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**Working Party on the Information Economy**

**ICT DIFFUSION TO BUSINESS: Peer review**

**Country report: Italy**

**English - Or. English**

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## **FOREWORD**

In June 2004, this report was presented to the Working Party on the Information Economy (IE). It was recommended to be made public by the Committee for Information, Computer and Communications Policy in October 2004.

The report was prepared by Graham Vickery of the OECD Secretariat. The series of peer reviews of ICT diffusion to business have been co-ordinated by Graham Vickery. It is published under the responsibility of the Secretary-General of the OECD.

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## SUMMARY

The structural characteristics of the Italian economy have a major role in shaping policies for ICT diffusion to Italian businesses. The level and speed of diffusion of new technologies are determined by the sectoral distribution of industry, the small size of businesses, and major regional variations in industry structure and resources. Overall, the telecommunications infrastructure is good, the growth of the Internet and broadband has picked up and computerisation is spreading despite the recent poor economic performance and government budget constraints.

Italy has a set of positive elements that can help diffuse ICTs to business, even if the economic structure is not everywhere conducive to diffusion. It can build on these strengths to accelerate the diffusion and effective use of ICTs by business. There are however a range of constraints in the business environment and on policies to enhance diffusion of ICTs to business and improve business performance. The following table summarises analyses and recommendations developed in more detail in the report to help overcome the weaknesses identified in the Italian system.

**Policy summary table**

<b>Policy domain</b>	<b>Current policy priority</b>	<b>This priority should be</b>	<b>Recommendations</b>
Co-ordination of initiatives	High	Continued	Co-ordination and direction may need further reinforcement, in the light of current devolution. Increase programme continuity and consistency.
Infrastructure	High	Continued	Broadband access needs continuing attention to ensure widespread national coverage
R&D	Medium	Increased	Incentives for business R&D need re-evaluation and strengthening
Equipment	High	Decreased	Shift to innovation and knowledge-based strategies
ICT skills	Low	Increased	ICT education, the use of ICT in schools and ICT-related skills development need much greater attention and upgrading
Business organisation	Low	Increased	Firms need to evolve towards more sophisticated business models
Content creation	Low	Increased	Initiatives to increase use of public digital information, and digital content creation
Trust / security	Medium	Continued	Promote use of digital signatures for government-related transactions
Demonstration / awareness	High	Continued	Foster awareness of the benefits of ICT among Italian businesses
Small firms	High	Maintained	Maintain focus on small firm sector, but shift away from traditional investment incentives
Evaluation	Low	Increased	More rigorous measurement and evaluation of policies are needed to improve policy design, delivery and impacts

## ICT DIFFUSION TO BUSINESS IN ITALY

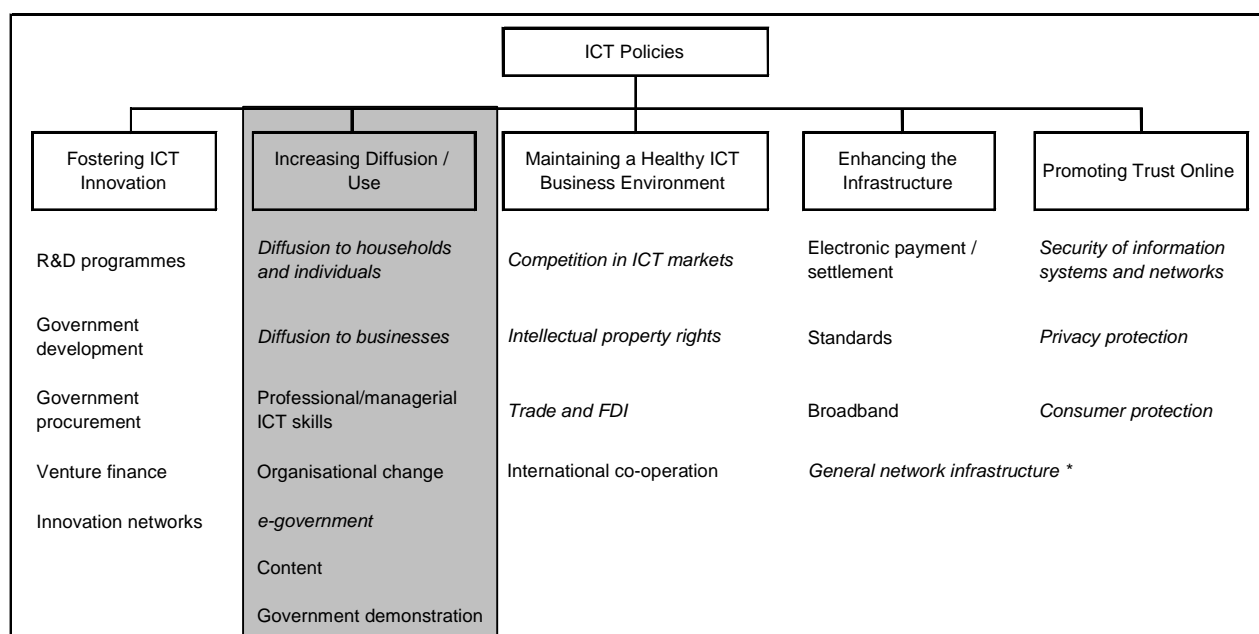
### Introduction

The OECD Growth Study concluded that information and communications technology (ICT) is a key input to productivity and growth performance (OECD, 2001a; OECD, 2001b; OECD, 2003d). In 2001 the OECD Council Ministerial urged the OECD to strengthen its peer review of structural reforms. The 2002 Council Ministerial requested “the OECD to increase its monitoring of member countries’ implementation of the recommendations of the OECD Growth Study”.

This report is part of the peer review process of policies promoting ICT diffusion to business, which has been designed to respond to the two Ministerial requests as part of the Growth Follow-up. OECD peer reviews are used as a method to bring together peers from member countries to discuss the policy experience and its main challenges in an individual country. Once a critical mass of countries has been reviewed, a cross-country comparative synthesis report will be prepared with a view to identifying common good policy practices. Following a first round of reviews conducted in the Working Party on the Information Economy (WPIE) in December 2003, the present report is background to the second round of reviews in June 2004. The discussion and comments made at the meeting will be reflected in the final version of this report.

