

THE DEBATE SURROUNDING THE NEW ECONOMY: AN APPROACH FOR AN ANALYSIS¹

Margarita Billón Currás *
Nuria Hernández Nanclares **
Fernando Lera López ***

The current debate over the possible existence of a "new economy" calls for an interpretation and analysis of the phenomenon from various points of view. Thus, the first part of the article contains a description of some of its main characteristics viewed both from the microeconomic and macroeconomic perspective. The fundamental role of Information and Communications Technology (ICT) is highlighted in both cases. The second part of the article discusses the major problems involved in measuring this phenomenon and the available data relating to it. This gives an indication not only of the importance of "the new economy" but also of the difficulties involved in estimating its dimensions.

Key words: "new economy", Information and Communications Technology (ICT), electronic market, measurement and quantification of the new economy, Internet.

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* Autonomia University of Madrid.

** University of Oviedo. Department of Applied Economics, Faculty of Economic Sciences. Avda. del Cristo s/n 33071 Oviedo. Tlfno. 985104990, email: nhernan@econo.uniovi.es

*** Public University of Navarra

1 INTRODUCTION

The sustained growth registered by the United States economy throughout the last decade has taken place in the presence of certain factors that have turned the economic situation in that country into one of extraordinary characteristics. Increased employment together with low inflation and growth in productivity resulting in GDP increases have led many experts to speak in terms of a "new economy", attributing its emergence largely to the spread of the use of the Information and Communications Technologies (ICT).

Parallel to the debate over whether the economic situation in the United States may correctly be referred to as a new economy, we are faced with additional discussion as to whether this new economic phenomenon could occur in other developed economies. In other words, whether the term "new economy" refers to a set of circumstances peculiar to the United States, that account for its particular evolution, or to changes that could also take place elsewhere.

In any event, it is clear that we are witnesses to a series of changes that are affecting developments in the world economy. In order to gain a better understanding of this new situation, we need to analyse and describe the different ways in which this phenomenon manifests itself.

It is the aim of this article to describe the main characteristics of the new economy, and how its quantification might be approached. The first section deals with the factors that explain the new scenario both from the macroeconomic and microeconomic perspective. The second part is a discussion of some of the problems involved in measuring this phenomenon, with reference to some of the attempts at quantification that are at present being undertaken.

2 DIFFERENT INTERPRETATIONS OF THE NEW ECONOMY

The new economy is a phenomenon that lends itself to analysis from various different standpoints, hence the number and variety of definitions to which it has given rise. The majority of these place the emphasis on the fact that this is an economy based on knowledge and ICT.

This point of view has led to the use of descriptive terms such as intangible and immaterial (*weightless economy*, Quah, 1999) with knowledge and information as the operative concepts; *digital economy* (US Department of Commerce, 1999), intended as a broader description than the first and placing special emphasis on the main sectors involved and the unprecedented convergence taking place between information technologies, computer science and communications; the *virtual economy* (Choi *et al.*, 1997) based on an online environment interconnected by means of networks of widely dispersed computers in which products, processes and players, all of them virtual, undergo constant innovation, thereby increasing the tendency towards convergence of products, markets and infrastructures; and net economy, where everything is interconnected and communication plays an essential role (Kelly, 1997).

Quite apart from these definitions, however, which tend to underline features deriving from the role played by ICT, it is possible to interpret this new phenomenon from a broader perspective which, while at times alluding to the transformations in the international economy resulting from the application of ICT, may, on occasions, also take into account other phenomena not necessarily related to technological progress.

The United Nations Economic and Social Council (2000) defines the new economy as the fusing of three simultaneous phenomena: the rapid technological progress ensuing from ICT, the internationalisation of the United States economy and changes in the international financial environment. In the opinion of Pulido (2000), the new economy shows signs of the globalisation process, the impact of technological progress resulting from ICT and the changes taking place in the world of business. Ontiveros (2000) associates the new phenomenon with globalisation, the dominance of knowledge as a basic input and the spread of ICT.

Understanding the new economy requires a process of constant change imposed by the speed of developments in Information and Communications Technology and analyses can be made from numerous perspectives. As a first step towards gaining some understanding of this phenomenon, let us distinguish between the macroeconomic and the microeconomic focus.

3 A MACROECONOMIC VIEW OF THE NEW ECONOMY

Though the latest reports concerning the situation in the United States economy point to deceleration in the growth rate, the third report on the situation of the digital economy published by the Department of Commerce (2000), claims that the US economy could be heading towards a period of economic expansion, which appears to be a result of the impact of the Internet, new possibilities in communication and the interconnection of the various economic agents.

