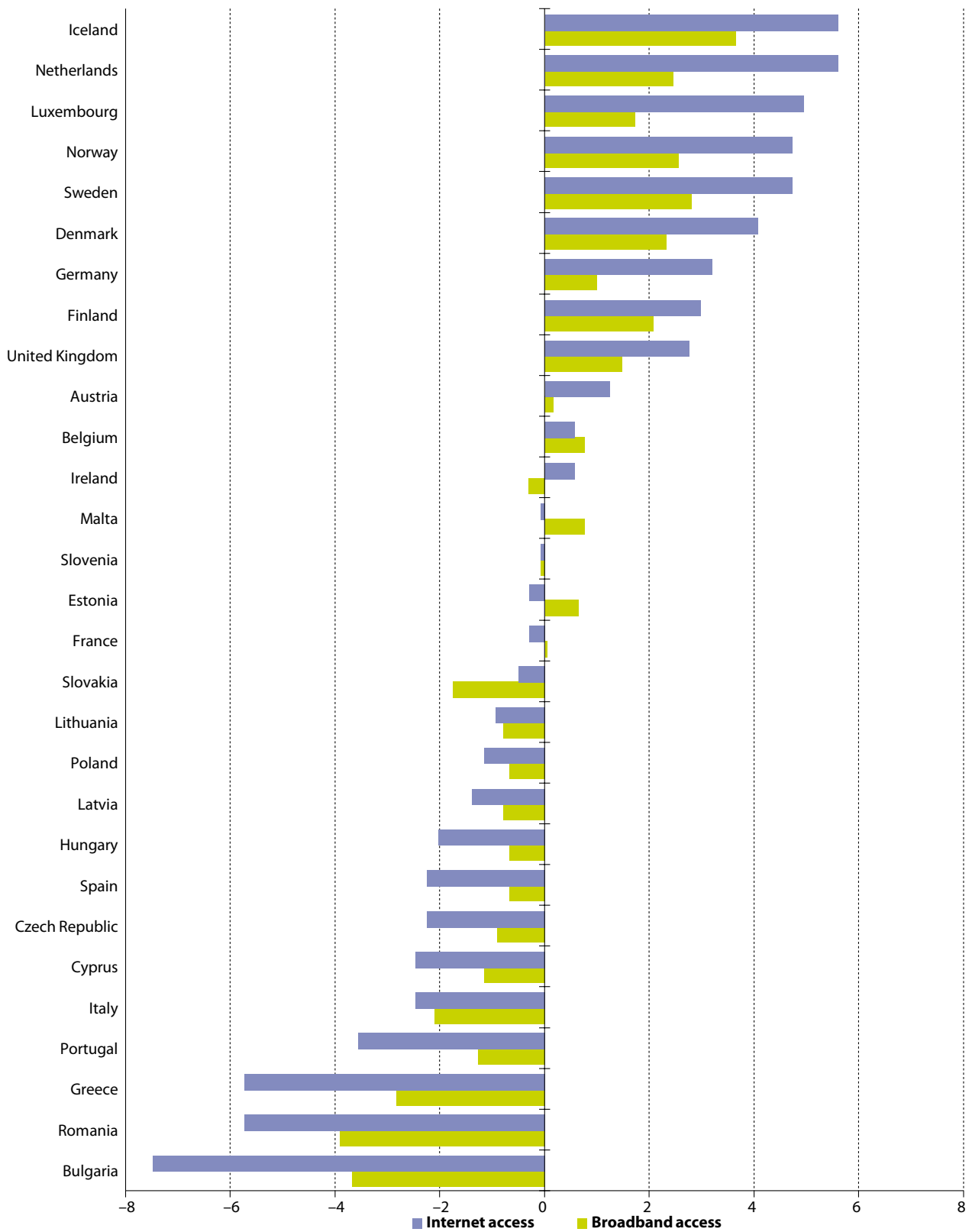
One of the most popular Internet activities is online shopping. The percentage of Internet users doing some shopping online has more than doubled over the last five years, and reached 43 % in 2009 for the EU-27. The advantages of e-commerce as compared to traditional shopping are that clients can order goods or services irrespective of the location of the shop. Opening hours do not apply, shopping is possible 24 hours a day, seven days a week. The Internet provides ample opportunities to get information about products in user forums or on other websites. It is very easy to compare the prices of selected goods or services, especially when using specialised price comparison websites. Shoppers are able to order products that are not normally offered where they live. For vendors, Internet shopping gives them opportunities to enlarge their potential client base. Competition is fierce, as competitors are only a few mouse clicks away. Trust is crucial for e-commerce, as seller and buyer do not have direct personal contact. Credit card details might be used fraudulently, or ordered goods might not be delivered properly, or, indeed, at all. It might take more effort to return goods if they do not meet the client's expectations. And some people might miss personal contact and advice while shopping online.

The most popular goods or services among Internet shoppers are travel and accommodation services (51 %), followed by clothes and sports goods (46 %) and household goods (37 %). These have shown the most dynamic growth between 2005 and 2009. Travel and accommodation services have grown by 17 % points and clothes and sports goods by 14 % points over the last five years. On the other hand, only 18 % of Internet shoppers buy computer hardware and 29 % order or download software.