The report reviews the status of diffusion of ICT to business in Italy and describes current and previous policies aimed at ICT uptake in firms, the focus for these peer reviews. It is one of the five pillars of the ICT policy framework used in the *Information Technology Outlook 2004* Policy Questionnaire, shown in Table 1. Given the complexity of the ICT diffusion process and the central role of a number of the other factors, attention is also given to the other parts of the framework (R&D, public procurement, payment systems, standards, broadband, trust and security) that are important elements in the diffusion of ICT to business.

**Table 1. ICT Policy Framework**



The report presents recommendations for possible policy actions based on the strengths and weaknesses observed in the Italian situation and the Italian policy approach. Policies to encourage ICT diffusion to business have covered traditional areas such as publicly financed awareness-raising and business services to develop ICT readiness in small and medium-sized firms, and also more general business environment policies such as infrastructure competition. The review does not focus directly on broader aspects of Information Society policies aimed at citizens' and household's uptake of ICTs and participation in the Information Society. Furthermore, the review should not be seen as a comprehensive evaluation of the effectiveness of all recent initiatives, but as a guiding tool for facing the challenges and setting priorities for new initiatives.

### ICT diffusion to business

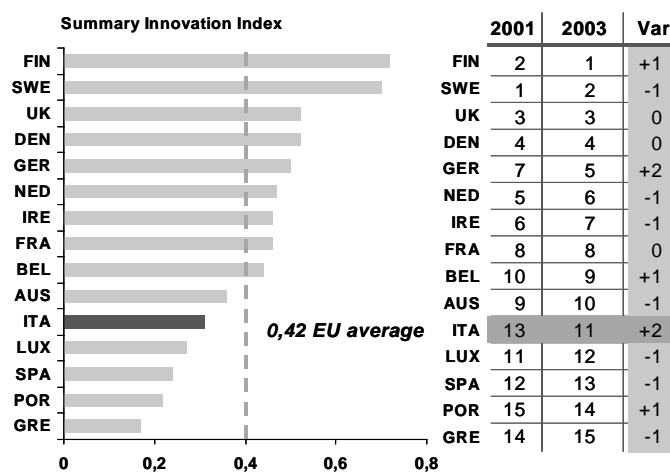
ICT investment and use can be a strong driver for labour productivity and multifactor productivity at firm level. Complementary factors including the regulatory environment, the availability of appropriate skills, the capability for organisational change, and the strength of accompanying innovations in ICT applications. All have major effects on the ability of enterprises to seize the benefits of private and public investments in ICT (OECD, 2003a).

The role of ICT as an enabler of change across traditional segments of society and its institutions also introduces some new challenges in terms of developing and implementing appropriate policies and implementation mechanisms. This broader understanding of success factors calls for a wider range of policies and better monitoring and evaluation of policies and their impact. Where such indicators are not available, the report draws on related data.

### Industry structure and economic setting

Economic analysis clearly shows the impact of technology on the productivity and competitiveness of any economic system. The economic system in Italy is becoming progressively less competitive and this has been attributed to the low level of private and public investment in technology. Italy is considerably behind its main European partners in many indicators of technology and innovation, but it is slowly filling the gap, as shown in the Summary Innovation Index for European countries (Figure 1). Italy has progressed by this measure over the last two years but still has further to go.

Figure 1. Summary Innovation Index



Source: 2003 European Innovation Scoreboard.

Promoting the diffusion and use of ICT has become a top priority on the government agenda. The government has taken numerous measures to redress the situation, in spite of funding difficulties and budget constraints. This report will examine the particular characteristics of the Italian economic system, present a picture of the current level of diffusion of ICT amongst Italian businesses and review the principal initiatives and policies of the government aimed at encouraging a more widespread use of ICT by businesses.

Structural and cyclical factors differentiate the Italian economic system from its main international partners. These factors strongly influence the diffusion of ICT and must be taken into consideration if public policies aimed at favouring the diffusion of ICT are to be effective.

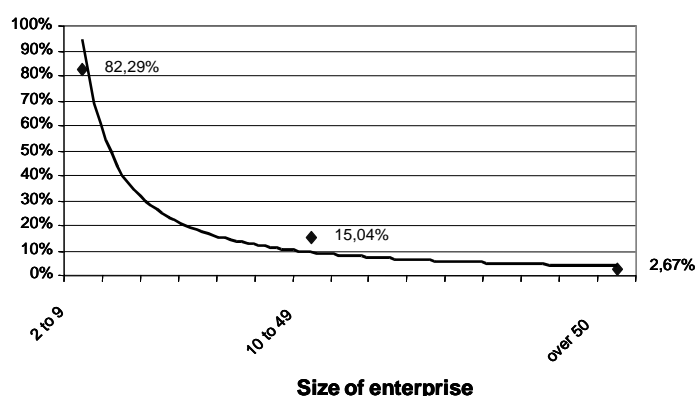
The main structural factors are:

- *Predominance of small and medium-sized enterprises.* The average size of these enterprises (3.6 employees) is the lowest in the EU. More than 98% of Italian firms have less than 20 employees and, out of a total of 4.1 million firms, only 2 600 have more than 250 employees.<sup>1</sup> SMEs in Italy currently do not have major demands for highly-qualified personnel, but the challenge of global competition means that they need to achieve greater critical mass and improve innovative capacity. This requires a major contribution in key activities including: research and development, technology, consulting, support for internationalisation, logistics, etc. The inelasticity of small firms in directly absorbing qualified personnel is in contrast to the prospects for expansion of advanced business services to provide specialised services to SMEs. It is important to have competitive knowledge-intensive service firms that are capable of shaping future economic development.<sup>2</sup>
- *The importance of business districts.* Since the 1990s, the phenomenon of aggregation and localisation of small businesses into business districts has increased noticeably. This form of economic organisation has influenced the dynamics of employment, innovation and product development and ICT use. In order to face global challenges, some Italian districts are switching from a “traditional district model” (headquarters and manufacturing facilities in the same geographic area) to a “new value chain model” (headquarters in Italy, manufacturing facilities in areas or countries with lower labour costs), adopted by North East district textile and shoe manufacturers.
- *Specialisation in sectors that are not R&D - and innovation-intensive,* and are less likely to have high rates of ICT uptake. Italian industry has a high share of mature/traditional sectors (textiles/clothing and the food industry together accounted for over 17% of employment and 15% of manufacturing added value in 2001).<sup>3</sup> However cross-country comparisons suggest that Italian manufacturing innovation performance is close to the European average, albeit the Italian services industry is considerably weaker than the average and, surprisingly, SME innovation co-operation is low both in the manufacturing and the services industries (Table 2).
- *A fragmented ICT sector.* High technology sectors have a low impact in the Italian economy (the manufacturing of electrical and electronic machines accounts for 7% of employment and 1.8% of value added in manufacturing).<sup>4</sup> The ICT industry is dominated by small firms (79 000 with an average of less than 8 employees per firm), which account for the major share of employment (Figure 2). Small size impacts negatively on R&D and investment, particularly in a period of falling prices, declining revenues, narrowing margins on products and services, and longer decision-making cycles for investment.