In addition to the impact of developments in ICT, there are other factors to help our understanding of the present economic situation. These are factors that may or may not be linked to technological developments; whatever the case, they nonetheless increase their effects. Here we refer to the various manifestations of the globalisation process, one of which is without doubt the role played by technology. From the macroeconomic standpoint, the new economy may be understood as the result of the combination of three phenomena: the development of technological infrastructure relating to ICT; the macroeconomic changes involved in ICT and the strengthening of the globalisation process.

3.1 ICT as the infrastructure of the new economy

The new economy rests on the infrastructure that has developed around the ICT and on its application via the Internet. The ICT have spread rapidly both in the economy and in society in general, partly because they have completely transformed the means of accessing, processing and storing information. This means that these technologies are at work in all aspects of human activity, permitting the creation of an infinite number of links between different areas, activities and agents.

The changes that have come about as a result of the use of ICT have fostered the emergence of the so-called information technology paradigm (Castells, 1997a). This new paradigm presents features that favour the development of an interconnected, interdependent economy, with a network structure. Its tremendous flexibility and capacity for transformation allow for the increasing convergence of specific technologies into a highly integrated system.

The framework for this paradigm is the Internet. Unlike other technologies, the Internet is an open network of widely dispersed computers, as opposed to the traditional type radiating from a single system. This means, for a start, that the different computers connected to the Internet are able to perform multiple functions. Also, the fact that the Internet is an open network means that it is based on open standards, allowing any computer on the net to log on by using the same protocols. This open network permits the interaction of different computer platforms and simplifies the exchange of information. These are the features of Internet that facilitate and enable individuals and firms to connect electronically. There is no doubt about the impact that this can have on a nation's economy, as we have said previously, with respect to that of the United States.

3.2 Macroeconomic transformations and the globalisation process

A further manifestation of the new economy can be seen in its effects on the macroeconomic variables of the various countries. As Ontiveros (2000) points out, the beginning of this year saw how the US economy beat the world record for growth cycle duration, this record had remained unchallenged since the 60s. The economic expansion that has taken in place in this country has led many economists to think that the key to such development must lie in increased productivity of labour, combined with low rates of inflation and unemployment. After decades in which the ICT revolution had coincided with the slowing down of growth in productivity, recent reviews of official statistics correct some errors of measurement and report a growth in labour productivity since the mid-nineties of around 2.5% (The United Nations Economic and Social Council, 2000).

This trend runs alongside the acceleration of the globalisation process, evident in the growing mobility among the factors of production, changes in the world of finance and trade, the liberalisation of the flow of capital goods and services, the role of direct investment, transfer of technology, etc.

These changes in the international economic scenario have been accompanied by a business strategy featuring mergers and take-overs. The current process is one of "convergence"

in markets and in business, a situation which in turn forces governments to take action to regulate competition. An example of this can be found in the regulation of sectors such as those of information and communications infrastructure in the European Union. The changes that are coming about as a result of regulation in certain sectors influence the role to be played by the State, with the result that governments, in this ever more global environment, have to bring in the legislation needed to permit the regulation "of" and "for" competition, by liberalising and lifting some regulations while introducing others (Liebenau and Thatcher, 1998).

Economic policies are also conditioned by globalisation. An example of this can be seen in the monetary policy practices of the Federal Reserve, which, through keeping interest rates low, has fostered the creation of businesses in the technological sector and increased investment in technology in other sectors.

From the macroeconomic point of view, therefore, the new economy makes its presence felt in the changes taking place in macroeconomic variables, in the transformations resulting from the globalisation process, including the role played in this by technology, and in the combined effects of these on the role of governments and the economic policies they need to design.

It must not be forgotten however, that the transformations in the world economic situation present tremendous challenges to the various economies, since, as pointed out by (Castells, 1997b), the information age is giving rise to severe processes of social exclusion both in developing countries and in poorer, depressed areas of the developed world.

4 A MICROECONOMIC VIEW OF THE NEW ECONOMY

From the microeconomic point of view, the new economy is apparent in the transformations taking place in the traditional market and the development of the electronic market and e-commerce, as a consequence of the impact of the ICT. Just as in the case of the term "new economy", there is no consensus when it comes to defining e-commerce. The most general definitions make reference to those new economic activities that are developing thanks to the infrastructure provided by the ICT, especially through the telecommunication networks.

However, these activities may be based either on the Internet, as a specific example of the application of information technologies, or on other networks. A distinction is therefore made between conventional or traditional electronic commerce and Internet-based commerce.

Electronic commerce favours the emergence of new products, agents, processes, new business relations and new communication and organisational patterns. Among the activities included under this type of commerce, we would find all those that require data transmission and digital documents, multimedia content, software programmes, or the exchange of products and services online, and many more besides.

While, in the world of traditional commerce, agents, products and processes are of a physical nature, in "pure" electronic commerce these three market components are digital; they come into being online. Somewhere between the two, however, mixed situations arise in which only one or some of the components are digital. These "intermediate" operations are also considered electronic commerce.

