

# Disparities in ICT Take-up and Usage Between EU Regions

Ivica Milicevic<sup>1</sup> and Karsten Gareis<sup>2</sup>

<sup>1</sup> Work Research Centre, Dublin, Ireland (i.milicevic@wrc-research.ie)

<sup>2</sup> empirica Gesellschaft für Kommunikations- und Technologieforschung mbH, Bonn, Germany  
(karsten.gareis@empirica.com)

## ABSTRACT

Regional data about the use of information and communication technology (ICT) are scarce. BISER (Benchmarking the Information Society: E-Europe Indicators for European Regions), a research project supported by the European Commission's IST Programme, is contributing to filling this gap, primarily by developing and piloting indicators for measuring Information Society developments at the regional level. Its main components are two representative surveys, a Regional Population Survey covering the entire population aged 15 and older and a Regional Decision Maker Survey which is targeted at establishments. They were conducted in early 2003 in a sample of 28 NUTS 2 regions across all EU Member States.

Since data from these surveys is not available at the time of writing, this paper makes use of data from an earlier population survey (SIBIS) which was carried out in 2002 in all EU Member States using a representative sample of 11,800 persons. The SIBIS project is a precursor of BISER and develops Information Society indicators for application at the national level. By using established regional typologies, in this case from the Study Programme on European Spatial Planning, it is possible to break down the data on ICT-related indicators from SIBIS according to types of regions such as agglomerations, service-dominated regions, service-biased regions, industrial regions, agriculture-biased regions, and agriculture-dominated regions.

The results from the analysis indicate that types of regions tend to differ significantly with regard to ICT take-up and usage, although this does not apply to all Information Society indicators, and not to the same degree.

## 1 Introduction

When terms such as the "Information Society" or the "New Economy" are used, the underlying context and assumptions are normally based on the notion of global or at least macro dimensions of change, i.e. at world, European or national level. But as these changes have swept through global and national economies as a whole, they are also restructuring and reshaping the *regions*, though in a variety of different ways and often with highly differentiated results.

The rapid development and increasing importance of information and communication technology (ICT) is considered to be one of the main drivers of these changes. The main ways in which these technologies impact on regions are by increasing the locational choice of firms, by offering new and often high-skilled jobs and new ways of working, and by providing solutions to problems of the mobility and access of individuals. Apart from these 'supply side' issues, the availability and diffusion of ICTs at the regional level has an important impact on 'citizen' side, i.e. in terms of offering a potential for improving public services available (e.g. availing of Internet based public services such as electronic government, health services, etc.), improving general quality of daily life, but also increasingly, and linked with the above, improving and sustaining employment opportunities.

However, there is clearly unequal access between regions to the technologies that drive the Information Society. The ability of regions to have access to and exploit the possibilities offered by new ICT affects their capacity to exploit their human resources, technology and

their development potential. This clearly means that the development of the Information Society has important implications for economic and social cohesion in Europe, understood as both cohesion between, as well as within, regions. This is all the more true in a globalising environment, where European regions have to compete not only at the EU but also at the global level.

Until recently, the discussion on disparities between regions in terms of access to ICT focused on the differences in the provision of the telecommunications infrastructure. As has been pointed out in the past (European Commission 1997), the cost of installing and operating new lines in poor/rural/peripheral areas is often higher than in other areas and the levels of GDP per capita tend to be lower. In addition, there may be a “time gap” concern, where provision may take longer in these so-called Less Favoured Regions (LFRs) which might explain and justify the need for public interventions. The “First Report on Economic and Social Cohesion” (European Commission 1996) found that the so-called *cohesion countries* (i.e. at that time, Portugal, Spain, Italy, Greece and Ireland) might require accompanying measures to help accelerate the development of networks, and this was especially the case within their regions.

The rapid changes driven forward by the liberalisation of telecommunications markets and the development of the regulatory framework of the telecommunications industry have had some beneficial effects on the LFRs. For example, in terms of digitalisation, figures on the number of lines connected to digital systems seem to show that networks have been modernised across countries as a whole without making a high regional distinction. Despite this, however (European Commission 2000a):

*...the technology gap between prosperous and less prosperous regions is much greater than the gap in GDP. In recent years, expenditure on R&D in the 25 least prosperous regions of the Union was only 25% of the Community average (0.5% of their GNP compared with an average of 2%). The gap is also striking in terms of jobs in the new technologies: 14.6% of the gainfully active population in the 25 most developed regions as compared with just over 4% in the 25 poorest regions.*

While arguably the telecommunications infrastructure is for the most part profitable, actual [levels of] access to ICT and investment in technology R&D and new technology jobs may be becoming increasingly divergent. Moreover, there is an increasing need to concentrate on other kinds of Information Society-related actions such as the stimulation of demand, human resources and training measures, and providing skills to enable citizens to access and use ICT and to raise awareness by citizens of the development of applications and [availability of] content. Both issues are increasingly relevant at regional level

For policy-making in this area, there is a strong need for *statistics* that show how the Information Society progresses and takes shape in different regions, or types of regions. These data must be capable of showing the shape and dynamics of developments in the supply and demand of ICTs and ICT applications. Unfortunately, the availability of data meeting these demands is still scarce at the national level, and particularly at the regional level inside of EU Member States. A related issue is the lack of comparable data, not least due to diverging methodological approaches and different time frames of data collection. The snapshot about regional ICT disparities presented in the second section of this paper makes a small contribution to the above task. It is useful to initially offer a brief description of the context that the paper is ultimately based upon, mainly the BISER IST project.

## **2 The context of empirical analysis of this paper– a brief overview of the BISER project**

BISER (Benchmarking the Information Society: eEurope Indicators for European Regions) is an ongoing research project which is being supported by the IST Programme of the European Commission. The aim of BISER is to develop, define and pilot statistical indicators for measuring and benchmarking the position of Europe's regions in the Knowledge Economy. Each region's economy and society will be examined in the context of the underlying structural foundations of the Information Society. The principal aim is to highlight differences in regional European economies and societies and to focus attention on policies which can promote cohesion in economic and societal development in the Information Society.

