WORKING PAPER

1-02

Production and diffusion of ICT in Belgium

A comparative analysis

Federal
Planning Bureau
Economic analyses and forecasts

Avenue des Arts 47-49
B-1000 Brussels
Tel.: (02)507.73.11
Fax: (02)507.73.73
E-mail: contact@plan.be
URL: http://www.plan.be

Greet De Vil, Chantal Kegels,
Mary van Overbeke

January 2002

Production and diffusion of ICT in Belgium

A comparative analysis

Greet De Vil, Chantal Kegels,
Mary van Overbeke

January 2002

This paper is part of the research program 'Transition vers la société de l'information: perspectives et défis pour la Belgique' financed by Services federaux des affaires Scientifiques, Techniques et Culturelles (S 2/64/01).

Federal Planning Bureau

The Belgian Federal Planning Bureau (BFPB) is a public agency under the authority of the Prime Minister and the Minister of Economic Affairs. The BFPB has a legal status that gives it an autonomy and intellectual independence within the Belgian Federal public sector.

BFPB'activities are primarily focused on macro-economic forecasting, analysing and assessing policies in the economic, social and environmental fields.

Internet

URL: http://www.plan.be

E-mail: contact@plan.be

Publications

Publications:

The Economic Forecasts
The "Short Term Update"

Planning Papers (the last numbers)

giving the results of policy analyses and assessments

91 *Verkenning van de financiële evolutie van de sociale zekerheid 2000-2050 - De vergrijzing en de leefbaarheid van het wettelijk pensioensysteem*
Perspectives financières de la sécurité sociale 2000-2050 - Le vieillissement et la viabilité du système légal des pensions
M. Englert, N. Fasquelle, M.-J. Festjens, M. Lambrecht, M. Saintrain, C. Streel, S. Weemaes - Januari Janvier 2002

92 *Les charges administratives en Belgique pour l'année 2000 - Rapport final*
De administratieve lasten in België voor het jaar 2000 - Eindrapport
Greet De Vil, Chantal Kegels - Janvier Januari 2002

Working Papers (the last numbers)

8-01 *General and selective wage cost reduction policies in a model with heterogeneous labour*
Peter Stockman - December 2001

9-01 *Évaluation de l'impact des mesures fiscales et non fiscales sur les émissions de CO_2*
Evaluatie van de impact van fiscale en niet-fiscale maatregelen op de CO_2-uitstoot
F. Bossier, I. Bracke, I. Callens, H. de Beer de Laer, F. Vanhorebeek, W. Van Ierland, ECONOTEC - Décembre - December 2001

Citations should refer to the publication, mentioning the author(s) and the date of publication.

Responsible Editor Henri Bogaert
Legal Depot: D/2002/7433/5

We would like to thank the members of the sectoral directorate of the FPB for their useful comments on earlier versions of the WP, and especially Hilde Spinnewyn who has provided all statistical support relative to the balance sheet database from the National Bank of Belgium.

Table of Contents

I Executive Summary

Information and communication technology (ICT) has become a significant economic activity in most industrialized countries as well as an important engine of innovation and changes in the rest of the economy. It has been recognized as one of the key factors boosting productivity growth and hence business sector competitiveness. Various initiatives have been recently adopted at regional, national and European levels in order to meet quickly the new challenges of ICT use and diffusion in Europe. A growing number of indicators are now available in order to assess the position of each country or region in terms of ICT development and to guide policy decisions in that field. The aim of this report is to provide a clear and succinct view of the relative development of ICT in Belgium by analyzing both the production and the diffusion of ICT in our economy[1] and to highlight the main weaknesses and strengths of the Belgian economy in that area.

Even if the sector has been recently characterised by stock markets ups and downs and numerous bankruptcies, production of ICT goods and services has contributed significantly during the nineties to the growth of economic activity and employment in some industrialised countries as for instance in Anglo-saxon and Scandinavian countries. Has Belgian economic activity benefited from the boom in the ICT sector to the same extent as other industrialised countries? What kind of development can be expected in the future? These are the main questions addressed in the part of the report devoted to the analysis of the Belgian ICT production sector.

As in other countries, the ICT production sector has been dynamic in the second part of the nineties but on the whole, its importance in terms of value added or employment remains small in Belgium compared to the leading countries. ICT manufacturing is the weakest part of the sector. Only 1% of Belgian business sector value added comes from this sector, which is similar to the level observed in Italy or Portugal. On the other hand, the telecommunication sector and the IT services are well developed and contribute to value added and employment in a similar proportion to the OECD average. On the whole, the ICT production sector now accounts for 5.5% of GDP in Belgium, employing approximatively 200,000 workers, nearly 5% of wage earners in Belgium.

As expected, this sector has been one of the most dynamic of the economy. Value added in current prices for the ICT sector has increased by 30% from 1995 to 2000. Showing an annual growth rate close to 15%, computer activities are by far the most dynamic part of the sector. Telecommunication services are also on a rapid growth trend (almost +10% of annual growth). Since 1993, the ICT sector has con-

1. The definition of ICT used in this document is the one adopted by the OECD in April 1998 and covers ICT manufacturing, telecommunication services and IT services

tributed 10% to the net creation of employment in the Belgian economy (15,000 new jobs out of a total of 145,000 in the economy as a whole).

The future of ICT development in Belgium is contingent on a number of elements which may differ depending on whether ICT products are more oriented to international markets or to local demand. For some of these elements, Belgium is in a good position, notably for the source of financing, while others such as R&D capacities, labour qualifications and in some cases, market structures may impede a more rapid development of the sector. The main conclusion of the analysis is therefore that the position of the Belgian ICT sector on international and local markets is not expected to change radically in the near future and the growth trend should continue to follow mainly the evolution of local demand.

Among the main factors determining the future of the ICT production sector, the control of firms and the related question of their autonomy of decision, are important especially when it comes to future investments. In the manufacturing industry, the autonomy of Belgian producers appears quite limited. The future of this market will mainly depend on decisions made by international groups and therefore on the attractiveness of the Belgian economy in that field. As far as telecommunication services are concerned, local demand remains the main driving force in this market at present, which means that the origin of firms may be of little importance for future developments. It is also the case for IT services, dominated by foreign firms with limited individual market share, which reduce the impact of their decisions. Finally, the content activities market is much more open and dependent on multiple Belgian decision centers.

In a high- tech sector as ICT, R&D capacities are crucial in order to remain innovative and to maintain market shares. Unfortunately, in the field of ICT, R&D indicators remain weak in Belgium compared to most of the OECD countries. A highly qualified labour force, especially engineers, is also necessary to support the development of new high-tech industries. According to the latest figures of the European innovation scoreboard, Belgium has a high rate of tertiary education among the working age population (27.1% compared to 21.2% in average in the EU). Meanwhile, the supply of scientists and engineers in Belgium is significantly below the EU average and below the most advanced countries in ICT sectors.

Finally, the availability of enough capital to launch activities is also a prerequisite for the development of a sector. High-tech venture capital investment is on a whole at a high level in Belgium (0.165% of GDP) compared to the EU (0.108%), especially for early stages. Belgium has the highest share of venture capital going to the communication sector and computer related sector in percentage of GDP. Funding supply seems therefore not to be a binding constraint for existing firms and starters in the ICT sector in Belgium.

The second part of the report analyses the diffusion of ICT in Belgium in comparison with the European Union average and the United States[1]. This diffusion is closely linked to the availability of efficient and cheap information and telecom-

1. Given the data available for this comparison, this section is mainly devoted to the internet diffusion. Belgium is well-positioned in other parts of the sector, e.g. the use of financially-linked software by households.

munication infrastructures. However, the use of the worldwide web mainly depends on its potential applications of which an interesting one is e-commerce.

Belgium seems to occupy an intermediary position in Europe as a country with both a satisfactory infrastructure and a good business environment but also with some lags in the use of the internet opportunities. In terms of internet diffusion measured by the number of users, Belgium has managed to catch up with and then surpass the European average although it is still a long way from American performance levels. This development was due to a combination of different factors.

In terms of computer infrastructure, Belgium is relatively well equipped, slightly better than the European average. In terms of the telecommunication infrastructure traditionally used (fixed telephony), Belgium fell somewhat behind in the past in comparison with its European partners and the United States. Telecommunication pricing levels and structures are important to understand the Belgian position. The main system in Belgium, as in most other European countries, is, indeed, internet connection pricing calculated per hour of connection with a distinction between peak and off-peak times. This pricing system makes the internet clearly less attractive than the fixed-price system used in Anglo-Saxon countries. Moreover, for a long time, Belgium was one of the most expensive European countries in terms of internet charges discouraging potential users. Since 2000, these charges have been sharply reduced. At the same time, the basic telecommunication infrastructure has been upgrated. The recent evolution of broadband puts Belgium at the top in Europe in terms of the penetration of broadband connections. Moreover, its position in alternative connection technologies (mobile, cable TV, fibre optic networks) is relatively good, allowing progressive generalization of rapid and "always on" type connections and thus boosting the development of internet services.

The other key element accounting for internet diffusion is the development of sufficient content to attract a great number of users. In this field, it clearly seems that Belgium is lagging behind in the development of domestic internet content, not only in comparison with the average European situation but mainly in comparison with the United States which, in February 2000, had almost 7 times more sites per 1000 inhabitants. Looking at this in more detail, the multimedia content of Belgian sites is also less developed than in other European countries. Various reasons could be given to explain this relative lag, one of them being that the Belgian multimedia market is segmented and small as three national languages coexist in our country.

Another important aspect of internet content is the availability of e-commerce. This availability requires secured web servers which allow the encryption of confidential data. Based on the evolution of the number of secured servers, the conclusion is that Belgium, like the rest of Europe, is far behind the United States and, more worryingly, that this gap has increased during recent years.

The development of B2C in Belgium took relatively longer than in other European countries but Belgium is catching up. Companies in Belgium have been much slower in adopting B2B than in most European countries, and hence also in the United States. The number of companies using the internet for sales or procure-

ment is more than 30% lower than the European average. But, as in other European countries, the use of the internet by Belgian firms is gradually being extended to all industries even if the development of internet market places organized by Belgian firms is not yet visible.

The development of ICT and its integration in the production process also requires firms to be able to mobilize a qualified labour force with ICT skills. The European Union estimates the deficit to be 800,000 jobs currently vacant in the European area. This figure could reach 1.7 million in 2003 if no action is taken. To respond to this challenge, the education system has to be adapted in order to integrate an e-learning dimension. One of the top priorities in this field is to provide the required infrastructure in terms of computers and connection to schools. The current Belgian position is in a similar range to most neighbouring countries but a long way from the US position. The awareness of the importance of early familiarisation with new technologies emerged relatively late in Europe in general and in Belgium in particular.

II Introduction

A. Defining the ICT sector

In April 1998, the working party on Indicators for the Information Society set up by the OECD adopted a definition for ICT sectors. This covers all industries associated with the production and distribution of information and communication technologies. For manufacturing industries, the products of a candidate industry:

- "must be intended to fulfil the function of information processing and communication including transmission and display;
- must use electronic processing to detect, measure and/or record physical phenomena or to control a physical process.

For services industries, the product of a candidate industry must be intended to enable the function of information processing and communication by electronic means."[1]

Based on this definition, the ICT sector includes the following industrial classes of revision 3 of the ISIC:

Manufacturing

3000 - Office, accounting and computing machinery

3130 - Insulated wire and cable

3210 - Electronic valves and tubes and other electronic components

3220 - Television and radio transmitters and apparatus for line telephony and line telegraphy

3230 - Television and radio receivers, sound or video recording or reproducing apparatus, and associated goods

3312 - Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process equipment

3313 - Industrial process control equipment

1. OECD, Defining the ICT sector, 2001.

Services

5150 - Wholesaling of machinery, equipment and supplies

7123 - Renting of office machinery and equipment (including computers)

6420 - Telecommunications

7200 - Computer and related activities

This list is far from perfect. Some activities are not entirely related to ICT (such as 3130 or 5150) while other ICT sectors are not taken into account. This is especially true of the "content industry" which produces and diffuses information through electronic devices. Sectors 221 (publishing), 222 (printing) and 223 (reproduction) are commonly considered as content activities. Media services such as film production and distribution (9211, 9212, 9213) as well as radio and television (9220) and press agencies (9240) may also be included.

At the international level, the data will not usually cover the content industry. In this report, as far as possible, the figures related to content activities will be added when looking at the Belgian situation.

III Importance of ICT sectors for the Belgian Economy

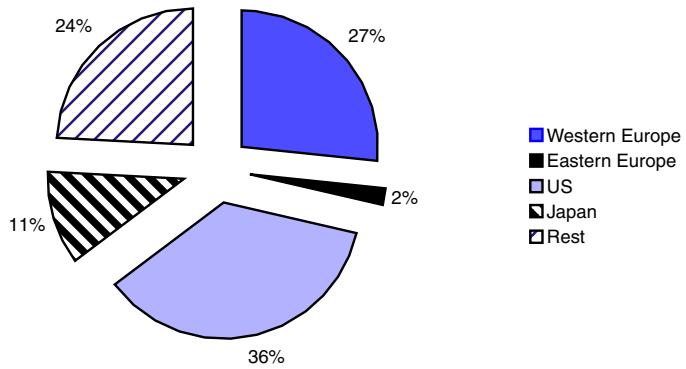
A. Belgium in an international perspective

The production of ICT goods and services has become one of the fastest-growing activities in the world, now contributing more than 7% of business GDP in the OECD zone. Despite stock markets ups and downs, the ICT producing sector has played in some countries a significant role in boosting economic growth as well as generating productivity gains. This first section analyses, in comparison with other OECD countries, the contribution of ICT production sectors to the Belgian economy in terms of value added, employment and trade flows.

1. The world ICT market

According to EITO estimates, the global market[1] for ICT products amounts to more than 2000 bn euro. The United States (US), Japan and the European Union (EU) are the three major marketplaces, accounting for 75% of the value of the ICT market. The US market alone is as large as the European and Japanese markets put together.

FIGURE 1 - Major regional ICT markets - 2000



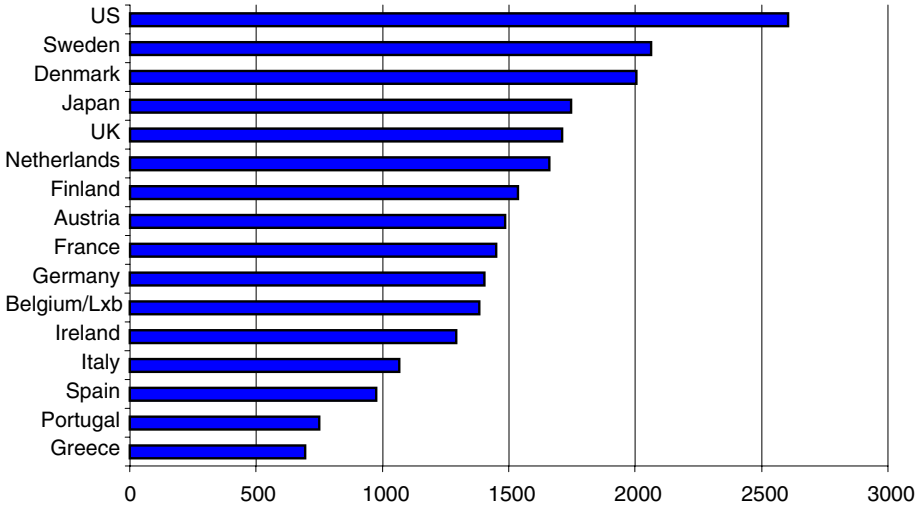
Source: EITO, 2001.

1. Measured as the value of final sales.

In 2000, the ICT equipment market was expected to amount to 667m euro, about a third of the whole ICT market, while software and IT services sales were close to 570m euro. Carrier services exceeded 770m euro and represented 38% of the entire ICT market. Growth continues to be strong in all segments, around 10% annually on average. The most dynamic part by far is the software market which is expected to grow by more than 30% in 2002 as compared with 2000. Nevertheless, some areas are starting to slow down: the Japanese IT market is growing by 6% annually compared to 10% in the US and the EU. The telecom market appears to be more mature, especially in Japan and in the US. The exceptional annual growth seen in Europe recently (around 15%) is also expected to decline in the near future.

When measured in terms of per capita ICT expenditure, the development of ICT markets appears more advanced in Japan and in the US than in the EU on average. But, as Figure 2 shows, the spread within Europe is substantial: the Swedes spend three times more on ICT products than the Greeks.

FIGURE 2 - Per capita ICT expenditures, Euro - 2000



Source: EITO, 2001.

2. Which are the most important producing countries?

The ICT market is far from homogenous. On the one hand there are more or less standardized products in a global and increasingly integrated and competitive market. This is the case with regard to most manufactured ICT products (computers, communication equipment, electronic components etc.) and also in some services such as communications or certain types of software. Within this market, producers will settle where conditions are most attractive. Determining factors will mainly be strong R&D capacities in that field, a highly qualified labour force and an easy access to venture capital. An existing network of producers in the sector and a dynamic local market may also explain why some countries are more specialised than others in this type of production.

On the other hand, various ICT services still continue to be locally rooted. These include equipment sales and "after sales" services, computer activities for ICT users, some telecommunication services (fixed and mobile telephony) as well as newspapers, film distribution etc. These activities are therefore set up in each country or region and their development depends mainly on the evolution of local demand.

The size of ICT producing sectors may be assessed in OECD countries for three different sectors: ICT manufacturing industry, telecommunications services, other IT services (computer activities, wholesaling and rental of office machinery)[1]. The industrial sector typically belongs to the first kind of market presented above. The telecommunication sector is a mixture of international and local markets. In IT services, the computer activities sector is dominated by firms competing at local level while wholesale activities appear to be much more open to international competition. Some countries, such as Belgium for instance, have a strong buying-selling sector, much larger that what would be needed to supply the local market.

TABLE 1 - Share of ICT sector in business sector value added and employment - in percentage

	Value added				Employment				
1997 or 1998	Total ICT	Industry	Telecom	IT serv.	Number	Total ICT	Industry	Telecom	IT serv.
Sweden	9.3	3.4	2.3	3.6	174187	6.3	2.1	1.3	2.8
United States	8.7	2.6	2.8	3.3	4521080	3.9	1.4	1.1	1.5
United Kingdom	8.4	1.9	2.4	4.1	1111630	4.8	1.3	0.8	2.7
Finland	8.3	3.9	1.8	2.5	87834	5.6	2.3	1.1	2.1
Austria	6.8	1.6	2.6	2.6	164786	4.9	1.2	1.9	1.8
Canada	6.5				430000	4.6			
Norway	6.4	0.9	2.0	3.5	73932	5.3	0.7	1.3	3.2
Denmark		1.4		4.9	96365	5.1	1.2	1.0	2.9
Ireland					55732	4.6	2.8	1.0	0.8
Germany	6.1	2.1	2.6	1.5	974000	3.1	1.2	0.7	1.2
Belgium	*5.8*	*1.0*	*2.0*	*2.8*	*130373*	*4.3*	*0.8*	*1.0*	*2.5*
Italy	5.8	1.1	3.2	1.6	671430	3.5	1.0	0.9	1.6
Japan	5.8	3.5	1.6	0.7	2059983	3.4	2.0	0.4	1.1
Portugal	5.6	1.0	2.9	1.7	94305	2.7	0.8	0.6	1.4
France	5.3	1.4	2.0	1.9	681038	4.0	1.4	1.0	1.6
Netherlands	5.1	1.5	1.9	1.7	199000	3.8	1.5	0.8	1.5
EU	6.4				4441000	3.9			
OECD	7.4				12800000	3.6			

Source: OECD, 2001.

1. As already mentioned, content-related activities are not yet taken into account by international ICT figures.

Based on the value added produced in ICT sectors, OECD countries can be classified into four categories from the most important to the least important:

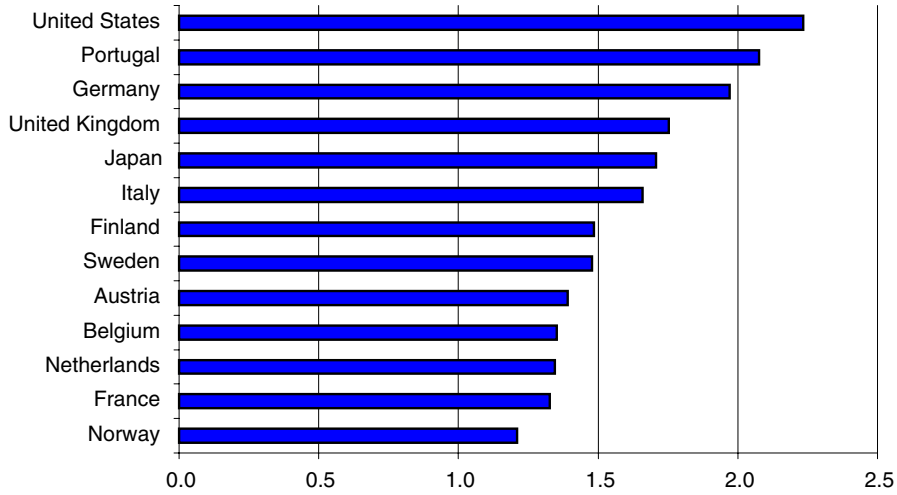
1. The United States, the United Kingdom and two Scandinavian countries (Sweden and Finland);
2. The other Scandinavian countries (Norway and Denmark) and Anglo-Saxon countries (Canada and Ireland) as well as Austria;
3. The center of the European Union: Germany, France, Netherlands, Belgium as well as Italy, Portugal and Japan;
4. The south of Europe: Greece and Spain.

As suggested before, some countries are specialised in ICT production: on average in the OECD, the ICT industry represents approximately 2% of business GDP. Finland, Japan, Sweden and the US[1] have a much stronger ICT manufacturing base (from 2.6% to 3.9% of business sector value added) while for most of the European economies, the share of the ICT industry is around 1-1.5% of business sector vallue added. At the other extreme, Belgium is at the bottom of the league of European countries in terms of ICT manufacturing production. Only 1% of the business sector value added comes from this sector, a similar level to what is seen in Italy or Portugal.

As far as telecommunications services are concerned, the performance range is much narrower, revealing less specialisation and a greater importance of local markets. Nevertheless this sector is larger in some countries such as the US, Italy, Portugal and, to a minor extent, Germany and Austria. The share of IT services is usually related to the development of ICT manufacturing and ICT use in the business sector. The leading countries in that field are the UK, Sweden, Norway, the US and more surprisingly Denmark. Good performance is also seen in Belgium, where the wholesaling sector is quite large.

1. Ireland should also be added, even though figures for that country are still incomplete. Value added produced by ICT industry could have reached more than 4% of GDP.

FIGURE 3 - Labour productivity in ict sectors related to business sector productivity in 1998



The ICT sectors record higher labour productivity[1] on average than other sectors of the economy. The share of these activities in terms of employment is therefore lower than their share in terms of value added. This is mainly the case for industrial ICT activities where labour productivity gains have been substantial in recent years. US labour producitivity is already one of the highest in the world. Out of all the OECD countries, the US ICT sector has the highest labour productivity in comparison with the rest of the economy, which could explain the strong development of these activities in that country. In Belgium, where labour productivity is also high on average, the difference between ICT sectors and the others is much lower than in the US while remaining within the range of most European countries. This can be related to the limited significance of ICT manufacturing in the Belgian ICT sector.

3. International trade

According to 1998 figures, exports of ICT goods and services represented 12.5% of total exports of OECD countries. The trade balance was on a whole slightly negative for the OECD area. The main exporters were by far the US (24% of the total) followed by Japan (16%) and the UK (9%). Belgium is in 13th place, well behind the leaders (Belgian ICT exports amounted to 2% of OECD ICT exports).

The ICT trade is of great importance for the external balance in some countries: trade in ICT products is very important in Ireland (30% of total trade) and also in Hungary, Korea, Mexico, Japan and Finland where the ICT trade accounts for almost 20% of total trade. For Belgium it represents 7%, which is low compared to most OECD countries.

1. Measured as the current value added by worker.

B. The development of the ICT sector in Belgium

More detailed figures may be obtained for Belgium alone. This gives us the opportunity to identify more precisely the most dynamic ICT branches in Belgium[1]. Moreover, the use of the balance sheets database from the NBB and the figures from the Ministry of Employment allow us to analyse the most recent trends in terms of value added produced, employment and number of firms involved in ICT activities.

1. A contribution to GDP of 5.5%

According to the 1997 figures on the latest complete survey of firms, value added by the Belgian ICT sector (excluding content activities) amounted to nearly 10bn euro, and contributed to 4.4% of GDP. Telecommunications services generated 30% of total ICT value added. The trading sector is also quite large: the turnover at that time was close to 20bn euro and represented two thirds of the whole turnover of the ICT sector. Imports and exports of ICT equipment have accounted for a growing share of business activities. At the opposite end of the scale, manufacturing activities are quite small. For instance, as already noticed, computer manufacturing is almost non-existant and employs only 486 workers in the whole country.