As for the products involved, digital goods are those that either already exist in digital format or can be put through a digitalisation process. For the most part they are information and knowledge based products. Within the digital economy, the differences between product and service become much less clear, to the extent that a product traditionally considered as merchandise becomes a service when its content is digitalised. Examples of this type of goods are physical goods that, being knowledge-based, can be digitalised and transmitted via a digital system; any type of goods or service that can be sent or received through the Internet; goods whose digital nature has no physical origin but are knowledge-based or knowledge process-based, and public or private business operations that can be totally digitalised (Choi *et al.*, 1997).

In order to define the features of these goods, it is necessary to bear in mind, first, the special nature of information products and, second, the ways in which the environments of the virtual market and the physical market differ. Knowledge-based digital products share with knowledge itself the common features of infinite growth potential and lack of rivalry, which mean that they will never run out and can be used repeatedly by numerous users.

This represents a serious challenge if the market is to function properly, since the use of these products can spread so easily that, unless adequate measures are taken to control ownership, agents may lose the incentive to develop new products. Thus the tremendous importance of the need to regulate intellectual property rights (LSE 2000).

The flexibility provided by the ICT, meanwhile, also enables digital products can be easily modified. This feature is of tremendous importance if we bear in mind how widely the demand for products can vary among the standard consumers operating on the electronic market. This means that supply must adapt constantly to individual preferences. The new technological environment, therefore, accentuates the need for differentiation.

The new market also modifies the characteristics and functions of traditional agents while encouraging the emergence of new intermediaries, while the changes in efficiency that take place bring about a complete transformation in the way they all interrelate.

Consumer behaviour differs between the virtual market and the physical world, in view of the fact that the quantity and quality of the information that is handled, the way it is sought, accessed and processed all take place through a network in which time and space take on a new meaning. The new consumer power acquired as a result affects such basic market issues as the way in prices and costs are determined, the question of efficiency, and so on.

Businesses, meanwhile, are faced with the dynamics of functioning as part of a network in which the salient features are the rapid life-cycle of products and services, reductions in transaction costs, cheaper production factors, lower levels of stocks, reduction in the time required to reach market or the decreasing importance in the new environment of company size. This obliges companies to adapt their ways of operating in the market, by taking up new business organisation models and new competing strategies, while the question of competitive advantage is also undergoing changes.

The new business paradigm requires firms to deal with competition not only from companies that normally operate on the traditional market and are gradually bringing their activities into the web, but also to deal with competition from cyberintermediaries, that is, companies with barely any physical presence, operating primarily in cyberspace.

Changes in the value chain the electronic market are directly related to the role of these new virtual intermediaries. As the electronic market continues to develop, these changes will grow. There is reason to believe that certain types of intermediaries may disappear, especially those chiefly involved in product distribution. Their survival will depend on the value added that they are able to generate.

The characteristics of this new market, as indicated by Choi *et al.* (1997), will, moreover, favour the emergence of yet more intermediaries offering support in the commercial transactions taking place. Examples of their new functions would be the supply of new services to guarantee product quality, organisation of the various segments of the electronic market, the supply of services to aid in locating the products offered on the electronic market, such that to obtain information will be to gain in efficiency, etc. The new intermediaries will bridge the gap between the vast amount of information provided and the capacity of consumers to absorb it. The need to attract the buyer's attention in the digital economy, help him to carry out his transactions and save him time in the process will be some of the roles to be filled by intermediaries in the electronic market. The role of the virtual intermediaries of the future may well go beyond providing support in transactions, and begin to facilitate various other processes both in the market and outside of it.

5 THE PROBLEMS INVOLVED IN MEASURING AND DETERMINING INDICATORS IN THE NEW ECONOMY

5.1 Measuring problems

The economic changes coming about as a result of the new economy require detailed analysis as to their quantitative relevance, if we are to obtain some idea of the dimensions of the phenomenon and determine its possible effects both on the economy and on other areas of human activity. The measurement and quantification of the phenomenon is one of the main challenges faced by researchers into this new situation. Among the various problems involved in measuring it, we could mention the following:

1. Ambiguity in defining the phenomenon, which in turn causes difficulties in obtaining a clear and consistent definition of the indicators used to measure it.

2. The difficulty involved in making price levels reflect the technical changes and quality improvements in goods and services resulting from the new economy. Price deflators need to be adjusted to capture the qualitative changes brought about by the ICT.

3. ICT-related goods and services are not only the output of industrial and services operations but also the input of those engaged in other activities. This complicates subsequent measuring processes, especially in the case of capital goods. This problem, which is also present in the conventional economy, is aggravated by the nature of the goods that prevail in the new economy.

4. As products are transformed by the new information and communication technologies, so new products and services are emerging that complicate the measuring process in the services sector, particularly in banking, insurance, retailing and communication services.