**Table 2. Indicators of innovation activity, 2000 and 2001**

	Innovation expenditure <sup>1</sup>		SMEs innovating in-house <sup>2</sup>		SMEs with innovation cooperation <sup>3</sup>	
	Manufacturing	Services	Manufacturing	Services	Manufacturing	Services
EU15	3.5	1.8	37.4	28.0	9.4	7.1
Austria	2.8	0.9	35.5	36.4	7.4	10.1
Belgium	4.9	0.9	46.2	31.8	11.7	7.7
Denmark	1.0	0.4	16.7	15.4	18.9	12.7
Finland	3.9	1.0	40.9	34.9	22.0	18.3
France	3.1	1.6	33.5	23.9	12.3	5.4
Germany	4.7	1.6	55.1	43.9	10.9	8.4
Greece	2.2	1.6	16.8	21.3	4.9	12.4
Italy	3.0	0.8	34.9	20.0	2.8	3.5
Luxembourg	2.1	1.2	38.8	39.6	-	-
Netherlands	3.1	0.8	42.5	28.1	11.1	8.5
Portugal	2.9	2.7	35.5	37.6	6.1	9.2
Spain	1.9	0.7	29.1	16.6	3.2	1.9
Sweden	6.4	19.1	35.5	35.6	14.1	12.8
United Kingdom	3.0	1.4	24.8	18.7	9.6	7.6

Source: European Innovation Scoreboard, 2003.

**Figure 2. Distribution of ICT firms by number of employees**

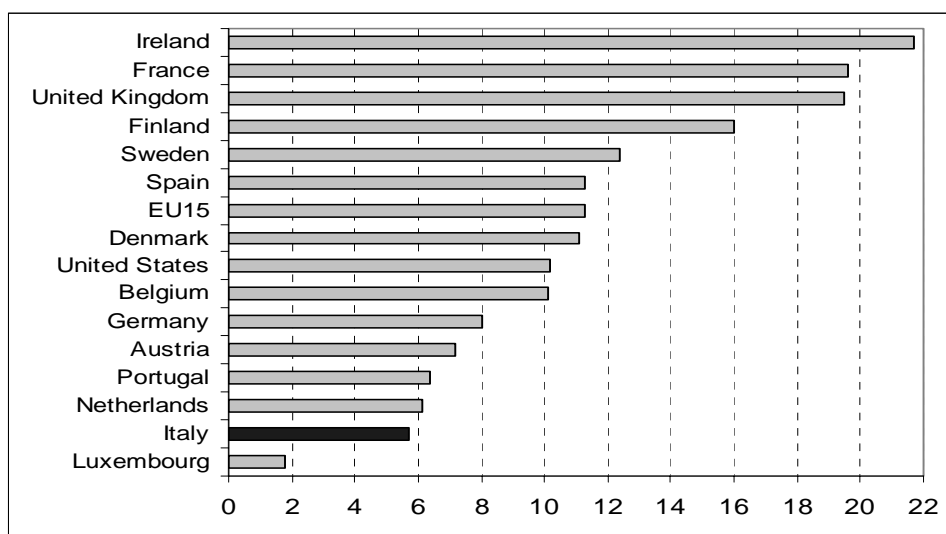
Source: Assinform.

- *A business environment characterised by:*

1. *Low levels of technical education.* Italy has only 5.5% of graduates in science and engineering disciplines in the 20-29 years age class compared with the European average of over 11% (see Figure 3). Furthermore computer use in schools is relatively low and school networking applications are not widespread (see Annex Table). On the other hand, ICT-using occupations are widespread across the economy, and ICT-using occupations have a higher than average share of employment in Italy compared with the rest of Europe (see Annex Figure). These employees may however have low level ICT skills, and there is a general recognition that skill levels need raising. The Italian school system is undergoing a major reform; pupils will attend school until 18 years of age (the minimum leaving age was 13); new high school profiles dedicated to scientific and technological fields will be introduced together with courses on computer literacy starting from lower secondary school. ICT training and ICT based teaching/learning is currently not mandatory, with the exception of vocational schools.

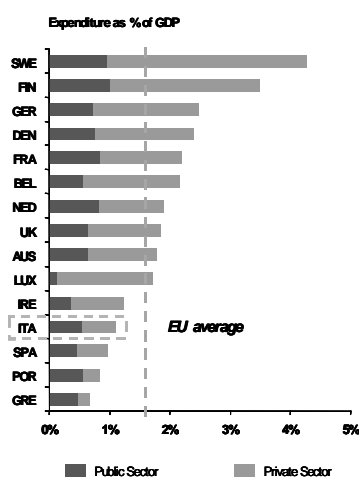


**Figure 3. Science and engineering graduates, 2001 or latest year  
percentage of 20-29 age class**



Source: European Innovation Scoreboard, 2003.