When looking at more detailed figures, the Belgian production sector seems strong in wholesaling, computer activities and, to a minor extent, in the manufacture of television, radio and communication equipment and apparatus (NACE code 32) (0.6% of GDP). Content-related activities in publishing, printing and reproduction of recorded media reached 1% of GDP in 1997. Media services which are not covered by the structural survey are estimated to produce value added of around 0.75bn euro. On a whole, content-related activities may add some 2.5-3bn euro to GDP which means that the ICT sector represents approximately 5.5% of Belgian GDP overall.

1. Content activities are included in this section, since they are increasingly digitalised and may benefit from the rapid technical progress made in areas such as transmission capacities.

TABLE 2 - Turnover and current value added (market prices) (m euro) - 1997

		Turnover m euro	Value added at factor cost m euro	Share in total GDP
NACE		4127.5	1661.4	0.8%
300	Manufacture of office machinery and computers	301.5	84.0	0.0%
3130	Manufacture of insulated wire and cables	287.9	84.3	0.0%
3210	Manufacture of electronic valves and tubes and other electronic components	528.9	239.9	0.1%
3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1175.4	636.7	0.3%
3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1407.1	456.8	0.2%
3320	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other pruposes, except industrial process and equipment control	281.1	106	0.0%
3330	Manufacture of industrial process control equipment	145.7	63.8	0.0%
	Trade and renting	20039.4	3172.4	1.5%
5143	Wholesale of electrical household appliances and radio and television goods	4334.5	398.0	0.2%
5164	Wholesale of office machinery and equipment	7385.4	1180.4	0.5%
5165	Wholesale of other machinery for use in industry, trade and navigation	7983.6	1442.3	0.7%
7133	Renting of office machinery and equipment, including computers	335.9	151.7	0.1%
6420	Télécommunications	4977.6	3194.8	1.5%
72	Computer and related activities	3326.7	1446.1	0.7%
	Contents (excluding media services)	5245.8	1884.5	0.9%
221	Publishing	2142.7	676.4	0.3%
222	Printing and service activities related to printing	3080.7	1199.7	0.6%
223	Reproduction of recorded media	22.4	8.4	0.0%
	Total ICT (including contents)	37717.0	11359.2	5.3%
	Total ICT (excluding contents)	32471.2	9474.7	4.4%

Source: NIS, Firm survey.

The figures from the balance sheet database make it possible to measure the growth in value added since 1995. As indicated in table 3, value added in the ICT sector has increased by 31% from 1995 up to 2000. Computer activities are by far the most dynamic part of the ICT sector: the annual growth rate has been close to 15%. Telecommunications services are also on a rapid growing trend (nearly +10% of annual growth). The rise that has been recorded in industrial activities is smaller but it should be kept in mind that price movements may hide the evolution in real terms. In industry, for instance, equipment prices have fallen substantially in the last years. The value added expressed in real terms should therefore have increased more rapidly than in current value terms. In computer services, the trend may have been different.

Compared to 1997, the share of the ICT sector in total GDP remained stable, estimated to 5.5% in 2000.

TABLE 3 - Share of ICT branches in total value added of the ICT sector - Total growth since 1995

	2000	1995	2000/1995
Industry	14.7	14.5	+29.9%
Sales and renting	21.9	26.5	+5.3%
Telecommunications	33.4	29.7	+43.6%
Computer and related activities	14.3	10.3	+77.0%
Content	15.7	19.0	+5.7%
Total ICT	100	100	+31.0%

Source: Balance sheets database[1], (NBB).

[1] These figures include all companies which have to produce a balance sheet, i.e. all companies with limited liability.

2. A growing number of firms

According to the balance sheet database, nearly 5,000 more firms were active in the ICT sector in 2000 as compared with 1995, which represents a net increase of 30%. The rate of new firms created each year in that sector was close to 8%. This was due both to increasing demand and market liberalisation. For instance the number of firms in telecommunications services has more than doubled since 1995. In 2000 there were at least 2,924 new firms in computer activities which confirms the huge development of this branch. In computer activities as well as in sales and renting and content activities, the average size of firms is significantly smaller than in industry and telecommunications.

TABLE 4 - Number of firms by ICT sector

	2000	since 1995
Industry	554	+57
Sales and renting	6800	+854
Telecommunications	587	+364
Computer and related activities	6938	+2924
Content	5376	+572
Total	20255	+4771

Source: Balance sheets database (NBB), Spinnewyn H., FPB, forthcoming.

3. Nearly 200,000 workers in the ICT sector (160,000 wage earners and at least 23,000 self-employed)

The ICT sector employs 5% of wage earners in Belgium (table 5). As mentioned before, industrial activities are small and employ less than 1% of wage earners. On the other hand the number of workers in ICT services is, relatively speaking, quite similar to other European countries. It is however difficult to get a precise view of the ICT work force because in branches like computer activities or media services, the number of self employed people appears to be substantial, close to 25% of the total. According to our own estimates, there should be 23,000 self-em-

ployed people working in the ICT production sector, mainly in computer activities, sales and media services.

TABLE 5 - Employment in ICT sectors (wage earners) - 1999

	Number	In % of total wage earners	Var 93/99 (nbr)
Industry	27350	0.9%	-1577
Sales and renting	37897	1.2%	3839
Telecommunications	29867	0.9%	1411
Computer and related activities	21633	0.7%	11108
Total ICT	116747	3.7%	14781
Content (including media services)	42676	1.4%	523
Total ICT including content activities	159423	5.0%	15304

Source: Minstry of Employment.

As can be seen from table 5, content activities are far from minor; more than 40,000 people are working in that field and their numbers have increased in the last six years. Sales and renting is the second most important ICT branch in terms of employment. Employment in wholesaling of computer and office equipment increased by more than 20% from 1996 to 1999. There are only 21,500 wage earners in computer activities but more than 7,000 self-employed people.

From 1993 to 1999, employment in the ICT sector increased by 15,304 while in the Belgian economy, 145,000 new jobs have been recorded. As expected, this sector is more dynamic than the rest of the economy: the increase in employment has reached 10% in the ICT sector compared to less than 5% in the economy as a whole.

During that period, the evolution of employment in the Belgian ICT sector was quite similar to what was observed in other industrialised countries, except in the case of telecommunications:

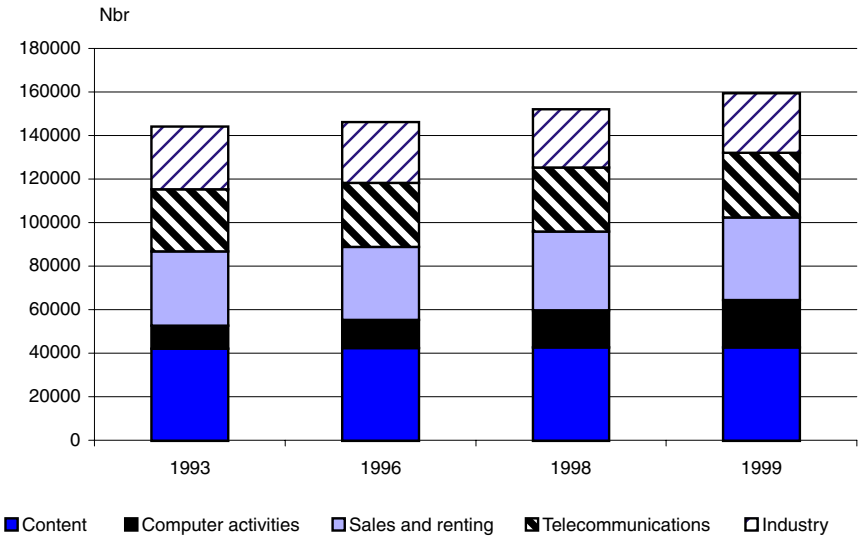
- in ICT manufacturing industry, employment has usually decreased due to high labour productivity gains, except in those countries specialised in ICT manufacturing;
- in telecommunications, employment has initially declined in most countries due to high productivity gains linked to network digitalisation. A study carried out by the French ministry of Economy and Finance has found that for 14 incumbent operators, employment has decreased by 20% between 1987 and 1997 while the number of fixed lines increased by 66% and the number of mobile telephony customers reached 28m people. In Belgium, productivity gains have been also substantial (cf. the statistical annex) but employment has continued to rise at the sectoral level until 1996. The adjustment in this country takes relatively longer than in other European countries. Recent figures published by the EC[1] show that thedeclining trend has been reversed in most countries: from 1996 to 2000, due to the arrival of new operators, employment in the telecommunication

1. EC, Market Performance of Network Industries Providing Services of General Interest: a First Horizontal Assessment, note for the EPC, December 2001.

sector has risen significantly in most European countries except Belgium and Sweden.

- everywhere computer activities and the sales sector have been the driving force behind growth in employment in ICT sectors. In Belgium, both the number of workers and the number of self-employed people in computer activities have doubled since 1993.

FIGURE 4 - Employment in the Belgian ict sector (wage earners)



Source: Ministry of Employment.

4. Contribution to external trade

ICT exports represent less than 7% of all exports of goods and services in BLUE (Belgium-Luxembourg Economic Union), a low level compared to other OECD countries (12.5%) while ICT imports amount to 7.4% of total BLUE imports compared to 13.2% for the OECD. On the whole, BLUE recorded a small trade deficit for ICT goods and services (-575m USD in 1998, according to OECD figures).

Some branches are, however, well integrated in international trade flows. In the area of equipment, trade is important due to strong import-export activities and the development of the wholesale sector. The trade balance is still negative except for radio, television and communication equipment. Exports in manufacturing sectors continue to progress rapidly, at a similar rate to OECD trade: in computer equipment, Belgian exports have increased by 18% annually since 1990; the growth for communication equipment has been close to 10%.

According to OECD data, in 1997 the BLEU was the sixth biggest exporter of telecommunications services, leading to an estimated trade surplus of 700m USD. Different factors may account for this good performance: the intensive use of the Belgian network from outside (which may be due to the many international organisations located in Brussels), the development of ADSL services by firms located in Belgium (such as Alcatell Antwerp) or the importance of the Luxembourg financial market. OECD figures also show that computer services is another important source of trade surplus estimated in 1997 to amount to 500m USD.

C. Future prospects for the ICT sector in Belgium

The future of ICT development in Belgium is contingent on various elements. These elements may differ depending on whether ICT products are more oriented to international markets or to local demand. One of these elements is the control of firms and the related question of their autonomy of decision especially with regard to future investments. The impact of these decisions on the development of the sector will also depend of the size of their market share. Other important elements are R&D capacities in the area of ICT and the availability of highly qualified labour. Finally, access to adequate funding to launch risky activities may also be considered as a prerequisite for the development of this high tech sector.

This section will seek to assess the Belgian position in these different areas as well as the future development of the ICT producing sector in the territory of Belgium.

1. Control of firms, market structure and autonomy of decision

The issue of the control of firms is important when considering the future development of the ICT production sector in Belgium. A study carried out by the FPB[1] has shown that only a minority (10%) of Belgian subsidiary companies of international groups can make decisions about investment abroad and only 51% can even decide to invest within Belgium. Investment decisions as well as decisions about the localisation of R&D teams, are highly significant for the future development of firms, especially in high-tech companies within the ICT sector. Furthermore the market structure can reinforce the importance of some firms. In a highly concentrated market, the decision by the largest firms to invest or not to invest may have a significant impact on the sector. It therefore seems important to look at the situation of ICT firms in Belgium as regards their market structure.

TABLE 6 - Value added of the 127 biggest ICT companies active in Belgium according to their country of origin

Country	Number of firms	Value added %
Belgium	52	52.65
Rest of the world of which	75	47.35
US	29	14.36
France	14	10.51
Total	127	

Source: NBB.

An analysis of the 127 largest ICT companies shows that 75 of them belong to groups located outside Belgium. In 1999 these represented 47% of the value added produced by these biggest companies. Among them, US and French companies seem well established in the Belgian market. This situation is not the same in all sectors. The telecommunication market is highly concentrated: a few Belgian firms account for almost 90% of value added (such as Belgacom, SWIFT, Telindus

1. Federal Planning Bureau, KUL, UCL: *Delokalisatie, innovatie en werkgelengenheid*, Onderzoeksrapport gefinancierd door de DWTC, June 2000.

and Coditel for instance). Content activities are still dominated by SMEs and Belgian firms also (among the big companies: VRT, Promedia, Roularta media group etc.). On the other hand, in the ICT industry where the five biggest companies represent 60% of value added, only three of the largest 10 are Belgian (of which the first six are Alcatel Bell, Philips, Barco (BE), Siemens Atea, Alcatel Microelectronics and Melexis (BE)). In the area of wholesale, the 10 largest firms are all linked to foreign countries (IBM, HP, Xerox, Philips, Compaq, Siemens etc.). Finally, most of the firms engaged in computer activities are SMEs but a majority of the largest ones are linked to foreign companies (Electronic Data Systems, Kbc exploitatie, Cap Gemini Belgium, Dolmen Computer Applications, Cisco Systems Belgium etc.).

As summarized in the following chart, the conclusions are that the autonomy of producers in the manufacturing industry appears quite small. The future of this market will mainly depend on decisions made by international groups. Even if foreign firms are the most important actors in wholesale and computer activities, the limited size of their market share will reduce the impact of their decisions. The content activities market is much more open and dependent on multiple Belgian decision centres. Last but not least the telecommunication market is still dominated by one firm, Belgacom, and its subsidiaries which are partly controlled by the Belgian State and by Ameritech. As local demand is the main driving force in this market at present, the origin of firms may be of little importance for future developments.

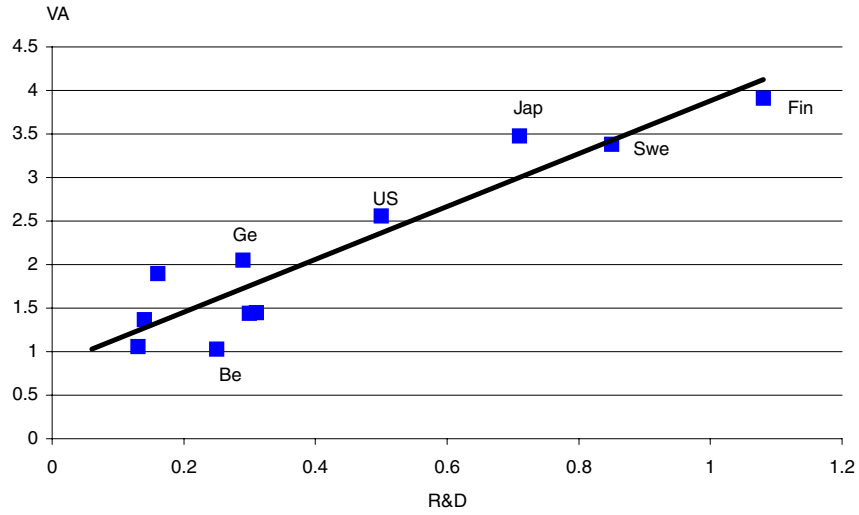
TABLE 7 - ICT producing sectors according to concentration and ownership

		Concentration index	
		-	+
Foreign firms	+	Computer activities Wholesale	ICT manufacturing
Belgian firms	-	Content activities	Telecommunications

2. R&D capacities

In high-tech sectors, which covers most branches of the ICT sector (the main exceptions being the sales and rental activities), the level of R&D is one of the most important factors of future development and of firms localisation. R&D activity could be measured through R&D expenditure incurred and by the number of patents registered in these fields. Graph 5 compares R&D and value added in ICT manufacturing. The correlation between the two is clear even if the direction of the correlation is not. The most specialised countries in that sector (Finland, Sweden, Japan and the US) have important R&D capacities in information and communication technologies as compared with the core European economies among which Belgium is one of the poorest.

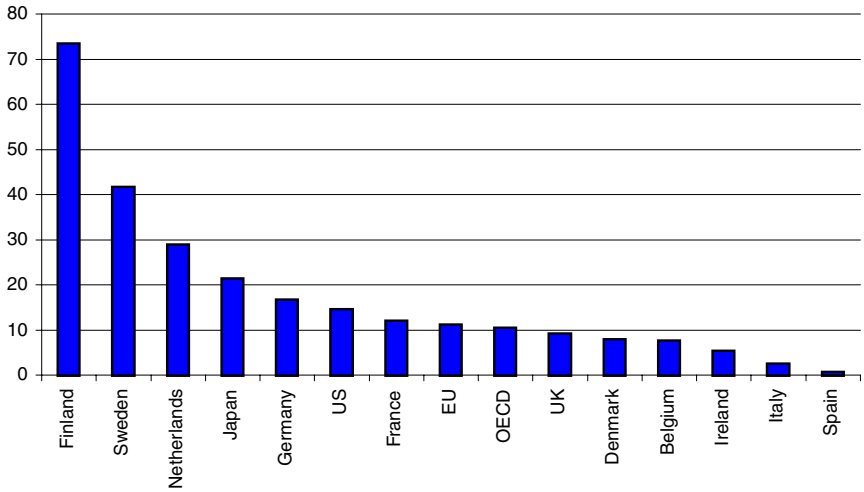
FIGURE 5 - ICT manufacturing: R&D as percentage of GDP and value added as percentage of business value added



Source: OECD, 2001.

The patterns of ICT patent per million inhabitants confirms the predominence of Finland and Sweden and to a minor extent of the Netherlands, as well as the weakness of Belgium. It should nevertheless be mentioned that patents are used less in ICT than in other high tech industries because of the rapidity of technical progress.

FIGURE 6 - Number of ICT patent per million inhabitants - EPO applications

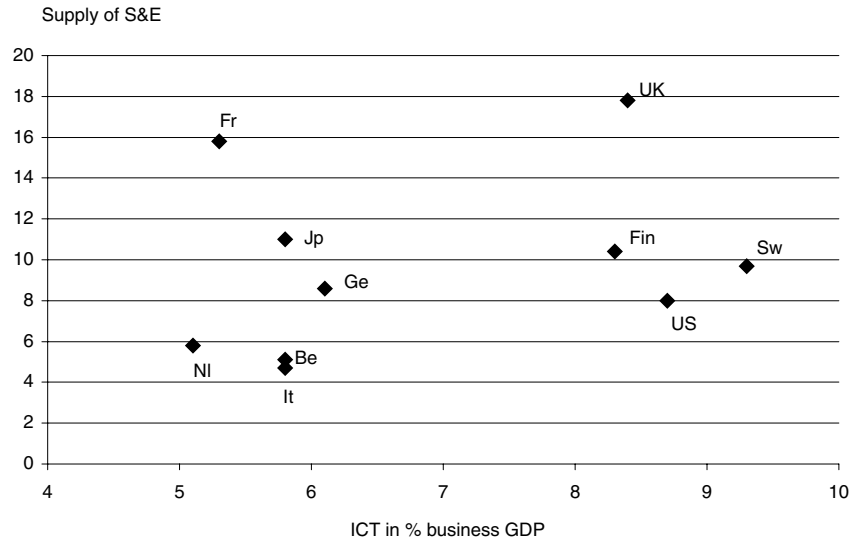


Source: OECD, 2001.

Belgium seems a long way from being a top ICT producing country. As indicated by R&D indicators, this should not change very much in the near future. Moreo-

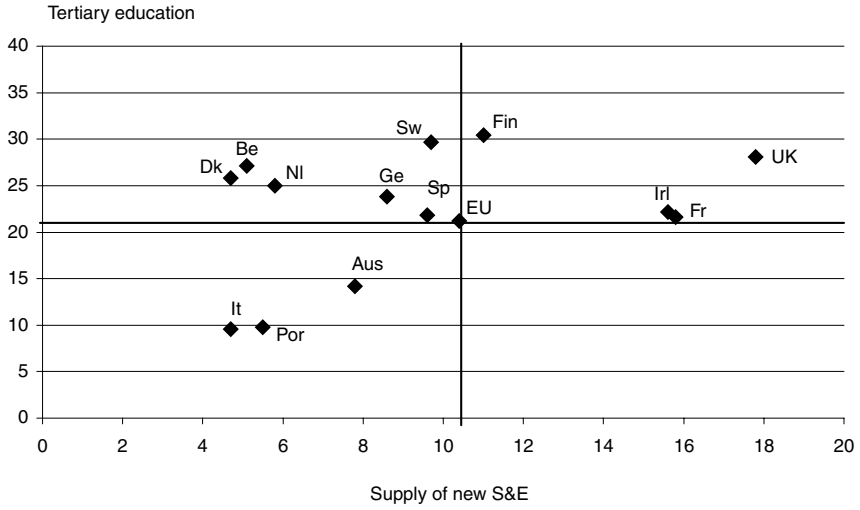
ver, a highly qualified labour force, especially engineers, is also needed to support the development of new high-tech industries (graph 7). According to the latest figures from the European innovation scoreboard, Belgium has a high rate of tertiary education among the working age population (27.1% as compared with 21.2% on average in the EU). Meanwhile, the supply of scientists and engineers in Belgium is significantly below the EU average and below the countries with the most advanced ICT sectors.

FIGURE 7 - ICT value added and supply of new scientists and engineers



Source: OECD 2001 and EU innovation scoreboard 2001.

FIGURE 8 - Supply of new Scientists and Engineers - Population with tertiary education



Source: EU - Innovation scoreboard, 2001
New Scientists and engineers in 0/00 of 20-29 years age class
Population with a tertiary education in % of 25-64 years age class.

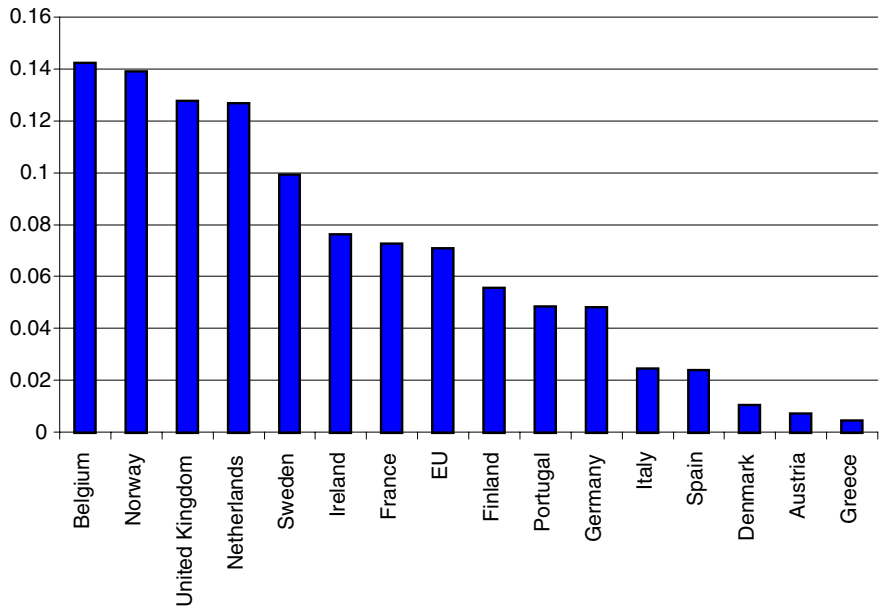
3. Innovation financing and ICT firms

One of the main barriers to innovation is the ability of new technology-based firms to raise adequate funding. Venture capital (VC) is one of the most important sources of funding for risky projects. VC is the sum of early stage capital (seed and start-up) plus expansion capital. Bank and private-placement financing are other possible sources. But venture capital is often more adequate in the high-tech sector because the level of investment, especially R&D investment, may be substantial at the start while the firm's turnover remains small. In this context, debt financing is less appropriate.

The level of high-tech venture capital investment is high in Belgium on the whole (0.165% of GDP) as compared with the EU (0.108%). This is accounted for by the importance of early stage investment in Belgium which amounted to more than 0.1% of GDP in 2000 as compared with less than 0.08% in the EU on average. As can be seen on graph 9, Belgium has the highest share of venture capital going to the communication sector and computer-related sector as a percentage of GDP. At EU level, only 22% of total VC is dedicated to communication and computers while in Belgium, 49% of VC goes to ICT (for instance 25% to communication compared to 11% in the EU). The trend is also quite positive both for VC supply and for VC in the ICT sector.

The supply of funding seems not to be a binding constraint for existing firms and starters in the ICT sector in Belgium. Moreover, according to the 1999 figures, important Belgian ICT firms were quoted on foreign secondary stock exchange markets (two on the Nasdaq, 11 on the Nasdaq Europe, 10 on Euro-NM) while 16 ICT firms were quoted on Euronext, most of which are in the computer sector (Real Software, Systemat, Link Software, Van Dijk and Bluegate).

