

Bailén, Maria Carmen Tolosa; Perez, José Miguel Giner

**Conference Paper**

## The Local Digital Divide in Spain: explanatory factors

50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Bailén, Maria Carmen Tolosa; Perez, José Miguel Giner (2010) : The Local Digital Divide in Spain: explanatory factors, 50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/119086>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# THE LOCAL DIGITAL DIVIDE IN SPAIN: EXPLANATORY FACTORS

José Miguel Giner Pérez (giner@ua.es)  
María Carmen Tolosa Bailén (mc.tolosa@ua.es)  
Department of Applied Economics and Economic Policy  
University of Alicante

## 1. Introduction.

Within the context of globalisation, the development of information and communication technologies (ICTs) is causing major economic, social and cultural transformations that affect a great deal of aspects in our lives. Changes affecting the economy have provided new ways to access information and knowledge (Jovanovic and Rob, 1989), leading to changes in how work is organised (Butera et al., 1990; Castaño, 1994; Castillo, 1988), how governments are organised (Norris, 2001) and how public services are provided (Ministry of Public Administrations, 2000), among other aspects. ICTs are highly important instruments of progress (García-Legaz Ponce, 2001), therefore, and help to improve productivity (Brynjolfsson and Hitt, 2003) and quality of life. The use of ICTs and the internet is a fundamental factor in how human capital adapts to the requirements of the knowledge economy. However, several factors exist that prevent people and businesses from adopting ICTs, which can have a negative effect on economic efficiency, wellbeing and employment. In this regard, ICTs constitute a factor of exclusion that help to increase inequalities between those that have access to information and those that do not, creating what has become known as the digital divide.

There are various explanations that define the phenomenon of the digital divide. A simple description is that it is the gap between those that have access to digital technologies and those that do not (Hilbert, 2001). According to another, it is the difference between countries, people and sectors that have access to and are able to use information tools, and those that do not. Monge and Chacón (2002) state that the digital divide “refers to the different access that people have to information and communication technologies, and the ability to use such tools, the current use made of them and the impact that they have on wellbeing”. Other explanations can be found in Ballesteros (2003), Perine (2000) and Sullivan (2001), and various other interpretations can be found at <http://www.labrechadigital.org><sup>1</sup>.

---

<sup>1</sup> Consulted: 21/04/2010.

Many other studies have revealed the differences that exist in terms of adopting and circulating new technologies between developed and developing countries. Chinn and Fairlie (2004), for example, analyse the factors that determine disparities in ICT and internet use, and confirm the importance of per capita income in explaining differences between countries.

Digital inequalities also exist at a regional level within countries (Billón and Lera, 2004; Carmona and García, 2007; Gareis and Osimo, 2004; Giner and Tolosa, 2001), with both developing and developed countries reporting major regional disparities in terms of ICT adoption. This digital divide is not only a separation between people (or countries or regions) who use new technologies and those without access, but also in terms of those who have access but do not know how to use it. These inequalities can also be observed between urban and rural areas within a region (Mills and Whitacre, 2003; Giner and Tolosa, 2007).

Therefore, given the negative effects that ICT and internet adoption can cause in terms of progress and of territorial and social cohesion, governments should look to guarantee the balanced implementation of these technologies, ensuring that citizens have universal ICT and internet access (Jordana, 2002) by avoiding the phenomenon of social exclusion and helping people to use the internet through education, appropriate regulation and the deployment of the necessary infrastructures, and by promoting co-operation between the public and private sectors. A two-speed society is to be avoided, in which the use of new technologies is widespread and commonplace among one part of the population, but others lack sufficient knowledge of ICTs and how they are used.

There are many factors that can lead to a digital divide and which make it a problem affecting all countries to varying degrees. As well as the technological aspects, the digital divide is a consequence of the lack or low level of development of telecommunication infrastructure (Dasgupta et al., 2001), the cost of equipment and the required connection, the lack of necessary knowledge (both technical knowledge and knowing how use new technologies properly) and the need for greater impetus from institutions. Specifically, if the digital divide is due to a lack of infrastructures, the solution would involve making alternative access technologies available to users (such as broadband connections over the mains electricity network); if the obstacles relate to a lack of know-how, then incentives for basic training or what is known as digital literacy would be needed, particularly for the population at greatest risk of exclusion. If the equipment and internet connection are expensive, places of public internet access could be provided, such as the telecentres model, which is a growing formula to increase the number of publically available points of access (Proenza et al., 2001) for

everyone and for people from different places. It is useful, therefore, to determine the reasons for unequal ICT access, as this allows policy makers to detect shortfalls and design more suitable policies for each situation.