Regional differences for e-commerce are shown on Map 7.3. Again, all regions in Norway, Sweden and Denmark, most of the United Kingdom, the Netherlands and Luxembourg have more



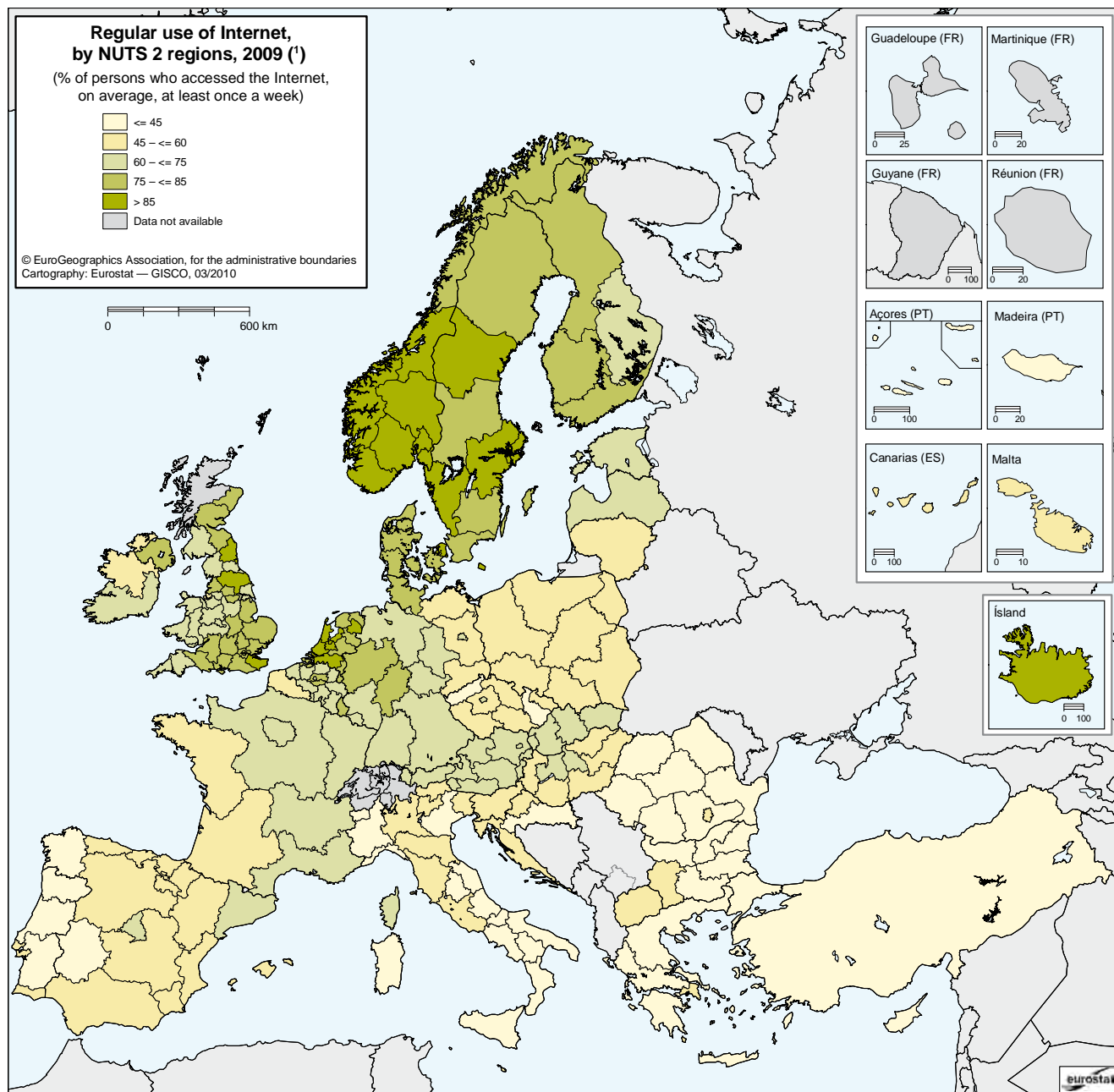
Figure 7.1: Time distance of Internet and broadband access of households, 2009
(computed distance in number of years as compared to the EU-27 average in 2009)



Source: Eurostat (isoc_si_broad and isoc_si_lia).