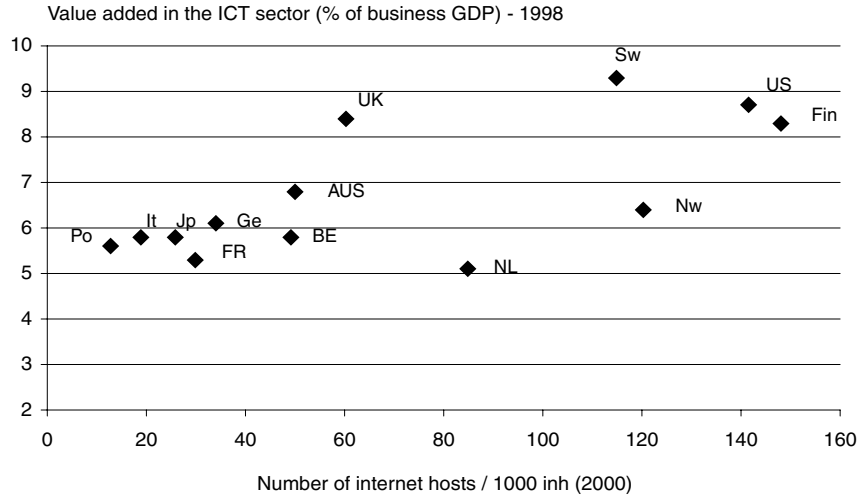
FIGURE 9 - Venture Capital in ICT sector as percentage of GDP - 1999



Source: Own calculations based on EVCA (1999), (2000).

The main impediments to the development of the ICT sector in Belgium are not financial in nature. As highlighted by various indicators, growth of this sector could be constrained more by weak R&D capacity in that field, a lack of highly qualified labour or significant barriers to market entry due to excessive administrative burdens or a high market concentration rate. The following graph shows that a relationship can also be established between the development of the ICT sector and the diffusion of ICT products at the national level. Weaker demand for ICT products at the local level could lead to less development in the ICT producing sector. This could be another reason for the slow development of the ICT sector in Belgium as will be shown by the parts below devoted to the diffusion of ICT in the Belgian economy.

FIGURE 10 - ICT diffusion and sector development



IV ICT diffusion

The diffusion of ICT and its impact are, to some extent, specific to the enterprise, the economic sector or the country being analysed. In other words, even if two countries exhibit the same rate of ICT investment, this is not necessarily translated into comparable economic performance.

At the company level, the amount invested in acquisition of ICT equipment is only a (small) part of the story. Indeed, the optimization of this kind of investment requires organizational changes and upgrading of workers' skills. At the whole economy level, the ability of a country to respond appropriately to a technological shock greatly depends on the availability of key factors such as an appropriate mix of skills or correct functioning of goods and capital markets. The rapid diffusion of ICT into some key economic sectors also plays a significant role. It is, for example, the case in the financial sector, in which modernization yields benefits for all other sectors, but it is also the case in the main sectors which could serve as examples to the rest of the economy. These factors collectively create an environment open to the integration of ICT.

This section analyses ICT diffusion in Belgium in comparison with the European Union average and the United States. ICT diffusion is basically closely linked to the diffusion of computer and telecommunication equipment. The use of new technologies, however, depends mainly on their potential applications. Given the available data, this section is mainly devoted to the analysis of the diffusion of the internet, including some particularly interesting extensions such as e-commerce[1].

A. Diffusion of internet infrastructure

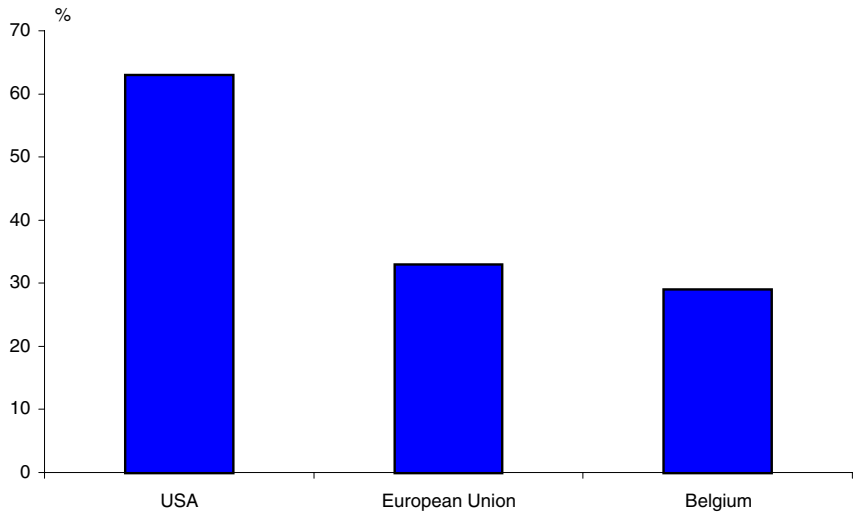
The most frequently used indicator of internet diffusion is the number of internet hosts[2] per 1000 inhabitants. This indicator underestimates the true number of internet users because it does not take into account the users connected behind firewalls and thus without an IP address. Moreover, the elaboration of this indicator presents some difficulties due to the allocation of generic domain names (.com or .org) to specific countries. Following the methodology used for this allocation, the estimated numbers of internet hosts could be very different. However, the overall picture given by this indicator is the same whatever the chosen source. In recent years Belgium has managed to catch up and then to surpass the European

1. This section will not address the topic of e-Government in Belgium, given the recent working paper published by Herman Van Sebroeck (WP 04-01, *E-GOV - Naar een elektronische overheid in België* - Federaal Planbureau 2001).
2. A host is defined as a computer with an Internet Protocol (IP) address connected to the network.

average but it still a long way from American performance when it comes to internet diffusion.

This first perspective may be supplemented by another indicator based on surveys, the number of internet users as apercentage of the population which is plotted on the following graph.

FIGURE 11 - Internet users as a percentage of the population - April 2001



Source: Eurostat, Statistics in Brief, 23/2001.

Although the internet penetration rate seems to be higher when using this indicator than when considering the number of internet hosts, the percentage of internet users in the population leads to a diagnosis of a Belgian lag since the penetration rate is now slightly below the European average and still along way from US performance.

We must, however, be careful with all these indicators because things are changing rapidly in these fields. For example, at the end of 1999 and the beginning of 2000, the number of connections exploded in Belgium following the multiplication of free access offers as indicated in the following table.

TABLE 8 - Number of internet connections in Belgium

	March 1999	July 1999	November 1999	March 2000	July 2000	November 2000	March 2001
Total number of connections	302435	369023	735303	1353002	1869016	2326268	2806549
Annual growth rate	210.6%	81.7%	691.1%	523.0%	163.6%	92.8%	75.6%

Source: ISPA, 2001, 8th Market Survey: 31 March 2001.

The profile of the new Belgian surfer is changing in relation to the extension of internet diffusion among the population. In 2000, according to the Insites survey[1], more than one in three new surfers was older than 45. In previous years, this group was often underrepresented. This survey also determined that on average new internet users are less well educated than the early adopters of the internet.

Access to the internet requires a minimal infrastructure, which currently means, in this country, at least a computer with a modem and a telephone line. It is therefore useful to link internet use with the diffusion of computer and communication technologies.

1. Diffusion of IT infrastructure

The device the most widely used to access the internet is still the computer. In 2000 there were 402 computers per 1000 inhabitants in Belgium while only 360 computers per 1000 inhabitants were recorded on average in the EU, as against 580 recorded in the United States. Unfortunately we do not have recent information on computers kept at home and at the office to allow an international comparison.

If, however, we use statistics issued by the ISPA (Internet Service Providers Association) for Belgium, we can gain an idea of the allocation of connections between enterprises and households. These data give a biased view of this allocation since all free connections are considered as private connections. Moreover, not all these connections are active connections. In March 2001, only 46% of the total number of connections had been used during the two months preceding the survey (Table 9).

TABLE 9 - Allocation of internet connections in Belgium

	March 1999	July 1999	November 1999	March 2000	July 2000	November 2000	March 2001
Private	226915	285910	639803	1224677	1736483	2191501	2654955
as percentage of total	75.0%	77.5%	87.0%	90.5%	92.9%	94.2%	94.6%
Enterprises	75520	83113	95500	128325	132533	134767	151594
as percentage of total	25.0%	22.5%	13.0%	9.5%	7.1%	5.8%	5.4%

Source: ISPA, 2001, 8th Market Survey: 31 March 2001.

1. InSites, April 2001, "Belgium has 2750000 internet users", Ghent.

2. Diffusion of telecommunication infrastructure

As already mentioned, the usual way for households to access the internet is via a modem and a phone line[1]. This kind of connection has the disadvantage that it is extremely slow[2]. This is why professionals prefer to use an ADSL or a leased line which offers faster connections. As regards the telecommunication infrastructure traditionally used, Belgium has accumulated a lag in comparison with its European partners and with the United States as illustrated by Table 10.

TABLE 10 - Basic internet infrastructure (2000)

per 1000 inhabitants	Belgium	European Union	United-States
Number of internet hosts	49.2	40.0	141.5
Number of computers	402	360	580
Number of PSTN lines	510	560	734

Source: IMD, 2001, The world competitiveness yearbook & Network Wizards for the Internet Software Consortium, 2000.

High speed internet is only just beginning to be introduced in Europe. Technologies like ADSL (1.1% of EU internet households in 2000) and cable internet modems (7.8%) are not yet widely diffused but introducing competition to local access networks should bring prices within the reach of far more residential customers. In Belgium, local loop unbundling has been introduced following agreement at community level at the end of December 2000 and is helping to stimulate the deployment of ADSL services. Indeed, at the beginning of 2001, more than 16% of Belgian internet users had a broadband connection. This evolution of broadband puts Belgium at the top in Europe with regard to the penetration of broadband connections. According to Telecommunications International News, Belgium has more broadband connections than any other European country except Germany. This type of connection, however, only represented 6% of the total number of business connections. This low figure means that enterprises are only using basic functions of the internet rather than incorporating this opportunity in their business, which would require a broadband connection[3].

Another indication of infrastructure quality is given by the capability of international pass bands. As shown in the following table, although capacities are far from American ones, Belgium is relatively well equipped in comparison to its European partners.

1. This kind of connection is implemented by the public switched telecommunication network, PSTN which is one of the available networks. The other networks are cable TV, fibre optic cable, and mobile phone.
2. With normal PSTN, the speed of connection is 56 kbps and with ISDN, the speed can reach 64 or 128 kbps. But the real increase in speed is only available when using digital technologies such as ADSL which allow speeds of at least 1 Mbps.
3. One explanation for this low figure could be the relatively high proportion of SMEs in the Belgian enterprise population.

TABLE 11 - Width of international pass bands (1999)

	in Mbps
United States	28308
United Kingdom	18338
Germany	11612
Netherlands	10874
France	9687
Belgium	*6213*
Sweden	4388
Italy	2200
Denmark	1274
Austria	979
Finland	670
Spain	618
Ireland	239

Source: Telegeography, 2000.

B. Internet content diffusion

The utility of the internet is also determined by the information and services available on the web. Internet users are frequently looking for local information not available on international sites. This observation clearly shows a vicious circle in internet diffusion which explains why the difference between advanced and lagging countries is increasing. There are relatively few internet users because of the lack of domestic content but there are few incentives to create local content because there are few potential users.

The number of sites, per 1000 inhabitants, in each country gives a first idea of the development of local internet content. Two statistics on sites are usually collected. On the one hand, sites with a country name in their domain name are attributed to this country[1]. This methodology gives a correct picture of the local content development but not of the true geographical allocation of sites. Indeed, a site with ".be" in its domain name could be localized in the United States. On the other hand, sites with a generic domain name are allocated among countries[2]. If this correction does not modify the European ranking, it has a great impact on the number of sites allocated to the United States. Indeed, many American and Canadian enterprises have chosen a generic domain name rather than a geographical reference. The two statistics are presented in the following table for the year 2000. It appears clearly that Belgium is lagging in the development of domestic internet content not only in comparison with the average European situation but mainly in comparison with the United States which in February 2000 held almost 7 times more sites per 1000 inhabitants.

1. ccTLD means country code Top Level Domain.
2. gTLD means generic Top Level Domain.

TABLE 12 - Number of sites per 1000 inhabitants (2000)

	Belgium	European Union	United States
ccTLD (July)	4.7	9.2	0.2
gTLD (February)	4.1	6.2	27.0

Source: OECD, 2000 & 2001.

If the physical location of sites does not have an impact on the development of domestic content, it is important to analyze the level of development of the underlying infrastructure. Internet service providers tend to chose their location on the basis of relative cost and network performance. In other words, the location of sites gives a clear indication of the relative competitiveness of internet infrastructures. Given the technical difficulties, no international study exist on this location of sites. But the limited number of surveys and case studies[1] shows a clear predominance of the United States as a preferred location for sites.

We do not have homogeneous statistics allowing an international comparison of site content. But we can obtain an indication of content through the number of radio station and multimedia sites available on the web. The following table shows the data for February 2000.

TABLE 13 - Internet multimedia content (February 2000)

Available on the Web	Belgium	European Union	United States
Number of radio stations	14	513	1922
Number of radios per million inhabitants	1.4	1.4	7.0
Number of multimedia sites[1]	1190.4	49043	159653
Number of multimedia sites per million inhabitants	117.3	130.8	578.0

[1] including gTLDs sites but excluding MP3 sites.

Source: OCDE, DSTI/ICCP/TISP/FINAL, July 2000, p. 66.

Once again this table gives an indication of the underdevelopment of web content in Belgium even though the figures are better than those concerning the number of sites. In addition to what has already been said on Internet diffusion in Belgium, other reasons could be raised to account for this delay. The Belgian multimedia market is segmented and small, since three national languages coexist in our country. Moreover, the utility of visiting multimedia sites partly consists in downloading sound and video files. For the majority of private internet users, this downloading takes time because of the telecommunication infrastructure used, and it therefore costs a lot because these connections are paid for per unit of connected time.

1. The most comprehensive overview of these studies is given by the OECD in an article titled "Local Access Pricing and e-commerce", July 26, 2000, pages 14 to 18.

C. Diffusion of e-commerce

Another important aspect of the internet content sites is the possibility of online trade, called e-commerce. There are two main categories of e-commerce: B2C (Business to Customers) and B2B (Business to Business)[1]. To date, no official data on e-commerce allowing an international comparison is available. Different private consultants, however, are publishing their estimates concerning the value of online transactions. The figures vary strongly from one estimate to another but expectations of an important development in this type of trade are common to all studies as illustrated by the following table.

TABLE 14 - Estimates of worldwide e- commerce in billions USD

	1999	2003	Annual average growth rate
e-Marketer	98.4	1244	89%
IDC	111.4	1317	85%
ActivMedia	95	1324	93%
Boston Consulting Group	1000	4600	46%

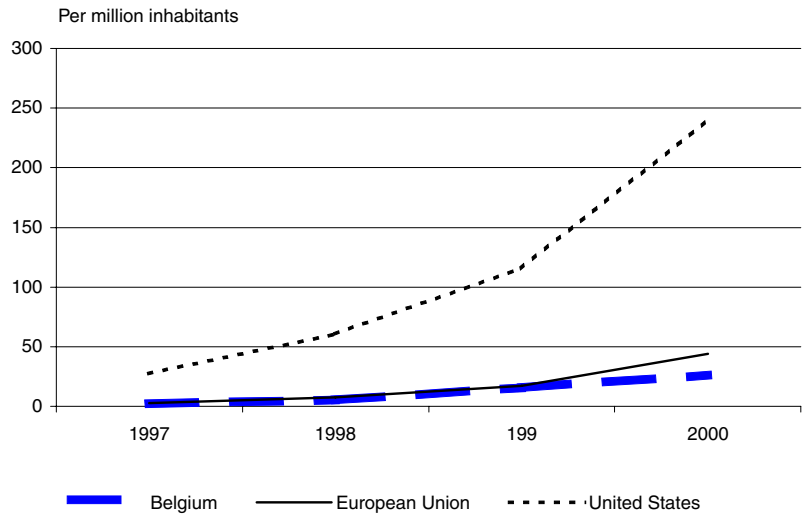
Source: OECD, ECO/CPE(2000)7, p. 7.

According to IDC[2] estimations, Belgium accounted for 2% of European e-commerce in 1999 and its share would remain constant for the next years. Belgium therefore has a middle position close to Denmark, Finland or Norway, just behind Spain (3%), Netherlands (6%), France and Italy (7%) and a long way behind the United Kingdom (25%) and Germany (30%).

E-commerce transactions pass through secured web servers which allow the encryption of confidential data. The following graph plots the number of secured servers per million inhabitants in the United States, in Europe and in Belgium from 1997 to 2000. We can clearly see that Belgium, like the rest of Europe, is far behind the United States and, more worrying, that this gap has increased in recent years.

1. The two other possibilities of e-commerce are C2C and C2B which are not as well developed and are not studied in this paper.
2. IDC, "Electronic Commerce in Belgium", September 1999.

FIGURE 12 - Number of secured web servers per million inhabitants



Source: OECD, 2001, Communication Outlook.

1. Diffusion of B2C

The development of B2C in Belgium has taken relatively longer than in other European countries but Belgium is catching up. According to the consultancy agency InSites, Belgium has almost one million (950,000) surfers with e-commerce experience or 35% of the 2.7 million regular internet users[1].

The share of online consumption in total private household consumption has decreased from 0.4% in 1999 to 0.37% in 2000. Consequently, with about 20 billion Belgian francs (500 million euro), the total online return was the same in 2000 as in 1999, which represents a standstill in market progression. There are various reasons to explain this situation. A large number of new surfers who bought something for the first time spent a lot less per purchase and their amount of purchases per year is a lot lower than that of more experienced surfers. A second reason is that more surfers purchased cheaper products than before. This made the average price per purchase fall to 5,700 BEF (140 euro) to 5,000 BEF (125 euro) per purchase, a fall of 12%.

E-commerce in Belgium, as in other countries, remains highly concentrated on few products as 70% of online return comes from five products: hotel reservations and transport tickets (33%), books and CD's (10%), software (10%), computer hardware (10%), financial products (6.5%).

The e-commerce market is becoming more domestically oriented. Indeed, two out of three online orders were placed on Belgian web sites in 2000. This is a rise of 20% in comparison to the 55% of local internet purchases in 1999. InSites cited two explanations for this reorientation. First, the marketing investments by Bel-

1. InSites, June 2001, "New internet surfers buy Belgian", Ghent.

gian e-commerce sites are clearly paying off. A second reason is that many inexperienced surfers limit themselves to a number of known sites and often these are of Belgian origin.

2. Diffusion of B2B

The bulk of online transactions occurs between enterprises. According to an OECD survey[1], B2B accounts for 70 to 85% of all online sales and is expected to undergo tremendously rapid development. These figures are confirmed by a survey of IDC[2], B2B e-commerce accounted for 79% of online expenditures in 1999. The share of B2B in total e-commerce expenditure is expected to reach 82% in 2002, as illustrated by the following table:

TABLE 15 - E-commerce expenditure in Belgium, BEF billions

	1999	2002
E-commerce	11.9	16.0
B2B	9.4	13.2
B2B as percentage of total	79.1	82.5

Source: IDC, 1999.

The most widespread current activities in B2B are procurement and sales. These two basic functions are usually seen as the foundation for more sophisticated functions such as online supply chain management and online product development.

Most companies begin with purchases of goods such as supplies for maintenance, repair, and operations (MRO). This category of products is non strategic in nature so it is a relatively safe place to experiment with new technologies and processes. In the long run, however, online procurement of the goods used to make a company's products will prove more important. One reason is that these account for the majority of procurement spending by firms. A more important reason, however, is that such a system can serve as a platform for other online services and activities. Specifically, building the technical and process infrastructure for direct goods will facilitate the development of online supply chain management. Moreover, moving sales and services online represents an opportunity not only to cut costs but also to boost customer loyalty and revenues. According to a Boston Consulting Group survey for the year 2000[3], 21% of respondents increased their total income thanks to online transactions while 19% have decreased their total costs, and a Goldman Sachs study[4] of American enterprises shows that the use of B2B generates a decrease in total cost of inputs from 2% to 40% according to the industry considered.

Despite these optimistic expectations, Belgian companies have been much more slower to adopt B2B e-commerce than most European countries, and hence also

1. OECD, ECO/CPE(2000)7, p. 7.
2. IDC Benelux, 1999, "Electronic commerce in Belgium".
3. The Boston Consulting Group, May 2001, "Incumbents take the initiative".
4. Goldman Sachs, "The shocking economic effect of B2B", Global Economic Paper, n° 37, 2000.

than the United States. The number of companies using the internet for sales or procurement is more than 30% lower than the European average as illustrated in the following table.

TABLE 16 - Percentage of companies using the internet (May 2001)

	%
For procurement	
Belgium	12%
European average	42%
For sales	
Belgium	19%
European average	49%

Source: Boston Consulting Group, May 2001, "Incumbents take the initiative", Belgian Report.

According to the Boston Consulting Group, several reasons specific to Belgium may help to explain why it is lagging behind.

- Firstly, due to its smaller market size, Belgium is seen as less favorable for the development of B2B start-ups and there is a clear lack of critical mass in B2B e-commerce. Indeed, there are around 20 active e-marketplaces in Belgium as against more than 100 in Germany and 70 in the United Kingdom. Moreover, Belgian B2B e-commerce initiatives have been launched more recently than those in Germany or the United Kingdom for example.
- Secondly, within each industry sector there are relatively few large Belgian companies by European standards to show the way and convert their smaller peers.
- Thirdly, most European B2B initiatives have been launched on a country-by-country basis with higher priority being given to large European countries.
- Fourthly, spending on telecom equipment and services is relatively lower (as a percentage of GDP) than in the leading countries for B2B e-commerce (Germany, UK and Switzerland).

As in other European countries, the use of the internet by Belgian firms is progressively being extended to all industries. The most intensive users, however, are still transportation, financial services, Postal/telecom, vehicles, electrical/electronic equipment, and metals/machinery.

V Determinants of ICT diffusion

Several interconnected factors determine the speed of adoption of a new technology in an economy: the relative price of the new technology in comparison with the others available, the size of potential user firms, the interaction between suppliers and potential users, the market structure of both supply and demand, national and international regulations. In addition to all these factors, ICT offers the specific feature that it is an industry with huge network externalities.

This section analyses the relative position of Belgium in relation to technologies linked to information and communications, the level and structure of ICT implementation costs, and the capability of using them.

A. Technical determinants and alternative technologies

The most widespread connection technology is the fixed telephone network, which integrates several types of equipment with different speeds for the transfer of information. The basic PSTN line allows a connection speed of 56 kbps. A first improvement is provided by the digital line, called ISDN[1] with a speed of 64 kbps. More frequent internet users are connected via an ADSL[2] line or a leased line. In both cases these lines allow a connection which is "always on" with a transfer speed of 300 kbps to several Megabps.

The following table gives a view of the Belgian position in relation to the main telecom infrastructure currently available. Belgium seems to be lagging behind slightly in comparison with the European average and the American situation with regard to the traditional telephone infrastructure, even despite the recent efforts of Belgacom, the historical incumbent, to digitize its network.

1. Integrated Service Digital Network (RNIS, in French).
2. ADSL stands for Asymmetric Digital Subscriber Line.

TABLE 17 - Telecommunication Infrastructure

	Belgium	European Union	United States
Fixed Telephone			
Number of PSTN lines /1000 inhabitants (2000)	510	560	734
Number of ISDN lines /1000 inhabitants (1999)	30	27	3
% of digital lines (1999)	91	98	98
Mobile			
Number of subscribers/100 inhabitants (1999)	31	40	32
% of subscribers to a digital network (1999)	100	92	51
Cable Television			
Number of subscribers/1000 inhabitants (1997)	362	104	246
Others			
% of households connected to cable (1999)	96	30	13
Number of DSL and cable lines/100 inhabitants (2001)	1.5	n.a.	2.3
Km of optical fibre/population (1997)	n.a.	16.5	72.2
Km of optical fibre/surface (1997)	n.a.	2.1	2.0

Source: OECD, 2001,STI Scoreboard & Communications outlook, IMD, 2001, The World competitiveness yearbook.

The mobile network is destined to play a more and more important role in internet connection. To date, GSM (Global System for Mobile) second generation[1], gives access to a very limited version of the internet, the WAP (Wireless Application Protocol), which due to very serious technical constraints, is not meeting with great success. In spite of this, the other service offered by the GSM, the SMS (Short Message System) is being used intensively, especially by teenagers. But the main expected improvement in this technology consists in the third generation mobiles called UMTS (Universal Mobile Telecommunications System[2]) which will provide a transfer speed of 2 Mbps and a direct connection to the internet. In Belgium, as in the majority of European countries, the licences for UMTS have recently been allocated by the government and a period of time is now needed to develop the new infrastructure for this kind of terminal[3].