The rationale for the project is the scarcity of available data and indicators, which are adaptable to the regional level of analysis. Currently available data must more often than not be supplemented, and in some cases even substantially modified, by a fresh approach delivering the required statistics. Such indicators constitute a major part of the benchmarking framework necessary to follow up the e-Europe Initiative and to track the path of Europe's regions development in the Information Society. The BISER process consists of the following steps:

- assessment of existing conceptual approaches relating to the emergence of the Information Society and the Knowledge Economy with the aim to build a framework for analysing ICT's impact on regional development, showing the role of all relevant factors at an appropriate level of detail;
- definition of a theoretically founded and transparent set of statistical indicators, the "e-Europe Regions Indicators" to accurately track development of Europe's regions in the Information Society;
- analysis of current and forthcoming statistical measures from official supranational and national statistical agencies, commercial research firms and other sources and develop by the way of rapid prototyping adequate operationalisations of component variables for which fresh data collection is required;
- design and conduct of regional surveys of the general population as well as of key decision-makers in selected regions across all Member States of the EU and use the results to point up developments in subgroups of the economy;
- identifying patterns and opportunities to accelerate development through regional collaboration and/or targeted policies.

BISER e-Indicators will be piloted in a population survey and an establishment survey. The former will cover people's access and use of basic ICT equipment and the Internet, uses of ICT in the context of work, education and training, health, travelling, interaction with authorities and government, and usage for explicitly "regional" purposes, as well as demographic and other background variables. The latter will contain questions on business demography and background statistics as well establishments' usage of ICT, the Internet and e-business solutions in general and core business contexts, and ICT usage in R&D, human resources management and interaction with public authorities.

There are 211 European regions at the NUTS 2 (Nomenclature des unités territoriales statistiques) level and clearly a project like BISER can not carry out surveys in each of these regions since accuracy of the resulting metrics requires a minimum number of observations. Within the limits of budget, it was decided to select 28 out of 211. The regions cover the range of patterns of sectoral structure ("agricultural", "manufacturing" and "services", depending on the share of employment in each of the sectors) and economic output (measured by GDP per head) as well as Member States according to the distribution of population.

Within each region the sample is set up as a random probability sample which will provide a representative picture of the resident population (aged 15+) and of the region's business establishments. The business sample will include establishments (and thus cover also branch

offices and not only autonomous enterprises) from different industries across all economic activities but exclude establishments with less than 5 employees. Sampling will be managed as a stratified approach, i.e. done separately for groups of establishments conforming with certain criteria, in order to guarantee a sample representative of the industrial structure and employment size distribution in each region.

The population survey will provide a person sample (rather than a household sample) and will be based on random dialling methods predominantly. Sampling in each Member States will be carried out allowing for national differences regarding organisation of telephone number allocation and unlisted telephone numbers, and taking other national peculiarities into account.

In terms of research methodology, BISER will make use of Computer Aided Telephone Interviewing (CATI). This technique offers the advantage of quick and fairly reliable data collection from a central unit. While there have been some doubts about accuracy of randomisation for general population surveys, recent developments in sampling practices can provide for real probability samples even with rather poor list sources and the growing share of 'non listed' numbers – the recognised shortcoming being that a very small number of households without telephone are not reached. CATI also offers best field control, automated sample administration, simultaneous data entry and permits a complex branching of the interview flow depending on filter questions and thus allows to apply questions tailored e.g. to the respondent's experiences with ICT, a firm's equipment status etc.

Carrying out a cross regional survey in different geopolitical and cultural areas poses some considerable challenges. Most prominently, the translation of questionnaires is a very delicate issue to deal with. Questions are commonly regarded as stimuli that need to be set consistently for all participants if analysis should lead to reliable results – and much of questionnaire design literature attempts to meet the challenge that underlying concepts are understood unequivocally by respondents even if they share a common cultural backgrounds and language. This challenge is even greater when doing international and interregional survey research. Nevertheless, academic research referring to multi-lingual questionnaire design is definitely in its very infancy yet. BISER meets the challenge by commissioning professional survey institutes with a good experience in cross-European survey research and by monitoring translation by means of re-checking the translations carried out by the institutes with the help of national experts that have expertise both in ICT matters and in survey design. After finalising questionnaires in that way, pre-tests will be carried out using CATI. This will allow BISER to check for comprehensibility of questions, spot possible inconsistencies of the instruments. Interviewing is expected to finish by early April, with data becoming ready for statistical analysis by mid April, and first results, based on respondent answers condensed to single figures and metrics in the course of the summer of 2003.

### **3 Findings and initial results based on the existing data**

Research findings presented in this paper are focusing on a regional digital divide and disparities in use of ICTs. Empirical findings focus on the issues around access to and the [certain patterns of] use of ICTs by citizens of regions. Arguably, this is only one side of the story since it is only a proxy for the full scope of availability of all these technologies within regions – that is to say, the supply side is not covered in this paper. Nevertheless, it conveys a good picture based on the extent of diffusion of these technologies within the EU regions.

In terms of data sources, since data from the BISER surveys elaborated upon in the previous section is not yet available, this paper makes use of data from an earlier general population survey (SIBIS) which was carried out in 2002 in all EU Member States using a representative sample of 11,800 persons. Although designed and carried out for benchmarking on at least nation state level (e.g. EU 15 versus USA, EU 15 versus Switzerland) a significant number of

IS indicators were transferable to a regional level. Consequently the SIBIS project data was successfully disaggregated down to NUTS II level for the purposes of this paper.