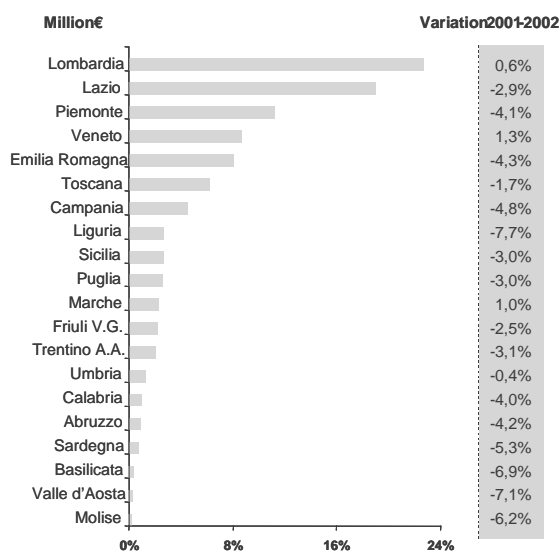
**Figure 4. R&D expenditure  
percentage of GDP**



Source: 2003 European Innovation Scoreboard

2. *Low research and development.* R&D expenditures are 1.2% of GDP, half of the EU average (Figure 4). However, a very high share of business R&D is performed by medium-sized firms and over 25% of business R&D is in the ICT-sector (see Annex Figures).
3. *Uneven distribution of economic activity and ICT infrastructure:* The major share of economic activity is concentrated in the North (55% of GDP), whereas the Centre (20%), and South (24%) have much lower shares.<sup>5</sup> Information technology expenditure is even more unevenly distributed in Northern Italy (Figure 5), and the geographical digital divide is wide between cities and rural areas.

**Figure 5. Distribution of IT expenditures by region percentages**



Source: MIT, Report on Innovation and Digital Technologies in 2003.

4. *Lack of innovation and risk financing*: Increasing global competition requires increased investment in innovation. The first CIRET Report (*Politecnico di Milano, RITA*) underlines that shortage of finance is the most important factor impeding innovation in a sample of 401 new SMEs specialised in high-technology services. The study shows that the main factors holding back innovation are a lack of specific public innovation support for SMEs, the high cost and difficulty of obtaining bank loans, and the inadequacy of alternative methods of funding such as venture capital. Eurobarometer surveys<sup>6</sup> on a sample of almost 8 000 European and US companies reveal that lack of finance and the complexity of administrative procedures are seen to be the greatest impediments to business start-ups in Europe, with Italy placed worst. On the other hand increasing bank costs drive the uptake of online banking, as Internet transactions are significantly cheaper – both for banks and customers – in comparison with traditional branch activity. This acts as a long-term incentive for banks to develop innovative online services.

Cyclical factors have also had important impacts on the economy:

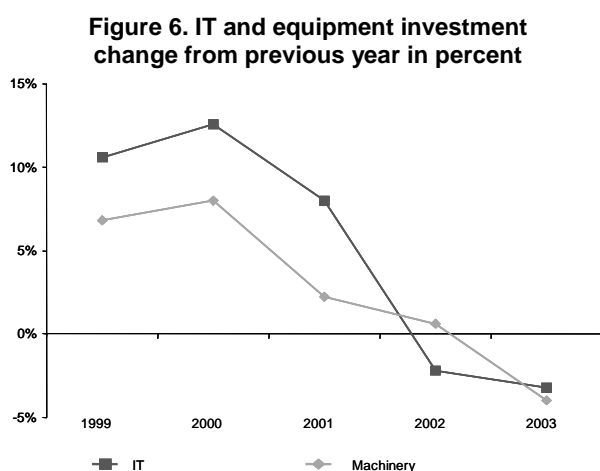
- *The economic slowdown*. Italy has performed less well than other major countries and regions over the last few years which constrains private and public sector activity, and affects ICT diffusion to business. Table 3 below shows recent economic performance of Italy, which has a major influence on both the setting and potential for the diffusion of ICTs to business and the role that policy can play, particularly because of budget constraints.

**Table 3. Macroeconomic indicators, Italy and selected countries and regions, 1998-2005**  
**Percentage change from previous year, except for unemployment**

	1998	1999	2000	2001	2002	2003	2004	2005
<b>GDP growth</b>								
Italy	1.7	1.7	3.2	1.7	0.4	0.4	0.9	1.9
US	4.2	4.4	3.7	0.5	2.2	3.1	4.7	3.7
Euro Area	2.8	2.8	3.7	1.7	0.9	0.5	1.6	2.4
OECD	2.7	3.3	3.9	1.0	1.7	2.2	3.4	3.3
<b>Private consumption</b>								
Italy	3.2	2.6	2.8	0.8	0.4	1.2	1.0	2.4
US	3.9	4.4	4.6	2.5	3.4	2.5	3.8	2.5
Euro Area	3.1	3.5	2.9	1.8	0.6	1.0	1.3	2.5
OECD	3.0	3.9	3.8	2.1	2.4	2.2	2.8	2.9
<b>Total domestic demand</b>								
Italy	3.1	3.2	2.4	1.4	1.3	1.3	1.2	2.7
US	5.3	5.3	4.4	0.7	2.8	3.3	4.5	3.7
Euro	3.5	3.4	3.1	1.1	0.5	1.2	1.8	2.5
OECD	3.1	4.0	4.0	0.7	1.9	2.5	3.3	3.2
<b>GDP deflator</b>								
Italy	2.7	1.6	2.2	2.7	3.1	2.9	2.5	2.4
US	1.1	1.4	2.2	2.4	1.5	1.7	1.7	1.6
Euro Area	1.7	1.1	1.4	2.4	2.6	2.0	1.7	1.7
OECD	3.0	2.3	2.7	2.9	2.5	1.9	1.7	1.6
<b>Unemployment rate</b>								
Italy	11.9	11.5	10.7	9.6	9.1	8.8	8.6	8.5
US	4.5	4.2	4.0	4.8	5.8	6.0	5.5	5.2
Euro Area	10.2	9.4	8.4	8.0	8.4	8.8	8.8	8.5
OECD	6.7	6.6	6.1	6.4	6.9	7.1	6.9	6.7

Source: OECD, 2004b.