Cable television is another available technology used to access the Web. This network uses two main categories of cables. The one most frequently used is coaxial cable with a speed of 1 Mbps and the most sophisticated is fiber optic cable with a speed of 57 Mbps. As illustrated in the previous table, the Belgian position is relatively good in terms of availability of the cable network. Offers of internet access by cable TV operators are, however, quite recent in this country but they are developing rapidly, providing an attractive alternative to classical technologies.

Fiber optic networks are also installed by different operators, either privately or in partnership with public authorities. This is happening, for instance, in the case of the national railway company (SNCB) which has developed a fiber optic network along its railways. These networks, which allow a very important transfer rate, are mainly used by companies involved in transfers of information such as mobile operators and Internet Services Providers (ISP). Given the lack of

1. Radio transmission takes the role of physical connection.
2. These phones use the pass band from 40.5 to 43.6 GHz.
3. A fourth generation is already under development, called MBS (Mobile Broadband System) with a pass band width depending on demand.

recent data, no international comparison is possible but significant investment efforts have been made during the last years to increase the number of available kilometers on these networks.

In order to increase the return on the infrastructure already installed, electricity providers are also testing the possibility of exchanging information on their networks but commercial offers do not yet exist in this country for this type of technology.

In conclusion, even if Belgium still has to make up for lost time in fixed telephone infrastructure, its position with regard to alternative connection technologies is relatively good, allowing a progressive generalization of rapid and "always on" type connections and thus boosting the development of internet services.

B. Price levels and structures

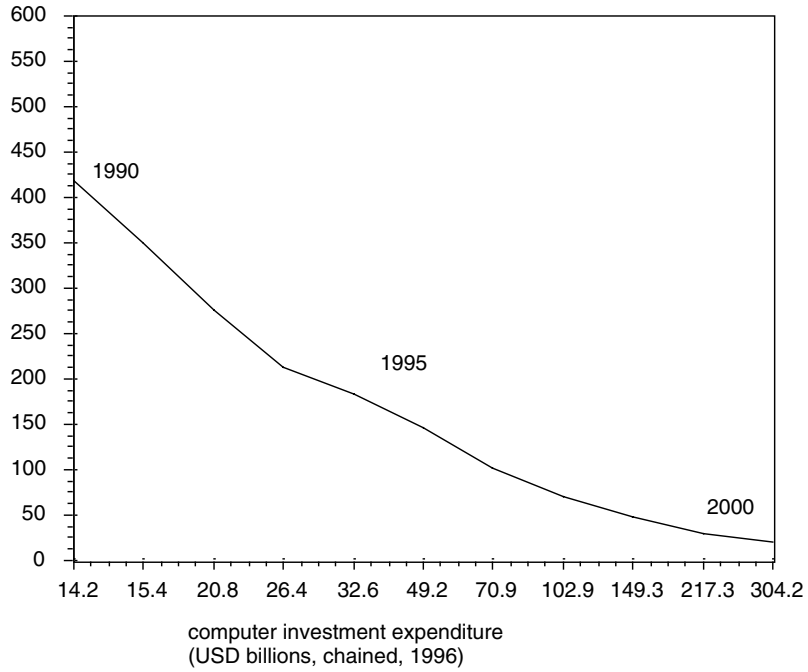
Cost is another important determinant of ICT use. The cost consists of the computer infrastructure cost and the internet connection cost.

As illustrated by the following graph, the price of computers at constant quality has fallen dramatically in recent years. This fall has been seen not only in chips but also in other peripheral materials such as printers or scanners. The price of software has also fallen but not to the same degree. Since the computer market is a global market, these price falls have been observed in all countries. The cost of infrastructure is not a factor determining the relative use of ICT between countries.

The cost of connection has two dimensions: one is the cost of telephone communication and the other is the cost of the service offered by the ISP. In recent years, due to the increase in competition, ISPs have offered free access. This has shed light on the other component: the price of communication. A study by the OECD[1] showed that there is a clear correlation between the cost of internet access and the diffusion of this tool. The countries which have achieved the lowest access cost are currently those with the highest proportion of internet users. Not only the level but also the structure of prices is an important determinant. Internet diffusion seems to have been greatly eased by connection costs independent of the time of connection. Indeed, all internet activities that need long connected time (e-commerce, multimedia etc.) are supported by a connection pricing system which is not dependent on the amount of connected time ("always on").

1. OECD, 2000, "Local Access Pricing and E-Commerce", p. 27 to 29.

FIGURE 13 - Computer price index (base 1996=100)



The main system in Belgium, as in most other European countries, is an Internet connection pricing system calculated per hour of connection with a distinction between peak and off peak times. Moreover, Belgium was the most expensive or one of the most expensive countries in terms of internet charges (see tables in the statistical annex).

C. Privacy Act and securitization of transactions

Other aspects seen as very important by internet users are the protection of privacy and the legal and financial securitization of transactions. In these fields, a national legislation is not appropriate since the internet is a worldwide network. That is why the European Union defines a common framework for its members and is engaged in discussions with the United States.

At the European level, five directives constitute the new framework for electronic communications and related services: general framework, access and interconnection, permits and licences, universal service and data protection. On a practical basis, the European Union is promoting the use of stored value cards as a way of securing transactions. These cards are already relatively widely diffused in Belgium[1] but this is not enough to promote their use in electronic transactions.

Private initiatives have also been launched to improve the security of e-transactions. One of the most important steps forward is the creation of a consortium comprising 11 banks and financial institutions and 3 mobile leaders (Nokia, Motorola and Ericsson) to transform the mobile phone into a true payment and

1. Belgium is relatively well-placed with regard to the use of stored value cards with 337 per 1000 inhabitants as against an European average of 271 in 1997.

investment platform. In Belgium, the firm ISABEL, the leader in the creation of secured environments for banking transactions, is developing its secured applications for e-commerce.

D. Education

ICT development and integration in the production process requires firms to be able to mobilize a qualified labour force with ICT skills. The European Union estimates the deficit to be 800,000 jobs currently vacant in the European area. This figure could reach 1.7 million in 2003 if no action is taken.

In order to respond to this challenge, the education system has to be adapted in view of integrating an e-learning dimension. One of the top priorities in this field is to provide the infrastructure needed in terms of computers and connections in schools. Belgium is currently in a similar position to most neighbouring countries in this connection.

TABLE 18 - Number of computers connected to the internet per 100 pupils, 2001

	Primary level	Secondary level
Sweden	7.3	19.9
Belgium	3.0	7.0
EU	2.7	6.5
Netherlands	2.3	6.5
France	2.1	4.6

Source: EC, 2001, Flash Barometer, June 2001.

The European Union and especially Belgium, seem only recently to have realized the importance of the education system for the diffusion of new technologies. Indeed, we had to wait until 1997 to see the Flemish community adopt a program of primary and secondary school computerization, 1998 for the same program in the French and German communities for secondary schools and 1999 for primary schools. The European pioneer countries in school computerization are France and Spain which launched their first programs from 1985 onwards.

The United States launched such an initiative[1] in 1994 which allowed it to increase the share of connected schools from 35% in 1994 to 94% in 1999.

E. Aptitude for ICT integration

As we have already mentioned, the ability of a society to integrate IT appropriately depends on the conjunction of several factors involving all the actors in economic and social life. Important factors are: a population open to technological change, dynamic and innovating firms and a legal and institutional

1. This initiative was called "National Infrastructure Initiative". Figures for US come from "State of the Internet", published by USIC in 2000.

framework promoting innovation. This framework goes beyond the degree of regulation and the administrative burdens but also involves the quality of corporate governance within the society. Indeed, several studies have shown that the most important vehicles of general-purpose technology are new firms or old enterprises with a new management[1]. The opportunity cost of changing technology is greater for incumbents than for new entrants. Technology change may be accelerated by mergers and acquisitions which substitute a new management for the old one. Sometimes the simple possibility of such a merger or acquisition is enough to promote the adoption of a new technology. Such a possibility is closely linked to the dynamism of the stock market. The architecture of financial markets is an institutional framework which may have an effect on the speed of diffusion of new technologies.

In conclusion, even if the internet consists of a worldwide web, domestic conditions play an important role in the ability of a country to take advantage of new technologies. This accounts for very different degrees of diffusion on a country-by-country basis.

In a recent study, the Economist Intelligence Unit (EIU) scored the 60 largest economies on "e-readiness". This word is a shorthand for the extent to which a country's business environment is conducive to internet-based commercial opportunities. It is a concept that spans a wide range of factors, from the sophistication of the telecoms infrastructure to the security of credit-card transactions and the literacy of the population.

One of the main conclusions suggested by this ranking is that policy matters. It is true that an entrepreneurial culture is unambiguously good for e-business. But active government support is important as well. One prerequisite for affordable internet access for instance, is a competitive telecoms market.

The countries are divided into 4 groups:

- E-business leaders: these countries already have most of the elements of "e-readiness" in place, though there are still some concerns about regulatory safeguards.
- E-business contenders: these countries have both a satisfactory infrastructure and a good business environment. But parts of the e-business equation are still lacking.
- E-business followers: these countries have begun to create an environment conductive to e-business but have a great deal of work still to do.
- E-business laggards: these countries risk being left behind, and face major obstacles to e-business growth, primarily in the area of connectivity.

The following table gives the ranking for the first 19 countries.

1. A clear demonstration of this principle is given in the paper by Bassanini, Scarpetta and Visco, 2000, "Knowledge, Technology and Economic Growth: Recent Evidence from OECD Countries".

TABLE 19 - E-business-readiness rankings

Ranking	Countries	Score (out of 10)
	E-business leaders	
1	United States	8.73
2	Australia	8.29
3	UK	8.10
4	Canada	8.09
5	Norway	8.07
6	Sweden	7.98
7	Singapore	7.87
8	Finland	7.83
9	Denmark	7.70
10	Netherlands	7.69
11	Switzerland	7.67
12	Germany	7.51
13	Hong Kong	7.45
	E-business contenders	
14	Ireland	7.28
15	France	7.26
16 (tie)	Austria	7.22
16 (tie)	Taiwan	7.22
18	Japan	7.18
19	*Belgium*	*7.10*

Source: EIU, "Pyramid Research e-readiness rankings", 2001.

The Belgian position is approximately in the middle of the European performance table. In addition to the Scandinavian countries which traditionally obtain high scores, the first group (E-leaders) also contains the UK (3), the Netherlands (10) and Germany (12). In 19th place, Belgium is among the E-business contenders group together with six other European countries. In the E-business contenders group, it is possible to distinguish a first group with Ireland (14), France (15) and Austria (16) and a second, larger group including Italy (22), Spain (24) and Portugal (25). Belgium thus occupies an intermediary position between these two groups in Europe.

VI Annexe

TABEL 20 - ICT SECTOR: TOTAL ICT

COUNTRY	PVA	PVA2	PVAD	PVABS	PVABSM	PVABST	PVABSO
	1997	1997	1997	1998	1998	1998	1998
AUSTRIA	127557	5.06	9379	6.80	1.62	2.57	2.59
BELGIUM	376090	4.32	10029	5.80	1.03	1.97	2.76
GERMANY	179200	4.89	89154	6.10	2.05	2.56	1.50
DENMARK					1.37		4.88
SPAIN							
EU							
FINLAND	37080	5.83	6139	8.30	3.91	1.84	2.51
FRANCE	309341	3.76	46033	5.30	1.44	1.96	1.86
UNITED KINGDOM	53329	6.63	81919	8.40	1.90	2.37	4.10
GREECE							
IRELAND							
ITALY	88508544	4.46	53837	5.80	1.06	3.17	1.59
LUXEMBOURG							
NETHERLANDS	28685	3.9	14131	5.10	1.45	1.91	1.69
PORTUGAL	750905	4.11	6155	5.60	1.00	2.88	1.74
SWEDEN	115258	6.36	11773	9.30	3.38	2.32	3.61
JAPAN	25064967	4.92	151909	5.80	3.48	1.62	0.71
UNITED STATES	581540	7.06	581540	8.70	2.56	2.76	3.33
NORWAY	33544	3.08	3670	6.40	0.89	2.00	3.46

PVA= Value added in the ICT sector in million of national currency
Source: OECD (2000), Measuring the ICT sector.

PVA2= Value added in the ICT sector - as % of GDP
Source: own calculations based on OECD (2000), Measuring the ICT sector and for GDP: EC (2000), Ameco database.

PVAD= Value added in the ICT sector in million of USD using PPP's
Source: OECD (2000), Measuring the ICT sector.

PVABS= Share of ICT producers value added in the total business sector value added
Source: OECD (2001), "Productivity growth in ICT using industries: a source of growth differentials in the OECD?", STI working paper 2001/4
Note: The figure for Norway is for 1996.

PVABSM= Share of manufacturing ICT producers in the total business sector value added
Source: OECD (2001), "Productivity growth in ICT using industries: a source of growth differentials in the OECD?", STI working paper 2001/4.

PVABST= Share of telecommunication producers in the total business sector value added
Source: OECD (2001), "Productivity growth in ICT using industries: a source of growth differentials in the OECD?", STI working paper 2001/4.

PVABSO= Share of other ICT services value added in the total business sector value added
Source: OECD (2001), "Productivity growth in ICT using industries: a source of growth differentials in the OECD?", STI working paper 2001/4.

TABEL 21 - ICT SECTOR: TOTAL ICT

COUNTRY	PEMP	PEMPS	PEMPSM	PEMPST	PEMPSO	PEMPHS	PROD	
	1997	1998	1998	1998	1998	1999	1997	1998
AUSTRIA	164786	4.90	1.17	1.92	1.81	1.60	1.05	1.39
BELGIUM	130373	4.30	0.75	0.97	2.54	1.80	1.23	1.35
GERMANY	974000	3.10	1.19	0.71	1.22	1.50	1.68	1.97
DENMARK	96365	5.10	1.16	1.02	5.13	2.20	1.41	
SPAIN						1.10		
EU						1.60		
FINLAND	87834	5.60	2.33	1.10	2.14	2.30	1.44	1.48
FRANCE	681038	4.00	1.40	1.00	1.61	1.70	1.25	1.33
UNITED KINGDOM	1111630	4.80	1.31	0.84	2.67	2.00	1.60	1.75
GREECE						0.60		
IRELAND	55732	4.60	2.83	0.97	0.80			
ITALY	671430	3.50	0.97	0.94	1.60	1.10	1.33	1.66
LUXEMBOURG						2.00		
NETHERLANDS	199000	3.80	1.48	0.78	1.52	3.20	1.24	1.34
PORTUGAL	94305	2.70	0.76	0.59	1.35	0.90	1.87	2.07
SWEDEN	174187	6.30	2.13	1.30	2.83	2.80	1.43	1.48
JAPAN	2059983	3.40	2.01	0.36	1.05		1.57	1.71
UNITED STATES	4521080	3.90	1.37	1.07	1.47	2.40	2.02	2.23
NORWAY	73932	5.30	0.74	1.31	3.22		0.91	1.21

PEMP= Total employment (number of persons employed) in the ICT sector
Source: OECD (2000), Measuring the ICT sector.

PEMPS= Share of the ICT producers in the business sector employment
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4
Note: The figure for Norway is for 1996.

PEMPSM= Share of the manufacturing ICT employment in the business sector employment
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4.

PEMPST= Share of the telecommunication sector employment in the business sector employment
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4.

PEMPSO= Share of the employment in other ICT services in the business sector employment
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4.

PEMPHS= Share of high-skilled ICT workers in total occupations
Source: OECD (2001), Science, technology and industry scoreboard
Note: The figure for the EU is the average of 14 EU member countries (no data for Ireland).

PROD= Productivity in the ICT sector related to the business sector producitivity
Source: own calculations (share of value added/share of employment), based on OECD (2000), Measuring the ICT sector and OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4.

TABEL 22 - ICT SECTOR: TOTAL ICT

COUNTRY	PPR	PPR2	PPRD	PIV	PIV2	PIVD	PIVA
	1997	1997	1997	1997	1997	1997	1992-99
AUSTRIA	395114	15.665	32375	26134	1.04	1922	4.8
BELGIUM	1307372	15.006		66646	0.76	1777	5.6
GERMANY							5.2
DENMARK	156229	14.049	26942				6.5
SPAIN							3.9
EU							
FINLAND	126633	19.926	27568				5.6
FRANCE	672501	8.176	115219	101189	1.23	15058	5.8
UNITED KINGDOM	129303	16.085	211682	12144	1.51	18654	8
GREECE							3.8
IRELAND							5.9
ITALY	183909073	9.27	119193	23650731	1.19	14386	4.2
LUXEMBOURG							
NETHERLANDS							6.7
PORTUGAL	2064856	11.298	11778	135328	0.74	1109	4.4
SWEDEN	388703	21.439	57964				8.2
JAPAN				7007661	1.38	42471	6
UNITED STATES							8
NORWAY	68842	6.321	9733				5.8

PPR= Production in the ICT sector in million of national currency
Source: OECD(2000), Developing ICT sector tables: A progress report for Belgium: NIS.

PPR2= Production in the ICT sector - as % of GDP
Source: own calculations based on OECD(2000), Developing ICT sector tables: A progress report, for Belgium: NIS and for GDP: EC(2000), Ameco database.

PPRD= Production in the ICT sector in million of US dollars
Source: OECD(2000), Developing ICT sector tables: A progress report.

PIV= Investments (capital expenditure) in the ICT sector in million of national currency
Source: OECD(2000), Measuring the ICT sector.

PIV2= Investments (capital expenditure) in the ICT sector as % of GDP
Source: own calculations based on OECD(2000), Measuring the ICT sector and for GDP: EC (2000), Ameco database.

PIVD= Investments (capital expenditure) in the ICT sector in million of USD PPPs
Source: OECD (2000), Measuring the ICT sector.

PIVA= Average ICT expenditure intensity as a % of GDP, average 1992-1999
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STO working paper 2001/4
Note: The figure for Norway is for 1996.

TABEL 23 - ICT SECOR: TOTAL ICT

COUNTRY	DEFI1		DEFI1I		PEXD	PEXD2	PIMD	PIMD2	PNE
	1998	1999	1998	1999	1997	1997	1997	1997	1997
AUSTRIA	8248	13929	0.00438	0.0071	4111	1.99	6608	3.19	9317
BELGIUM	148220	331376	0.06626	0.14222	11273	4.63	11616	4.77	
GERMANY	375100	955062	0.01952	0.04818	49621	2.34	55545	2.62	
DENMARK	14879	17284	0.00959	0.01059					11888
SPAIN	82423	133239	0.01584	0.02382	7587	1.36	12135	2.17	
EU	2578592	5632827	0.03401	0.07086					
FINLAND	14429	67147	0.01257	0.05563	7981	6.52	5595	4.57	5816
FRANCE	239451	980271	0.01846	0.07276	31679	2.25	33275	2.36	30867
UNITED KINGDOM	1212932	1722846	0.09685	0.12781	51662	3.92	52007	3.95	95520
GREECE	0	5412		0.00461					
IRELAND	25654	64665	0.0338	0.07617					
ITALY	70996	268856	0.00667	0.02446	13594	1.17	21305	1.83	81524
LUXEMBOURG									
NETHERLANDS	161089	468639	0.04606	0.12666	31254	8.29	31790	8.44	
PORTUGAL	4529	50283	0.00464	0.0483	2096	2.01	3164	3.03	7223
SWEDEN	29437	222106	0.01389	0.09929	14519	6.11	10810	4.55	15021
JAPAN					113424	2.69	52793	1.25	44422
UNITED STATES					130706	1.59	175172	2.13	172809
NORWAY	102037	198763	0.07801	0.13909	1860	1.21	3929	2.55	7103

DEFI1= Total venture capital investments in the communication sector and computer related sector in 1.000 ECU
Source: EVCA (1999) (2000), European Venture Capital Association Yearbook 1999, 2000.

DEFI1I= Total venture capital investments in the communication sector and computer related sector as % of GDP
Source: own calculations based on EVCA (1999) (2000), European Venture Capital Association Yearbook 1999, 2000 and EC (2000), Ameco database.

PEXD= Total ICT exports, in million of US dollars
Source: OECD (2000), Developing ICT sector tables: A progress report.

PEXD2= Total ICT exports as % of GDP
Source: own calculations based on OECD(2000), Developing ICT sector tables: A progress report and EC (2000), Ameco database.

PIMD= Total ICT imports, in million of US dollars
Source:OECD (2000), Developing ICT sector tables: A progress report.

PIMD2= Total ICT imports as % of GDP
Source: own calculations based on OECD (2000), Developing ICT sector tables: A progress report and EC (2000), Ameco Datbabase.

PNE= Number of enterprises in the ICT sector
Source: OECD (2000), Measuring the ICT sector.

TABEL 24 - ICT-SECTOR: TOTAL ICT

COUNTRY	PRDMAN1		PRDMAN2		PRDSERV1		PRDSERV2	
	1995	1999	1995	1999	1995	1999	1995	1999
AUSTRIA								
BELGIUM	0.22	0.25	17.7	17	0.06	0.11	4.9	7.4
GERMANY	0.3	0.29	19.9	17.4				
DENMARK	0.14	0.14	13.2	11.4	0.11	0.14	10	11.7
SPAIN	0.06	0.06	16.1	13.4	0.03	0.06	6.6	12.2
EU								
FINLAND	0.54	1.08	37.2	49.8	0.1	0.19	7.3	8.7
FRANCE	0.34	0.3	24	22.3				
UNITED KINGDOM	0.15	0.16	11.4	12.8	0.15	0.14	11.8	11.3
GREECE								
IRELAND	0.33	0.41	34.6	40.5	0.07	0.1	7.7	9.7
ITALY	0.14	0.13	27	24	0.01	0.01	2.8	2.6
LUXEMBOURG								
NETHERLANDS	0.26	0.31	25.4	29.4				
PORTUGAL								
SWEDEN	0.73	0.85	28.2	29.7	0.1	0.2	4.1	7.2
JAPAN	0.59	0.71	30.4	33.2				
UNITED STATES	0.49	0.5	27.3	25.5		0.16		8.1
NORWAY	0.16	0.15	19	16.6	0.12	0.17	13.3	19.7

PRDMAN1= ICT related R&D expenditure in manufacturing industries, as % of GDP
Source: OECD (2001), Science, Technology and Industry Scoreboard.

PRDMAN2= ICT related R&D expenditure in manufacturing industries, as % of business enterprise sector R&D expenditure
Source: OECD (2001), Science, Technology and Industry Scoreboard
Note: the manufacturing industries (indicators PRDMAN1 & PRDMAN2) are defined as ISIC, rev.3 divisions: 30 (manufacture of office, accounting and computing machinery); 32 (manufacture of radio, television and communication equipment and apparatus) and 33 (manufacture of medical, precision and optical instruments, watches and clocks).

PRDSERV1= ICT related R&D expenditure in services industries, as % of GDP
Souce: OECD (2001), Science, Technology and Industry Scoreboard.

PRDSERV2= ICT related R&D expenditure in services industries, as % of business enterprise sector R&D expenditure
Souce: OECD (2001), Science, Technology and Industry Scoreboard
Note: the services industries (indicators PRDSERV1 & PRDSERV2) are defined as ISIC, rev. 3 divisions: 64 (post and telecommunications) and 72 (computer and related activities)
Note: for the indicators PRDMAN1-2 and PRDSERV1-2, the data for Belgium is for year 2000 instead of 1999, for Denmark, France and the Netherlands the data is for year 1998 instead of 1999, for Ireland the data is for 1997 instead of 1999 and for Norway the data is for year 1998 for manufacturing industries and 1997 for services industries instead of 1999.

TABEL 25 - ICT-SECTOR: TOTAL ICT

COUNTRY	PRD1						PRD2					
	1992	1993	1994	1995	1996	1997	1992	1993	1994	1995	1996	1997
AUSTRIA		0.6						20.2				
BELGIUM			1	1					22.6	21.9		
GERMANY	4.5	4.3	4.4	3.9		2.3	24.1	24.3	24.5	17.2		14.4
DENMARK	1.3	1.2	1	0.9	0.9	0.9	8.9	8	8	8	8	8
SPAIN	4.3	2.6	1.2	1.7	1.9	2.4	15	16.3	16.5	15.2	15.4	16
EU	4	3.7	3.3	3			21.4	21.6	22.1	19.6		
FINLAND	1.4	3.3	2.9	2.1	1.5	1.1	22.2	22.7	30.1	37.5	42.4	45.6
FRANCE	3.4	3.2	3	2.7	2.6	2.4	13.1	13.8	14.9	14.6	14.9	15.4
UNITED KINGDOM	3	2.8	1.5	1.6	1.7	1.1	11.8	12.5	11.8	11.8	12.2	11.2
GREECE		2						20.7				
IRELAND	8.7	8.5	6.6	4.9	5.1	5.1	26.9	23.7	25	26.9	35.1	35.1
ITALY	6.8	5.9	5	4.6	4.1	1.9	20.9	23.7	25.7	24.8	24.5	26
LUXEMBOURG												
NETHERLANDS	4.2	4.1	4.2	4.3	4.2	4.1	25.3	26.2	26.5	27.5	26.7	26.2
PORTUGAL				0.1		1	34			23		
SWEDEN	2.7	2.9	2.6	1.4	1	0.8	25.9	22.7	23	21.4	22.2	23.4
JAPAN	8.6	8.9	8.7	9	9.9	9.9	26.8	26.4	27.7	28.5	27	27.4
UNITED STATES	9.6	7.9	8.1	6.7	9.1	11.6	11.2	11.4	12.8	14.2	15.6	15.9
NORWAY	0.8	0.9	1.1	1.5	1.2	1.1	19.2	18.3	18	17.9	17.3	16.7

PRD1= R&D expenditure as % of BERD (Business enterprise expenditure on R&D) performed in office machinery and computer industry
Source: OECD(1999), Main science and technology indicators.