With regard to other main aspect of methodological approach of this paper, the regional typology selected for this analysis is based on a work of DIW (German Institute for Economic Research) and EPRC (European Policies Research Centre)(Weise et al. 2001). It is based on the results of a cluster analysis using the variables population density and shares of agriculture, industry and services in total employment. The main objective of this approach is to build clusters of, in this case, regions that are as homogenous as possible with regard to the elements inside each cluster and as heterogeneous as possible as regards the profiles of the individual clusters.

The cluster analysis yielded the following six types of regions:

- Cluster 1 "Agglomerations": determined by exceptional high values for population density.
- Cluster 2 "Service dominated": All regions in this cluster show remarkably high share in service employment, with industrial and agricultural employment below the average.
- Cluster 3 "Service biased": This cluster combines regions with an above- average share in services but not dominated by services, i.e. they have also a significant share (close to average) of employment in either agriculture or industry.
- Cluster 4 "Industry": These regions all have above average shares of industrial employment and no specific strength in either agriculture or services.
- Cluster 5 "Agriculture biased": These regions show above average shares of agricultural employment. However, all regions in this cluster also have comparatively high shares in either industrial or service employment.
- Cluster 6 "Agriculture dominated": These regions are characterised by very high shares of agricultural employment.

Here it should be noted that, for a number of reasons, NUTS II regions are not perfectly suited for the analysis of spatial disparities in ICT use: The NUTS nomenclature uses normative criteria for the delineation of regions (as opposed to analytical criteria). Normative regions are the expression of a political will; their limits are fixed according to the tasks allocated to the territorial communities, according to the sizes of population necessary to carry out these tasks efficiently and economically, and according to historical, cultural and other factors. The delineation of normative regions does usually not take account of (and hence does not correspond with) spatial relationships which underlay regional development, e.g. between the living and working locations of the labour force (commuting regions). For this, a system of analytical (or functional) regions would be needed which would have to be defined according to analytical requirements. In spite of these shortcomings, BISER makes use of NUTS mainly for two reasons:

- because of the lack of a uniform system of functional regions that covers the whole of the EU;
- because of the need to ensure comparability and coherence with other data being used at the sub-national level, mainly the REGIO database of the European Commission (DG Regio).

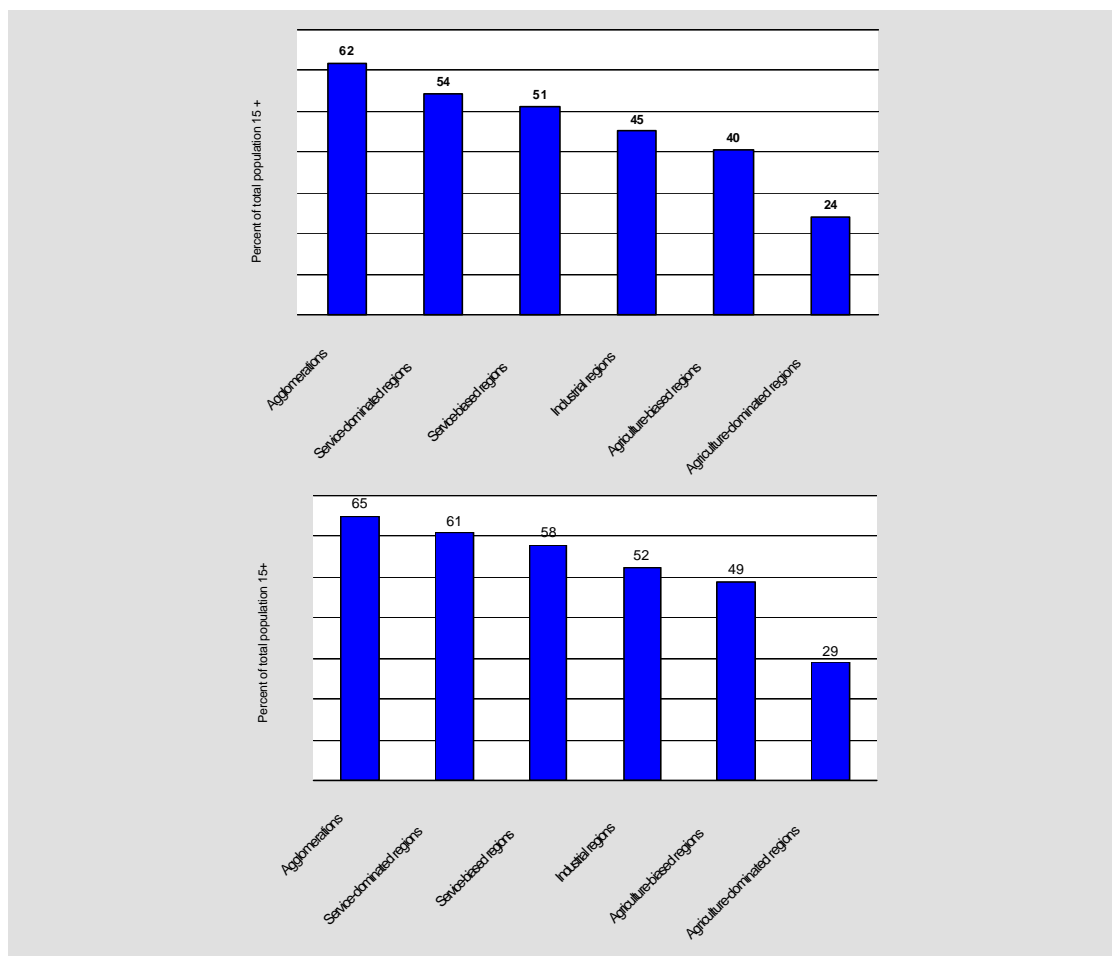
In terms of the method of statistical analysis employed for the purposes of this paper, the main emphasis is on bivariate analysis, based on straightforward Information Society indicators, with some utilisation of composite indicators where appropriate. While the main units of observations are regions (NUTS II level), the main units of analysis are effectively individuals residing in these regions. All findings presented are statistically significant ( $p < 0.05$ ).