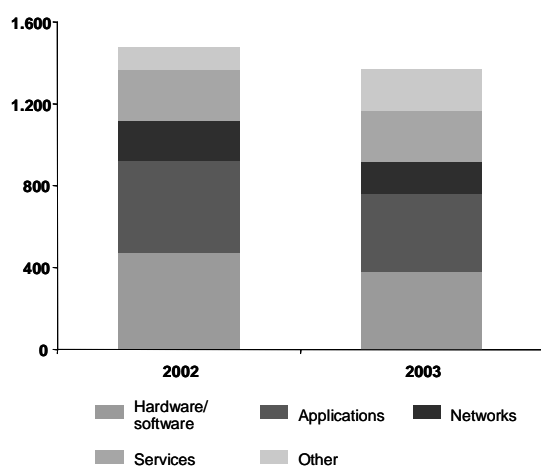
- *Business investment has declined* as slower growth has affected profitability and growth prospects. This has reduced the availability of resources to modernise the business sector and invest in IT equipment (Figure 6).



Source: Assinform.

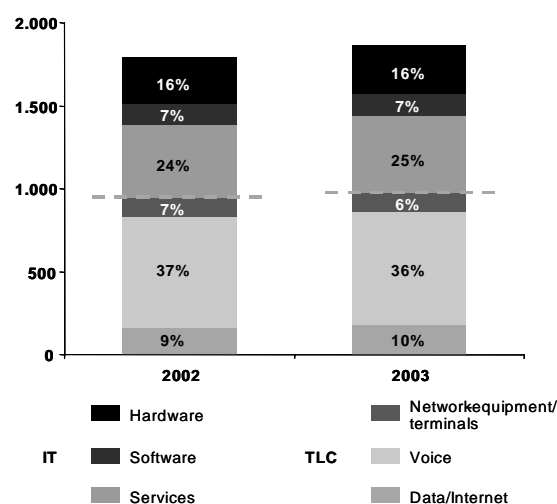
- *Increased international competition*, especially from Asian countries that are particularly strong in the key sectors in which Italian firms have excelled.
- *The loss of international competitiveness*, and the decline in export growth. This is also linked to the introduction of the Euro and the reduction of freedom in monetary policies. Foreign trade trends are negative in comparison with other countries of the European Union; the contribution of exports to economic growth dropped sharply after 2000 and became negative in 2002.
- *Public administration ICT investment* has remained stable, with combined IT and telecommunications expenditures for central and local government remaining approximately flat in the past two years despite budget constraints (Figures 7 and 8). The aggregation of public sector demand should increase the efficiency and scope of ICT investment and boost the ICT supply industry and have indirect positive impacts on business sector ICT investments.

**Figure 7. Central public administration expenditures on ICT  
EUR million**



Source: CNIPA, 2004.

**Figure 8. Local public administration expenditures on ICT  
EUR million**



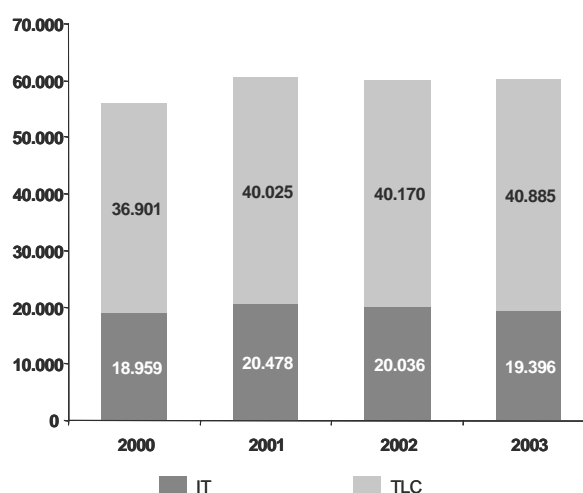
Source: Federcomia, IDC, e-Regions, 2003.

These elements combined have tended to slow private and public investment in ICT, but on the other hand they have spurred the government to use a wide range of instruments to raise ICT investment and expand its use.

### Business use of ICT

Aggregate investment in ICT has flattened off or declined in the past few years. After rapid growth until 2001, aggregate demand for ICT has remained stable at around EUR 60 billion with communications growing and IT contracting (Figure 9).

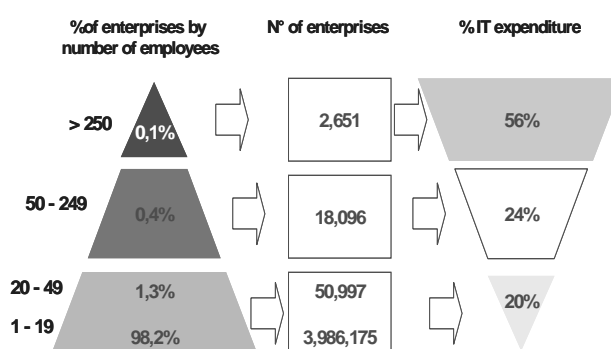
**Figure 9. ICT market, 2000-2003**  
EUR million



Source: Assinform/Netconsulting, 2004.

This pattern of ICT spending is common across OECD countries, and the slowdown has been prolonged in Europe (see *OECD Information Technology Outlook 2004*, OECD 2004c). The economic slowdown has prompted firms to reduce IT investments, major telecommunications infrastructure investments have slowed and the mobile telephony sector is showing signs of maturity. The slowdown is also affected by the characteristics of the Italian economy, in particular the small average size of companies which slows total expenditure on ICT and influences the type of investment (see below). By firm size, 56% of total IT spending comes from 0.1% of companies with more than 250 employees (2 651 companies), whereas 4 million companies with less than 50 employees generate 20% of the total expenditure so that there are relatively low impacts on IT spending from the small firm sector (Figure 10).

**Figure 10. IT expenditure by size of enterprise**



Source: MIT, Report on Innovation and Digital Technologies in Italy, 2003.

### *Telecommunications*

The telecommunications market is relatively advanced in Italy. It has around the OECD average density of telecommunications channels per 100 population, and cellular mobile penetration is second only to Luxembourg among OECD countries (see Annex Figures).

### *IT equipment and the Internet*

Although ICT investment and uptake has been relatively slow (see Annex Figures), there are signs of positive change as more businesses use information and communication technologies. According to a 2003 ISTAT survey, 43.8% of employees used a PC at work and 24.3% used the Internet (Table 4). Italian businesses are increasingly improving their level of basic computerisation.