PRD2= R&D expenditure as % of BERD performed in the electrical/electronic industry
Source: OECD(1999), Main science and technology indicators.

TABEL 26 - ICT SECTOR: INFORMATION TECHNOLOGY

COUNTRY	PITMV						PITMVG				
	1997	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
AUSTRIA	3837	4181	4554	5046	5490	5976	9.0%	8.9%	10.8%	8.8%	8.9%
BELGIUM	5127	5650	6254	6923	7701	8487	10.2%	10.7%	10.7%	11.2%	10.2%
GERMANY	42059	46008	50631	55701	61159	67405	9.4%	10.1%	9.8%	9.8%	10.2%
DENMARK	4303	4721	5134	5832	6466	7130	9.7%	8.7%	12.3%	10.9%	10.3%
SPAIN	7290	8566	9850	11189	12341	13531	17.5%	15.0%	13.6%	10.3%	9.6%
EU	169573	186856	207096	233261	259093	287428	10.2%	10.8%	10.5%	9.9%	10.9%
FINLAND	2697	2967	3326	3735	4160	4613	10.0%	12.1%	12.2%	11.4%	10.9%
FRANCE	31561	34671	38482	43204	48588	54761	9.9%	11.0%	12.3%	12.5%	12.7%
UNITED KINGDOM	37251	41067	45605	53106	59380	66106	10.2%	11.1%	12.7%	11.8%	11.3%
GREECE	858	977	1086	1252	1378	1506	11.8%	11.1%	15.3%	10.1%	9.3%
IRELAND	1172	1314	1461	1637	1828	2032	12.1%	11.2%	11.7%	11.6%	11.2%
ITALY	15264	16623	18336	20660	22965	25399	8.9%	10.5%	12.5%	11.2%	10.6%
LUXEMBOURG											
NETHERLANDS	9362	10268	11431	12623	13958	15391	9.7%	11.3%	10.6%	10.6%	10.3%
PORTUGAL	1286	1412	1570	1789	1950	2132	9.8%	11.2%	14.0%	9.0%	9.3%
SWEDEN	7506	8431	9376	10564	11729	12959	12.3%	11.2%	11.0%	11.0%	10.5%
JAPAN	95659	111359	114664	122021	128244	135740	-4.0%	3.0%	6.4%	5.1%	5.8%
UNITED STATES	293914	383815	417936	457132	501017	546803	9.6%	8.9%	9.4%	9.6%	9.1%
NORWAY	3312	3608	4138	4525	5015	5535	8.9%	12.3%	9.3%	10.8%	10.4%

PITMV= Market value of the IT sector- in million Euro
Source: EITO (2000 & 2001), European Information technology Observatory 2001
Note: the figure for Belgium is inclusive Luxembourg
Note: the figure for the EU is the total IT market value in the European Member countries.

PITMVG= Yearly growth (%) of the market value of the IT sector
Source: EITO (2001), European Information Technology Observatorly
Note: the figure for Belgium is inclusive Luxembourg.

TABEL 27 - ICT SECTOR : INFORMATION TECHNOLOGY

COUNTRY	PITMVR					
	1997	1998	1999	2000	2001	2002
AUSTRIA	2.11%	2.22%	2.31%	2.45%	2.57%	2.70%
BELGIUM	2.22%	2.35%	2.48%	2.60%	2.73%	2.86%
GERMANY	2.25%	2.39%	2.55%	2.74%	2.92%	3.11%
DENMARK	2.88%	3.03%	3.10%	3.31%	3.52%	3.70%
SPAIN	1.47%	1.64%	1.75%	1.85%	1.91%	1.98%
EU	2.33%	2.45%	2.59%	2.74%	2.93%	3.11%
FINLAND	2.49%	2.57%	2.74%	2.83%	2.99%	3.16%
FRANCE	2.54%	2.68%	2.86%	3.10%	3.34%	3.60%
UNITED KINGDOM	3.20%	3.26%	3.37%	3.46%	3.86%	4.10%
GREECE	0.80%	0.90%	0.93%	1.03%	1.07%	1.08%
IRELAND	1.66%	1.70%	1.67%	1.59%	1.56%	1.54%
ITALY	1.48%	1.56%	1.66%	1.77%	1.87%	1.96%
LUXEMBOURG						
NETHERLANDS	2.81%	2.92%	3.06%	3.14%	3.22%	3.34%
PORTUGAL	1.37%	1.41%	1.47%	1.58%	1.61%	1.67%
SWEDEN	3.56%	3.95%	4.14%	4.28%	4.79%	5.04%
JAPAN	2.51%	3.16%	2.71%	2.37%	2.69%	2.78%
UNITED STATES	4.04%	4.93%	4.82%	4.26%	4.57%	4.78%
NORWAY	2.42%	2.75%	2.88%	2.61%	2.81%	2.98%

PITMVR= Market value of the IT sector- as % of GDP

Source: EITO (2000), European Information technology Observatory 2001 and for GDP: European Commission (April 2001), AMECO database

Note: the figure for Belgium is inclusive Luxembourg.

TABEL 28 - ICT SECTOR : INFORMATION TECHNOLOGY

COUNTRY	PIT	PITHA		PITSO		PITSE	
	1997	1990	1997	1990	1997	1990	1997
AUSTRIA	4087	50.2	46.2	12.9	17.2	36.9	36.6
BELGIUM	5621	45	43.3	20.9	23.4	34.2	33.3
GERMANY	43662	44.3	44.8	14	18.8	41.7	36.4
DENMARK	4547	51.7	46.3	12.3	14.4	35.9	39.3
SPAIN	6984	51.7	51.4	14.8	14.9	33.5	33.8
EU							
FINLAND	3097	59.7	52	11.4	13.5	28.9	34.5
FRANCE	33425	44.6	35.4	11.9	16.9	43.5	47.7
UNITED KINGDOM	42213	49.3	46.4	17.3	20.8	33.4	32.8
GREECE	889	48.1	52.3	10.3	13.4	41.6	34.4
IRELAND	1166	72.1	52.7	7.2	15.1	20.7	32.2
ITALY	16432	46.8	38.6	17.4	19.1	35.8	42.3
LUXEMBOURG							
NETHERLANDS	9852	49.8	47.3	15.1	22.9	35.1	29.7
PORTUGAL	1168	45	55.4	14.6	13.5	40.4	31.1
SWEDEN	8216	51.1	46.4	10.1	11.5	38.8	42.2
JAPAN	97233	51.8	48.5	6.8	10.8	41.5	40.7
UNITED STATES	316634	43.4	43.8	15.8	17.1	40.8	39.2
NORWAY	4037	50.1	47.5	13.3	14.6	36.5	37.9

PIT= Total market value of the IT market in 1997 in US$ billion
Source: OECD (2000), Information technology outlook.

PITHA= % of hardware sector in the IT market
Source: OECD (2000), Information technology outlook.

PITSO= % of packaged software sector in the IT market
Source: OECD (2000), Information technology outlook.

PITSE= % of IT services in the IT market
Source: OECD (2000), Information technology outlook.

TABEL 29 - ICT SECTOR : INFORMATION TECHNOLOGY

COUNTRY	PMER						
	1992	1993	1994	1995	1996	1997	1998
AUSTRIA	3	4	4	4	4	4	4
BELGIUM	7	6	7	8	8	8	8
GERMANY	4	6	6	5	7	6	7
DENMARK	5	4	5	5	4	4	5
SPAIN	5	5	5	5	5	6	6
EU	5.3	5.4	5.5	5.6	6.1	6.2	6.7
FINLAND	4	4	5	4	4	4	5
FRANCE	8	9	10	9	9	9	9
UNITED KINGDOM	9	10	9	7	11	10	11
GREECE	4	3	2	5	5	6	6
IRELAND	4	6	6	7	5	6	7
ITALY	2	2	3	3	5	6	6
LUXEMBOURG							
NETHERLANDS	6	5	6	7	7	7	7
PORTUGAL	4	3	3	3	4	4	5
SWEDEN	9	8	6	7	7	7	8
JAPAN							
UNITED STATES							
NORWAY	5	7	8	7	8	8	8

PMER= Number of IT companies with combined market share of 40% (mergers)

Source: EITO(2000), European Information Technology Observatory 2000 (millennium edition)

Note: The figure for the EU is the unweighted average of the number of IT companies in 14 EU member countries (no data for Luxembourg).

TABEL 30 - ICT SECTOR : TELECOMMUNICATION

COUNTRY	PTEMV					
	1997	1998	1999	2000	2001	2002
AUSTRIA	4220	5050	6078	6954	7455	7770
BELGIUM	5324	6006	6868	7801	8561	9123
GERMANY	44580	48651	53515	59368	65964	71171
DENMARK	3596	4002	4362	4778	5190	5495
SPAIN	16212	18780	22724	27146	31457	34077
EU	186629	212816	241700	276499	307226	329837
FINLAND	2938	3471	3939	4196	4461	4725
FRANCE	28260	32370	36533	42107	46751	50078
UNITED KINGDOM	32603	36855	40637	47113	52745	56943
GREECE	3198	4127	5166	6022	6704	7204
IRELAND	2120	2460	2783	3211	3627	3859
ITALY	25540	30162	35529	40772	44505	47672
LUXEMBOURG						
NETHERLANDS	8889	10141	11662	13656	15162	15947
PORTUGAL	3529	4431	4885	5650	6162	6692
SWEDEN	5620	6310	7019	7725	8482	9081
JAPAN		89619	93024	99536	106304	113214
UNITED STATES		238363	254333	270356	286848	301190
NORWAY	3019	3385	3753	3966	4195	4424

PTEMV= Telecommunication market value - in million Euro
Source: EITO (2001), European Information Technology Observatory
Note: The figure for Belgium is inclusive Luxembourg
Note: The figure for the EU is the sum of the telecommunication market value of 15 EU member countries.

TABEL 31 - ICT SECTOR : TELECOMMUNICATION

COUNTRY	PTEMVG						PTEMVR				
	1998	1999	2000	2001	2002	1997	1998	1999	2000	2001	2002
AUSTRIA	17.73%	20.40%	14.40%	7.20%	4.20%	2.32%	2.68%	3.08%	3.38%	3.49%	3.51%
BELGIUM	10.99%	14.40%	13.60%	9.70%	6.60%	2.31%	2.50%	2.73%	2.93%	3.04%	3.07%
GERMANY	9.03%	10.00%	10.90%	11.10%	7.90%	2.39%	2.53%	2.70%	2.92%	3.15%	3.28%
DENMARK	8.06%	9.00%	9.50%	8.60%	5.90%	2.41%	2.57%	2.64%	2.71%	2.83%	2.85%
SPAIN	15.64%	21.00%	19.50%	15.90%	8.30%	3.28%	3.59%	4.04%	4.48%	4.86%	4.98%
EU	14.03%	13.57%	14.40%	11.11%	7.36%	2.56%	2.79%	3.02%	3.25%	3.48%	3.56%
FINLAND	15.86%	13.50%	6.50%	6.30%	5.90%	2.72%	3.01%	3.24%	3.18%	3.20%	3.23%
FRANCE	14.55%	12.90%	15.30%	11.00%	7.10%	2.28%	2.50%	2.72%	3.02%	3.21%	3.30%
UNITED KINGDOM	8.94%	10.30%	15.90%	12.00%	8.00%	2.80%	2.93%	3.00%	3.07%	3.43%	3.53%
GREECE	24.48%	25.20%	16.60%	11.30%	7.50%	2.99%	3.80%	4.41%	4.96%	5.20%	5.19%
IRELAND	14.06%	13.11%	15.40%	12.90%	6.40%	3.00%	3.19%	3.17%	3.11%	3.09%	2.92%
ITALY	18.29%	17.80%	14.80%	9.20%	7.10%	2.48%	2.82%	3.21%	3.50%	3.62%	3.69%
LUXEMBOURG											
NETHERLANDS	12.99%	15.00%	17.10%	11.00%	5.20%	2.67%	2.88%	3.12%	3.40%	3.49%	3.46%
PORTUGAL	23.46%	10.20%	15.70%	9.00%	8.60%	3.76%	4.44%	4.56%	4.98%	5.08%	5.24%
SWEDEN	10.62%	11.20%	10.10%	9.80%	7.10%	2.67%	2.95%	3.10%	3.13%	3.46%	3.53%
JAPAN	-2.60%	3.80%	7.00%	6.80%	6.50%		2.54%	2.20%	1.93%	2.23%	2.32%
UNITED STATES	6.92%	6.70%	6.30%	6.10%	5.00%		3.06%	2.93%	2.52%	2.62%	2.63%
NORWAY	9.01%	10.90%	5.70%	5.80%	5.50%	2.21%	2.58%	2.62%	2.28%	2.35%	2.38%

PTEMVG= Yearly growth rate of the telecommunication market value - in %
Source: EITO (2001), European Information Technology Observatory
Note: The figure for Belgium is inclusive Luxembourg.

PTEMVR= Telecommunication market value - as % of GDP
Source: EITO (2001), European Information Technology Observatory and for GDP European Commission (April 2001), Ameco database
Note: The figure for Belgium is inclusive Luxembourg.

TABEL 32 - ICT SECTOR : TELECOMMUNICATION

COUNTRY	PTEVA	PTEEM	PPROD1					
	1998	1998	1989	1991	1993	1995	1997	1999
AUSTRIA	2.57	1.92	171.5	189.0	209.5	239.3	288.1	350.8
BELGIUM	1.97	0.97	149.6	159.0	176.1	197.4	251.5	344.0
GERMANY	2.56	0.71	134.2	151.7	167.8	209.9	247.5	321.8
DENMARK		1.02	164.2	172.7	202.3	243.7	277.1	332.2
SPAIN			166.2	169.7	195.7	230.8	282.8	627.0
EU			141.9	163.1	190.7	227.5	267.7	377.0
FINLAND	1.84	1.1	134.3	158.9	214.6	236.2	291.6	287.7
FRANCE	1.96	1	172.4	188.8	203.6	200.8	232.0	331.2
UNITED KINGDOM	2.37	0.84	101.6	119.8	159.3	229.9	235.7	331.8
GREECE			127.7	151.9	181.1	232.4	278.4	406.9
IRELAND		0.97	66.9	79.7	95.5	120.2	171.8	222.5
ITALY	3.17	0.94	183.3	225.7	272.3	313.5	399.1	566.4
LUXEMBOURG			244.2	253.8	278.4	326.4	419.0	547.7
NETHERLANDS	1.91	0.78	214.2	236.7	228.4	268.2	337.8	345.3
PORTUGAL			89.7	116.2	149.9	189.6	271.0	471.4
SWEDEN	2.32	1.3	139.3	190.8	256.9	245.8	275.6	417.3
JAPAN	1.62	0.36	188.0	216.5	251.8	298.3	434.0	513.8
UNITED STATES	2.76	1.07	153.7	161.6	185.2	210.8	248.0	264.1
NORWAY	2	1.31	137.7	133.6	145.6	182.5	207.4	248.3

PTEVA= The share of the telecommunication sector in the total business sector value added
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STI working paper 2001/4
Note: The figure for Norway is for 1996.

PTEEM= The share of the telecommunication sector in the total business sector employment
Source: OECD (2001), "Productivity growth in ICT-producing and ICT-using industries: a source of growth differentials in the OECD?", STI working paper 2001/4
Note: The figure for Norway is for 1996.

PPROD1= Productivity of a Public Telecommunication Operator (PTO): number of fixed and mobile access paths per employee of a PTO
Source: OECD (2001), Communication Outlook.

TABEL 33 - ICT SECTOR : TELECOMMUNICATION

COUNTRY	PTEIV						PTEIVR		
	1988-90	1991-93	1994-96	1997	1998	1999	1997	1998	1999
AUSTRIA	965.2	1 308	1 283	1 000	898	960	0.02%	0.02%	0.02%
BELGIUM	614.5	780	928	537	497	590	0.05%	0.05%	0.04%
GERMANY	9 278.4	15 792	12 686	11 942	10 852	11 229	0.02%	0.02%	0.02%
DENMARK	490.1	417	551	671	1 130	881	0.03%	0.02%	0.02%
SPAIN	4 517.0	4 298	3 994	2 654	2 959	3 506	0.02%	0.02%	0.02%
EU				45 716	46 729	52 375	0.02%	0.02%	0.02%
FINLAND	669.3	510	632	833	596	573	0.01%	0.02%	0.02%
FRANCE	4 549.6	6 077	6 176	6 424	6 457	5 632	0.02%	0.02%	0.03%
UNITED KINGDOM	4 821.8	3 766	4 869	9 957	8 930	12 840	0.01%	0.02%	0.01%
GREECE	290.8	808	751	842	1 199	1 403	0.01%	0.01%	0.01%
IRELAND	221.3	257	329	588	652	585	0.01%	0.01%	0.02%
ITALY	7 365.1	8 659	5 065	6 728	7 479	6 856	0.02%	0.02%	0.02%
LUXEMBOURG	39.1	72	96	79	30	55	0.02%	0.06%	0.04%
NETHERLANDS	1 143.8	1 573	1 514	1 494	2 677	4 734	0.03%	0.01%	0.01%
PORTUGAL	562.5	971	1 001	1 000	1 444	1 618	0.01%	0.01%	0.01%
SWEDEN	1 079.9	1 164	1 197	967	929	913	0.02%	0.03%	0.03%
JAPAN	15 388.5	20 339	33 113	32 812	32 867	32 925	0.03%	0.03%	0.03%
UNITED STATES	23 401.1	26 064	37 751	54 224	65 829	88 434	0.01%	0.01%	0.01%
NORWAY	449.7	483	603	787	1 350	1 020	0.02%	0.01%	0.01%

PTEIV= Public telecommunication investment - in USD millions
Source: OECD (2001), Communications outlook
Note: The figure for the EU is the sum of the public telecommunication investment in the 15 EU member countries.

PTEIVR= Public telecommunication investment - as % of GDP
Source: OECD (2001), Communications outlook and for GDP: European Commission (April 2001), AMECO database.

TABEL 34 - DIFFUSION IT

COUNTRY	DIPC1				DIPC2	DINE1	DINE1B	DINE2
	1997	1998	1999	2000	1999	2000	2000	1999
AUSTRIA	246.0	290.0	344.0	401.6	75	17	16	13
BELGIUM	249.0	285.0	343.8	402.4	65	20	15	15
GERMANY	231.0	268.0	317.4	372.6	62	14	11	11
DENMARK	349.0	396.0	476.6	560.5	84	45	41	48
SPAIN	127.0	152.0	178.7	205.9	64	10	7	11
EU	219.3	258.0	306.2	360.0	67	18	15	17
FINLAND	354.0	442.0	507.8	573.3	82	28	23	39
FRANCE	231.0	273.0	318.9	369.4	64	13	11	10
UNITED KINGDOM	283.0	323.0	379.0	442.4	80	24	22	26
GREECE	73.0	90.0	108.4	130.2	50	6	5	6
IRELAND	263.0	303.0	352.6	408.6	134	17	14	15
ITALY	158.0	194.0	245.0	308.0	57	19	14	16
LUXEMBOURG	300.0	300.0	300.0	300.0		27	18	31
NETHERLANDS	292.0	340.0	400.6	468.3	80	46	42	43
PORTUGAL	103.0	131.0	156.3	183.8	27	8	7	7
SWEDEN	353.0	444.0	510.4	576.1	102	48	43	58
JAPAN	228.0	272.0	325.5	389.2	32			
UNITED STATES	450.0	499.0	538.9	580.5	135			
NORWAY		437.0	506.8	571.7	140			

DIPC1= Number of computers in use - per 1 000 inhabitants
Source: IMD (2000 and 2001), The world competitiveness yearbook
Note: the figure for the EU is the ratio of the total number of computers in use in the 15 EU member countries to the total population in the EU.

DIPC2= Number of business PC's per 100 white-collar workers
Source: EITO (2001), European Information Technology Observatory,
Note: the figure for Belgium is inclusive Luxembourg

DINE1= Proportion of people which have an Internet connection at home
Source: Eurobarometer (2001), Measuring information society 2000.

DINE1B= Proportion of people which use an Internet connection at home
Source: Eurobarometer (2001), Measuring information society 2000.

DINE2= Proportion of people which has access to or use of a modem
Source: EITO (2000), European Information Technology Outlook (based on Eurobarometer 51).

TABEL 35 - DIFFUSION IT

COUNTRY	DINE3				DINE4	DINE5	
	1997	1998	1999	2000	1998	1998	2000
AUSTRIA	7.2	17.8	27.9	48.6	2.08	13 561	93 671
BELGIUM	7.9	16.3	26.1	36.1	1.09	6 992	47 729
GERMANY	10.3	14.8	20.1	28	2.01	128 086	1.607 192
DENMARK	26	37.1	59.2	68.1	8.11	34 173	108 931
SPAIN	4	6.3	9.3	14.8	0.59	7 522	25 012
EU	10.2	15.2	21.9	33.4	1.69	432 904	3 440 942
FINLAND	68.1	99.2	120.5	147.4	1.85	7 118	20 992
FRANCE	5.3	7.7	12	18.1	0.71	16 497	63 433
UNITED KINGDOM	15.7	23.6	33.3	47.9	3.1	131 724	937 448
GREECE	2.8	3.6	6.8	10.8	0.26	2 099	15 728
IRELAND	13	12.8	16.4	28.1	1.07	2 070	9 535
ITALY	3.7	5	9	25.2	0.64	22 254	180 071
LUXEMBOURG	3.1	14.5	19.4	33.3	2.96	8 4	4 575
NETHERLANDS	21.9	35.3	50.6	75.3	2.9	30 187	253 331
PORTUGAL	3.1	5.1	6.3	10.5	13.4	4 911	13 178
SWEDEN	35	45.2	63.2	98.2	4.86	24 946	60 116
JAPAN	8.4	12.8	18.3	28.3	0.39	34 745	68 515
UNITED STATES	56.5	87.5	142	215	5.53	44 810	64 780
NORWAY	40.9	75.6	85.7	106.7	2.44	7 695	37 605

DINE3= Number of internet hosts - per 1 000 inhabitants (according to Netsizer host data)
Source: OECD (2001), Communications outlook 2001.

DINE4= Estimated number of web servers - per 1 000 inhabitants
Source: OECD (1999), Communications Outlook.

DINE5= Number of web sites by ccTLD (country code Top Level Domain) in July 1998 and July 2000
Source: OECD (2001), Communications outlook.

TABEL 36 - DIFFUSION IT

COUNTRY	DINE6	DINE7		DINE8	DINE9					
	2000	1998	2000	2000	1995	1996	1997	1998	1999	2000
AUSTRIA	64695	1.7	11.6	7.9	5.6	9.9	12.4	20.2	35.5	50
BELGIUM	42000	0.7	4.7	4.1	2.8	5.3	10	19.1	36.8	49.2
GERMANY	793547	1.6	19.6	9.7	4.8	7.9	12.4	18.4	25.6	34
DENMARK	63870	6.4	20.5	12.1	9	18.8	32	51.1	73.4	92.7
SPAIN	27121	0.2	0.6	0.7	1.5	2.6	4.6	9.9	16.2	22.8
EU		1.2	9.2	6.19	4.19	7.86	11.96	19.33	28.99	40.01
FINLAND	29802	1.4	4.1	5.8	22.5	55.3	67.1	104	122.7	148.1
FRANCE	67158	0.3	1.1	1.1	2.5	4.4	6.6	11.4	22.7	29.8
UNITED KINGDOM	895369	2.2	15.8	15.2	6	12.1	18.1	28.2	43.7	60.3
GREECE	11461	0.2	1.5	1.1	0.6	1.4	2.1	4.4	8.1	9.6
IRELAND	7073	0.6	2.6	1.9	3.3	7.1	10.8	16.6	28.8	36.4
ITALY	80148	0.4	3.2	1.4	1.1	2.6	4.6	8	12.6	18.9
LUXEMBOURG	4727	2	10.7	11.1	4.9	9.5	12.8	23.6	38.1	43.5
NETHERLANDS	142442	1.9	16.1	9.1	9.9	16.3	25.5	42	56.9	84.8
PORTUGAL	10342	0.5	1.3	1	1	2	2.2	5.4	8.1	12.8
SWEDEN	75266	2.8	6.8	8.5	14.6	26.3	39.7	62.1	69	114.8
JAPAN	76436	0.3	0.5	0.6	1.4	4.2	8	11.8	18.1	25.8
UNITED STATES	7465358	0.2	0.2	27	14	26.2	37.2	78.1	118	141.5
NORWAY	28284	1.7	8.5	6.4	16.1	29.4	50.1	77	92.8	120.3

DINE6= Number of web sites weighted by gTLD (generic Top Level Domain) in February 2000
Source: OECD (2000), Local access pricing and e-commerce.