Map 7.2: Regular use of the Internet, by NUTS 2 regions, 2009 (1)
 (% of persons who accessed the Internet, on average, at least once a week)

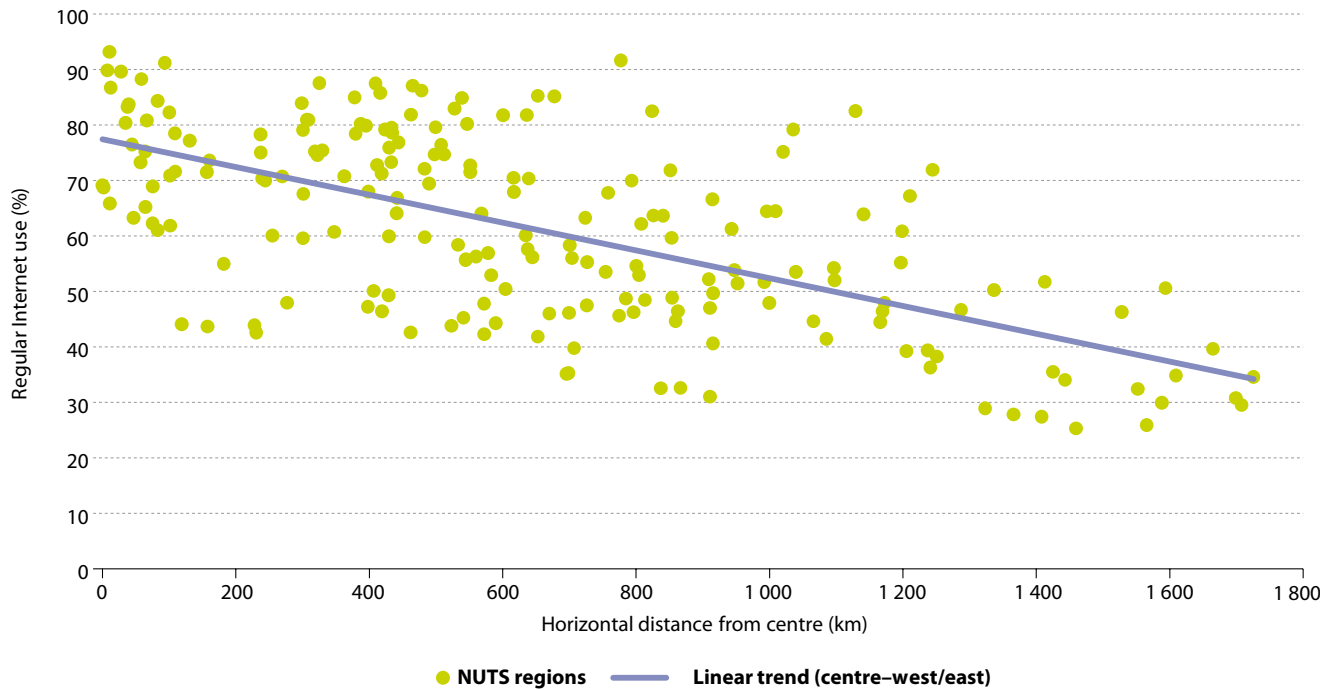


(1) Germany, Greece, France and Poland, by NUTS 1 regions; Slovenia, national level; Czech Republic, 2008; Turkey, 2007 and national level; Finland, Åland (FI20) combined with Länsi-Suomi (FI19).

Source: Eurostat (isoc_r_iuse_i).

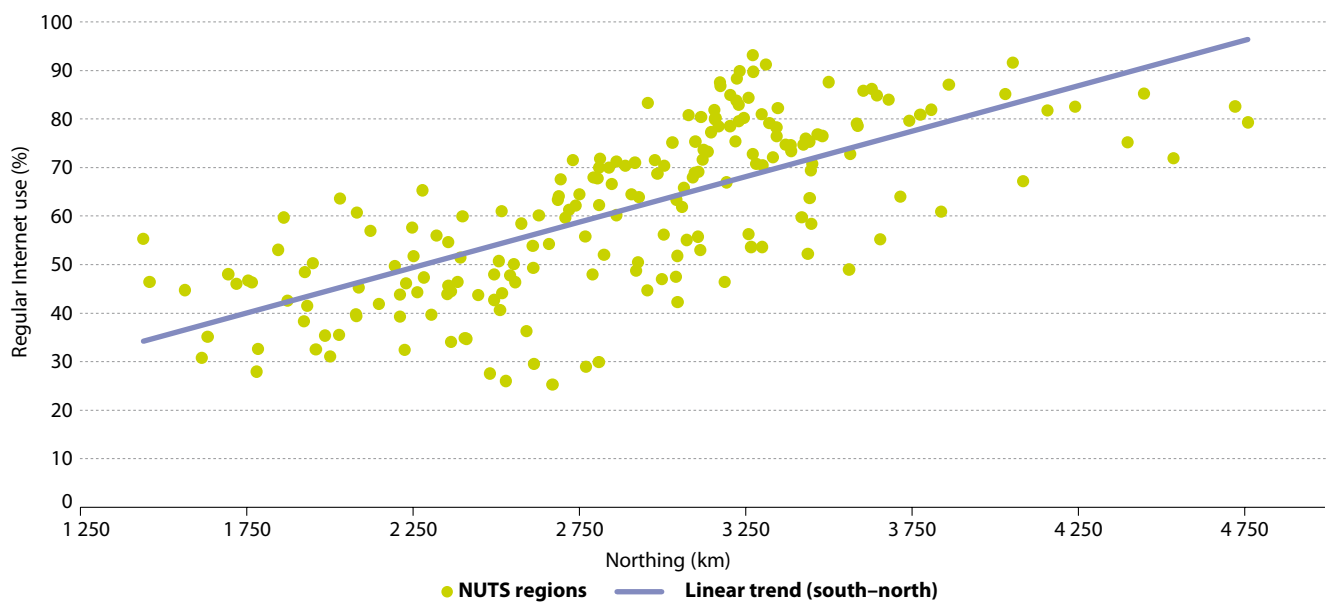


Figure 7.2: Regional trend of regular Internet use in horizontal direction to the west and east of Europe
(% of persons who accessed the Internet, on average, at least once a week)