**Table 4. Use of PCs and PCs connected to Internet, 2003  
percent of enterprises and change from 2002**

Number of employees	PC users 2003	Var. %	PC with Internet users 2003	Var. %
Manufacturing				
10-49	26.9	1.5	15.6	15.3
50-99	36.6	8.2	20.1	20.6
100-249	42.0	7.0	21.2	23.5
over 249	49.4	3.5	21.9	-1.7
<b>Total manufacturing</b>	<b>37.8</b>	<b>4.2</b>	<b>19.1</b>	<b>10.0</b>
Services				
10-49	47.9	4.2	31.0	23.5
50-99	49.1	5.4	31.0	18.2
100-249	52.6	8.3	33.6	21.3
over 249	53.3	2.9	29.5	17.3
<b>Total services</b>	<b>51.0</b>	<b>4.3</b>	<b>30.6</b>	<b>19.9</b>
<b>Total</b>	<b>43.8</b>	<b>4.7</b>	<b>24.3</b>	<b>16.2</b>

Source: ISTAT.

### *Broadband*

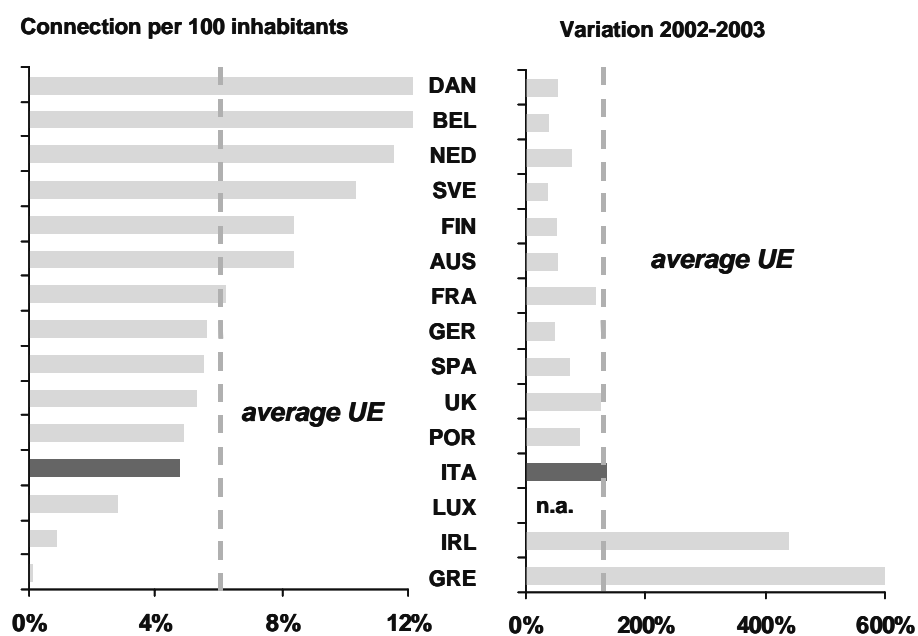
After a slow start broadband uptake is increasing rapidly. Recent statistics show that the overall broadband growth rate in companies was 103% in 2003 (Table 5), with comparable or even faster growth of broadband users in the household sector. Compared with other European countries broadband penetration in Italy shows very rapid increase from a low base (Figure 11), although the position of Italy compared with other OECD countries could improve further (see Annex Figure). Recent rapid growth is in part due to the government incentive for the diffusion of broadband as well as the strategies of the main operators who are promoting broadband services particularly xDSL.

**Table 5. Type of Internet connection by size of enterprise, 2003**  
percent of enterprises connected to the Internet and change from 2002

Number of employees	Type of connection					
	Analogic modem		Isdn		xDSL	
	2003	Var. %	2003	Var. %	2003	Var. %
Manufacturing						
10-49	41,9	-3,4	48,8	-19,8	26,3	157,1
50-99	22,4	-27,6	42,0	-35,8	53,6	133,6
100-249	19,2	-29,6	35,3	-32,4	62,5	72,3
over 249	24,2	-12,0	26,3	-31,6	62,6	64,4
<b>Total manufacturing</b>	<b>38,8</b>	<b>-5,7</b>	<b>47,1</b>	<b>-22,0</b>	<b>31,1</b>	<b>135,4</b>
Services						
10-49	34,1	-9,4	43,5	-24,7	42,1	81,0
50-99	30,4	-13,7	36,6	-31,7	57,7	79,0
100-249	28,0	-19,4	34,1	-23,4	59,1	72,8
over 249	25,7	-18,1	35,7	-19,6	55,7	31,5
<b>Total services</b>	<b>33,4</b>	<b>-10,2</b>	<b>42,6</b>	<b>-25,1</b>	<b>44,1</b>	<b>78,7</b>
<b>Total</b>	<b>36,5</b>	<b>-7,6</b>	<b>45,2</b>	<b>-23,3</b>	<b>36,7</b>	<b>103,3</b>

Source: ISTAT.

**Figure 11. Broadband penetration: European countries 2003**



Source: European Commission – IDC, 2004.

*E-business*

The diffusion and implementation of more advanced ICT applications presents a more complex picture. Simpler applications (e-mail) are used extensively by smaller firms and more advanced ones by larger firms (Websites, Intranets, Extranets). According to ISTAT data for 2003, 61% of companies had at least one e-mail address, and more than 20% had a Web site or an online page on the Internet but with considerable variation by size (Table 6). Compared to the previous year, the increase in the use of e-mail was over 10%, and there was a 5% increase in business Web sites to reach a total of 21.7% of businesses with websites.