5. Many of the estimations carried out involve sales or income, which means that some movements may be registered twiceover. These estimations, moreover, fail to capture either displacement effects on other traditional forms of trade or profits resulting from this activity, since the available data covers only volumes of sales and clients.

6. The difficulty of measuring intangibles. Serious problems arise when it comes to measuring and quantifying intangible products, especially in the services sector. This is aggravated by the increasing diffusion of ITC in all types of activities: business, the public sector, non-profit-making organisations and households, together with traditional goods and services.

In short, there is currently a great lack of reliable statistics with which to measure and quantify the new economy, especially in the area of electronic commerce, thus the possibilities of comparing different countries are also limited. As stated in SEDISI (2000), the usual measuring tools are not suitable for measuring the magnitude and extent of the effects of ICT, since they rely on concepts, definitions and theories that belong to the economic frame of reference of the industrial society. These measuring difficulties, together with the limitations

imposed by the lack of full series of temporal data, force us to rely on forecasts, which vary substantially depending on which organisation is consulted.

5.2 The need for new indicators

The measuring problems to which we have alluded give rise to a need for suitable indicators to enable us to measure the importance and impact of the new economy, ICT and the services surrounding the digital economy. This would explain why in some countries statistical processing systems are undergoing extensive transformation. In this respect, the United States is the most striking example, given the importance of the new economy in its economic growth process. The Department of Commerce has, since 1997, been discussing a series of changes in its economic indicators. Some recent attempts at creating new indicators are shown in Table 1, where they appear grouped under three main headings:

1. Indicators to measure ICT infrastructure.
2. Indicators to measure activity on the Internet and in electronic commerce.
3. Indicators that attempt to quantify the economic and social effects of the phenomenon.

Table 1. The different types of indicators for measuring the new economy

| Types of Variables | Variables to be measured | Measuring indicators |
|--|--|---|
| 1. Infrastructure variables or indicators | -Data Networks -Public Communications -Transmission Infrastructure - Mobile infrastructure <u>E.g.</u> : computers, modems, servers, mobile telephones, etc. | - Infrastructure Indicator (U.Texas) - Application Indicator (U. Texas) - Conditions of Usage Indicator (Bouwman) - Infrastructure Indicator (Figuera) - Technology Indicator (Elmer) - Connectivity Indicator (Gault) - Infrastructure Indicator (Sedisi) -Access Devices Indicator (Sedisi) |
| 2. Activity variables or indicators | - Sales - Revenue - Profits - Users - Penetration | - Intermediary Indicator (U.Texas) - Commerce and Internet Indicator (U.Texas) - Social Usage Indicator (Bouwman) - Sales and Revenue Indicator (traditional) - Supply and Demand Indicator (Elmer) - Macroeconomic Data Indicator (Elmer) - Household Usage Indicator (Gault) - Business Usage Indicator (Gault) - Services, Usage, and Content Indicator (Sedisi). - ICT Industry Indicator (Sedisi) |
| 3. Impact variables or indicators | - Effects on sectors -Effects on business organizations -Effects on product ion processes - Effects on markets - Effects on education | - Bouwman Indicator - US National Science Agenda Indicator - US Census Office Indicator |

Source: Authors' own

5.3 Internet indicators developed by the University of Texas

The Center for Research on Electronic Commerce at the University of Texas in Austin, with the support of Cisco Systems, is involved in a determined effort to quantify the Internet phenomenon. The need for a coherent measuring methodology has led this Center to develop one of its own in order to obtain a reliable indicator of the importance of the Internet based on two variables: the revenue and jobs it generates. First of all an indicator is created which in itself can be further broken down into four layers or indicators. This makes it possible not only to analyse commercial transactions but also to take account of layers of infrastructure and applications:

1. Infrastructure indicator: covers sales and jobs at the firms that supply the products and services that make up the infrastructure of the net, including computer manufacturers and the suppliers of services to guarantee security on the net.

2. Applications indicator: Covers firms that supply e-commerce applications, consultation services, multimedia applications, development of software for the net, companies that design, construct and maintain web sites, etc.

3. Intermediary indicator: Covers any firm involved in increasing the efficiency of electronic commerce by simplifying links and interaction between buyers and sellers on the Web and the Internet, this includes suppliers of portals, Internet brokers, etc. These firms do not earn their income through sales, but through advertising, subscriptions and commissions.

4. Internet commerce indicator: Covers all firms offering products and services to other firms and to consumers in general: both in the form of tangible and intangible goods, such as professional services, flight tickets, financial services, etc.

It might be said that the first two of these layers or indicators deals with the broadest aspects of Internet infrastructure, while the other two cover Internet activity in its stricter sense.