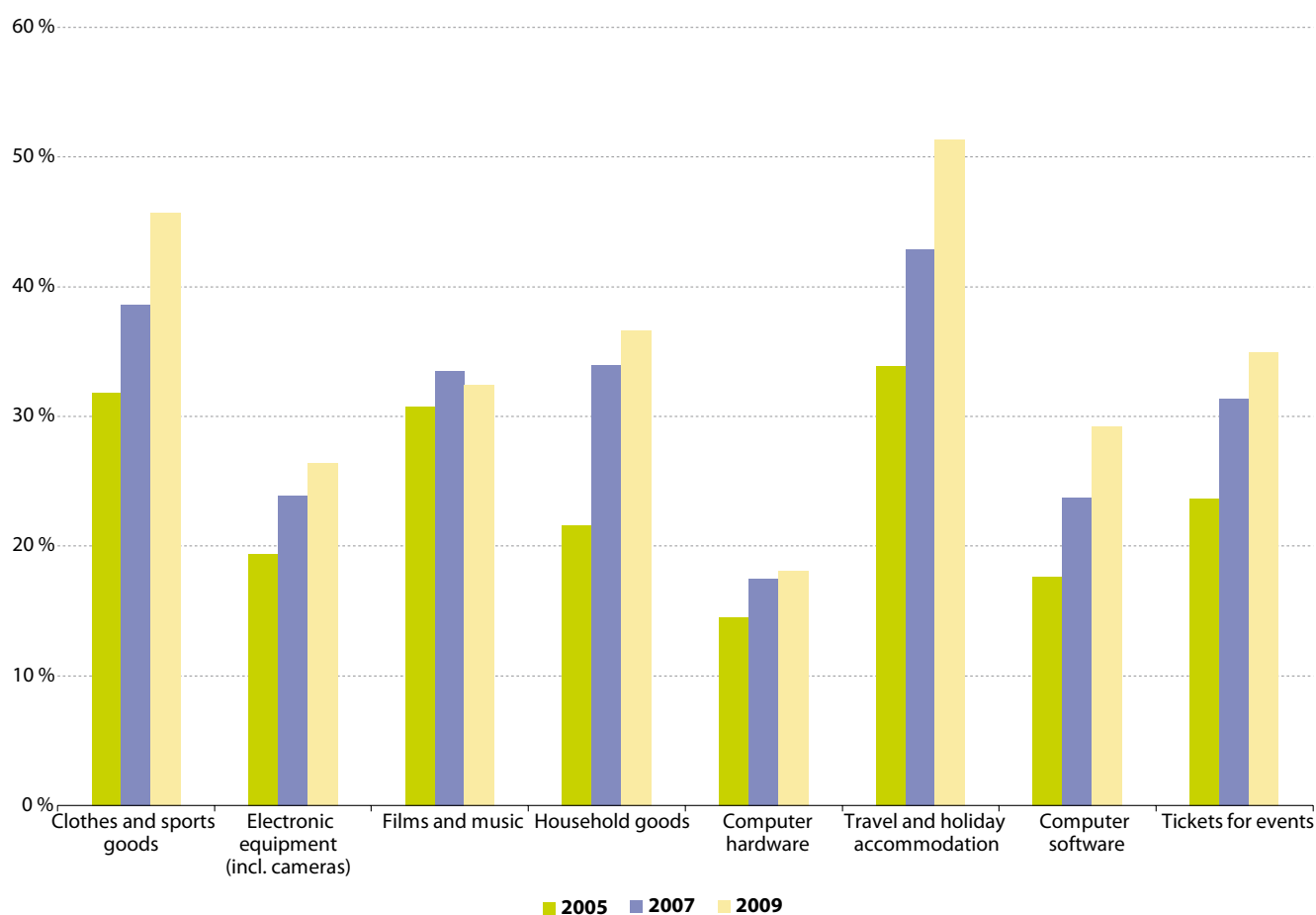
Source: Eurostat ([isoc_ci_ifp_fu](#)).

Figure 7.3: Regional trend of regular Internet use in vertical direction from the south to the north of Europe
(% of persons who accessed the Internet, on average, at least once a week)



Source: Eurostat ([isoc_ci_ifp_fu](#)).

Figure 7.4: Types of goods and services bought or ordered over the Internet for private use, EU-27
(% of individuals who bought or ordered over the Internet in the last 12 months)



Source: Eurostat ([isoc_ec_ibuy](#)).