**Table 6. Use of IT in enterprises, 2003  
percent of enterprises and change from 2002**

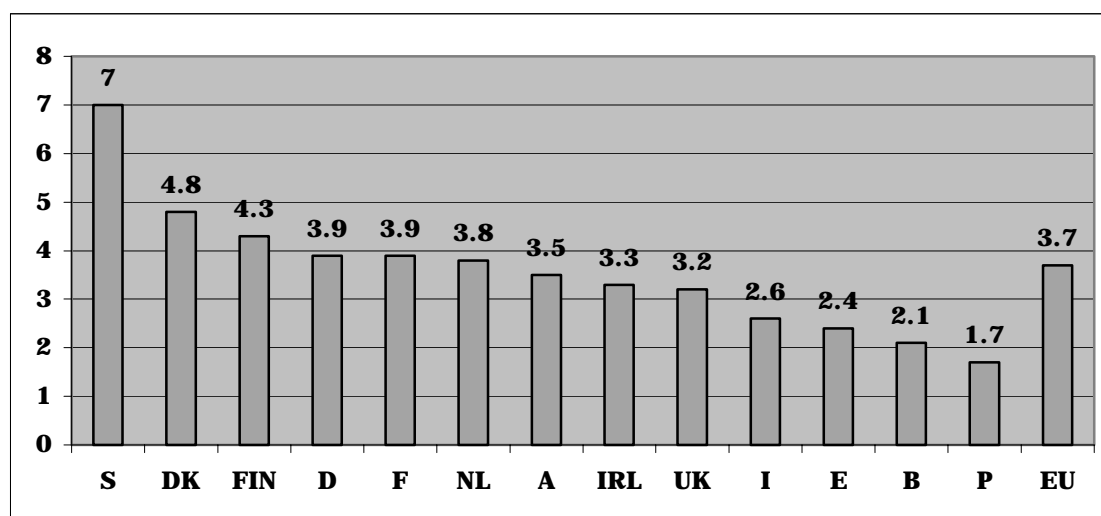
Number of employees	Total		technology					
			e-mail		Internet		Website	
	2003	Var. %	2003	Var. %	2003	Var. %	2003	Var. %
Manufacturing								
1-9	61,0	6,1	56,3	7,1	67,8	<i>n.a.</i>	22,5	2,7
10-49	95,0	1,3	78,4	1,0	84,1	4,7	49,7	4,7
50-99	99,8	0,4	94,8	0,6	96,7	1,1	76,0	1,3
100-249	99,8	0,0	98,2	0,9	98,2	1,0	83,3	4,8
over 249	100,0	0,1	99,1	0,1	99,8	0,6	87,9	5,2
<b>Total manufacturing</b>	<b>66,7</b>	<b>5,0</b>	<b>62,1</b>	<b>4,9</b>	<b>72,1</b>	<b>n.a.</b>	<b>29,9</b>	<b>2,8</b>
Services								
1-9	58,7	4,6	59,8	12,1	71,4	<i>n.a.</i>	18,4	6,8
10-49	92,5	0,3	79,8	1,8	85,3	4,9	48,2	3,3
50-99	98,5	0,1	93,6	7,6	94,8	4,4	65,4	6,1
100-249	98,6	1,7	94,9	4,6	97,3	5,4	70,0	4,8
over 249	99,5	-0,2	96,4	0,9	96,5	1,2	81,6	11,8
<b>Total services</b>	<b>59,6</b>	<b>4,5</b>	<b>60,7</b>	<b>11,5</b>	<b>72,1</b>	<b>n.a.</b>	<b>19,8</b>	<b>6,3</b>
Total								
1-9	59,0	4,8	59,2	11,3	70,9	<i>n.a.</i>	19,1	5,9
10-49	93,9	0,8	79,0	1,3	84,6	4,8	49,1	4,1
50-99	99,3	0,3	94,4	3,1	96,0	2,3	72,1	2,9
100-249	99,3	0,7	96,9	2,1	97,8	2,5	78,3	4,6
over 249	99,8	0,0	98,0	0,3	98,3	0,8	85,2	7,5
<b>Total</b>	<b>60,8</b>	<b>4,5</b>	<b>61,0</b>	<b>10,1</b>	<b>72,1</b>	<b>n.a.</b>	<b>21,7</b>	<b>5,1</b>

Source: ISTAT, Annual Report 2003.

Use of more complex e-business innovation strategies have been slow despite ICTs and the Internet offering greater scope to explore new production approaches, and develop product and process innovations and applications. Due to industrial specialisation and small firm size Italian firms tend to innovate in a “soft” sense in design, new markets and *ad hoc* solutions, and often regard technological innovation with caution and do not adopt it in their usual business activities (Figure 12).



**Figure 12. Technological innovation spending 2001  
percent of industry turnover**



Source: OECD (2002), *The sources of economic growth in OECD countries*, Paris.

Slower adoption in smaller Italian firms can be explained by a mix of demand and supply factors:

- *Sector specialisation.* Italian SMEs are essentially artisanal in origin, using highly qualified professional labour as their key resource. This has shaped an industry structure based on industrial districts specialised in "mature" sectors. This was very successful in a rapidly growing markets based on product features (creativity, aesthetics) rather than process and cost efficiency, and where technology is often secondary to personal intuition, market development, etc.
- *Financial factors.* Entrepreneur owners provide initial finance and subsequently the banking system provides debt finance. Resources are insufficient to experiment with technological innovations due to reluctance by owner-entrepreneurs to take on outside partners, and the low inclination of the financial system to finance high-risk, high-potential innovation projects.
- *Cost of investment.* More sophisticated ICT equipment requires larger investments, and only large enterprises are able to sustain such costs.
- *Supply of innovative technologies* may also be weak. Solutions offered by large multinationals are not always appropriate and specialised small providers may not be at the innovation forefront. Firms saying "the technology is not useful" may reflect available solutions not being adapted to their circumstances and needs, for example knowledge management or ERP solutions are usually designed for large companies.

Furthermore there are 6.5 millions micro-enterprises (enterprises with less than 10 employees and revenues below EUR 2 million) making up 97% of total enterprises, with 8.5 million employees (53% of the total work force) and 34% of GDP. These enterprises are the least open to ICT; they are slow in adoption and tend not to use more advanced solutions. Only 1/3 have a Web site; only 10% undertake B2B transactions and only 3% e-commerce. There are numerous obstacles as well as those above: low perception of the potential of ICT applications to the re-engineering of business processes, digital illiteracy, low propensity for ICT training, etc.