The following indicators were considered, within region type:

- Share of population who use computers (for work or for private purpose)
- Share of population who use the Internet (reference period 4 weeks)
- Share of population who have access to the Internet at home (broadband/narrowband)
- Regional digital divide (a composite indicator, combining the above three, measuring the relative gap in relation to EU average)
- Share of workforce who avail of e-learning for work-related learning
- Share of workforce who practise multi-locational work (telework)
- Share of workforce who practise tele-cooperation
- Share of Internet users who have bought online in the 12 months prior to the survey
- Share of population o Internet users who have done online banking or purchased financial products online in the 12 months prior to the survey
- Use of the Internet to obtain health information amongst the population of Internet users
- Share of population who have a mobile phone for own personal use

Next, we present the findings and illustrate them graphically. We start with the indicators of basic access to ICTs and move on to highlight some aspects of use patterns, both for private purposes, be they commercial or non-commercial in nature, as well as those that are mainly work related.

**Figure 3-1. Prevalence of Internet use (top) and a computer use (bottom) by region type**

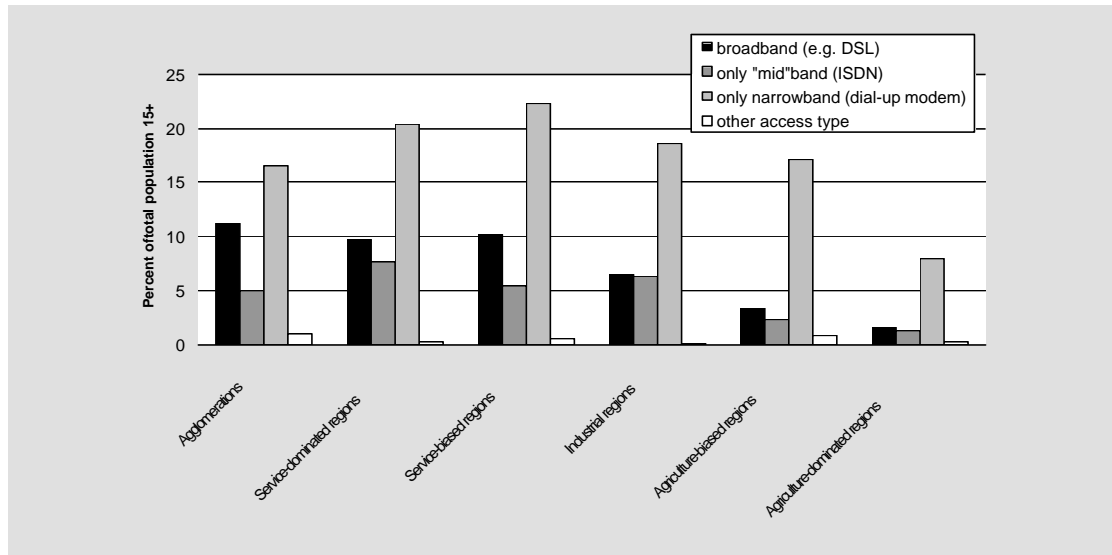


Source: SIBIS General Population Survey, 2002. Base: Total population aged 15+

Usage of some of basic ICT tools and applications is considerably dependent on the type of region. Thus densely populated regions and those where service sector is dominant economic

activity appear to be much more likely to use the Internet, while their residents are also more likely to use a computer (Figure 3-1). The difference is even more pronounced in terms of quality of access: While around 10% of users located in agglomerations and service-dominated/biased regions have broadband access to the Internet at home, the respective figure for agriculture-dominated regions is only 2% (Figure 3-2).

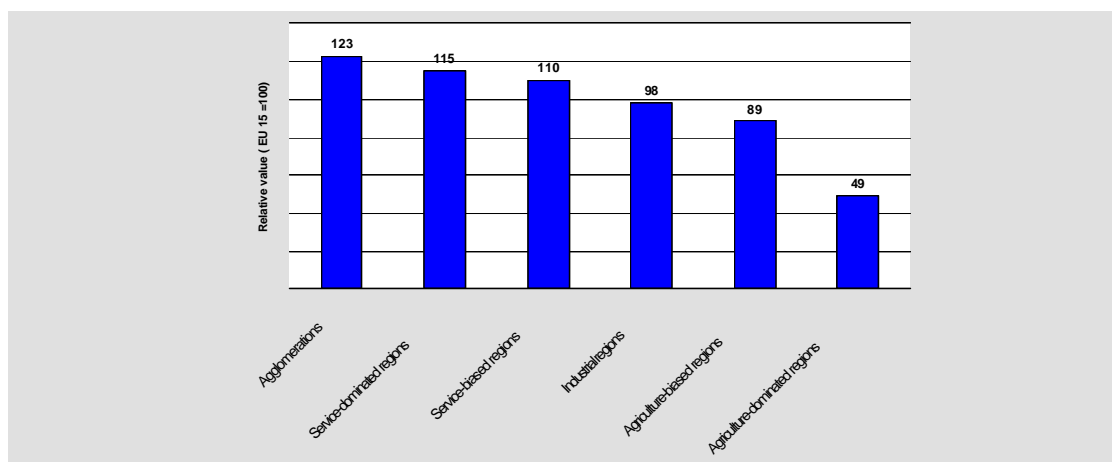
**Figure 3-2. Types of Internet access – prevalence within regions, by region type**



Source: SIBIS General Population Survey, 2002. Base: Total population aged 15+

The size of digital divide between regions can be well assessed by utilising a composite indicator that combines some basic access and use indicators. This approach was followed by generating Digital Divide Index (DIDIX), based on utilisation of the indicators deemed most relevant for capturing the basic digital divide at the regional level. It is effectively a summary measure of home access rates, Internet use rate, and computer use rate. As such, it is a relative measure, capturing the divide in relation to EU average. A value of 100 on the DIDIX indicates that the regions of this type are at the EU average. As illustrated in Figure 3-3 below, the size of the digital divide, expressed in this way, between the regions appears to be substantial, with agriculture-dominated regions reaching only half the EU average with regard to access to and use of basic ICTs.