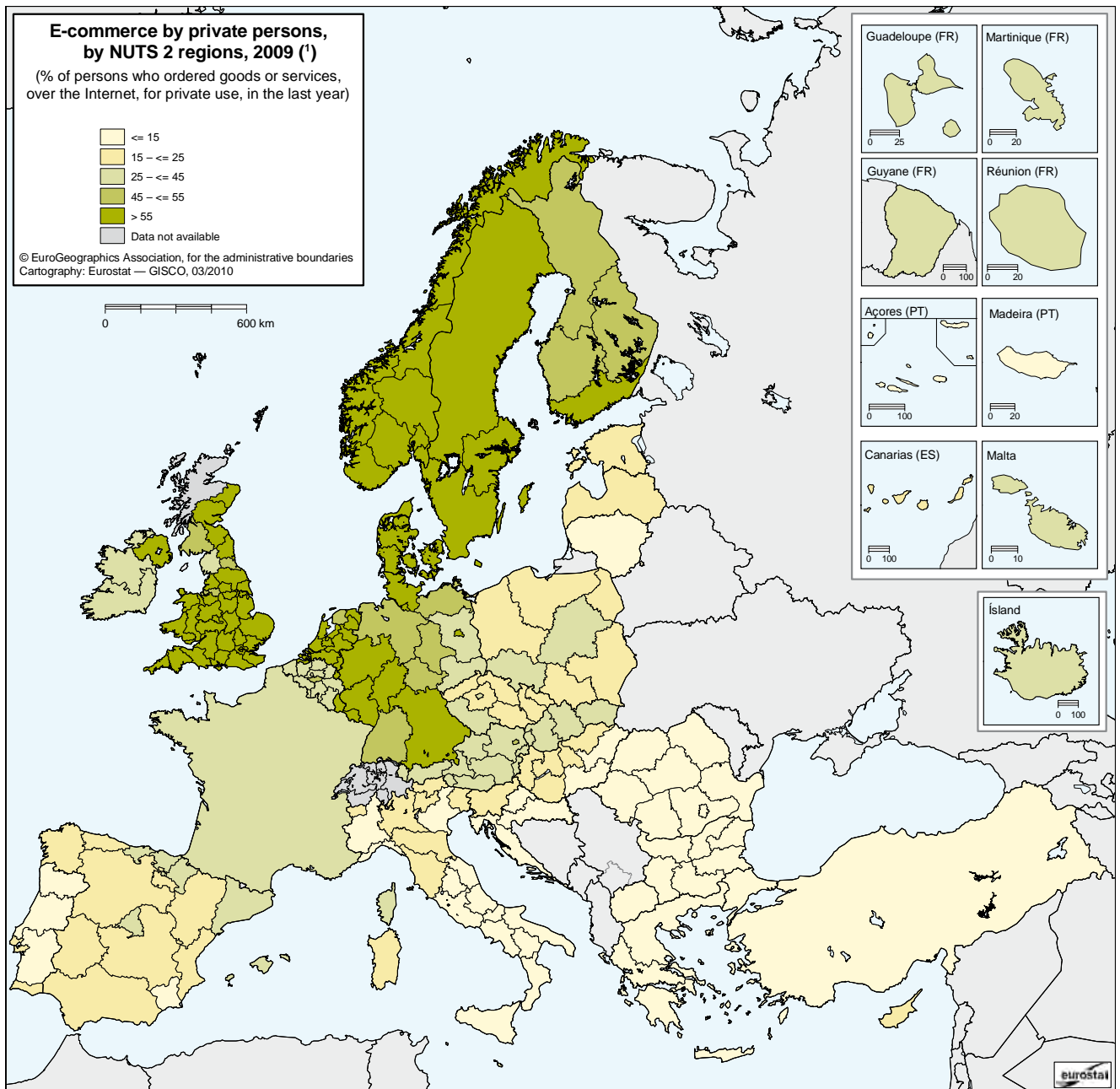
than 55 % of the population buying goods or services online. The EU-27 average is 37 % of the target population. The share for 2009 has increased by 5 percentage points as compared to the previous year. Almost all regions in the eastern and southern Member States of the EU-27 show a share of 25 % or less of the total target population. Except for Spain, the variation among regions in those Member States is quite low. All regions in Finland, Sweden, Denmark, the United Kingdom, the Netherlands and Luxembourg have a share of e-shoppers above 45 % of the total target population, whereas in Greece, Bulgaria, Romania and Lithuania, the share is under 15 %.

The 2009 survey on the use of information and communication technologies includes a special module on e-commerce by private persons. In addition to questions on the type of products and

services ordered online, data were collected on the volume of orders and reasons for shopping online. Figure 7.5 ranks reasons for online shopping. Lower prices come top, and are very important for half of the sample of online shoppers in 2009. Next come certainty about legal rights and guarantees, convenience, the opportunity to buy products not available locally, and the user-friendliness of a website. About 45 % to 50 % of online shoppers consider these reasons very important. About 30 % to 40 % rate a wider choice of goods or services, trustmarks on the website, or opinion ratings of users on the seller's website as very important. At least 75 % consider all of these reasons as important, to at least some extent. Certainty about legal rights is mentioned by more than 84 % of online shoppers, so it is crucial for future growth in e-commerce.