The aim of this research is thus to explain the extent of the internet's reach and the use of ICTs in Spain, including an analysis of territorial factors. The work is structured into four sections, the first of which is the introduction, followed by an analysis of the variables that influence internet penetration based on urban or rural location, using the *Survey on ICT Equipment and Use in Households* conducted by the National Statistics Institute in 2009. By tabulating these microdata, models can be devised to explain internet penetration in Spanish households. The third section analyses whether different results regarding how widespread access to ICTs is may be explained by differences in institutional capacity when political authorities implement specific measures. The fourth section sets out the main conclusions.

## **2. Territorial analysis of the degree of development of the Information Society and internet penetration in Spain.**

Spanish society's perception of ICTs and the internet has undergone changes in recent years. According to data issued by the National Statistics Institute in 2009, 63% of the population had used a computer in the three months prior to the date of the questioning and 59.8% had used the internet, a rise of 6% in the number of internet users from the previous year. The number of Spanish households with internet access rose to 8.3 million people (54% of all households). Bandwidth penetration in Spain continues to rise, reaching 7.9 million households (51.3%).

According to the Orange Foundation's *Annual Report on Development of the Information Society in Spain (eSpain 2009)*, personal computers and internet usage continue to converge, as is occurring in other countries of similar economic circumstances, to the extent that the concept of people who use a computer but do not access the internet is disappearing. However, internet usage levels are not equal throughout Spain. In general, regions with higher income levels or larger urban populations report higher internet use. This is confirmed by the data on households and users in table 1, which shows figures for households according to the type of equipment, and for people according to ICT use, and based on the size of municipality for the 2004-2009 period. The number of households with a computer of some kind rose from 52.3% in 2004 to 66.3% in 2009, an increase of 14 percentage points. Municipalities in which

this variable has developed the most are those of fewer than 10,000 inhabitants, at 58.1% of households, an increase of 16.9 percentage points. With regard to internet access, households in larger towns generally show the highest percentages. In 2009, 54% of households had internet access, and 51.3% accessed the internet using broadband. Notable differences can be observed by the size of municipality, as around 60% of households in towns of more than 50,000 inhabitants have an internet connection (with an increase of around 20 percentage points since 2004), compared with 42.3% of households in smaller municipalities and 57% of households in larger municipalities accessing the internet using broadband, compared with 38.5% of households in smaller municipalities. The lower figures for internet access in more rural municipalities can be explained by economic factors, as creating access in these areas is not sufficiently profitable for telecoms operators. The number of people that had used a computer in the past three months had risen to 63.2%. The difference between the largest and smallest municipalities is 14.8 percentage points, a figure which rises to 15.6 percentage points for the number of internet users. However, computer users are increasingly likely to be internet users, regardless of the size of the municipality where they live. Finally, the percentage of people that shop online is less than 20% in all cases, although in this case the differences between large and small municipalities are not as big (6.5 percentage points). E-commerce as an alternative to traditional commerce means greater benefits for rural towns and villages, as they do generally lack the same range of articles and services that are available in cities, and online shopping allows them to access a multitude of products without the need to travel.

The following section analyses various Information Society penetration indicators that were obtained using primary data (microdata) from the *Survey on ICT Equipment and Use in Households* in Spain produced by the National Statistics Institute in 2009. Two types of indicators are considered (table 2): people that have used the internet in the past three months (vertical percentages of the total) and internet use penetration in the past three months (which reflects the percentage for each variable of the total for the category that it defines). The data as presented take the territorial perspective into account, i.e. they are also analysed by size of municipality that each household is in (urban/rural)<sup>2</sup>.

With regard to the first indicator, 53% of internet users are male (regardless of the type of municipality), and 70% of all internet users are between 15 and 45 years of age. The

---

<sup>2</sup> Municipalities of more than 20,000 inhabitants are considered urban; those with fewer are considered rural.

percentage of internet users increases as people's level of studies rises. This is not true in rural areas, however. In rural and urban areas alike, more than 65% of internet users are at work, mainly as employees. And when considering household incomes, 60% of internet use is in households with monthly incomes ranging between €1,100 and €2,700, regardless of the type of municipality.