DINE7= Number of web sites by ccTLD (country code Top Level Domain) per 1000 inhabitants in July 1998 and July 2000
Source: OECD (2001), Communications outlook
Note: the figure for the EU is the ratio of the total number of web sites by ccTLD of the 15 EU member countries to the total population in the EU.

DINE8= Number of web sites including gTLD (generic Top Level Domain) per 1000 inhabitants in 02/2000
Source: OECD (2000), Local access pricing and e-commerce
Note: the figure for the EU is the ratio of the total number of web sites (weighted by gTLD) of the 15 EU member countries to the total population in the EU.

DINE9= Number of internet hosts - per 1 000 inhabitants (according to Network Wizards for the Internet Software Consortium (ISC)) (data: 07/1995; 07/1996; 07/1997; 07/1998; 07/1999; 01/2000)
Source: OECD (2000), Local access pricing and e-commerce
Note: the figure for the EU is the ratio of the total number of Internet hosts in 15 EU member countries to the total population in the EU.

TABEL 37 - DIFFUSION IT

COUNTRY	DEIN3		DEIN4	
	1998	2000	1998	2000
AUSTRIA	30	24	12.9	5
BELGIUM	35	30	8.7	6
GERMANY	27	31	6.8	8
DENMARK	47.3	45	13.9	13
SPAIN	28.4	26	4.2	5
EU	33.3	27	7.5	7
FINLAND		50		10
FRANCE	42.1	24	8	6
UNITED KINGDOM	30.2	20	6.2	3
GREECE	29	16	13.7	6
IRELAND	29.4	13	4.1	4
ITALY	32.3	22	6.8	7
LUXEMBOURG	32.9	24	9.2	5
NETHERLANDS	48.3	61	11.3	12
PORTUGAL	31.6	16	3	4
SWEDEN	49.2	46	17.3	15
JAPAN				
UNITED STATES				
NORWAY				

DEIN3= % of citizens with interest for the use of internet to manage bank account or other transactions or to consult the stock exchange or other economic information prices
Source: Eurobarometer (50.1 (1998) & 53 (2000)), Measuring information society.

DEIN4= % of citizens which have the willingness to pay for the use of internet for banking services
Source: Eurobarometer (50.1 (1998) & 53 (2000)), Measuring information society.

TABEL 38 - DIFFUSION IT

COUNTRY	DEIN3A	DEIN3B	DEIN3C	DEIN3D	DEIN3E	DEIN3F
	2000	2000	2000	2000	2000	2000
AUSTRIA	56	39	39	41	21	18
BELGIUM	58	54	39	37	35	17
GERMANY	73	51	53	51	35	25
DENMARK	86	47	54	38	16	32
SPAIN	71	58	38	36	20	18
EU	69	47	47	43	25	23
FINLAND	80	54	58	31	64	28
FRANCE	59	43	41	41	16	15
UNITED KINGDOM	75	56	52	43	17	29
GREECE	54	55	43	50	17	28
IRELAND	71	56	45	38	7	35
ITALY	63	33	40	37	10	15
LUXEMBOURG	70	43	43	41	27	13
NETHERLANDS	63	40	46	57	40	29
PORTUGAL	49	45	39	30	9	13
SWEDEN	79	44	48	37	35	16
JAPAN						
UNITED STATES						
NORWAY						

DEIN3A = % of Internet users which uses electronic mail (e-mailed family, friends or colleagues) in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEIN3B = % of Internet users which searched for educational material and documents in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEIN3C = % of Internet users which searched for information about a specific product in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEIN3D = % of Internet users which downloaded free software in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEIN3E = % of Internet users which carried out operations on his bank account in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEIN3F = % of Internet users which searched for information which concerns his health in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

TABEL 39 - DIFFUSION TELECOM

COUNTRY	DITEF1			DITEF2						DITEFM1
	1997	1998	2000	1990	1995	1996	1997	1998	1999	1999
AUSTRIA	495.7	502.1	484	41.8	46.6	48.4	49.2	49.5	47.7	99.6
BELGIUM	474	474.4	510	39.3	46.1	47.3	48.8	49.6	50.2	81.3
GERMANY	561.6	566.3	622	50.6	51.4	54	55.1	56.7	58.8	87.4
DENMARK	628.8	653.8	709	56.6	61.1	61.8	63.2	65.9	68.4	117.8
SPAIN	401	416.7	472	32.4	38.6	39.8	41.5	42.6	45	82.8
EU	520.03	528.61	560.3		49.3	50.8	51.9	53.0	54.3	93.9
FINLAND	557.5	569.9	551	53.5	55.5	57.1	59.9	55.4	55.1	120.2
FRANCE	583.6	582.9	586	49.5	56.1	56.9	57.5	57.5	57.8	92.7
UNITED KINGDOM	536.5	549.2	584	44.1	50.4	52.4	53.3	55	56.5	96.6
GREECE	521	525.2	536	39.1	49.4	50.9	51.7	52.7	53.3	91.4
IRELAND	405.6	448.5	483	28.1	36.5	39.3	41	44.1	46.4	89.1
ITALY	451.4	456.1	471	39.4	43.8	44.4	45.1	45.6	46.4	99.1
LUXEMBOURG	610.2	710	817	47.8	56.7	62.1	66.4	68.7	71.9	120.1
NETHERLANDS	551	584.5	651	46.4	52.5	54.3	56.8	59.5	60.8	103.7
PORTUGAL	401.6	412.1	431	24.1	36.7	38.5	40.2	41.3	42.3	89.1
SWEDEN	685.4	696.4	707	68.3	68.7	69.4	70.1	71	73.8	131.3
JAPAN	502.3	493.9	585	44.2	49.6	51.1	51.7	52.8	54.6	99.5
UNITED STATES	625.6	676.6	734	54.6	60.2	62.4	64.9	66.8	69.8	101.4
NORWAY		654.2	755	50.3	56.8	58.2	62.1	66.2	70.5	132

DITEF1= Main telephone lines - per 1 000 inhabitants (exclusive mobile phone, inclusive public phone)
Source: IMD (1999 and 2001), The world competitiveness yearbook
Note: The figure for the EU is the ratio of the total number of main telephone lines in the 15 EU member countries to the total population in the EU.

DITEF2= Number of fixed telecommunication channels (= traditionnal telecommunication access lines + ISDN lines) per 100 inhabitants
Source: OECD (2001), Communications outlook
Note: The figure for the EU is the ratio of the total number of fixed telecommunication channels in the 15 EU member countries to the total population in the EU.

DITEFM1= Number of telecommunication access paths (= fixed and wireless) per 100 inhabitants
Source: OECD (2001), Communications outlook
Note: The figure for the EU is the ratio of the total number of telecommunication access paths in the 15 EU member countries to the total population in the EU.

TABEL 40 - DIFFUSION TELECOM

COUNTRY	DITEM1										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
AUSTRIA	1	1	1	1	1	1	1	2	3	3	4
BELGIUM	1	1	1	1	1	1	2	2	2	3	3
GERMANY	1	1	2	2	3	3	3	3	4	4	4
DENMARK	1	1	2	2	2	2	2	2	4	4	4
SPAIN	1	1	1	1	2	2	2	2	2	3	3
EU											
FINLAND	1	1	2	2	2	2	2	2	3	3	3
FRANCE	2	2	2	2	2	2	3	3	3	3	3
UNITED KINGDOM	2	2	2	3	4	4	4	4	4	4	4
GREECE	0	0	0	2	2	2	2	2	3	3	3
IRELAND	1	1	1	1	1	1	1	2	2	3	3
ITALY	1	1	1	1	1	1	2	2	2	3	4
LUXEMBOURG	1	1	1	1	1	1	1	1	2	2	2
NETHERLANDS	1	1	1	1	1	1	2	2	4	5	5
PORTUGAL	1	1	2	2	2	2	2	2	3	3	3
SWEDEN	2	2	3	3	3	3	3	3	3	3	4
JAPAN	2	2	2	2	4	5	5	5	5	5	5
UNITED STATES	2	2	2	2	2	3	6	6	7	7	7
NORWAY	1	1	1	2	2	2	2	2	2	2	2

DITEM1= Number of mobile operator equivalents (= when network commenced or was expected to commence offering services)
Source: OECD (2000), Cellular mobile pricing structures and trends.

TABEL 41 - DIFFUSION TELECOM

COUNTRY	DITEM2									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
AUSTRIA	1	1.5	2.2	2.8	3.5	4.8	7.4	14.3	28.5	51.9
BELGIUM	0.4	0.5	0.6	0.7	1.3	2.3	4.7	9.6	17.2	31.1
GERMANY	0.3	0.7	1.2	2.2	3	4.6	7.1	9.9	17	28.6
DENMARK	2.9	3.4	4.1	6.9	9.7	15.7	25.1	27.5	36.4	49.4
SPAIN	0.1	0.3	0.5	0.7	1	2.3	7.6	10.9	17.9	37.8
EU	0.82	1.17	1.53	2.23	3.65	5.88	8.84	13.95	23.54	39.65
FINLAND	4.5	5.7	7	9.1	12.8	19.9	29.2	45.6	57.2	65
FRANCE	0.5	0.7	0.8	0.8	1.4	2.5	4.2	9.8	19.1	34.9
UNITED KINGDOM	1.9	2.2	2.6	3.8	6.8	9.8	11.7	14.3	21.9	40.2
GREECE	0	0	0	0.3	1.5	5.3	6.7	8.6	19.6	38.1
IRELAND	0.7	0.9	1.3	1.6	2.3	3.7	8.2	14.4	25.5	42.7
ITALY	0.5	1	1.4	2.1	3.9	6.9	11.2	20.5	35.6	52.7
LUXEMBOURG	0.2	0.3	0.3	1.3	3.2	6.6	10.9	16.1	22	48.2
NETHERLANDS	0.5	0.8	1.1	1.4	2.1	3.5	2	10.8	21.3	43
PORTUGAL	0.1	0.1	0.4	1	1.8	3.5	6.8	15.4	30.8	46.8
SWEDEN	5.4	6.6	7.5	9	15.8	22.8	28.3	35.8	46.4	57.6
JAPAN	0.7	1.1	1.4	1.7	3.5	8.2	16.7	30.4	37.4	44.9
UNITED STATES	2.1	2.9	4.3	5.6	8.5	11.8	16.3	20.4	25.6	31.5
NORWAY	4.6	5.3	6.5	8.6	13.5	22.6	29	38.4	47.5	61.5

DITEM2= Cellular mobile telephone subscribers - per 100 inhabitants

Source: OECD (2000), Cellular mobile pricing structures and trends and for 1998 & 1999: OECD (2001), Communications outlook

Note: the figure for the EU is an unweighted average of the 15 EU member countries.

TABEL 42 - DIFFUSION TELECOM

COUNTRY	DITEM3	DITE				
	1999	1995	1996	1997	1998	1999
AUSTRIA		37.1	18.9	26.8	21.8	19.2
BELGIUM	25	20.7	24.6	12.7	9.8	10.8
GERMANY	200	24.5	33.7	27.4	22.1	21.6
DENMARK	50	12.8	22.0	14.5	30.1	21.2
SPAIN	60	33.4	33.0	26.4	23.5	26.6
EU						
FINLAND	75	18.9	32.1	27.1	16.4	14.2
FRANCE	60	23.0	19.5	22.4	22.4	17
UNITED KINGDOM	70	14.4	23.8	27.9	20	25.3
GREECE	15	24.1	23.6	25.6	27.9	28.1
IRELAND		16.4	24.1	27.6	34.2	23.9
ITALY	150	22.9	22.4	23.3	27.4	22.9
LUXEMBOURG		21.8	49.4		8.9	15.1
NETHERLANDS		19.3	17.0	18.8	28.2	44.1
PORTUGAL	60	33.6	24.7	31.0	34.8	35.2
SWEDEN	70	18.2	16.3	14.0	12.6	12.3
JAPAN		32.9	33.9	29.8	31	25.3
UNITED STATES		19.4	20.1	21.1	24.1	29.3
NORWAY	70	21.6	21.1	21.8	26.9	20.8

DITEM3= Number of SMS (Short Message Services) in April 1999 (in million)
Source: OECD (2000), Cellular mobile pricing structures and trends.

DITE= Public telecommunication investment - as % of revenue
Source: OECD (2001), Communication Outlook.

TABEL 43 - DIFFUSION E-COMMERCE

COUNTRY	DIEC1	DIEC1B	DIEC2	DIEC3	DIEC4	DIEC5	DIEC6	DIEC7		DIEC8	
	1999	1999	1999	1999	1998	1999	1999	1998	1999	1998	1999
AUSTRIA	96	0.0457	210	0.23	120	13	2.2				
BELGIUM	82	0.0329	420	0.16	90	11	1.3		37		40
GERMANY	1199	0.0565	200	0.3	1370	13	2.4		10		20
DENMARK	46	0.0263	220	0.2	90	8	2.5				
SPAIN	70	0.0117	185	0.06	220	11	0.9		24		41
EU		0.0435						16	19	23	33
FINLAND	51	0.0395	160	0.22	160	10	4.7		9		18
FRANCE	345	0.0239	215	0.14	310	8	0.8		17		30
UNITED KINGDOM	1040	0.0721	280	0.37	970	11	2.5		28		38
GREECE					30	11	0.4				
IRELAND					40	13	1.6		15		33
ITALY	194	0.0165	145	0.09	360	12	0.9		23		30
LUXEMBOURG											
NETHERLANDS	182	0.0459	210	0.34	320	13	3		10		20
PORTUGAL	70	0.0629	185	0.06	50	11	0.7				
SWEDEN	232	0.0969	170	0.68	260	10	4.6		21		42
JAPAN	1648	0.0379	334	0.06							
UNITED STATES	24170	0.263	195	0.48	19666	39	11.1		15		38
NORWAY	61	0.0399	200	0.26	100	10	3.5		13		42

DIEC1= B2C eCommerce: value of transactions, million US dollar (1999)
Source: OECD (2000), E-commerce: Impact and policy challenges.

DIEC1B= B2C eCommerce: value of transactions- as % of GDP
Source: own calculations, OECD (2000), E-commerce: Impact and policy challenges and EC (2000), Ameco database (GDP)
Note: the figure for the EU is the ratio of the total value of transactions of 12 EU member countries (no data for Greece, Ireland and Luxembourg) to the total GDP of these countries.

DIEC2= B2C eCommerce: value of transactions - growth rate (1999/98)
Source: OECD (2000), E-commerce: Impact and policy challenges.

DIEC3= B2C eCommerce: penetration rate, % of retail sales
Source: OECD (2000), E-commerce: impact and policy challenges.

DIEC4= B2C eCommerce: number of buyers, thousands (end 1998)
Source: OECD (2000), E-commerce: Impact and policy challenges.

DIEC5= B2C eCommerce: number of buyers, as % of internet users
Source: OECD (2000), E-commerce: Impact and policy challenges.

DIEC6= B2C eCommerce: number of buyers, as % of working age population
Source: OECD (2000), E-commerce: Impact and policy challenges.

DIEC7= % of interviewees which strongly agree that e-commerce forms a significant part of the way they currently operate
Source: Andersen Consulting (1999), eEurope takes off (based on interview results).

DIEC8= % of interviewees which strongly agree that e-commerce offers a real competitive advantage
Source: Andersen Consulting (1999) (idem).

TABEL 44 - DIFFUSION E-COMMERCE

COUNTRY	DIEC9		DIEC10	DIEC11		DIEC13			
	1998	1999	1998	1999	2001	1997	1998	1999	2000
AUSTRIA			74			3.2	13	29.5	55.2
BELGIUM		73	64	1.97	4.47	2.1	5.1	15.7	26.2
GERMANY		67	57	2.31	5.42	1.8	6.8	19.8	45.8
DENMARK			76	2.25	5.15	2.1	10.1	21.2	54.3
SPAIN		51				3	6.7	10.9	19.3
EU	50	59				2.72	7.58	17.32	44.2
FINLAND		55	70	3.56	6.59	3.9	15.7	34.8	66.3
FRANCE		33	64	1.62	4.67	1.1	4.3	10.7	21.9
UNITED KINGDOM		66	56	3.46	6.02	6	14	29.5	74
GREECE						0.5	1.4	4.5	8.3
IRELAND		82				4.6	16.6	26.2	65.4
ITALY		47		2.02	5.67	1.5	3.4	7.5	13.9
LUXEMBOURG						7.2	28.4	61	101.7
NETHERLANDS		43	75	3.01	6.95	4.8	9.4	19.4	34.2
PORTUGAL						1.6	3.1	6	11.6
SWEDEN		64	67	5.05	8.52	6	20.7	45.7	91.6
JAPAN			54			1.6	4.2	9.2	22.9
UNITED STATES		65	148			27.6	60.8	116	240.3
NORWAY		68		2.56	5.48	5.2	14.5	29.3	61.2

DIEC9= % of interviewees which strongly agree that they will be much more reliant on e-commerce in five years time than they are now
Source: Andersen Consulting (1999), eEurope takes off (based on interview results).

DIEC10= Value of all goods and services transacted on-line per user in 1998 in euro
Source: Booz Allen & Hamilton (2000), The competitiveness of Europe's ICT markets.

DIEC11= % of sales over the internet in the business sector - today (in 1999) and in 2 years (2001)
Source: The Bathwick Group (Oct. 1999), E-business in a connected world, Study Report Belgium.

DIEC13= Secure web servers per 1 million inhabitants
Source: OECD (2000), Local access pricing and e-commerce and for 2000 (July): OECD (2001), Communications outlook.

TABEL 45 - NETWORK DIGITALISATION

COUNTRY	DEIN1					DEIN1B				
	1993	1995	1997	1998	1999	1993	1995	1997	1998	1999
AUSTRIA	904	16813	85683	152000	247000	0.11	2.09	10.61	18.82	30.52
BELGIUM	1163	28071	96548	180000	311000	0.12	2.77	9.48	17.64	30.41
GERMANY	230800	881400	2887200	4031000	4449000	2.84	10.79	35.19	49.14	54.22
DENMARK	2354	14082	58000	113000	241000	0.45	2.69	10.98	21.32	45.31
SPAIN	138	10828	228000	177000	355000	0.00	0.28	5.80	4.50	9.01
EU						1.07	3.99	13.25	22.18	26.75
FINLAND	545	6416	57855	95000	151000	0.11	1.26	11.26	18.43	29.23
FRANCE	103000	288800	556000			1.79	4.97	9.49		
UNITED KINGDOM	50000	132500	200000	350000	550000	0.86	2.26	3.39	5.91	9.24
GREECE	0	303	2564	24000	44000		0.03	0.24	2.28	4.18
IRELAND				49000	76000				13.23	20.30
ITALY	3989	49061	335000		1241000	0.07	0.86	5.82		21.53
LUXEMBOURG		1000	5000	9000	17000		2.44	11.88	21.10	39.31
NETHERLANDS	1175	23700	279000			0.08	1.53	17.87		
PORTUGAL	0	7891	47845	86000	133000		0.80	4.81	8.63	13.32
SWEDEN		19700	70000	120000			2.23	7.91	13.56	
JAPAN	215573	463566	2056288	3480000	5802000	1.73	3.69	16.30	27.51	45.80
UNITED STATES	264323	510652	1174950	705000	876000	1.03	1.94	4.39	2.61	3.21
NORWAY	0	14000	146000	305000	525000		3.21	33.14	68.83	117.66

DEIN1= Number of ISDN subscribers

Source: OECD (1999), Communications outlook.

DEIN1B= Number of ISDN subscribers per 1000 inhabitants

Source: own calculations based on OECD (1999), Communications outlook, (ISDN subscribers) and EC (2000), Ameco database (total population)

Note 1: The average of the EU is the ratio of the total number of ISDN subscribers in the EU member countries for which data is available to the total population of these countries

Note 2: The average of the EU for 1997, 1998, 1999 is the ratio of the total number of ISDN subscribers for respectively 14, 12 and 12 EU member countries (those for which data is available) to the total population of these countries.

TABEL 46 - NETWORK DIGITALISATION

COUNTRY	DEIN2			DEIN2B			DEIN2C
	1995	1996	1997	1995	1996	1997	1999
AUSTRIA	865800	897029	931499	107.59	111.29	115.4	38
BELGIUM	3628961	3657648	3686001	357.89	360	362.08	96
GERMANY	15800000	16670000	18700000	193.53	203.55	227.9	53
DENMARK	1190000	1240000	1260545	227.53	235.74	238.74	56
SPAIN	401346	438629	462339	10.24	11.17	11.76	3
EU				93.09	98.29	103.94	30
FINLAND	817100	845100	875142	159.9	164.9	170.26	42
FRANCE	1885000	2108000	2280000	32.42	36.11	38.9	12
UNITED KINGDOM	1326842	1872962	2373548	22.64	31.85	40.22	13
GREECE	5000	8000	13000	0.48	0.76	1.24	
IRELAND	498000	514000	544000	138.29	141.75	148.63	49
ITALY			46272			0.8	1
LUXEMBOURG	131000	133000	136000	319.51	319.71	323.04	90
NETHERLANDS	5625000	5715000	5918000	363.87	368	379.09	89
PORTUGAL	58000	171000	383000	5.89	17.33	38.77	18
SWEDEN	2400000	2400000	2400000	271.8	271.49	269.66	50
JAPAN	3637000	5001000		28.96	39.73		17
UNITED STATES	61800000	63654000	65564000	234.83	238.8	245.75	13
NORWAY	667186	664852	690000				40

DEIN2= Number of cable television subscribers
Source: OECD(1999), Communications outlook.

DEIN2B= Number of cable television subscribers - per 1000 inhabitants
Source: OECD(1999), Communications outlook.

DEIN2C= % of households connected to cable
Source: OECD (2001), Communications outlook
Note: the figure for Europe is the weighted average of the % of households connected to cable in 14 EU member countries (no data available for Greece).

TABEL 47 - NETWORK DIGITALISATION

COUNTRY	DEIN8					DEIN9		
	1993	1995	1997	1998	1999	1997	1998	1999
AUSTRIA	54	72	82	92	100	78.5	91	95
BELGIUM	54	66	83.1	83	91	98.19	100	100
GERMANY	41	56.3	100	100	100	94.18	97	
DENMARK	46	61	86	100	100	84	92	
SPAIN	41	56	80.8	86	87	74.58	87	
EU1		76.2	94.8	96.0	98.0			
EU	60.7	76.2	90.2	95.5	97.9	82.85	91.42	
FINLAND	62	90	100	100	100	77.95	88	
FRANCE	86	100	100	100	100	97.83	98	100
UNITED KINGDOM	75	88	100	100	100	78.85	91	
GREECE	22	37.1	47.1	75	91	100	100	100
IRELAND	71	79	92	100	100	64.76	81	
ITALY	57	76	94	98	100	71.08	83	89
LUXEMBOURG	82	100	100	100	100	100	100	100
NETHERLANDS	93	100	100	100	100	84.66	97	100
PORTUGAL	59	70	88.3	98	100	99.5	100	
SWEDEN	67	91	99.1	100	100	76.18	88	
JAPAN	72	90	100	100	100	95.39	99	
UNITED STATES	82	90	94.5	96	98	11.67	30	51
NORWAY	60	82	100	100	100	76.88	85	92

DEIN8= Digitalisation of the fixed network: % of digital access lines
Source: OECD (1999), Communication outlook
Note: EUDEIN8 is the unweighted average of the percentage digital access lines in the European Union
Note: EU1DEIN8 is the weighted average of the % digital access lines in the EU. Weightings are based on the share of each country's total number of main telephone lines to the total of the 15 EU member countries.

DEIN9= Digitalisation of the mobile network: % of subscribers to digital network
Source: OECD (1999), Communication outlook
Note: EUDEIN9 is the weighted average of the % of mobile subscribers to digital networks in the EU. Weightings are based on the share of each country's number of cellular mobile subscribers to the total of the 15 EU member countries.