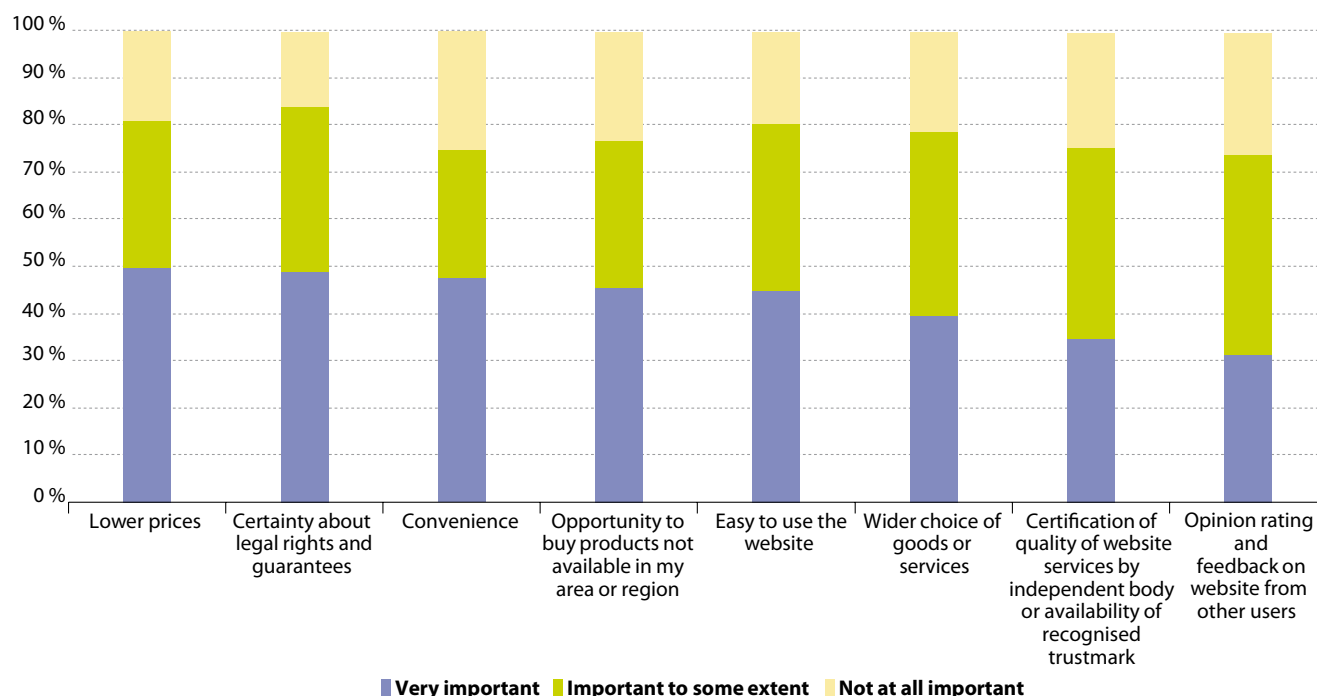
Map 7.3: E-commerce by private persons, by NUTS 2 regions, 2009 ⁽¹⁾
 (% of persons who ordered goods or services, over the Internet, for private use, in the last year)



⁽¹⁾ Germany, Greece, Poland and Sweden, by NUTS 1 regions; Ireland, France and Slovenia, national level; Czech Republic, 2008; Turkey, 2007 and national level; Finland, Åland (FI20) combined with Länsi-Suomi (FI19).

Source: Eurostat ([isoc_r_blt12_i](#)).

Figure 7.5: Arguments for ordering goods or services via the Internet, EU-27, 2009
(% of individuals who ordered goods or services, over the Internet, for private use, in the last year)



Source: Eurostat ([isoc_ibuy](http://ec.europa.eu/isoc_ibuy)).

Non-users of the Internet

At EU-27 level, 30 % of the population aged between 16 and 74 years do not use the Internet. The EU is promoting e-inclusion, that is, enabling all individuals and communities to get involved in all aspects of the information society ⁽³⁾. The idea is to promote the use of information and communication technologies to overcome digital exclusion and improve economic performance, employment opportunities, quality of life, social participation and cohesion. EU regional policies explicitly aim to facilitate affordable access to the Internet, including access to the network, terminals, contents and services, especially in remote and rural areas. The aim is to achieve broadband coverage for at least 90 % of the population by 2010. Eurostat figures from the survey on Community ICT use provide information on the take-up of ICTs in the regions. Actual take-up may lag behind the numbers of those potentially reachable.

In recent years, the share of non-users has dropped at EU-27 level. In 2009, it stood at 30 % of the target population, down from 45 % in 2005. Regarding distribution, there is a higher than average share of those with a lower level of education, older people,

or those living in rural areas. However, the share of non-users fell for all of these disadvantaged groups between 2005 and 2009. Still, they are lagging behind the trend, especially when compared to those with higher education, those under 25, or those living in urban areas.