In terms of the indicator of internet use penetration (table 2), internet users in urban areas are chiefly male (63.8%), between 15 and 24 years of age (93.3%), university graduates (90.7%) and people in employment (76.2%). These sociodemographic characteristics are repeated for internet users in rural areas. However, in this indicator aspects can be observed that mean rural areas differ from large towns. In total terms, urban internet users exceed rural users by 25%. By gender, the greatest difference occurs in males (with 28.7% more urban than rural users). By age, the percentage of urban internet users is higher than that of rural users, but the highest differences between types of municipality can be observed in the population above 55 years of age; in demographic terms, there are no notable differences in internet usage between young people in urban areas and those in rural settings. In terms of completed studies, the greatest difference is in primary education (128.6), although in all cases the percentage of urban internet users exceeds that of rural users, except for university graduates (91.1% of rural graduates frequently use the internet, compared with 90.7% of urban graduates). With regard to users' employment status, the main differences are found among the unemployed (39.4% more unemployed internet users in urban areas than in rural settings). Of these, pensioners are at greatest risk of exclusion: 13.6% in urban municipalities had used the internet in the previous three months, compared with 6.8% of rural pensioners. Rural pensioners have the double condition of being elderly and living in small municipalities, which are the two most significant causes for digital exclusion.

Table 3 considers internet use by place of access. The household and the workplace are the two main locations where the internet is accessed, both globally and by type of municipality. With the exception of the household, the workplace, cybercentres and hotspots<sup>3</sup>, percentages for other access points are higher for rural municipalities. An analysis of access from public places indicates how important this variable is in rural areas. Specifically, 11.3% of the rural population access the internet from public libraries, compared with 9.2% of the urban

---

<sup>3</sup> A hotspot is an area with a Wi-Fi signal that allows users to connect to the internet in public places at no cost or for a fee, which depends on the wireless internet service provider.

population, and 4.4% connect from council buildings, compared with 3.2% in urban areas. Public access points in rural areas are particularly important in bringing new technologies to rural citizens, helping to bridge the digital divide. In this sense, the recorded increase in recent years in the number of public access points is the result of measures being implemented by various administrations to promote the Information Society in rural areas, as is analysed in the next section.

Finally, one aspect that could help to explain the digital divide based on the type of municipality is the analysis of the reasons that households do not have broadband (table 4). The reasons for which households do not have broadband internet access are mainly that they have no need for it (40.9% state this reason) and that it is too expensive to connect (30.6%). These reasons also apply to urban areas (44.9% and 35.9%, respectively). For rural areas, however, apart from not needing a broadband connection (35.6%), the other main reason is the lack of availability in the area (32.2%). This would justify the importance of the 2005-2008 Broadband Extension Programme and the Avanza Infrastructures Sub-Programme, as explained in the following section.

In light of the results obtained, it is interesting to analyse the role that public administrations have played. This is covered in the following section.

### **3. The role of public administrations: initiatives to reduce the digital divide.**

One important way to explain territorial differences in the degree of adoption and spread of ICTs is to analyse the measures that have been designed by the various levels of decision makers to promote this process. Institutional differences in the implementation of measures could explain these inequalities. This section, therefore, first enumerates different initiatives implemented in the European Union and in Spain (by the central authorities and at a regional level) to promote the spread of the Information Society.

In December 1999, the European Commission adopted the *eEurope* Initiative with the aim of extending the Information Society to all inhabitants and businesses in the European Union. The initiative was put into practice as part of the framework of two successive projects: *eEurope 2002*, which focused on increasing internet connectivity throughout Europe, and *eEurope 2005*, which was aimed at converting that connectivity into increased economic productivity and improved and more accessible services for European citizens. In June 2005, the European Commission presented a new strategy, *i2010 – A European Information Society*

for 2010, focusing on three priorities: producing a single European space for information, with accessible and safe broadband communications, rich and diverse content, and digital services; promoting innovation and investment in research into ICTs; and a European information society based on inclusion that promotes growth and employment, and which gives priority to improving public services and quality of life.