TABEL 48 - NETWORK DIGITALISATION

COUNTRY	DEIN10				
	1993	1994	1995	1996	1997
AUSTRIA	45298	64558	92320	121255	152584
BELGIUM	4985	7776	11176	17323	
GERMANY	102300	114700	124600	137600	149200
DENMARK	9300	10300			
SPAIN	24857	29339	36041	43086	47030
EU1					
EU					
FINLAND	164024	327416	425955	511214	647121
FRANCE	34000	53700	1100000	1300000	1700000
UNITED KINGDOM	116363	166804	284410	357826	471627
GREECE	2745	4615	8000	9570	11240
IRELAND	8600	9600	11200		40015
ITALY	1333000	1719000	1964000	2196000	2444000
LUXEMBOURG					1260
NETHERLANDS	12000				
PORTUGAL		6580	9607	9861	10536
SWEDEN	25000				
JAPAN	168300	212629	248731	299010	366866
UNITED STATES	10039000	11872000	13928000	16599000	19263000
NORWAY	11400	12700	13800		

DEIN10 = Digitalisation of the network: fibre optic cable as the medium for inter-exchange transmission network - in number of fibre km. or cable km.
Source: OECD (2001), Communication outlook.

TABEL 49 - NETWORK DIGITALISATION

COUNTRY	DEIN10B					DEIN10C				
	1993	1994	1995	1996	1997	1993	1994	1995	1996	1997
AUSTRIA	5.67	8.04	11.47	15.04	18.90	0.54	0.77	1.10	1.45	1.82
BELGIUM	0.49	0.77	1.10	1.71		0.16	0.25	0.37	0.57	
GERMANY	1.26	1.41	1.53	1.68	1.82	0.29	0.32	0.35	0.39	0.42
DENMARK	1.79	1.98				0.22	0.24			
SPAIN	5.53	7.37	11.89	13.71	16.50	0.70	0.93	1.50	1.74	2.10
EU1	5.09	6.78	10.93	12.61	15.17	0.58	0.78	1.25	1.45	1.75
EU	5.53	7.37	11.89	13.71	16.50	0.70	0.93	1.50	1.74	2.10
FINLAND	32.35	64.33	83.36	99.75	125.90	0.49	0.97	1.26	1.51	1.91
FRANCE	0.59	0.93	18.92	22.27	29.01	0.06	0.10	1.99	2.36	3.08
UNITED KINGDOM	2.00	2.86	4.85	6.09	7.99	0.48	0.68	1.17	1.47	1.93
GREECE	0.26	0.44	0.76	0.91	1.07	0.02	0.03	0.06	0.07	0.09
IRELAND	2.42	2.69	3.11		10.93	0.12	0.14	0.16		0.57
ITALY	23.37	30.05	34.28	38.27	42.50	4.42	5.71	6.52	7.29	8.11
LUXEMBOURG					2.99					0.49
NETHERLANDS	0.78					0.29				
PORTUGAL		0.66	0.98	1.00	1.07		0.07	0.10	0.11	0.11
SWEDEN	2.87					0.06				
JAPAN	1.35	1.70	1.98	2.38	2.91	0.45	0.56	0.66	0.79	0.97
UNITED STATES	38.89	45.54	52.92	62.27	72.20	1.02	1.21	1.42	1.69	1.96
NORWAY										

DEIN10B= Digitalisation of the network: fibre optic cable - in number of fibre km. or cable km. per 1000 inhabitants
Source: OECD (1999 & 2001), Communication outlook
Note: the average for the EU is the ratio of total number of kilomter fibre optic cable in the EU countries (with data) to the total population of the EU
Note: the variable EU1 is the ratio of the total number of kilomter fibre optic cable in the EU countries (with data) to the total population of the EU with exclusion of Denmark, Luxembourg, the Netherlands and Sweden (no data for 1995-1996).

DEIN10C= Digitalisation of the network: fibre optic cable - in number of fibre km. or cable km. per km
Source: OECD (1999 & 2001), Communication outlook
Note: the average for the EU is the ratio of total number of kilomter fibre optic cable in the EU countries (with data) to the total area of the EU
Note: the variable EU1 is the ratio of the total number of kilomter fibre optic cable in the EU countries (with data) to the total area of the EU with exclusion of Denmark, Luxembourg, the Netherlands and Sweden (no data for 1995-1996).

TABEL 50 - ICT PRICING : TELECOMMUNICATION

COUNTRY	DEPRT1	DEPRT2	DEPRT3	DEPRT1B	DEPRT2B	DEPRT3B	DEPRT4	DEPRT5
	2000	2000	2000	2000	2000	2000	2000	2000
AUSTRIA	233.31	173.36	406.67	233.31	316.77	550.08	228.74	636.46
BELGIUM	215.89	229.53	445.43	215.89	426.01	641.91	178.42	780.08
GERMANY	157.39	202.45	359.84	157.39	351.14	508.53	135.68	705.03
DENMARK	173.9	119.31	293.21	173.9	206.79	380.69	139.12	359.64
SPAIN	186.27	253.15	439.43	186.27	497.22	683.49	160.58	839.21
EU	182.52	185.93	368.46	182.52	332.92	515.45	170.41	563.28
FINLAND	156.61	162.47	319.08	156.61	285.97	442.59	128.37	425.65
FRANCE	146.76	208.57	355.33	146.76	352.13	498.89	184.46	538.95
UNITED KINGDOM	201.28	84.73	286.01	201.28	190.27	391.55	247.06	495.86
GREECE	137.25	302.32	439.57	137.25	559.67	696.92	116.31	722.52
IRELAND	230.13	216.23	446.36	230.13	336.16	566.29	190.19	631.35
ITALY	180.6	259.45	440.04	180.6	465.11	645.71	205.16	771.57
LUXEMBOURG	175.65	151.3	326.95	175.65	249.81	425.46	152.74	394.7
NETHERLANDS	202.79	141.38	344.17	202.79	234.53	437.32	172.58	446.34
PORTUGAL	241.79	286.9	528.69	241.79	553.62	795.4	206.65	716.57
SWEDEN	142.54	115.17	257.72	142.54	206.05	348.59	151.65	338.2
JAPAN	340.18	93.13	433.31	340.18	270.63	610.81	261.94	762.19
UNITED STATES	276.76	189.26	466.02	276.76	331.99	608.75	298.77	593.15
NORWAY	186.55	119.63	306.19	186.55	208.22	394.77	151.67	332.68

DEPRT1= Basket of residential telephone charges (exclusive international calls and calls to mobile networks) - fixed charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT2= Basket of residential telephone charges(exclusive international calls and calls to mobile networks) - usage charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT3= Basket of residential telephone charges (exclusive international calls and calls to mobile networks) - total charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT1B= Composite basket of residential telephone charges (inclusive international calls and calls to mobile networks) - fixed charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook..

DEPRT2B= Composite basket of residential telephone charges (inclusive international calls and calls to mobile networks) - usage charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT3B= Composite basket of residential telephone charges (inclusive international calls and calls to mobile networks) - total charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT4= Basket of business telephone charges (exclusive international calls and calls to mobile networks) - fixed charge in US dollars based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT5= Basket of business telephone charges (exclusive international calls and calls to mobile networks) - usage charge in US dollars based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

TABEL 51 - ICT PRICING : TELECOMMUNICATION

COUNTRY	DEPRT6	DEPRT4B	DEPRT5B	DEPRT6B	DEPRT7	DEPRT8	DEPRT9
	2000	2000	2000	2000	2000	2000	2000
AUSTRIA	865.2	228.74	949.46	1178.19	467220	486949	2136501
BELGIUM	958.51	178.42	1298.34	1476.76	646761	446129	2783935
GERMANY	840.72	135.68	1041.33	1177.01	439329	384141	21379556
DENMARK	498.76	139.12	565.64	704.76	103310	164185	682427
SPAIN	999.79	160.58	1426.85	1587.43	1188070	651369	5015182
EU	733.68	170.41	921.71	1092.12	358658.98	382520.47	3734262.60
FINLAND	554.02	128.37	736.3	864.67			613836
FRANCE	723.41	184.46	891.63	1076.09	519389	437302	2124016
UNITED KINGDOM	742.91	247.06	820.04	1067.1	299359	442198	2051527
GREECE	838.83	116.31	1300.49	1416.8	355162	584913	3550397
IRELAND	821.54	190.19	945.6	1135.78	278303	311530	1871245
ITALY	976.73	205.16	1238.27	1443.43	473353	590555	3874065
LUXEMBOURG	547.44	152.74	639.05	791.79	179959	270089	2657946
NETHERLANDS	618.92	172.58	679.29	851.88	217137	481142	2823415
PORTUGAL	923.23	206.65	1355.32	1561.98	610042	483061	3584227
SWEDEN	489.85	151.65	570.22	721.88	67882	240893	844540
JAPAN	1024.13	399.81	1166.14	1565.95		776556	4818364
UNITED STATES	891.92	298.77	916.13	1214.9		994235	2065200
NORWAY	484.35	151.67	526.4	678.07	233145	299673	1278355

DEPRT6= Basket of business telephone charges (exclusive international calls and calls to mobile networks) - total charge in US dollars based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT4B= Composite basket of business telephone charges (inclusive international calls and calls to mobile networks) - fixed charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT5B= Composite basket of business telephone charges (inclusive international calls and calls to mobile networks) - usage charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT6B= Composite basket of business telephone charges (inclusive international calls and calls to mobile networks) - total charge in US dollar based on PPP for 08/2000
Source: OECD (2001), Communication outlook.

DEPRT7= Basket of national leased line charges for M.1020 - in US dollars based on PPP for 08/2000
Source: OECD(2001), Communication outlook.

DEPRT8= Basket of national leased line charges for 64kbit/s - in US dollars based on PPP for 08/2000
Source: OECD(2001), Communication outlook.

DEPRT9= Basket of national leased line charges for 1.5/2.0Mbit/s - in US dollars based on PPP for 08/2000
Source: OECD(2001), Communication outlook
Note for DEPRT1 to DEPRT9: The figures for the EU are calculated as a weighted average of the charges operated in the 15 EU member countries. The weightings of the charges are based on the share of each country's access lines in the EU total.

TABEL 52 - ICT PRICING : TELECOMMUNICATION

COUNTRY	DEPRT10		DEPRT11		DEPRT12		DEPRT13	DEPRT14	DEPRT15
	1998	1999	1998	1999	1998	1999	1999	1999	1999
AUSTRIA	1.8	1.82	1.8	1.82	2.37	2.4	1.82	1.82	2.4
BELGIUM	1.11	1.07	2.1	1.8	2.94	2.56	1.07	1.8	2.56
GERMANY	0.99	1.01	1.69	1.72	2.58	2.63	1.01	1.72	2.63
DENMARK	0.98	0.93	1.82	1.67	2.22	1.91	0.93	1.67	1.91
SPAIN	1.49	0.99	1.49	1.59	4.17	3.07		5.71	13.52
EU	1.09	0.89	1.76	1.48	3.03	2.23			
FINLAND	1.78	1.43	1.78	1.43	4.1	3.28	1.43	1.43	3.28
FRANCE	0.99	0.61	2.11	1.5	2.93	2.23	0.61	1.5	2.23
UNITED KINGDOM	0.61	0.62	0.87	0.9	1.69	1.27	0.62	0.9	1.27
GREECE							1.98	1.98	2.83
IRELAND	1.54	1	2.38	1.6	3.57	2.26	2.21	4.16	5.19
ITALY	1.19	1	1.95	1.6	3.94	2.3	1	1.6	2.32
LUXEMBOURG	2.21	2.25	2.21	2.25	2.21	2.25	2.25	2.25	2.25
NETHERLANDS	1.17	1	1.6	1.41	2.06	1.7	1	1.41	1.7
PORTUGAL	3.2	0.99	6.4	1.63	12.8	2.58	2.65	4	5.64
SWEDEN	1.14	0.86	1.77	1.16	2.41	1.59	0.86	1.16	1.59
JAPAN									
UNITED STATES									
NORWAY									

DEPRT10-DEPRT12= Interconnection rate for fixed call termination on a fixed network, local level (DEPRT10), single transit (DEPRT11), or double transit (DEPRT12) - in eur/100 per minute
Source: EC (2000), Annexe 1 of the "Fifth report on the implementation of the telecommunication regulatory package"
Note DEPRT10-DEPRT12: The figure for the EU is compiled as a weighted average of the interconnection rates operated in 14 EU member countries (data for Greece is not available). Weightings of charges are based on the share of each country's access lines in the total of the 14 countries taken into account.

DEPRT13-DEPRT15= Interconnection rate for mobile call termination on a fixed network, local level (DEPRT13), single transit (DEPRT14) or double transit (DEPRT15) - in euro/100 per minute
Source: EC (2000), Annexe 1 of the "Fifth report on the implementation of the telecommunication regulatiry package".

TABEL 53 - ICT PRICING : MOBILE TELECOMMUNICATION

COUNTRY	DEPRT16	DEPRT17	DEPRT18	DEPRT19	DEPRT20	DEPRT21	DEPRT22	DEPRT23
	1999	1999	2000	2000	2000	2000	2000	2000
AUSTRIA	10.29	2.57	258.61	108.87	367.49	287.71	294.12	581.83
BELGIUM	12.28	1.54	287.64	11.19	298.83	721.23	172.57	893.81
GERMANY	13.97	0.73	189.11	165.82	354.94	371.12	598.44	969.56
DENMARK	9.83	0.55	131.26	100.11	231.37	192.99	581.45	774.43
SPAIN	9.18	1.91	113.79	171.39	285.18	142.79	958.44	1101.23
EU		1.62	159.06	159.63	318.69	323.51	644.15	967.66
FINLAND	13.45	1.4	31.65	119.52	151.17	89.75	773.90	863.65
FRANCE	12.67	1.44	197.61	223.36	420.97	547.16	144.59	691.74
UNITED KINGDOM	10.56	0.98	307.95	8.60	316.54	565.92	263.40	829.32
GREECE	23.88	1.02	133.68	196.07	329.75	113.29	1088.05	1201.34
IRELAND	13.33	2.55	411.60	75.05	486.65	988.95	885.88	1874.84
ITALY	10.83	1.79	2.37	255.42	257.78	75.92	1021.43	1097.35
LUXEMBOURG	8.44	1.16	168.03	103.49	271.52	409.11	455.53	864.65
NETHERLANDS	6.85	2.29	130.10	147.93	278.04	158.92	863.13	1022.05
PORTUGAL	13.67	1.4	194.99	303.28	498.27	424.97	1172.86	1597.84
SWEDEN	8.46	2.92	119.85	57.81	177.65	159.36	852.28	1011.64
JAPAN	19.35	0.28	331.74	93.92	425.65	315.94	705.30	1021.24
UNITED STATES	10.5	0.5	273.03	19.80	292.83	728.21	38.41	766.62
NORWAY		1.46	64.17	141.61	205.79	239.06	332.07	571.13

DEPRT16= Pre-paidcard pricing for 30 minutes usage - in US dollars PPP in June 1999
Source: OECD (2000), Cellular mobile pricing structures and trends.

DEPRT17= SMS pricing per 10 messages in US dollars
Source: OECD (2000), Cellular mobile pricing structures and trends.

DEPRT18= Basket of consumer mobile telephone charges (50 min. per month and exclusive international calls)- fixed charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook.

DEPRT19= Basket of consumer mobile telephone charges (50 min. per month and exclusive international calls)- usage charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook.

DEPRT20= Basket of consumer mobile telephone charges (50 min. per month and exclusive international calls)- total charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook.

DEPRT21= Basket of business mobile telephone charges (300 min. per month including 60 minutes international calls)- fixed charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook..

DEPRT22= Basket of business mobile telephone charges (300 min. per month including 60 minutes international calls)- usage charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook.

DEPRT23= Basket of business mobile telephone charges (300 min. per month including 60 minutes international calls)- total charges in USD based on PPP for 08/2000
Source: OECD (2001), Communications outlook
Note for DEPRT18 to DEPRT23: The figures for the EU are calculated as a weighted average of the charges operated in the 15 EU member countries. The weightings of the charges are based on the share of each country's mobile telephone subscribers in the EU total.

TABEL 54 - ICT PRICING : INTERNET CHARGES

COUNTRY	DEPRI1			DEPRI2			DEPRI3		DEPRI4	
	1998	1999	2000	1998	1999	2000	1999	2000	1999	2000
AUSTRIA	100.1	80.24	44.78	64.03	48.59	32.4	128.15	70.51	64.87	45.73
BELGIUM	97.7	82.32	51.79	46.59	41.94	35.8	147	81.35	66.23	51.79
GERMANY	68.44	46.15	34.12	68.44	46.15	34.12	76.78	50.71	76.78	50.71
DENMARK	54.04	52.63	30.51	31.73	27.99	30.51	91.53	48.09	42.25	41.98
SPAIN	42.09	50.66	45.53	42.09	50.65	28.32	85.87	77.02	85.87	31.27
EU	64.03	59.37	41.99	45.96	41.28	32.03	96	65.52	61.07	44.15
FINLAND	28.38	32.15	29.88	19.77	26.77	27.78	43.73	41.18	32.97	36.97
FRANCE	72.05	60.6	33.65	48.27	38.15	33.65	95.73	59.5	62.07	59.5
UNITED KINGDOM	70.01	60.57	40.75	46.17	32.42	26.61	105.61	60.41	49.31	27.13
GREECE	60.15	65.38	41.9	60.15	65.38	36.77	88.46	52.16	88.46	41.9
IRELAND	80.16	59.26	54.02	50.57	29.84	31.04	83.22	75.38	41.82	41.8
ITALY	42.27	41.39	32.21	35.64	29.45	26.38	67.91	45.71	44.04	38.79
LUXEMBOURG	73.06	91.93	58.56	52.98	61.86	37.87	152.06	99.94	91.93	58.56
NETHERLANDS	62.79	51.13	50.08	40.23	33.38	35.49	85.66	81.63	47.77	50.08
PORTUGAL	61.2	77.33	47.31	46.12	60.12	45.82	124.27	77.24	82.27	57.75
SWEDEN	48.01	38.81	35.33	36.6	26.51	24.14	64.09	58.36	39.48	35.98
JAPAN	51.65	40.15	35.49	51.65	40.15	35.49	54.64	49.01	54.64	49.01
UNITED STATES	39.77	35.18	21.43	39.77	35.18	21.43	37.3	23.76	37.3	23.76
NORWAY	49.9	46.71	45.47	35.36	39.37	38.7	64.28	63.9	50.76	51.05

DEPRI1= Basket of internet access charges for 20 hours at peak moment - in US dollars based on PPP
Source: OECD (2001), Communications outlook.

DEPRI2= Basket of internet access charges for 20 hours at off-peak moment - in US dollars based on PPP
Source: OECD (2001), Communications outlook.

DEPRI3= Basket of internet access charges for 40 hours at peak moment - in US dollars based on PPP
Source: OECD (2001), Communications outlook.

DEPRI4= Basket of internet access charges for 40 hours at off-peak moment - in US dollars based on PPP
Source: OECD (2001), Communications outlook.

TABEL 55 - QUALITY OF SERVICES

COUNTRY	DEQU1						
	1993	1994	1995	1996	1997	1998	1999
AUSTRIA		45	40			6	
BELGIUM	28		7	5	4	5	5
GERMANY							
DENMARK	8	9	8				
SPAIN	8	5	3	4	5	5	5
EU							
FINLAND	5	5	6	4	5	5	4
FRANCE	8	8	7	6	6		
UNITED KINGDOM	0	0	0	0	0		
GREECE		220	30	9	5	7	7
IRELAND			13		11		
ITALY	12	10	8				10
LUXEMBOURG	30	30	30				
NETHERLANDS			5		1		
PORTUGAL	60	19	8	9	9	4	6
SWEDEN			5				
JAPAN	0	0	0	0	0		
UNITED STATES	5	0	3	2	2	2	2
NORWAY	0	0	0				

DEQU1= Network access: waiting time for new connections in days
Source: OECD(2001), Communications outlook.

TABEL 56 - QUALITY OF SERVICES

COUNTRY	DEQU2						
	1993	1994	1995	1996	1997	1998	1999
AUSTRIA	18	19	16.7	8.3	7.2	6.2	
BELGIUM	3	2	7.4			4.7	4
GERMANY	13	9	8.7				
DENMARK							
SPAIN	2	1.7	1.3	1.5	1.6		
EU			9.8				
FINLAND	9.9	8.3	8.3	6.8	9	8.4	
FRANCE	7	6	6.3	5.9	6.2		
UNITED KINGDOM	15	14	14	14	13.8	13.6	14.3
GREECE	51	43	34	35.7	31	24	17
IRELAND	19	17		14	15		
ITALY	12	13	12.6		16.5	16.2	17.2
LUXEMBOURG	14	12.8	5	7.7	2.9	10.1	
NETHERLANDS	3	3	2.5	2.2	2.4	2.7	
PORTUGAL	52	46	52	24.1	20.8	14.7	11.2
SWEDEN	9	8	8.4	4.2	4.3		
JAPAN	2	2	1.7			1.4	
UNITED STATES				13.5	14.5	15	13.7
NORWAY	14	14	14	12.5	14		

DEQU2= Faults on main lines - number of faults per 100 lines

Source: OECD(2001), Communications outlook

Note1: The figure for the EU is a weighted average of the number of faults in 12 EU member countries (no data for Denmark, UK and Ireland). Weightings of faults are based on the share of each country's main lines in the total number of main lines in these 12 EU member countries

Note2: Because of different interpretations of the definition of faults among the countries, the data should be interpreted with caution.

TABEL 57 - QUALITY OF SERVICES

COUNTRY	DEQU3						
	1993	1994	1995	1996	1997	1999	2000
AUSTRIA		93	92	93		97	98
BELGIUM	82	87	87		90	90	90
GERMANY	83	93	83.4	71	83.2		85.9
DENMARK	85	86	91.7	91			
SPAIN				94.4	97.2	95.8	95.5
EU			86.21				
FINLAND	66	69	69.1	75.5	75.5	71.4	74.1
FRANCE	87	88	88.3	90.6	87.3		
UNITED KINGDOM		82	84	84.5	82.4	72	92
GREECE	57	58	58.4	64.6	77.4	83	90.5
IRELAND		100	75	78	76		
ITALY	92	93	93.3				92
LUXEMBOURG		90	91	94	93	93	
NETHERLANDS		87	97	99	98	98	
PORTUGAL	90	91	81	91.8	87	84.7	88.9
SWEDEN		85	85		77		
JAPAN	100	100					
UNITED STATES							
NORWAY	75	74	73.7	76	73		

DEQU3= % of faults repaired within 24 hours

Source: OECD(2001), Communications outlook

Note1: The figure for the EU in 1995 is the weighted average of the faults repaired within 24 hours in 14 EU member countries (no data for Spain in 1995). Weightings are based on the share of each country's main lines in the total number of main lines in those 14 member countries.

Note2: Because of different interpretations of the definition of faults repaired within 24 h. among the countries, the data should be interpreted with caution (e.g. the Netherlands: within 48 h., Germany: within 3 working days).

TABEL 58 - INTERNET SECURITY AND THE BARRIERS OF E-COMMERCE

COUNTRY	DEINS1	DEINS2	DEINS3	DEINA1	DEINA2	DEINA3
	2001	2001	2001	2001	2001	2001
AUSTRIA	78.5	7.7	7.4	9.2	7.1	0.7
BELGIUM	82.9	13.9	14.1	8.2	13.1	0.8
GERMANY	77.7	9.1	6.2	14.2	10.3	0.6
DENMARK	71.7	7.3	9.0	7.5	8.6	0.7
SPAIN	87.4	13.8	7.9	10.6	7.0	0.4
EU	80.5	11.1	9.7	15.1	11.4	0.9
FINLAND	87.7	6.8	4.8	12.0	8.5	0.1
FRANCE	83.4	3.9	6.7	20.0	13.4	0.9
UNITED KINGDOM	82.5	13.4	10.5	28.0	16.0	2.4
GREECE	96.8	11.0	11.0	4.6	5.4	0.8
IRELAND	80.8	12.4	13.2	14.2	10.9	2.1
ITALY	76.7	8.4	11.1	7.1	10.0	0.1
LUXEMBOURG	81.5	20.1	18.0	10.3	13.8	0.1
NETHERLANDS	80.3	25.9	14.1	10.6	10.4	0.3
PORTUGAL	87.7	6.8	4.8	1.2	7.5	0.2
SWEDEN	83.5	13.0	10.6	11.3	10.2	0.5
JAPAN						
UNITED STATES						
NORWAY						

DEINS1= % of respondents which has an anti-virus software for his computer at home or privately used lap top
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEINS2= % of respondents which has a smart card reader or other for his computer at home or privately used lap top
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEINS3= % of respondents which has an electronic signature software for his computer at home or privately used lap top
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEINA1= % of respondents which has already encountered security problems with the Internet like too many unsolicited mails
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEINA2= % of respondents which has already encountered security problems with the Internet like the catch of a virus
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEINA3= % of respondents which has already encountered security problems with the Internet like the abuse of a credit card number mails
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

TABEL 59 - INTERNET SECURITY AND THE BARRIERS OF E-COMMERCE

COUNTRY	DEIN5			DEIN5B		
	1995	1996	1997	1995	1996	1997
AUSTRIA	17	3101	3400	2.11	384.74	421.21
BELGIUM	30	761	3430	2.96	74.9	336.94
GERMANY		22000	35000		268.63	426.56
DENMARK	295	390		56.41	74.14	
SPAIN		1344	3502		32.22	89.11
EU	1349	29095	46080	7.99	171.85	271.48
FINLAND	846	1175	189	165.56	229.27	36.77
FRANCE						
UNITED KINGDOM	0	25	113	0	0.43	1.91
GREECE						
IRELAND						
ITALY			62			1.08
LUXEMBOURG						
NETHERLANDS						
PORTUGAL	161	299	384			
SWEDEN						
JAPAN						
UNITED STATES						
NORWAY						

DEIN5= Number of stored value cards in use (thousands)
Source: OECD (2000), E-commerce: Impacts and policy challenges.