Once the Internet indicator has been created with its four layers, it must be decided how and where the data for each of the levels is to be obtained. The University of Texas has turned

to numerous sources of secondary data, to obtain a final sample of 3.400 US firms that earn part or all of their income through the Internet in some area of the world.

Tables 2 and 3, which show this indicator and its four layers, provide clear evidence of the importance of the Internet as an economic phenomenon, as significant growth can be appreciated in each of the four layers.

Table 2. Internet Indicators. Revenue (in billions of dollars) and growth rate. U.S. (*)

| Indicators | 1998, 1 st four months | 1999, 1 st four months | Rate of variation |
|--------------------------|-----------------------------------|-----------------------------------|-------------------|
| Infrastructure Indicator | 26,795 | 40,139 | 50% |
| Applications Indicator | 13,925 | 22,487 | 61% |
| Intermediary Indicator | 10,992 | 16,666 | 52% |
| Internet Commerce Ind. | 16,508 | 37,540 | 127% |
| Internet Indicator (***) | 64,000 | 107,969 | 68% |

Source: Whinston *et al.* (1999).

(*) Estimations state that 75% of revenue is generated in the U.S. and the remaining 25% in other countries.

Table 3. Internet Indicators: jobs and growth rate. U.S. ()**

| Indicators | 1998, 1 st four months | 1999, 1 st four months | Rate of variation |
|-----------------------------|-----------------------------------|-----------------------------------|-------------------|
| Infrastructure Indicator | 472.517 | 656.551 | 39% |
| Applications Indicator | 407.858 | 563.124 | 38% |
| Intermediary Indicator | 355.358 | 444.302 | 25% |
| Internet Commerce Indicator | 506.693 | 900.882 | 78% |
| Internet Indicator (***) | 1.572.999 | 2.301.707 | 46% |

Source: Whinston *et al.* (1999).

(**) Estimations state that 85% of jobs are generated in the U.S. and the remaining 15% in other countries.

(***) As can be observed, some double entries in jobs and revenue figures have been avoided.

5.4 Indicators in the electronic commerce environment

In the area of electronic commerce also, a major effort has been made to obtain adequate quantification, especially as to the amount of traffic and number of users. The various sources providing data on electronic commerce differ widely in their explanations of the phenomenon.

Bouwman *et al.* (1999) propose three types of indicators for measuring electronic commerce:

1 Indicators relating to the basic conditions governing the use of electronic commerce, such as ease of access, the availability of computers, modems, the Internet in the home, etc.

2 Indicators that take into account the actual use of electronic commerce: usage data, types of usage, sectors and products, etc.

3 Indicators that measure the effects and implications of the use of electronic commerce, with distinctions as to whether these effects are on businesses, sectors, or the economy as whole.

Elmer (1999), meanwhile, points to the need to obtain indicators in four areas: demand, supply, the technology used, and macroeconomic variables. Figuera (1999) develops a series of indicators relating exclusively to aspects of electronic commerce: infrastructure: number of Internet hosts, and numbers of computers, modems and mobile phones.

Finally, as far as Spain is concerned, we must mention the contribution made by SEDISI (2000) who have developed a methodology for measuring the Information Society, which aims to offer a picture of the application of ICT in Spain and other countries, via a series of indicators grouped under: ICT industry indicators, access indicators, services indicators, usage indicators, and content indicators.

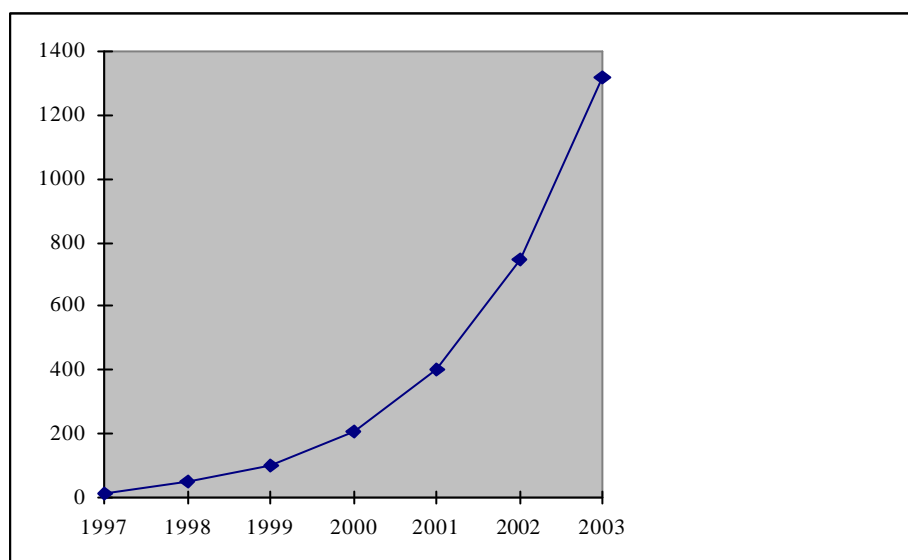
6 QUANTIFICATION OF THE NEW ECONOMY

Having examined some of the problems involved in measurement and some attempts at quantifying the digital economy, we intend in this section to present some data that will give a general idea of the importance of the phenomenon.