The lower the educational level attained, the more likely a person is to be a non-user, and the difference widened between 2005 and 2009. The ratio between non-users with higher education compared to those with lower education increased from 1:4.6 in 2005 to 1:7.8 in 2009. That is to say, 52 % of those without higher education were non-Internet users in 2009, against only 7 % of those with higher education. Significant differences were also observed for older people, and to a lesser degree for place of residence, with a rural/urban divide. Take-up of the Internet mirrors and emphasises differences in society. Policies to combat these inequalities are vital to prevent them widening.

Regarding users, out of the 19 regions where the non-user rate was below 12 % in 2009, eight are located in Sweden, seven are in the Netherlands, two in Denmark, and one in the United Kingdom. The highest shares of non-Internet users are

⁽³⁾ http://ec.europa.eu/information_society/events/ict_riga_2006/doc/declaration_riga.pdf



located in Italy (one region), Portugal and Greece (both three regions), Bulgaria (four regions) and Romania (seven regions). The regions with the highest share of non-users, with two thirds of the target population, are Sud-Muntenia (RO31) and Sud-Vest Oltenia (RO41).

Map 7.4 shows the distribution of regions according to the share of persons who have never used the Internet as a deviation from the EU-27 average. Regions in green have fewer non-users than the EU-27 average, while regions in yellow and orange are above the EU-27 average. The geographical distribution shows similar patterns to those described above. All regions in the Scandinavian countries, Finland, Sweden, Denmark as well as the Netherlands, the United Kingdom, Slovakia and Luxembourg are below 25 % of the target population, while the share of non-users in almost all regions in Bulgaria, Greece, Portugal, Romania, southern Italy and Cyprus is above 45 %. As seen above, regions in the east and west of the EU-27 tend to have higher shares of non-users as compared to the EU-27 average. Urban regions with higher population density tend to be below the EU-27 average. This tendency is visible, for example, for Athina, Lisboa, Madrid, Paris, Wien, Praha or Berlin.

Conclusion

Statistics on use of information and communication technologies in households and by individuals are collected annually at level 1 of NUTS. Some EU Member States additionally provide information at NUTS 2 level. The statistics illustrate that there are considerable differences regarding access and use of information and communication technologies among the regions

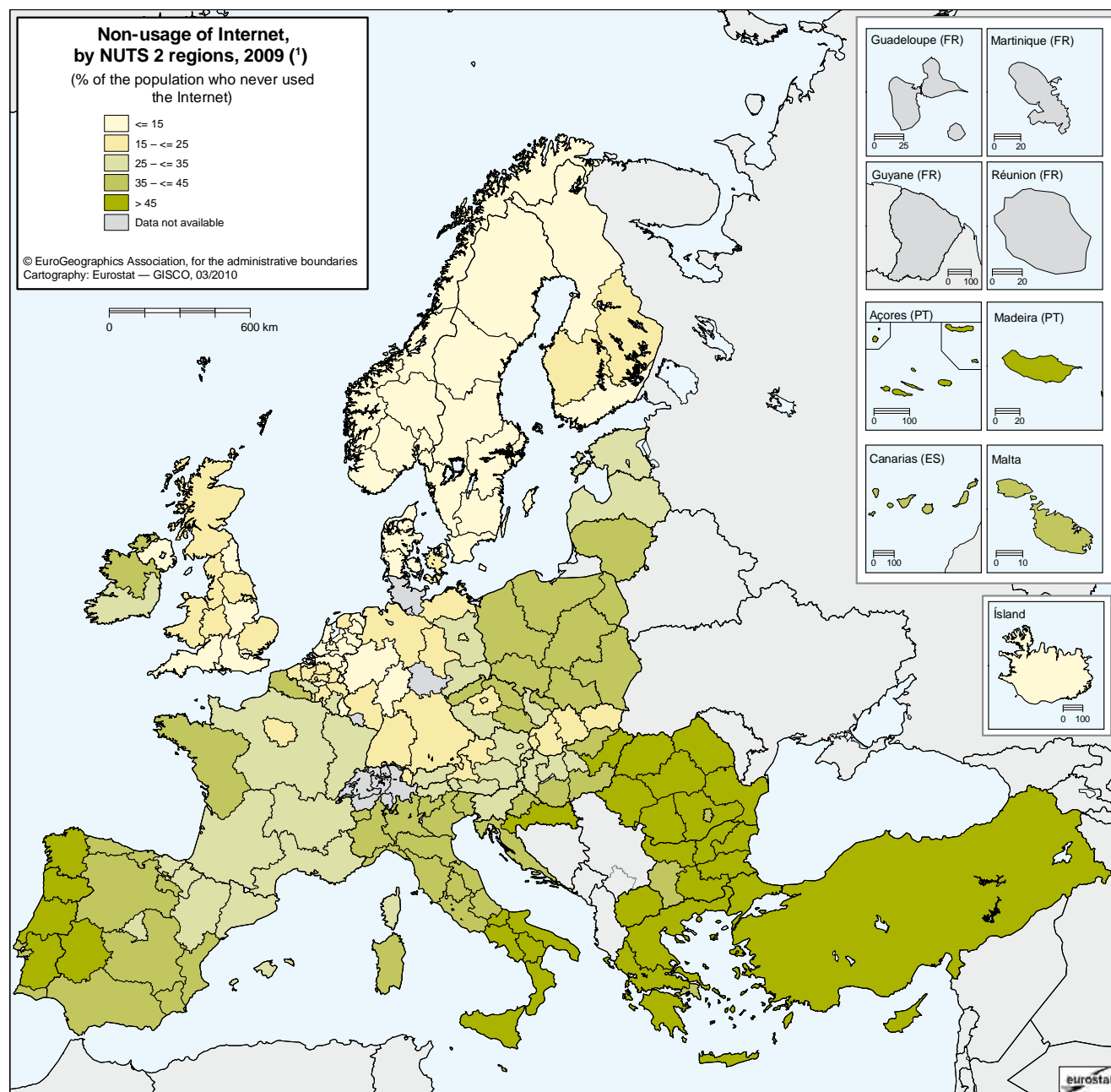
of the EU-27. Within the last few years, all Member States have increased access to and use of ICTs. However, differences in society regarding education, age and population density also appear in the pattern for the introduction of Internet and related services, and may reinforce these inequalities. To overcome this, the European Union has set explicit policy targets to achieve an inclusive information society. This includes the geographical dimension of the digital divide. The policies are benchmarked according to the 'Benchmarking Digital Europe' framework.