**Figure 3-3. Relative digital divide based on access and use of ICTs , by region type**



Source: SIBIS General Population Survey, 2002

### Vignette 1 - DIDIX background

Digital Divide Index (DIDIX) is based on the utilisation of the indicators deemed most relevant for capturing the basic digital divide in relatively advanced Information Societies such as the EU. The rationale is to emphasise the *usage* of technologies. It was nevertheless deemed important to include home access indicators, given the expectations that access at home should become more important as more and more transactions relevant for everyday life are set to become available and subsequently performed online. A computer use indicator does not distinguish between the location of use. The index composition is elaborated below.

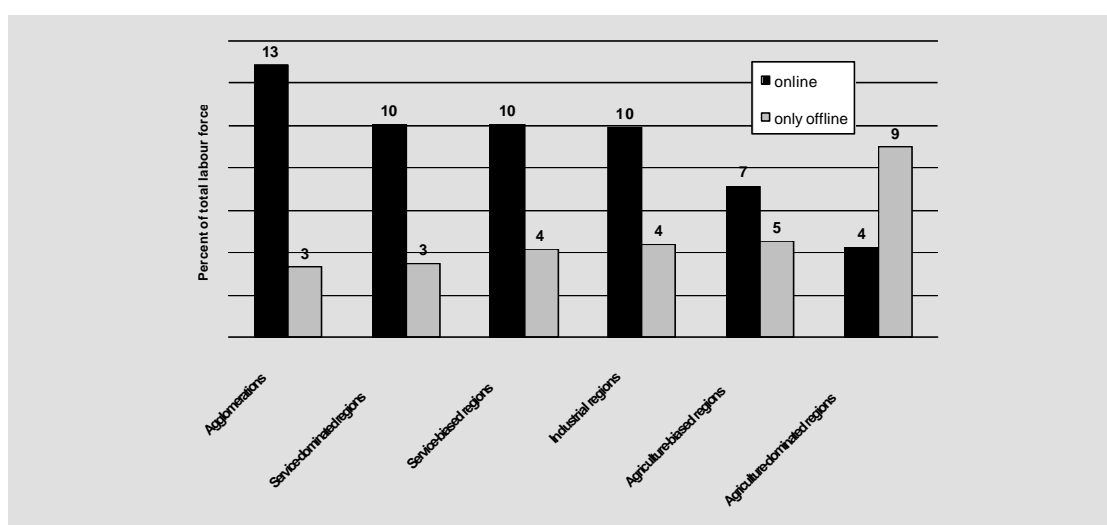
Indicator	Definition	Weight
Percentage of computer users	Data are based on the Sibis GPS survey question "Have you used a PC, Mac, or any other computer, for work or for private purposes – in the last four weeks?"	50%
Percentage of internet users	Data are based on the Sibis GPS survey question: "Have you used the internet at least once in the last four weeks, at home, at school, or work or at any other place?"	30%
Percentage of internet users at home	Data are based on The Sibis GPS survey question (A5): "Do you have access to the Internet in your home?"	20%

The DIDIX approach follows the work undertaken by Hüsing and Selhofer (2002), which was further utilised in Sibis project (SIBIS 2003a). The main aim was to capture the levels of digital divide in terms of at risk population subgroups (i.e. in terms of gender, income, age and education divide).

Going beyond basic access and use indicators, it was sought to ascertain whether and to what extent there exist differential patterns of use of ICTs depending on region type. One of the main issues here concerns the use of ICTs for supporting certain work-related activities.

Probably best starting point is skill acquisition (at the level of workplace). The relevance of work related training and life long learning in terms of enhancing individual potential for participation in Knowledge Economy are well recognised (Finke 2000) and participation rates are increasingly being monitored. This activity was also undertaken by the SIBIS pilot survey, in which the EU labour force was asked whether they participated in work-related training provided by their employer or another organisation, or practised self-directed learning which was related to their work. While the differences regarding this particular aspect appear to exist, they are not strongly pronounced at regional level (indeed, much larger differences in rates of labour force engaging in life long learning appear to exist at nation state level).