The quantification presented includes figures at worldwide level, and also for the United States, the EU and Spain, and focuses on the two most fully developed indicators, that is, those referring to infrastructure and supply and demand.

To begin the analysis with the activity indicators, Graph 1 shows the development of electronic commerce worldwide, with a highly significant growth forecast, based on the demand for products such as IT, books, travel and clothing.

Graph 1. Growth of electronic commerce worldwide (in billions of \$)



Source: Elder (1999), from IDC data.

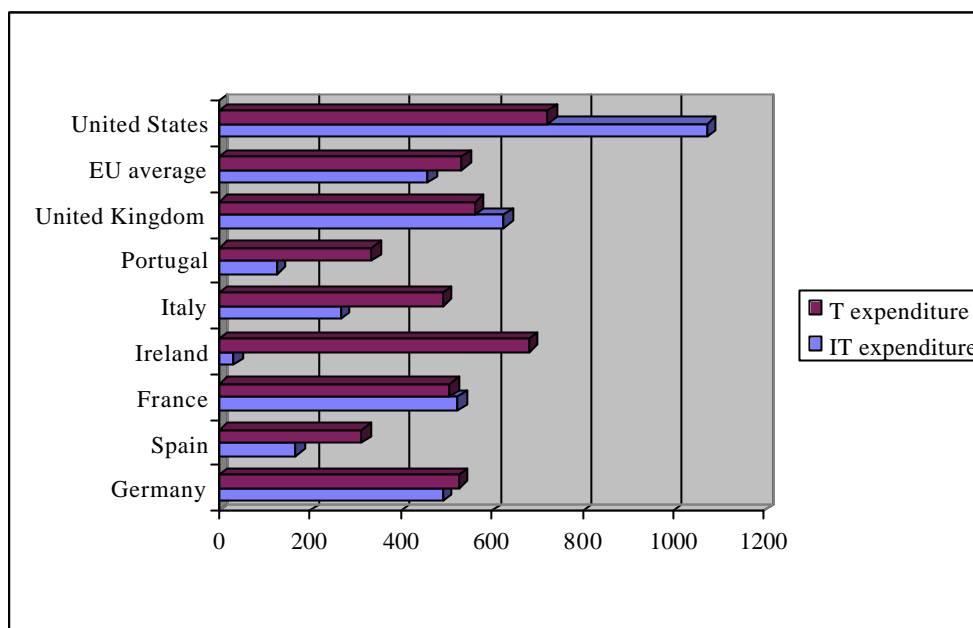
If we break down ICT expenditure into IT and telecommunications in per capita terms, Graph 2 shows the leader to be the United States, where the ICT industry accounts for 30% of the country's economic growth since 1995 (US Department of Commerce, 2000).

Within the European Union, Spain emerges in a comparatively weak position, with a total expenditure in telecommunications in 1998 of only 58,8% of the European average.

Analysis of various infrastructure indicators, such as servers and computers, at worldwide level and for the OECD, provides a ranking (ISI) shown in Table 4, that illustrates the worldwide situation as to ICT infrastructure.

Although major differences exist between countries, significant growth is taking place on all continents. To quote an example, in terms of the numbers of people connected to the Internet, the increase from March 1999 to March 2000, was 156% in Africa, 155% in Asia, 102% in South America, 102% in Europe and 41% in Canada and the US (US Department of Commerce, 2000).

Graph 2. Comparison of per capita expenditure in telecommunications and IT



Source: Authors's own, with data from Sedisi (2000). IT expenditure is for 1997, and telecommunications expenditure for 1998.