The maps in this chapter reveal specific spatial patterns that are visible for all indicators. There is a clear north-south gradient, with higher values of Internet access and use in northern Member States. The second pattern is a latitudinal pattern. Regions in the west and east of the European Union tend to have lower shares of Internet access and use than regions in the centre. Finally, urban or densely populated regions have a higher share of the population accessing and using the Internet than thinly populated areas. To achieve policy goals on participation in the information society, keeping up efforts to provide affordable access to the Internet via broadband, and educating people to equip them with the skills to access and benefit from Internet use will be essential. The new European 2020 strategy for smart, sustainable and inclusive growth⁽⁴⁾, and the related flagship initiative 'Digital Agenda for Europe' will emphasise measures extending very fast Internet access, in achieving a single digital market, and ensuring a sustainable digital society.

⁽⁴⁾ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>



Map 7.4: Non-usage of the Internet, by NUTS 2 regions, 2009 ⁽¹⁾
 (% of the population who never used the Internet)



⁽¹⁾ Germany, Greece, France, Poland and United Kingdom, by NUTS 1 regions; Ireland and Slovenia, national level; Czech Republic, 2008; Turkey, 2007 and national level; Finland, Åland (FI20) combined with Länsi-Suomi (FI19).

Source: Eurostat (isoc_r_cux_i).



Methodological notes

European statistical data on use of information and communication technologies have been available since 2003. Harmonised data have been published since 2006, based on Regulation (EC) No 808/2004 of 21 April 2004, concerning Community statistics on the information society. The regulation describes two modules or areas of statistical data production: statistics on the use of ICT in enterprises, and statistics on ICT use in households and by individuals. Annual Commission regulations define the set of indicators for which data are collected by the EU Member States. Regional data on a limited list of indicators have been available at the level of NUTS 1 since 2006 as a voluntary contribution by the Member States, and since 2008 on a mandatory basis. Some Member States provide regional data at NUTS 2 level on a voluntary basis. The data collection for each module is divided into a core part, i.e. access to ICT, and general use of ICT. Questions on access to ICT are addressed to the household, while questions on the use of ICT are answered by individuals within the household. Following the principles of the i2010 benchmarking framework, the model questionnaire includes an annual topic of special focus, i.e. e-government (2006), e-skills (2007), advanced services (2008), e-commerce (2009) and security (2010).

The survey covers individuals aged between 16 and 74, and households with at least one member within this age range. The reference period is the first three months of the calendar year.

The presentation of statistics on ICT use is restricted to a number of core indicators for which regional data are available. These regional indicators are 'access to the Internet at home by household', 'access to the Internet via broadband by household', 'Regular Internet users', 'Persons who have never used the Internet' and 'E-commerce by individuals'.

The term 'access' does not refer to 'connectivity', i.e. whether connections can be provided in the household's area or street, but to whether anyone in the household was able to use the Internet at home.

The term 'broadband connection' refers to the speed of data transfer for uploading and downloading data. Broadband requires a data transfer speed of more than 144 kbit/s. The technologies most widely used for broadband access to the Internet are Digital Subscriber Line (DSL) or cable modem.

Internet users are persons who have used the Internet within the last three months. Regular Internet users have used the Internet at least once a week within the reference period of three months.

For the purpose of the households' module, e-commerce via the Internet is defined as placing orders for goods or services via the Internet. Purchases of financial investments, e.g. shares, confirmed reservations for accommodation and travel, participation in lotteries and betting, and obtaining payable information services from the Internet or purchases via online auctions, are included in the definition. Orders via manually typed e-mails are excluded. Delivery or payment via electronic means is not a requirement for an e-commerce transaction.