In Spain, measures to promote the Information Society have evolved in response to the various initiatives adopted by the European Commission. The strategies began with the *Info XXI Action Plan* (2001-2003), which included projects to stimulate the development of the Information Society in Spain and make it more accessible to everyone in society. This was followed by *España.es* (2004-2005), which was aimed at spreading the use of new technologies by strengthening the availability of contents and services, improving accessibility through public access points and stimulating the creation of training programmes. The *2006-2010 Plan for the Development of the Information Society and for Convergence with Europe and between Autonomous Communities (Plan Avanza)* was approved in November 2005. The plan sought to achieve three key objectives: increase the penetration of new technologies and the internet in Spanish society; improve business productivity and competitiveness; and bridge the digital divide. The *Plan Avanza* took a relatively general approach, initially focusing on access to ICTs rather than initiatives to do with actual usage. Its achievements include creating a critical mass in Spain in terms of market, users, ICT acceptance and global service coverage. The plan also implemented industrial-based ICT measures in areas such as information services, health, education and electronic identity cards, among others. However, as a consequence of the measures implemented by Avanza, new needs have arisen and challenges remain that mean existing measures need to be strengthened and new initiatives devised. In this regard, *Plan Avanza2* (2009-2012) seeks to resolve certain shortfalls resulting from the original plan, such as the fact that rural areas and collectives at risk of exclusion are not forming part of the Information Society. Avanza2 is also designed to contribute to Spain's economic recovery by increasing demand and promoting development of the ICT sector. Its initiatives are divided into five areas: developing the ICT sector with the aim of supporting businesses developing new ICT products, process, applications, contents and services; empowerment in ICTs aimed at mass inclusion in the Information Society of citizens and businesses (particularly SMEs and their workers); digital public services to improve the quality of online services provided by public administrations, particularly local authorities; infrastructure to promote the development and



implementation of the Information Society in local settings; and strengthening the trust and security of citizens and businesses in ICTs.

Spain's autonomous regions also play a fundamental role in implementing the Information Society. Given Spain's diverse nature, which can be observed in the sociodemographic and economic differences that exist between regions, the various autonomous communities have applied different initiatives adapted to their own specific contexts (Giner and Tolosa, 2007). However, although these specific plans have helped to reduce some differences, there continue to be discrepancies in the indicators of ICT and internet penetration between regions<sup>4</sup>. Among its objectives, *Plan Avanza* is also geared towards convergence between the autonomous regions in the Information Society. In this regard, measures have been taken that have had an impact on the different autonomous regions. Even though the initial situation shows notable differences between regions, there has been significant progress. Table 5 shows the main results for *Plan Avanza* by region in terms of internet users and households with an internet connection.

In rural areas, using new technologies could lead inhabitants and businesses in rural areas to have the same means and opportunities as in large cities; the use of ICTs and the internet could increase the dynamism of rural areas and solve the major problem of delocalisation that they suffer from. This is particularly important when considering that almost 50% of the land in Spain is mountainous, and 23% of the population lives in rural areas. However, as is shown in the previous section, the Information Society and the internet have led to increased differences separating rural and urban societies, which means that the digital divide continues to exist. With regarding to this divide and specifically to the isolation of rural areas in terms of the internet and the Information Society, and with the aim of ensuring equal access to communication networks for people living in remote and less well-developed areas, in March 2003 the Ministry of Agriculture, Fisheries and Food, the Spanish Federation of Municipalities and Provinces (FEMP) and the public organisation Red.es signed a Collaboration Framework Agreement to implement the *Rural Internet* programme. This programme has provided broadband internet access to more than 1,500 previously unconnected municipalities by installing public access centres with free access to new technologies using a high-quality connection. The Programme was well received and led to a new agreement being signed between the FEMP and Red.es to strengthen and extend the

---

<sup>4</sup> A description of the current situation of the Information Society in Spain's autonomous regions can be found in the report "The Information Society in Spain 2009" published by the Telefónica Foundation and available at <http://sociedadinformacion.fundacion.telefonica.com/>

measures implemented. A new programme thus arose, *Telecentres*, which was implemented between 2005 and 2007 with the aim of bridging the digital divide and improving the levels of broadband access in rural populations and less well-integrated collectives. These telecentres have computers connected to the internet and trained staff to help people get online either for free or for little cost, as well as carrying out maintenance. As a result of this programme, approximately 1,500 telecentres were installed in rural areas with difficulties in accessing new technologies, preferably areas that did not have broadband. The *Telecentres* programme currently has its own internet portal, through which it implements measures to inject dynamism and inform users about the telecentres. Furthermore, promoted by the Ministry of Industry, Tourism and Commerce, the 2005-2008 *Broadband Extension Programme*<sup>5</sup> is a national programme aimed at providing broadband in rural and isolated areas in Spain to the same technical and economic standards as in urban areas. The programme, which is carried out in co-ordination with similar initiatives for the autonomous regions<sup>6</sup>, is aimed at providing subsidies and interest-free credit to telecoms operators to incentivise investments in equipment and infrastructures that make it possible to provide broadband in rural and isolated areas with little or no coverage<sup>7</sup>. The programme has provided broadband access to 58,442 communities, benefiting eight million people in more than 5,700 municipalities. Fourteen autonomous regions and two autonomous cities participate in the programme, and map of the municipalities covered by the Programme is available at:

<http://www.bandaancha.es/EstrategiaBandaAncha/ProgramaPeba/Paginas/ZonasCubiertas.aspx>

Finally, as part of Plan Avanza2, the Avanza Infrastructures Sub-Programme is aimed at facilitating the investments required to extend coverage of telecoms services, particularly in rural areas as a way to strengthen their economic development and include citizens and businesses in the Information Society. Specifically, the measures considered include a line of aid aimed at implementing access infrastructures that can meet the demand for broadband in rural areas to a level similar to that available in urban areas. The measures also aim to accelerate the implementation of new technologies in rural areas and public networks at a local level for Public Administration services, and finally to implement measures to

---

<sup>5</sup> <http://www.bandaancha.es/EstrategiaBandaAncha/ProgramaPeba/Paginas/ProgramaPeba.aspx>, consulted on 19/05/2010.

<sup>6</sup> <http://www.bandaancha.es/EstrategiaBandaAncha/Paginas/IniciativasAutonomicas.aspx>, consulted on 19/05/2010.

<sup>7</sup> Urban ADSL and rural ADSL are two intrinsically different services. This is because of where they are deployed: in rural areas, given that the installation cost is much higher than in urban areas, the profitability of the service is not attractive to private investors, so incentives are given by means of public subsidies.

isseminate and communicate the advantages and opportunities provided by advanced telecoms services.

#### **4. Conclusions.**

To talk of ICTs and the internet means discussing the digital divide. The differences between those that have access to information and those that do not (retired people, housewives, the unemployed, immigrants or inhabitants of rural areas) have been attributed to low levels of infrastructure development, the high cost of equipment and connections, the lack of necessary knowledge and the need for greater promotion by public institutions. It is important to halt the advance of the digital divide and extend the Information Society to all. Otherwise, productivity will not increase, which in turn will affect long-term growth of per capita income levels. However, reducing the digital divide involves improving not just numbers but also the quality and efficient use of the Information Society.

In terms of ICTs, the challenges continue to be convergence with the most developed countries and ensuring that technological progress is not just for large towns and cities. Further analysis reveals that there is greater internet use in urban areas than in rural towns and villages. In both cases, the user profile is chiefly young, male and a student in higher education, although differences between urban and rural indicators are clear and confirm the need for continued efforts in rural areas. This study confirms that internet use in rural areas is on the increase among younger generations, people with a higher level of studies and people with higher income levels. This is why the planned measures to extend the Information Society throughout Spain focus on rural areas in particular.

The range of initiatives implemented by the various tiers of administration (European, national and regional) are all geared toward promoting the Information Society and combating the isolation of rural areas. However, although action continues in this regard, there is still a lot to be done to close the gap with the leading countries and the persistent digital divide between rural and urban society. However, comparing the data on the digital divide between rural and urban society with data from a previous study (Giner and Tolosa, 2008), a reduction of the gap can be observed in the global internet penetration indicators by sex, age (except in people over 75 years of age), level of studies (except in further and higher education) and those in employment (the gap has widened between unemployed people in rural and urban areas).

Central government plans to support the Information Society have concentrated on achieving high levels of ICT access by developing ICT infrastructure and competency in the telecommunications market. For this reason, Spain currently has high levels of broadband internet use and high rates of growth of ICT access in people's households.

Thanks to support from the public sector, Spain continues to progress in the Information Society, though slowly, and as can be observed in the 2009 eSpain Report, doubts exist about whether some of the objectives of the Lisbon Agenda are being met, such as households with internet access or the population that routinely uses the internet. On the other hand, according to the 2009 National Reforms Programme, it would be possible to reach the EU-15 average level in the composite indicator for convergence<sup>8</sup> in the Information Society, which considers the progress made relative to Europe in ICT access and use by citizens and businesses, yet the figure reached is only 85%. Although the variable of businesses with broadband access is above average, the other three variables are still behind the EU-15 averages.

To conclude, it is important for individuals and countries not to miss the boat in new information technologies, as to do so would mean to miss out on important increases in both productivity and quality of life. For this reason, budgetary efforts still need to be made to modify current trends and respond to the new model of society and new needs in the spread and development of ICTs and the internet.