Figure 3-4. Prevalence of E- learning by region type

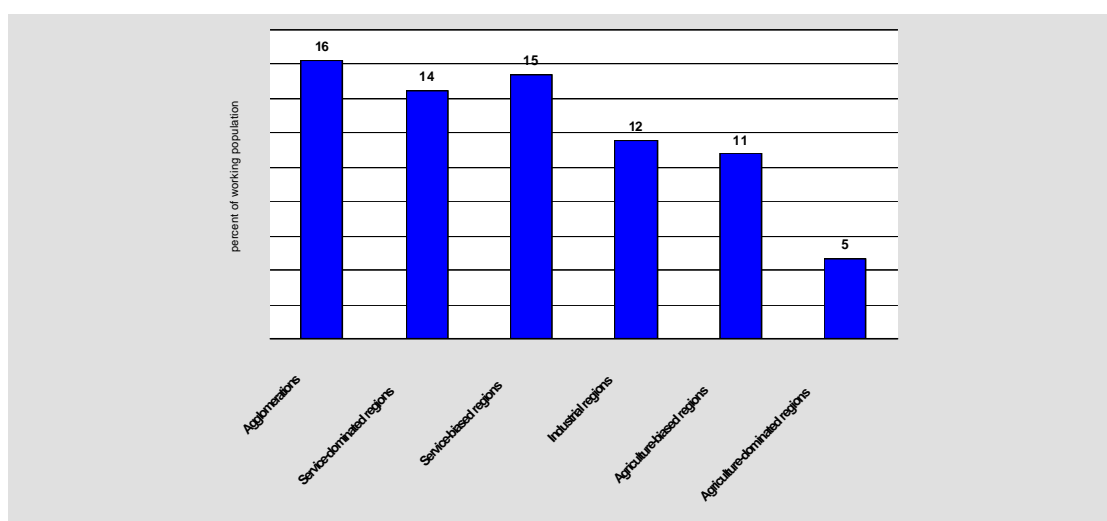


Source SIBIS 2002, General Population Survey. Base: Labour force

However, these differences are discernible when usage of ICTs to support life long learning is considered, that is to say, they were much more pronounced in relation to its e-component, with say respondent from agriculture dominated regions only half as likely to engage in this activity in relation to their counterparts from ‘agglomeration’ type of regions (Figure 3-4 above). For the working definition used for the survey, it can be distinguished between two broad groups of eLearning [technologies]: offline and online eLearning. The first category comprises multi-media learning material such as computer programmes on diskettes, video tapes and CD-ROMs, the second category is limited to learning content which is provided exclusively online through the Internet or the computer network of the employing organisation (e.g. Intranet) or the school/university, respectively. Another distinction can be made in relation to asynchronous versus synchronous type.

Another area that is extremely important in terms of participation in Knowledge Economy concerns usage of ICT tools and applications in the workplace. In this regard, telework and tele-cooperation have been identified as areas in which the nature of ICT-enabled changes has a significant impact on the ways in which work and associated tasks are being conducted. Considering teleworking, at another level, this is one of the crucial areas of so-called ICT enabled outcomes, that is to say, whether the ICT use has made a difference to individual circumstances. Thus the availability of teleworking arrangements<sup>1</sup> can have a major impact on the ways in which working population can introduce more flexibility into their life (e.g. combine work and family obligations more effectively, reduce commuting time, etc) with one of the potential results being an improvement in general quality of life. Furthermore, the availability of teleworking seems to have a certain employment enhancing potential, and it has been suggested that the share of EU population participating in the labour force is higher than it would have been without it (SIBIS 2003b).

**Figure 3-5. Prevalence of telework by region type**



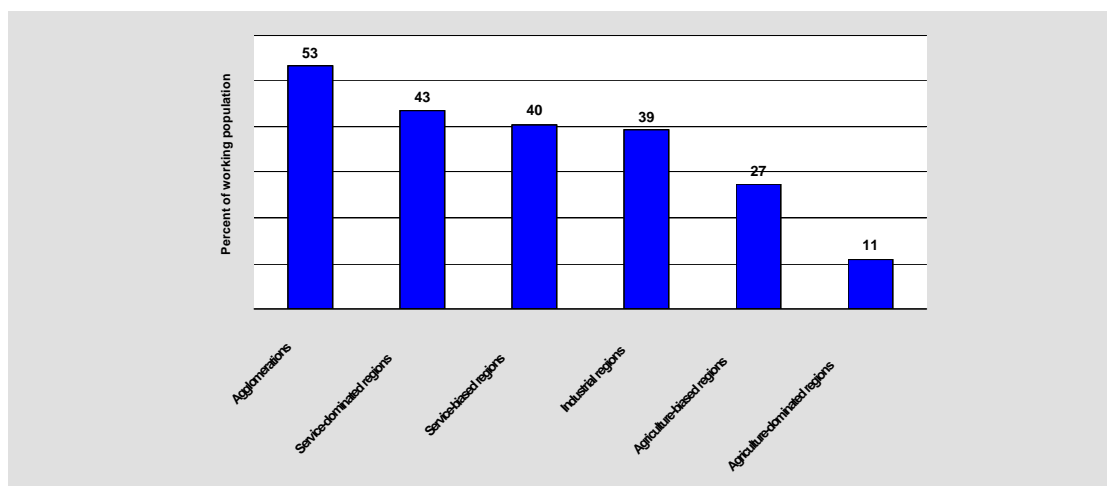
Source: SIBIS General Population Survey, 2002. Base: Working population

It seems however that teleworking is still much more prevalent in high population density areas, while the nature of work that is conducive to teleworking arrangements also makes it more likely to occur in services dominated regions. This in turn might represent a

<sup>1</sup> The definition of what constitutes telework adopted in this paper follows the approach taken in SIBIS project. Essentially, three main categories have been distinguished (incorporating the use of ICTs and changes with regard to locations at which the work is carried out). These are **home based** (working at home with a computer/ using ICTs to transfer results) which can be either permanent, alternating or supplementary in nature, **mobile** (working away from main place of work / using online connections on a business trip, e-mail, Internet or remote access), and **self employed** persons teleworking from their home office.

considerable challenge for other regions, not least in terms of offering an additional flexibility to its residents regarding their working life.

**Figure 3-6. Prevalence of telecollaboration<sup>2</sup>, by region type**



Source: SIBIS General Population Survey, 2002. Base: Working population

While telework is usually singled out as the most significant ICT-related development with regard to changes to work location, another associated concept has risen to prominence of late, being telecollaboration<sup>3</sup>. Here the main focus is on the seamless nature in which the work process related communication is conducted, regardless of the geographical location i.e. the use of the electronic data transfer, email and the Internet for contacts between different workplaces at geographically distant locations, as well as within the same company that is geographically dispersed and / or has workers either permanently or temporarily based outside main place of work. Tele-cooperation can be seen as an ICT enabled supplement for the movement of labour and as such it seems to be a very relevant issue for the regional agenda.