Table 4. The Information Society Index(*). Ranking by countries

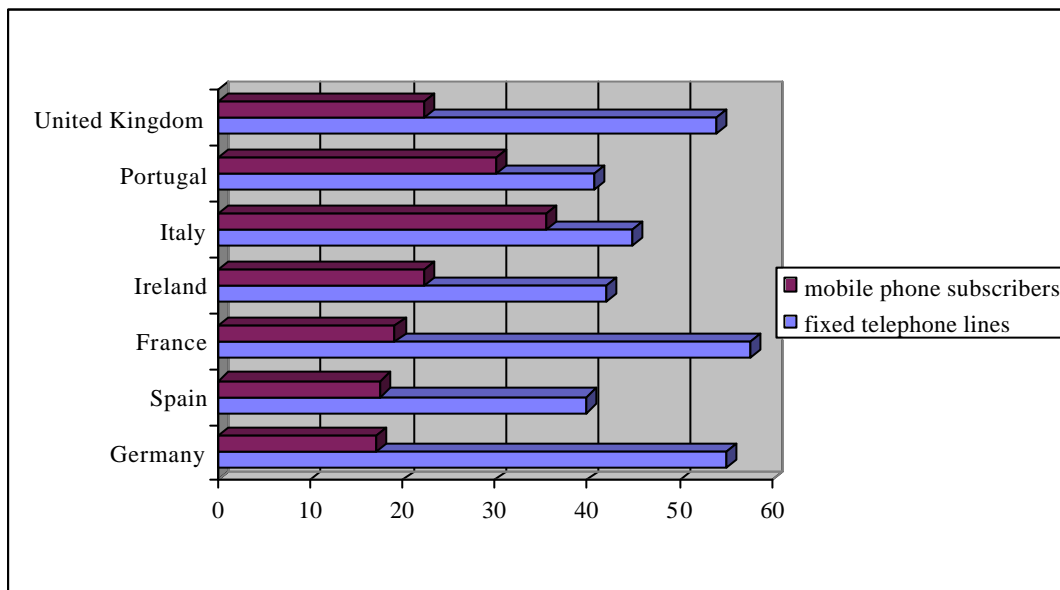
| 1999 ISI | Country | Score |
|----------|----------------|-------|
| 1 | Sweden | 5062 |
| 2 | United States | 5041 |
| 3 | Finland | 4577 |
| 4 | Norway | 4481 |
| 5 | Denmark | 4336 |
| 6 | Canada | 4257 |
| 7 | Holland | 4230 |
| 8 | Switzerland | 4174 |
| 9 | Australia | 4129 |
| 10 | Japan | 4093 |
| 11 | Singapore | 4014 |
| 12 | United Kingdom | 3807 |
| 13 | Germany | 3558 |
| 14 | Hong Kong | 3484 |
| 15 | Belgium | 3419 |
| 16 | Austria | 3397 |
| 17 | New Zealand | 3289 |
| 18 | Taiwan | 3177 |
| 19 | Ireland | 3144 |
| 20 | Israel | 3140 |
| 21 | France | 3140 |
| 22 | South Korea | 2931 |
| 23 | Italy | 2703 |
| 24 | Spain | 2533 |

Source: IDC, compiled by the Internet Users Association.

(*) This ranking was obtained by taking into account the capacity of each country to access computerized telecommunications networks and produce content for the new information society. The 23 different aspects taken into account fall into four categories: computer infrastructure, telecommunications infrastructure, Internet infrastructure and social framework

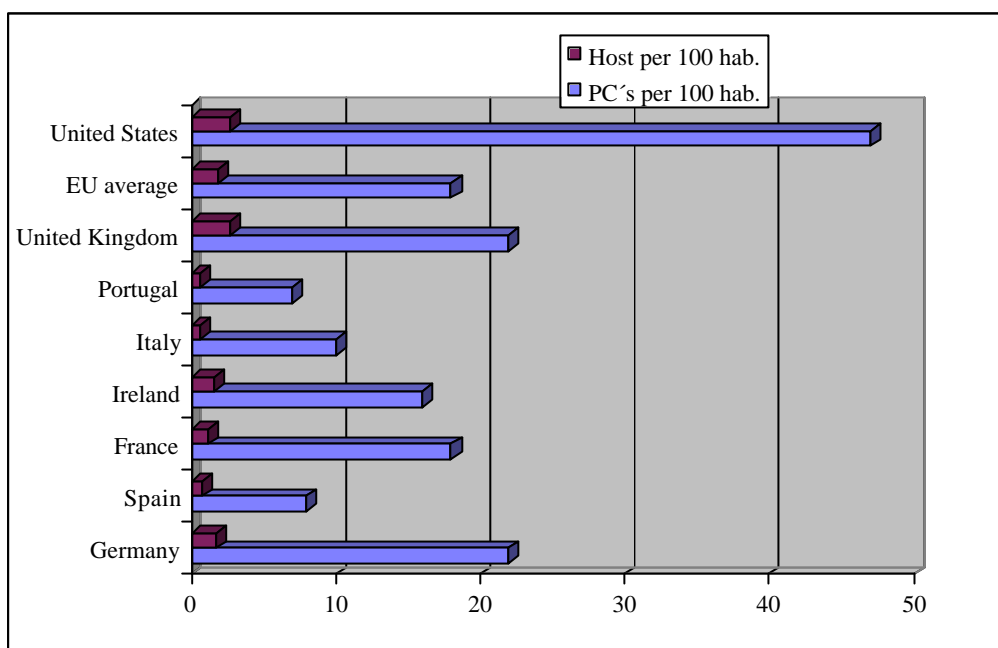
If we are to examine the situation in Europe, mention must be made of the major differences in infrastructure between the various member countries of the EU. Graph 3 shows fixed telephone lines and mobile phone subscribers per 100 inhabitants for 1997 and 1998 respectively. Graph 4, meanwhile, focuses on Internet infrastructure, with numbers of pcs and hosts connected to the Internet per 100 inhabitants for 1997 and 1999 respectively.