---

<sup>8</sup> The four indicators that make up the composite indicator for convergence in the Information Society are household broadband, internet citizens, business broadband and e-commerce.

## Tables.

**Table 1**  
**Households according to the type of equipment and persons according to ICT use, 2004-2009**

	Households						Persons					
	With computer		With internet access		With broadband internet access		Computer users <sup>1</sup>		Internet users <sup>1</sup>		E-shopping <sup>1</sup>	
N° inhabitants	2004	2009	2004	2009	2004	2009	2004	2009	2004	2009	2004	2009
More than 100.000	58,4	70,2	39,7	59,3	19,7	57,0	55,4	68,5	46,9	65,5	6,5	18,2
50.000 - 100.000	55,1	70,4	35,8	60,2	17,1	57,8	52,8	64,3	42,3	61,1	6,5	16,5
20.000 - 50.000	51,3	65,5	32,4	53,8	13,3	52,0	46,9	64,9	38,0	60,9	4,2	15,2
10.000 - 20.000	50,3	65,0	30,5	51,6	12,1	48,8	44,3	59,0	35,8	55,7	5,3	14,0
Less than 10.000	41,2	58,1	23,5	42,3	6,4	38,5	38,7	53,7	30,5	49,9	4,1	11,7
Total	52,3	66,3	33,6	54,0	14,7	51,3	49,0	63,2	40,4	59,8	5,5	15,7

<sup>1</sup>Frecuency: in the last three months.

Note: Information about households and persons in horizontal percentages (%) of the total households' data and the total people's data (16-74 years of age).

**Source:** *Survey on the Equipment and Use of Information and Communication Technologies (ICT) in Households* produced by National Statistics Institute (NSI) -2009- and authors' elaboration.

**Table 2**  
**Internet penetration indicators**

	Internet users <sup>1</sup> (vertical percentages of the total)			Internet users <sup>1</sup> (penetration indicator)			
	Total	Urban	Rural	Total	Urban	Rural	U/R (%)
Total	100,0	100,0	100,0	54,2	58,3	46,4	125,8
Gender:							
Male	53,2	53,0	53,7	58,8	63,8	49,5	128,7
Female	46,8	47,0	46,3	49,8	53,1	43,1	123,2
Age:							
15-24	20,1	19,6	21,4	92,3	93,3	90,3	103,3
25-34	29,2	28,7	30,5	80,1	82,5	75,2	109,8
35-44	24,8	24,6	25,3	68,2	72,3	60,1	120,2
45-54	16,6	16,9	15,9	54,9	60,1	44,9	133,8
55-64	6,9	7,7	4,9	29,1	34,5	18,2	189,1
65-74	2,0	2,1	1,7	11,0	13,3	7,2	184,1
>75	0,4	0,5	0,3	2,4	3,1	1,3	245,0
Level of studies:							
Illiterate	0,0	0,0	0,0	0,4	0,4	0,4	116,2
Basic studies	7,0	6,4	8,3	13,1	14,4	11,2	128,6
Secondary studies (1)	21,7	19,4	27,2	52,7	54,8	49,2	111,3
Secondary studies (2)	27,6	28,1	26,5	77,0	77,9	74,7	104,3
Professional formation	13,8	13,6	14,3	83,9	84,3	83,0	101,6
University studies	29,9	32,5	23,7	90,8	90,7	91,1	99,6
Labour:							
Yes	66,0	65,5	67,5	72,6	76,2	65,3	116,8
No	34,0	34,5	32,5	36,3	40,3	28,9	139,4
Employment status (Labour=Yes):							
Employees	55,0	55,5	53,8	74,5	77,4	68,2	113,4
Self-employed workers	11,0	10,0	13,6	64,4	70,5	55,8	126,4
Employment status (Labour=No):							
Unemployed	11,1	11,3	10,7	58,6	62,1	51,1	121,5
Students	12,3	12,4	11,9	98,4	98,6	97,9	100,7
Household labour	4,1	4,0	4,5	19,2	20,7	16,7	124,3
Pensioners	3,9	4,2	3,2	11,0	13,6	6,8	199,5
Other employment status	2,5	2,7	2,2	52,1	58,2	39,9	145,9
Household incomes:							
<1100€	11,9	11,7	12,6	22,3	25,7	17,0	151,5
1100€ - 1880€	31,9	30,1	36,2	52,3	54,7	48,0	114,0
1800€ - 2700€	29,6	30,3	27,9	74,0	77,0	66,9	115,1
>2700€	26,6	27,9	23,3	86,6	88,3	82,0	107,8

Note: Differences observed between the urban and the rural location is statistically significant at 99% level of confidence.