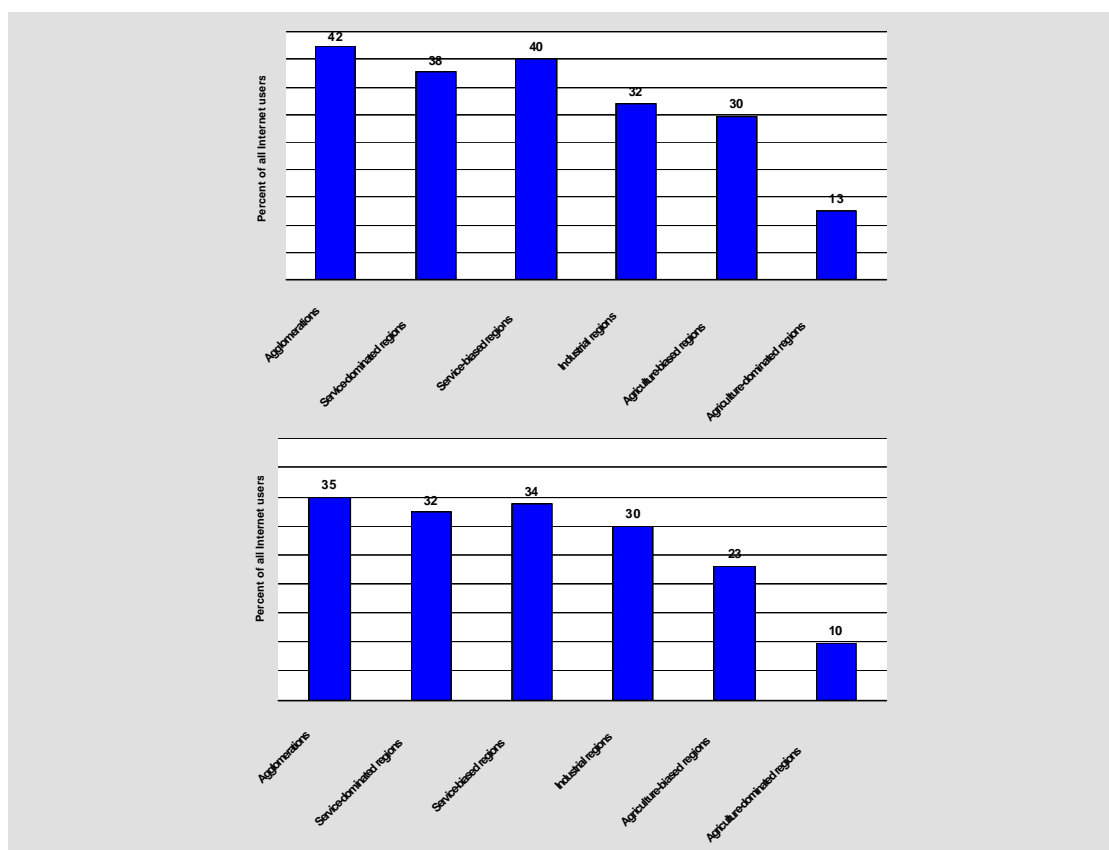
The empirical picture in this regard however differs somewhat to the one characterising teleworking. Thus while high density and service biased regions were most likely to be using ICTs to tele-collaborate with externally based business partners and colleagues, industrial regions fare comparatively well.

The advent of the Information Society has been heralded as being instrumental in bringing about many improvements in terms of individual everyday life. One way to ascertain this is to consider what is done 'online'. Again, there seems to be a significant differential in online use patterns that can be related to regional background. Thus online residents from traditionally less advanced regions appear to be less likely to engage in online purchasing and even more so in online banking/financial transactions (Figure 3-7; note that the base here is Internet users). Thus not alone are residents from these regions less likely to be in position to access these services, they are also less likely to use them once access barriers have been overcome.

<sup>2</sup> Includes self employed who are computer users and / or Internet users.

<sup>3</sup> Tele-cooperation (or effectively, in situ e-work) was operationalised for the SIBIS GPS as communicating with external business related contacts via e-mail, video-conferencing or electronic data transfer. As an explanation external persons were described as "customers, clients, suppliers, other business contacts, but also colleagues working at other locations but for the same company".

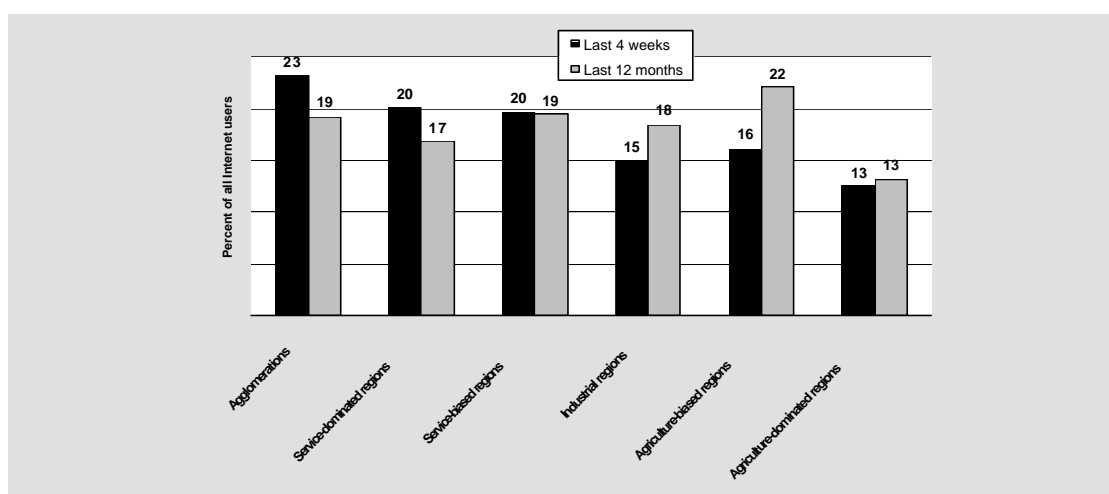
**Figure 3-7. E commerce related activities– prevalence of online shopping (top) and electronic banking (bottom) amongst Internet users, by region type**



Source : SIBIS General Population Survey. Base: Regular and occasional Internet users

Their ‘regional’ disadvantage, however, seems to have less impact on online searching for health-related information though (Figure 3-8). This is particularly the case if both regular and occasional usage rates are considered together. The nature of the need to search for health related information lends itself well to this intermittent type of use of online services available (e.g. coinciding with relevant life events). What is important though is that, encouragingly, certain aspects of non commercial online application and service can, at least to a considerable degree, transcend the geographical distance.