Graph 3. Comparison of the number of fixed telephone lines and mobile phone subscribers per 100 pop.



Source: Authors's own, with data from.Sedisi (2000).

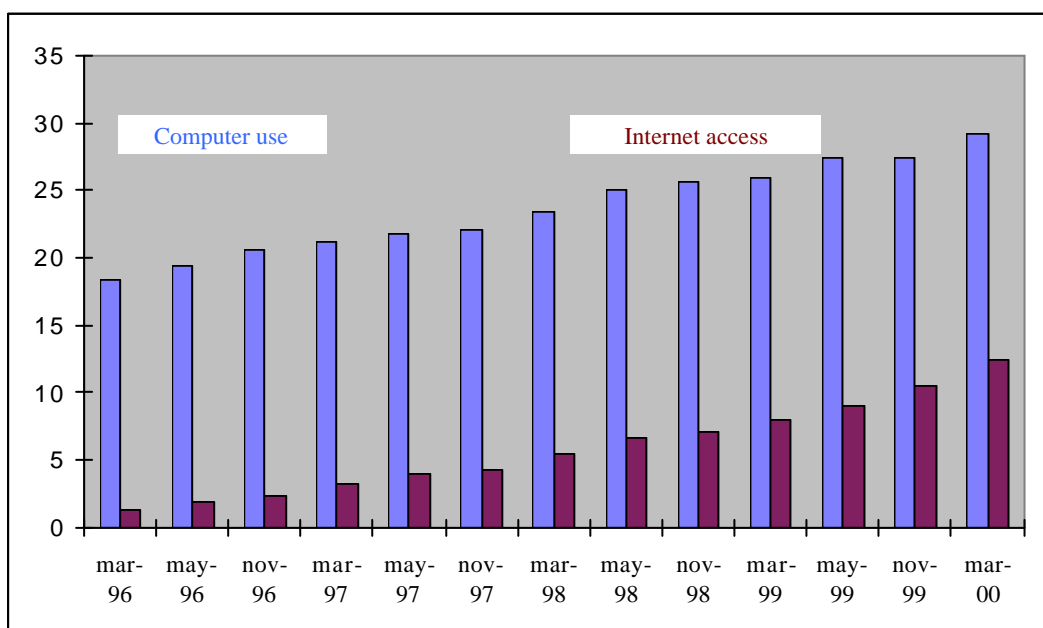
Graph 4. Comparison of number of pcs and hosts per 100 pop.



Source: Authors's own, with data from.Sedisi (2000).

Finally, turning to the situation in Spain, we are able to observe a notable delay in the progress of this country towards forming part of the new economy, in spite of the Strategic Initiative for the Development of the Information Society, launched by the Government in 1999.

Graph 5. Percentage of computer and Internet users in the Spanish population. For the 1996-2000 period.



Source: General Media Survey. General data on Internet users in Spain

This delay is obvious in the comparative weakness of Spain's score on the various indicators for activity and infrastructure, except for access terminals, particularly television sets per household, and numbers of automatic cash dispensers and sales outlet terminals.

In spite of this comparative weakness registered by our country on the various indicators, it is worth mentioning the improvement in infrastructure that has taken place in recent years. This is illustrated in Graph 5, which shows the increase in the percentage of the population who are pc users and who have Internet access

7 CONCLUSIONS

The new economy is a networking, virtual, intangible and digital economy based on information, knowledge, innovation and digital information decoding, which is developing as a result of the impact of the Information and Communication Technologies.

From the macroeconomic perspective, it can be interpreted as the result of a combination of three phenomena: the development of technological infrastructure associated with the ICT, the macroeconomic transformations in the economies deriving from the application of these technologies and the strengthening of the globalization process.

The microeconomic effects of the new economy are taking place in the electronics market, where new products, agents and processes are emerging in the midst of new business relations and new models of communication and organization. These new conditions favour changes in market structure and competitive strategies as well as speeding up convergence in technologies, infrastructure, markets and products.

With a phenomenon of such importance, it is essential that the appropriate indicators be found to enable it to be properly quantified and its economic and social effects analysed. This, however, is no easy task, because, besides all the problems involved in measuring intangibles, we have not yet come up with a universally accepted definition of the phenomenon.

The indicators currently being used can be classified into different types according to whether they measure levels of infrastructure, activity, supply or demand or whether they are concerned with social or

economic effects. It is to be hoped that before long reliable statistics will become available that will make international comparisons possible and facilitate the coordination of public initiatives in this new economic environment.

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