DEIN5B= Number of stored value cards in use per 1000 inhabitants
Source: OECD (2000), E-commerce: Impacts and policy challenges
Note DEIN5 & DEIN5B: the figure for Finland in 1997 includes only the new multipurpose card product that has replaced the previous respective products.

TABEL 60 - INTERNET SECURITY AND THE BARRIERS OF E-COMMERCE

COUNTRY	DEIN6			DEIN7		
	1995	1996	1997	1995	1996	1997
AUSTRIA		45.8	49.9		15	13.2
BELGIUM	33.3	33.7	32.1	4.9	4.1	3.9
GERMANY		67.4			13.6	10.3
DENMARK	136.5	135.9		1.2	1.3	1.3
SPAIN	0	15.2	16		5.8	3.1
EU	20.2	24.1	25.2	1.6	1.9	4
FINLAND	35	48.6	18.9	0.9	0.8	2.2
FRANCE						
UNITED KINGDOM	0	29.7	20.5	0		
GREECE						
IRELAND						
ITALY						6.8
LUXEMBOURG						
NETHERLANDS						
PORTUGAL	14.1	15.3	16.1	1.9	1.9	1.9
SWEDEN						
JAPAN						
UNITED STATES						
NORWAY						

DEIN6= Average value per (re)loading of the stored value card (in euro)
Source: OECD(2000), E-commerce: Impacts an dpolicy challenges.

DEIN7= Average value per purchase with the stored value card (in euro)
Source: OECD(2000), E-commerce: Impacts and policy challenges
Note DEIN6-7: the figure for Finland in 1997 includes only the new multipurpose card product that has replaced the previous respective products.

TABEL 61 - INTERNET SECURITY AND THE BARRIERS OF E-COMMERCE

COUNTRY	DEECB1	DEECB2	DEECB3	DEECB4	DEECB5
	1999	1999	1999	1999	1999
AUSTRIA					
BELGIUM	37	50	13	53	47
GERMANY	53	20	7	63	30
DENMARK					
SPAIN	46	38	11	49	70
EU	38	27	11	33	23
FINLAND	24	3	0	6	12
FRANCE	43	40	23	27	17
UNITED KINGDOM	44	34	9	28	3
GREECE					
IRELAND	48	39	15	39	18
ITALY	47	23	20	47	27
LUXEMBOURG					
NETHERLANDS	37	23	10	7	10
PORTUGAL					
SWEDEN	21	18	9	27	6
JAPAN					
UNITED STATES	52	50	13	30	30
NORWAY	23	6	3	13	3

DEECB1= % of interviewees which rates the security of financial, personal or corporate information as a big barrier to the development of e-commerce in their industry
Source: Andersen Consulting (1999), eEurope takes off.

DEECB2= % of interviewees which rates the concerns over privacy as a barrier to the development of e-commerce in their industry
Source: Andersen Consulting (1999), eEurope takes off.

DEECB3= % of interviewees which rates a restrictive regulatory framework as a barrier to the development of e-commerce in their industry
Source: Andersen Consulting (1999), eEurope takes off.

DEECB4= % of interviewees which agrees strongly that the reduction of access and telecoms costsis a key requirement for the further development of e-commerce in Europe
Source: Andersen Consulting (1999), eEurope takes off.

DEECB5= % of interviewees which agrees strongly that low European PC penetration is a barrier to the growth of e-commerce
Source: Andersen Consulting (1999), eEurope takes off.

TABEL 62 - ICT, TRAINING AND EDUCATION

COUNTRY	DETR1	DETR2	DEED1	DEED2	DEED3	DEED4	DEED5	DEED6
	2001	2001	2001	2001	2001	2001	2001	2001
AUSTRIA	49.1	21.7	9.3	11.7	17.2	11.0	2.6	9.5
BELGIUM	43.9	21.6	9.0	12.4	32.3	8.6	3.0	7.0
GERMANY	51.7	23.8	4.3	7.1	3.5	4.9	1.6	4.4
DENMARK	64.8	37.4	23.5	66.3	42.4	30.6	16.7	43.8
SPAIN	40.2	21.9	6.9	7.4	27.0	7.2	2.6	3.6
EU	49.8	23.9	6.8	11.3	24.0	8.6	2.7	6.5
FINLAND	76.0	49.7	13.4	14.6	30.1	38.4	8.4	13.3
FRANCE	44.0	21.5	6.4	10.5	37.8	3.5	2.1	4.6
UNITED KINGDOM	60.5	29.4	8.5	15.5	0.0	11.1	4.3	11.2
GREECE	53.3	24.3	1.5	6.0	16.3	7.2	0.5	2.3
IRELAND	70.8	32.6	8.6	12.1	79.9	70.9	3.3	7.6
ITALY	25.8	10.9	4.5	11.1	12.5	5.5	1.7	5.2
LUXEMBOURG	51.9	19.9	45.8	16.0	8.9	32.2	17.7	14.3
NETHERLANDS	52.0	14.6	11.9	11.0	30.3	12.5	2.3	6.5
PORTUGAL	57.4	28.9	3.8	5.7	15.4	4.0	1.8	2.5
SWEDEN	66.1	42.0	10.1	23.1	22.3	15.3	7.3	19.9
JAPAN								
UNITED STATES								
NORWAY								

DETR1= % of respondents which have had any training in the use of computers
Source: European Commission (2001), Eurobarometer Flash 97 (02/2001).

DETR2= % of respondents which have had any training in the use of Internet
Source: European Commission (2001), Eurobarometer Flash 97 (02/2001).

DEED1= The number of computers per 100 pupils in primary level
Source: European Commission (2001), Flash Barometer June 2001.

DEED2= The number of computers per 100 pupils in secondary level
Source: European Commission (2001), Flash Barometer June 2001.

DEED3= The number of computers per 100 pupils in professional/technical level
Source: European Commission (2001), Flash Barometer June 2001.

DEED4= The number of computers per 100 pupils in all levels
Source: European Commission (2001), Flash Barometer June 2001.

DEED5= The number of computers connected to the Internet per 100 pupils in primary level
Source: European Commission (2001), Flash Barometer June 2001.

DEED6= The number of computers connected to the Internet per 100 pupils in secondary level
Source: European Commission (2001), Flash Barometer June 2001.

TABEL 63 - ICT, TRAINING AND EDUCATION

COUNTRY	DEED7	DEED8	DEED9	DEED10	DEED11	DEED12	DEED13
	2001	2001	2000	2001	2001	2001	2001
AUSTRIA	13.8	6.0	13	0.4	7	14	42
BELGIUM	17.9	3.5	6	1.1	4	14	40
GERMANY	2.1	2.5	11	0.9	1	5	23
DENMARK	37.1	22.7	9	2.2	4.6	17	63
SPAIN	14.4	3.3	20	0.5	7	1	20
EU	12.1	4.1	10	0.8	5	6	36
FINLAND	25.9	29.5	12	1.2	51	1	77
FRANCE	14.3	3.8	8	0.6	5	3	32
UNITED KINGDOM		6.5	9	1.3	7	4	57
GREECE	3.4	1.9	19	0.4		3	6
IRELAND	53.5	5.5	12	1.6			69
ITALY	5.3	2.2	7	0.6	3	8	32
LUXEMBOURG	6.9	21.0	8	0.8	3		32
NETHERLANDS	19.6	3.6	6	0.9	1	25	37
PORTUGAL	9.6	1.9	16	0.3	2	2	20
SWEDEN	19.1	11.6	9	1.4	18	7	65
JAPAN							
UNITED STATES							
NORWAY							

DEED7= The number of computers connected to the Internet per 100 pupils in professional/technical level
Source: European Commission (2001), Flash Barometer June 2001.

DEED8= The number of computers connected to the Internet per 100 pupils in all levels
Source: European Commission (2001), Flash Barometer June 2001.

DEED9= % of respondents which have Internet access in the University
Source: European Commission (2001), Eurobarometer 53.0: Measuring information society 2000.

DEED10= The weekly hours of Internet use for all levels
Source: European Commission (2001), Flash Barometer June 2001.

DEED11= The percentage of schools connected to the Internet via ADSL
Source: European Commission (2001), Flash Barometer June 2001.

DEED12= The percentage of schools connected to the Internet via a cable modem
Source: European Commission (2001), Flash Barometer June 2001.

DEED13= The percentage of teachers who use the Internet for non-computing teaching on a weekly basis - all levels
Source: European Commission (2001), Flash Barometer June 2001.

TABEL 64 - ICT, TRAINING AND EDUCATION

COUNTRY	DEED14	DEED14B	DEED15	DEED15B	DEED16	DEED17	DEED18
	1998	1998	1998	1998	1998	1998	1998
BELGIUM		24	41	72	59	25	13
GERMANY		12.38		82.94			
DENMARK		75	85	100		14	6.6
FINLAND	87	90	96	95		12	10
FRANCE	24	10.5	55	52.9 - 84*	73	30.9	17.5 - 7*
UNITED KINGDOM		62		93		13	8
ITALY	28		73		73		
LUXEMBOURG			79		76		
NETHERLANDS		23		72		23	30
SWEDEN		56		91		13	6
JAPAN	69		58		50		
UNITED STATES		89				6	
NORWAY	56		81		98		

DEED14= % of students in schools using computers with access to e-mail or internet in primary education - in 1998/99
Source: OECD(2000), Education at a glance.

DEED14B= % of primary schools connected to the Internet - 1998-1999
Source: EC (2000), Designing tomorrow's education promoting innovation with new technologies
Note: Figure for Belgium is for Flanders only.

DEED15= % of students in schools using computers with access to e-mail or internet in lower secondary education - in 1998/99
Source: OECD(2000), Education at a glance
Note: The figure for Belgium is only for the French community
* for France: the first figure corresponds to the lower secondary school and the second to the higher secondary school.

DEED15B= % of secondary schools connected to the Internet -1998-1999
Source: EC (2000), Designing tomorrow's education promoting innovation with new technologies
Note: Figure for Belgium is for Flanders only.

DEED16= % of students in schools using computers with access to e-mail or internet in upper secondary education - in 1998/99
Source: OECD(2000), Education at a glanceNote: The figure for Belgium is only for the French community.

DEED17= Number of pupils per computer - primary school (1998-1999)
Source: EC (2000), Designing tomorrow's education promoting innovation with new technologies
Note: Figure for Belgium is for Flanders only.

DEED18= Number of pupils per computer - secondary school (1998-1999)
Source: EC (2000), Designing tomorrow's education promoting innovation with new technologies
Note: Figure for Belgium is for Flanders only
* for France: the first figure corresponds to the lower secondary school and the second to the higher secondary school.

TABEL 65 - ICT, TRAINING AND EDUCATION

COUNTRY	DEED19				
	10th perc.	25th perc.	median	75th perc.	90th perc.
BELGIUM	10	16	23	37	56
GERMANY					
DENMARK	6	8	11	14	19
FINLAND	6	9	12	17	22
FRANCE	12	15	21	28	40
UNITED KINGDOM					
ITALY	7	9	20	34	58
LUXEMBOURG	7	11	14	22	25
NETHERLANDS					
SWEDEN					
JAPAN	8	12	19	28	37
UNITED STATES					
NORWAY	7	8	12	16	22

DEED19= Ratio of students to computer in lower secondary education, for schools with computers (1998-1999) - in percentiles (10, 25, 75, 90) and for the median school
Source: OECD (2000), Education at a glance
Note: The figure for Belgium is only for the French community.

TABEL 66 - ICT, TRAINING AND EDUCATION

COUNTRY	DEED20						DEED21					
	None	under 10%	11-25%	26-50%	51-75%	76-100%	None	under 10%	11-25%	26-50%	51-75%	76-100%
AUSTRIA												
BELGIUM	65	18	12	4			69	10	9	5	4	2
GERMANY												
DENMARK	15	21	22	21	13	7	16	12	12	9	16	35
SPAIN												
EU												
FINLAND	5	12	30	27	20	7	5	1	2	10	21	63
FRANCE	59	29	9	2			62	12	9	7	3	6
UNITED KINGDOM												
GREECE												
IRELAND												
ITALY	44	29	16	6	3	1	54	25	8	6	3	3
LUXEMBOURG	3	58	26	13			3	17	31	3		45
NETHERLANDS												
PORTUGAL												
SWEDEN												
JAPAN	75	19	5	1			75	8	3	2	1	12
UNITED STATES												
NORWAY	22	19	22	20	13	4	25	15	12	11	12	25

DEED20= Percentage of teachers who have used e-mail in lower secondary schools (1998-1999)
Source: OECD (2000), Education at a glance
Note: The figure for Belgium is only for the French community.

DEED21= Percentage of students (at the end of the target grade) who have used e-mail in lower secondary schools (1998-1999)
Source: OECD (2000), Edcuation at a glance
Note: The figure for Belgium is only for the French community.

TABEL 67 - ICT AND EDUCATION : USE OF ICT FOR THE REALISATION OF INSTRUCTIONAL ACTIVITIES

	Independent learning by students	Weaker students: additional instruction	Differences in entrance level	Students learn info-search	Emphasis on skills development	Same materials, same pace	Teachers follow all students activities	Students responsible for onw learning	Students work at own place	Co-operative projects	Student self-assesment	Students learn by doing	Parts of school subjects combined
AUSTRIA													
BELGIUM	7	7	5	24	7	4	3	12	16	9	2	9	6
GERMANY													
DENMARK	24	30	18	58	26	2	8	5	33	45	3	26	24
SPAIN													
EU													
FINLAND	16	4	9	47	22	8	26	12	21	11		38	9
FRANCE	15	20	10	26	13	6	12	7	19	14	3	21	12
UNITED KINGDOM													
GREECE													
IRELAND													
ITALY	10	13	5	35	23	6	12	4	11	15	4	33	21
LUXEMBOURG	12		18	64	33	19	29	6	17	19	6	39	22
NETHERLANDS													
PORTUGAL													
SWEDEN													
JAPAN	12	4	3	19	17	8	17	9	18	11	1	17	4
UNITED STATES													
NORWAY	16	45	9	55	7	2	2	5	11	21	1	20	15

The realisation of instructional activities largely with the help of ICT in lower secondary education, as indicated by school principals, expressed as a % of students (1998-1999)
Source: OECD (2000), Education at a glance
Note: The figure for Belgium is only for the French community.

TABEL 68 - ICT AND EDUCATION : MAJOR OBSTACLES BY REALISATION OF ICT OBJECTIVES

COUNTRY	Not enough computers available	Noth enough copies of software	Insufficient variety of software	Insufficient teacher time	Difficult to integrate into teaching	Not enough supervisory staff	Hard to schedule computer time	Difficult use for low achieving students	Internet: no time in the school schedule
BELGIUM	85	75	55	47	67	65	60	16	56
DENMARK	65	34	53	17	65	39	40	32	37
FINLAND	72	37	48	49	46	40	70	13	21
FRANCE	72	66	54	48	76	55	58	20	47
ITALY	54	50	11	57	57	49	42	17	53
LUXEMBOURG	65	33	14	41	81	83	62	53	70
JAPAN	63	51	67	70	42	60	45	10	41
NORWAY	77	34	52	54	66	39	42	12	28

COUNTRY	Internet: no time for teachers to explore	Not enough space to locate	Lack of the interest of teachers	Teachers lack knowledge/skills	Not enough training opportunities	No plan to prevent theft/vandalism	Lack of support from school abroad	Telecom infrastructure is weak	Other major obstacles
BELGIUM	51	37	27	73	37	19	1	22	4
DENMARK	52	31	7	65	41	18	8	5	2
FINLAND	42	28	30	79	38	6	14	7	3
FRANCE	45	27	41	85	48	9	3	18	11
ITALY	51	31	26	45	50	18	9	26	6
LUXEMBOURG	23	46	59	80	29	22	17	9	26
JAPAN	3	15	29	60	49	12	25	41	4
NORWAY	36	17	17	70	49	14	27	14	

Major obstacles in realising the school's ICT related objectives as reported by school principals, expressed as a percentage of lower secondary students (1998-1999)
Source: OECD (2000), Education at a glance
Note: The figure for Belgium is only for the French community.

TABEL 69 - ICT AND EDUCATION : WAYS OF TRANSFER OF ICT KNOWLEDGE AMONG TEACHERS

COUNTRY	Via informal contacts/communication	Via school's ICT working group	Regular item at staff meetings	Via a regular newsletter	Teacher repeats external course	Courses by an external agency	Via in-school courses	Via computer co-ordinator	No organised structure	Transfer ICT knowledge, other
AUSTRIA										
BELGIUM	75	15	7	4	60	21	28	56	23	3
GERMANY										
DENMARK	92	23	5	14	33	50	63	78	50	
SPAIN										
EU										
FINLAND	67	7	3	2	19	33	45	72	14	9
FRANCE	86	7	7	1	12	11	18	43	44	6
UNITED KINGDOM										
GREECE										
IRELAND										
ITALY	74	32	13	5	29	45	72	44	18	4
LUXEMBOURG	89	6			24	52	43	74	52	4
NETHERLANDS										
PORTUGAL										
SWEDEN										
JAPAN	72	18	8	3	14	41	38	41	18	2
UNITED STATES										
NORWAY	87	16	4	1	16	38	61	73	22	6

Different ways that ICT knowledge is transferred among teachers in lower secondary education, expressed as a percentage of students (1998-1999)
Source: OECD (2000), Education at a glance
Note: The figure for Belgium is only for the French community.

TABEL 70 - E-GOVERNMENT

COUNTRY	DEEG1	DEEG2	DEEG3	DEEG4	DEEG5	DEEG6
	2000	2000	2001	2001	2001	2001
AUSTRIA	21	18	41.90	29.80	13.00	48.50
BELGIUM	16	18	47.10	33.80	8.20	44.00
GERMANY	21	10	48.20	38.50	7.50	38.60
DENMARK	38	19	50.30	26.50	29.60	33.90
SPAIN	21	13	39.80	15.40	13.10	52.80
EU	19	15	44.30	27.90	12.20	45.40
FINLAND	36	21	56.60	38.10	24.00	32.30
FRANCE	18	18	42.40	28.10	4.20	49.50
UNITED KINGDOM	18	11	39.60	28.90	8.30	49.80
GREECE	17	19	42.90	18.10	10.00	4.20
IRELAND	13	16	50.60	33.90	7.30	43.00
ITALY	12	19	41.90	15.20	13.80	50.70
LUXEMBOURG	15	19	31.80	16.60	5.70	60.70
NETHERLANDS	10	21	57.50	29.00	33.90	29.30
PORTUGAL	12	18	15.60	9.50	7.70	77.10
SWEDEN	38	11	47.40	29.90	26.50	39.00
JAPAN						
UNITED STATES						
NORWAY						

DEEG1 = % of Internet users which visited the web site of his local authority in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEEG2 = % of Internet users which visited a web site of the government in the past three months
Source: Eurobarometer 53.0, Measuring information society 2000.

DEEG3 = % of respondents which got on line with their administration for finding or downloading information
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEEG4 = % of respondents which got on line with their administration for enquiries by e-mail
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEEG5 = % of respondents which got on line with their administration for submission of forms
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

DEEG6 = % of respondents which got never on line with their administration
Source: European Commission (2001), Flash Eurobarometer 97 (02/2001).

VII Bibliography

Bassanini, Scarpetta et Visco, 2000, "Knowledge, Technology and Economic Growth: Recent Evidence from OECD Countries".

Benchmarking pilootproject "Financiering van Innovatie" 1997.

BIPE, "Les technologies de l'information et des communications et l'emploi en France; appréciation macro-économique", juin 2000, Ministère de l'Economie, des Finances et de l'Industrie, France.

BOOZ-ALLEN&HAMILTON, "The Competitiveness of Europe's ICT Markets", Ministry of Economic Affairs, The Netherlands, 2000.

The Boston Consulting Group, "Online Retailing in Belgium", February 2000.

The Boston Consulting Group, "Incumbents Take the Initiative - Belgian Report", May 2001.

Comité consultatif pour les télécommunications, Sixième rapport annuel, 1er janvier - 31 décembre 1999.

L'Echo net, Flash info, 30/06/00.

Economists Intelligence Unit (EIU), "Pyramid Research e-readiness rankings", 2001.

EITO, European Information Technology Observatory, 2001.

European Commission, Flash Barometer, June 2001.

EU, Working group statistics on the information society, doc.IS-WG/00/05/EN, 2000.

EU, Innovation Scoreboard 2001, Cordis focus, Issue n°18, September 2001.

Eurostat, Statistics in brief, 23/2001.

Eurydice, "Technologies de l'information et de la communication dans les systèmes éducatifs en Europe", 2000.

Fabrimetal -FABIT, "De informatie- en communicatietechnologiesector in België in een wereld perspectief", February 2000.

Federaal Planbureau, KUL, UCL: "Delokalisatie, innovatie en werkgelegenheid". Study Report financed by OSTC, June 2000.

Federal Planning Bureau, Van Sebroeck H., "The Financing of Innovation with Venture Capital - An Update of the EU Benchmarking Pilot Project froma Belgian Perspective", WP 09-00, 2000.

Federal Planning Bureau, De Vil G., Kegels C., Spinnewyn H. en van Overbeke M., "Productie en Diffusie van ICT in België. Een vergelijkende analyse", Intermediary Report, September 2000.

Federal Planning Bureau, Van Sebroeck H., "E-GOV - Naar een elektronish Overheid in België", WP 04-01, 2001.

Goldman Sachs, "The shocking economic effect of B2B", Global Economic Paper, n°37, 2000.

Grid electronic publishing consulting Consultancy-Lentic, "The Electronice Information Services Industry in Belgium 1997-1999", December 1999, A survey and report for the EC (DGXIII) and the SSTC.

IDC, "Electronic Commerce in Belgium", September 1999.

IMD, "The world competitiveness Yearbook & Network Wizards for the Internet Software Consortium", 2000.

IMD, "The World Competitiveness Yearbook", 2001.

INS, Enquête structurelle auprès des entreprises, 1997.

International Data Corporation (IDC), "Electronic Comerce in Belgium", Septembre 1999.

ISPA, 2001, 8th Market Survey: 31 March 2001.

Ministère de l'Economie, des Finances et de l'Industrie, "Technologies et société de l'information", Edition 1999, France.

NBB, Balanscentrale, editie October 2001.

OCDE, "Use of Information and Communication Technology at work", DSTI/ICCP/IE(97)8/FINAL, 16 July 1998.

OCDE, "E-Commerce: Impacts and Policy Challenges", ECO/CPE(2000)7, 3 May 2000.

OCDE: "Local Access Pricing and e-commerce", DSTI/ICCP/TISP(2000)1/FINAL, 26 July 2000.

OCDE, "Perspectives des technologies de l'information de l'OCDE; TIC, commerce électronique et économie de l'information", 2000.

OCDE, "The Information and Communication Technology Sector: a Definition", DSTI/ICCP/AH(98)1, 1998.

OCDE, Economic Outlook, June 1998.

OCDE, Labour Force Statistics 1978-1998, 1999 edition.

OCDE, "Venture capital: supply versus demand issues" DSTI/ind(2000)1, 2000.

OCDE, Information Technology Outlook, 2000.

OCDE, "Developing ICT sector core Tables: a Progress Report", DSTI/ICCP/IIS/RD(2000)1, 2000.

OCDE, "Producitivity Growth in ICT Using Industries: A Source of Growth Differentials in the OCDE?", STI Working Paper, 2001/4, 2001.

OCDE, "Measuring the ICT sector", 2001.

OCDE, STI Scoreboard and Communications Outlook, 2001.

Rayport & Sviokla, 1996, "Exploiting the Virtual Value Chain", The McKinsey Quarterly, n°1.

"Telegeography", Gregory Staple (editor), Washington D.C., TGI, 2000.

USIC, "State of the Internet", 2000.