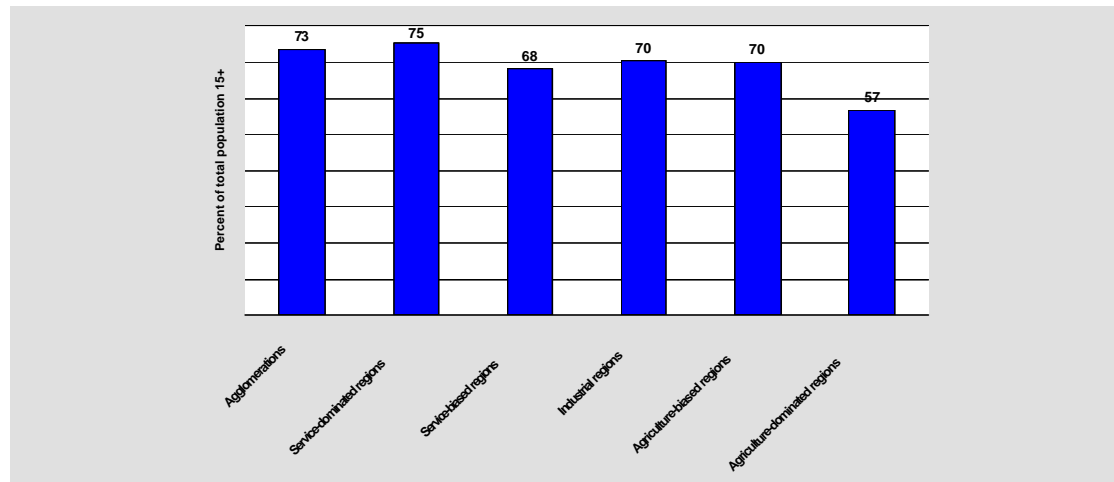
**Figure 3-8. Use of Internet to search for health related information, by region type**



Source: SIBIS General Population Survey 2002. Base: Regular and occasional Internet users

It is also encouraging to see that one of most widespread ICT tools that is used in everyday life – mobile telephone – is also relatively well widespread (see Figure 3-9), with agriculture dominated regions lagging only slightly behind the rest. Closer analysis shows that while regions do differ somewhat in terms of pattern of mobile phone use, at least when one of its most frequently used features is concerned – text messaging – there is no linear decline from the most advanced to least advanced type of regions. Given the widespread view that mobile phone-based devices will increasingly replace PCs as gateways to Internet access, this finding might point towards a more equal distribution of ICT applications among types of regions in the future.

**Figure 3-9. Prevalence of mobile telephone ownership, by region type**



Source: SIBIS General Population Survey, 2002. Base: Total population aged 15+

#### 4 Conclusions and perspectives for future research

The findings highlighted in this paper show that often heard rhetorical arguments supporting the ‘death of distance’ concept are not well founded upon sound empirical evidence. Indeed, a general picture about the actual state of the regions in relation to ICTs usage is yet to substantiate this view, given that regions with highest population density have been regularly characterised by highest rates of use of ICTs, in itself hardly a proof that distance does not matter.

It has been shown that regions differ significantly in terms of the share of population using basic ICTs such as a computer and the Internet. This aspect of digital divide can be seen as focusing on the basic ICT endowment at the individual level, which is often regarded as a precondition for utilising ICTs to make amendments to, and improve individual circumstances. At this level, it appears that those regions that are already more advanced are also better positioned to gain any additional advantages associated with the advent of the Information Society. Thus their residents are in general more likely to use a computer and the Internet, and by a simple extension, more likely to participate in all activities utilising this medium. More importantly, this was found to be the case regarding Internet based services that are more tangible in a sense that are commercial in nature, such as online shopping and electronic banking. Furthermore, this was still largely the case even after taking into account the differences at the population level, that is to say, considering the Internet users only. An important implication is that both the rates as well as certain patterns of Internet use (what is actually done on line) are to a considerable degree related to the type of region one resides and works in. Another related issue is the access to broadband, where differences in the rates of access among region types were discernible even to a bigger extent than for the other indicators: The population of agglomerations or service-biased regions are five types more

likely to have broadband access to the Internet than those who live in agriculture-dominated regions.

The area of work is another important theme where a regional divide can be observed. Thus it appears that those residing in traditionally more advanced regions were more likely to have experienced ICT enabled changes to their everyday working life, mainly through [being in a position to] avail of teleworking arrangements. However while they were at the same time also more likely to be using ICT communications tools to tele-collaborate with externally based business partners and colleagues, there are some interesting patterns here with the divide not being as sharp and linear.

Somewhat similar picture emerges in relation to e-learning – while the differences between agglomerations and agriculture dominated / biased regions appear sharp, the same does not seem to hold across other types of regions.

While most of the arguments outlined above raise strong scepticism regarding the empirical foundations of the ‘death of the distance’ concept, there are some encouraging signs in terms of certain aspects of ICT diffusion at regional level. Thus there appears to be less disparities in terms of mobile telephone ownership and certain patterns of their usage among region types, and at least these disparities do not necessarily conform to previously identified pattern. Furthermore, it appears that certain aspects of Internet usage can transcend the distance, being substantiated by rather uniform rates found regarding usage of the Internet for accessing health related information. It has to be emphasised though that this held for the comparisons between population of Internet users, leaving aside the initial disparities in access rates. This in turn reinforces the message that many people from traditionally less advanced regions still lack basic opportunities (or, it might be argued, motivation) to participate in the Information Society.

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