<sup>1</sup>Frecuency: in the last three months.

**Source:** Survey on the Equipment and Use of Information and Communication Technologies (ICT) in Households (microdata) produced by National Statistics Institute (NSI) -2009- and authors' elaboration.

	Total	Urban	Rural	U/R (%)
Household	81,3	82,7	77,7	106,5
Workplace	42,7	44,1	39,4	111,8
Centres of study	14,2	14,2	14,2	99,7
Other households	27,5	27,3	28,0	97,8
Public libraries	9,8	9,2	11,3	80,9
Postal offices	0,4	0,3	0,5	64,9
Public centres	3,6	3,2	4,4	72,7
Social centres	2,1	1,9	2,7	71,4
Cybercentres	8,3	8,5	7,9	106,9
Hotspots	6,5	6,7	5,9	112,8
Other place	5,5	5,9	4,4	132,1

Note: Differences observed between the urban and the rural location is statistically significant at 99% level of confidence.  
**Source:** *Survey on the Equipment and Use of Information and Communication Technologies (ICT) in Households* (microdata) produced by National Statistics Institute (NSI) -2009- and authors' elaboration.

	Total	Urban	Rural	U/R (%)
Too expensive to connect	30,6	35,9	23,6	152,1
No need for it	40,9	44,9	35,6	126,2
Lack of availability in the area	20,3	11,3	32,3	35,1
Access to other places	16,1	19,3	11,8	164,2
Other reasons	27,4	29,8	24,2	123,3

Note: Differences observed between the urban and the rural location is statistically significant at 99% level of confidence.  
**Source:** *Survey on the Equipment and Use of Information and Communication Technologies (ICT) in Households* (microdata) produced by National Statistics Institute (NSI) -2009- and authors' elaboration.

**Table 5**  
**Regional results for *Plan Avanza***

Region	Internet users (%)		Households with internet access (%)	
	2003	2010	2003	2010
Andalucía	29	55	21	48
Aragón	36	63	26	54
Asturias	32	58	21	55
Baleares	38	65	30	60
Canarias	38	57	29	55
Cantabria	31	60	23	57
Castilla-La Mancha	25	55	15	46
Castilla y León	32	57	21	45
Cataluña	39	66	33	63
C. Valenciana	34	60	23	50
Extremadura	24	50	14	42
Galicia	28	50	17	42
La Rioja	32	54	21	51
Madrid	44	68	32	64
Murcia	32	51	22	47
Navarra	35	66	27	57
País Vasco	35	62	32	60
SPAIN	34	60	25	54

*Source: Plan Avanza and authors' elaboration.*



## **Bibliography.**

Ballesteros, F. (2003): *La Brecha Digital. El riesgo de exclusión en la Sociedad de la Información, Biblioteca Fundación AUNA.*

Billon, M. y Lera, F. (2004): *The North-South Digital Divide in Information and Communication Technologies development: the case for Spain regions, 44th European Congress of the Regional Science Association, Aug. 25 – 29.*

Brynjolfsson, E. and Hitt, L. (2003): “Computing productivity: Firm-level evidence,” *Review of Economics and Statistics*, Vol. 85, Nº 4.

Butera, F., Di Martino, V. y Köhler, E. (Eds.) (1990): *Technological development and the improvement of living and working conditions*, Kogan Page, London.

Carmona Martínez, M. y García Jiménez, L. (2007): “Difusión del uso de Internet en España. ¿Existe una brecha digital entre Comunidades Autónomas?”, *Revista de Estudios Regionales*, nº 80, Universidades Públicas de Andalucía.

Castaño, C. (1994): *Tecnología, empleo y trabajo en España*, Alianza, Madrid.

Castillo, J.J. (Ed.) (1988): *Las nuevas formas de organización del trabajo*, Ministerio de Trabajo y Seguridad Social, Madrid.

Chinn M.D. y Fairlie R.W. (2004): *The determinants of the Global Digital Divide: a cross country analysis of computer and Internet penetration, Discussion Paper nº881, Economic and Growth Center at the Yale University.*

Dasgupta, S., Somik L. and Wheeler, D. (2001): “Policy reform, economic growth and the digital divide: An econometric analysis”, *World Bank Working Paper* nº 2567.

Feijóo González, C. y Gómez Barroso, J.L. (2006): “Infraestructuras avanzadas de telecomunicación: soporte para el desarrollo de la sociedad del conocimiento”, *Ekonomiaz*, nº 63, in [http://www1.euskadi.net/ekonomiaz/taula4\\_c.apl?REG=820](http://www1.euskadi.net/ekonomiaz/taula4_c.apl?REG=820)

García-Legaz Ponce, J. (2001): “Sector público y economía digital”, *Información Comercial Española*, nº 793.

Gareis K. y Osimo D. (2004): *Benchmarking regional performance in the Information Society: turning it into practice, Workshop “Measuring the information society: what, how, for whom and what?”*, 5th Annual Conference of the Association of Internet Researchers, September 18th, Brighton.

- Giner J.M. y Tolosa M.C. (2001): *Desequilibrios territoriales en el marco de la Nueva Economía en España, Actas de la XXVII Reunión de Estudios Regionales, VVAA, Asociación Española de Ciencia Regional.*
- Giner, J.M. y Tolosa, M.C. (2007): *Determinants of the Internet penetration in Spanish homes: a territorial analysis, 47th European Congress of the Regional Science Association, Aug. 29 – Sep.2.*
- Giner, J.M. y Tolosa, M.C. (2008): “*La brecha digital local en España: factores explicativos*”, *XXXIV Reunión de Estudios Regionales, 27-29 noviembre, Jaen.*
- Hilbert, M.R.(2001): *From industrial economics to digital economics: an introduction to the transition*, CEPAL, Santiago de Chile.
- Jordana, J. (2002): *Gobierno y Sociedad de la Información: viejos problemas, nuevas dificultades*, VII Congreso Internacional del CLAD sobre la Reforma del Estado y de la Administración Pública, Lisboa, Portugal.
- Jovanovic, B. and Rob, R. (1989): “The Growth and Diffusion of Knowledge”, *Review of Economic Studies*, nº 56, october.
- Korupp, S. y Szydlík, M. (2005): “Causes and Trends of the Digital Divide”, *European Sociological Review*, nº 4, vol. 21.
- Mills, B.F. y Whitacre, B.E. (2003): “Understanding the non-metropolitan-metropolitan Digital Divide”, *Growth and Change*, nº 34(2), p.219-243.
- Ministerio de Administraciones Públicas (2000): “Una nueva Administración al servicio de los ciudadanos”, *Libro Blanco para la mejora de los Servicios Públicos*, Ministerio de Administraciones Públicas, Madrid.
- Monge, R. y Chacón, F. (2002): “Cerrando la brecha digital en Costa Rica”, *Fundación CAATEC*, Costa Rica.
- Norris, P. (2001): *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*, Cambridge University Press.
- Perine, K. (2000): *Bridging the Digital Divide*, in <http://www.thestandard.com/>
- Proenza, F., Bastidas-Buch, R. y Montero, G. (2001): *Telecenters for Socioeconomic and Rural Development in Latin America and the Caribbean*, FAO-ITU-IADB, in [www.iadb.org/regions/itdev/telecenters](http://www.iadb.org/regions/itdev/telecenters)
- Sullivan, B. (2001): *¿Is digital divide growing by design?*, in <http://zdnet.com.com/2100-11-529162.html?legacy=zdnm>

## **Useful information in Internet.**

*eEspaña. Informe Anual sobre el Desarrollo de la Sociedad de la Información en España (diversos años)* available at [http://www.fundacionorange.es/areas/25\\_publicaciones/publi\\_analisis\\_prospectiva.asp](http://www.fundacionorange.es/areas/25_publicaciones/publi_analisis_prospectiva.asp)

*eEurope2005: una Sociedad de la Información para todos* available at <http://europa.eu/scadplus/leg/es/s21012.htm#eEurope>

*Hacia la Europa basada en el conocimiento. La UE y la Sociedad de la Información* available at <http://ec.europa.eu/publications/booklets/move/36/es.pdf>

*i2010. Una Sociedad de la Información europea para el crecimiento y el empleo* available at <http://europa.eu/scadplus/leg/es/s21012.htm#eEurope>

*“La Sociedad de la Información en España 2009”* available at <http://sociedadinformacion.fundacion.telefonica.com/>

*Plan Avanza* available at <http://www.planavanza.es>

*Programa de Extensión de la Banda Ancha* available at <http://www.bandaancha.es/>

*Programa Telecentros* available at <http://www.telecentros.es/> and <http://internetrural.red.es>