*E-commerce.* Business activities linked to e-commerce are more common among larger Italian firms. Numbers of businesses buying online have increased markedly but the number selling online has declined,

due to the decrease in small firm sellers (Table 7). Among on-line sellers, large enterprises (over 250 employees) use the Internet strategically to improve services including service quality (90.3%), process speed (85.3%) and for cost savings (73.7%), whereas small enterprises (10-49 employees) use e-commerce primarily to increase their customer base and make themselves known (80.0%).

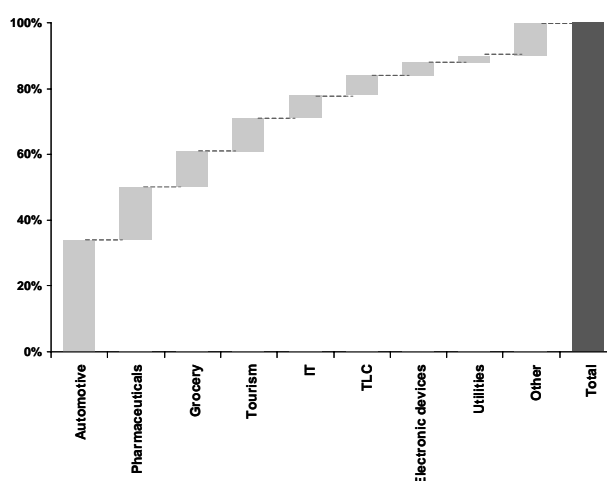
**Table 7. E-commerce by size of enterprise, 2002  
manufacturing and services and change from 2001**

Number of employees	on line purchases	Var. %	on-line sales	Var. %
1-9	7.7	20.4	3.7	-4.5
10-49	9.5	22.6	4.2	-3.2
50-99	14.4	23.7	5.8	-1.9
100-249	19.2	52.4	12.6	9.1
over 249	23.5	11.5	23.0	22.1
<b>Total</b>	<b>7.9</b>	<b>20.6</b>	<b>3.8</b>	<b>-4.1</b>

Source: ISTAT.

Business to business (B2B) e-commerce (Figure 13) reached EUR 84 billion in 2003 led by the automotive and pharmaceuticals sectors, which account for more than 50%, and the total was equivalent to 5% of transactions between companies. Electronic Data Interchange (EDI) is still the technology mainly used (70% of companies), but the widespread utilisation of the Internet is leading to a rapid increase of Internet based solutions.

**Figure 13. Sector distribution of business-to-business e-commerce, 2003**  
Percentage of B2B e-commerce

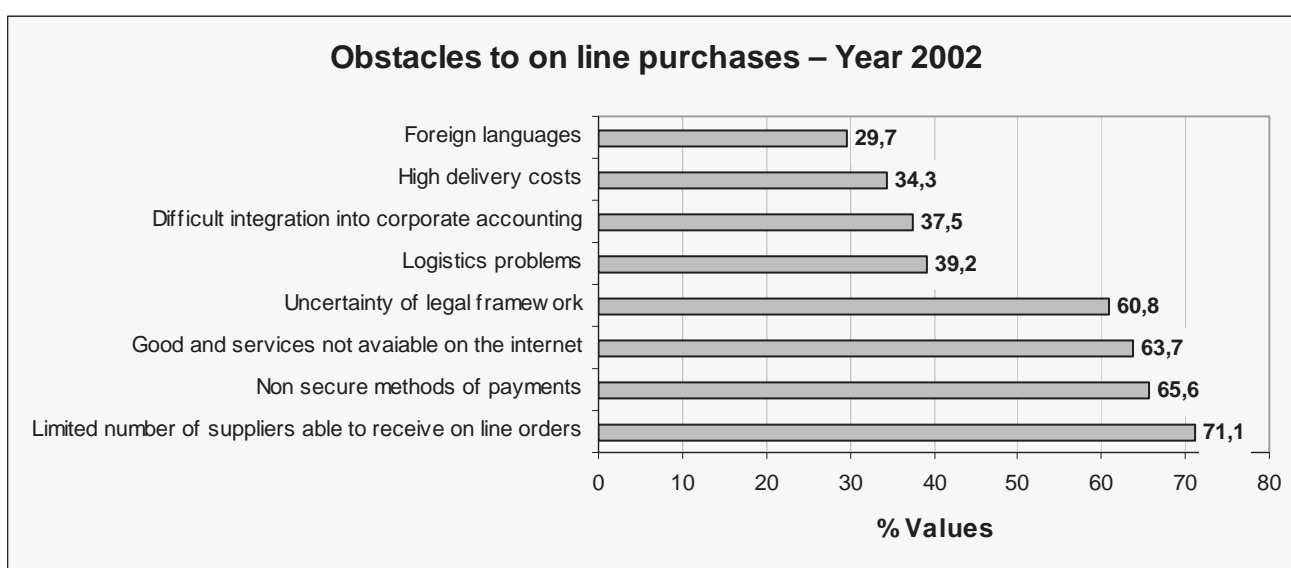


Source: Politecnico di Milano, Il B2B in Italia, 2004.

*Obstacles to e-commerce.* There are a number of reasons for the delay in more widespread use of e-commerce particularly among small firms, including lack of information, lack of trust in computerised systems (particularly towards online payment) and negative perceptions of existing legislation. These are common issues across OECD countries.

*Purchases.* The main obstacles to purchasing online are: a limited numbers of suppliers able to receive online orders (71.1%); non-secure methods of payment (65.6%); difficulty in adapting the business activities to e-commerce (63.7%); uncertainty of the legal framework (60.8%). Lesser obstacles are logistics problems, the difficulty of integrating e-commerce into existing accounting systems, high delivery costs and use of foreign language (Figure 14). *Sales.* Obstacles to online sales are similar to those for purchases: non-secure methods of payment is the most important obstacle (66.1%); limited number of clients able to make online orders (63.7%); the uncertainty of the legal framework (60.6%); and the high costs for development and maintenance of an e-commerce system (51.2%). The main difference is that for purchasers, goods and services not available on the Internet is an important obstacle (63.7%), whereas for sellers goods and services not saleable is a lesser obstacle (36.4%).

**Figure 14. Main obstacles to e-commerce purchases, 2002**  
percent of firms



Source: ISTAT, Annual Report 2003.

### ***ICT applications in services – banking and tourism***

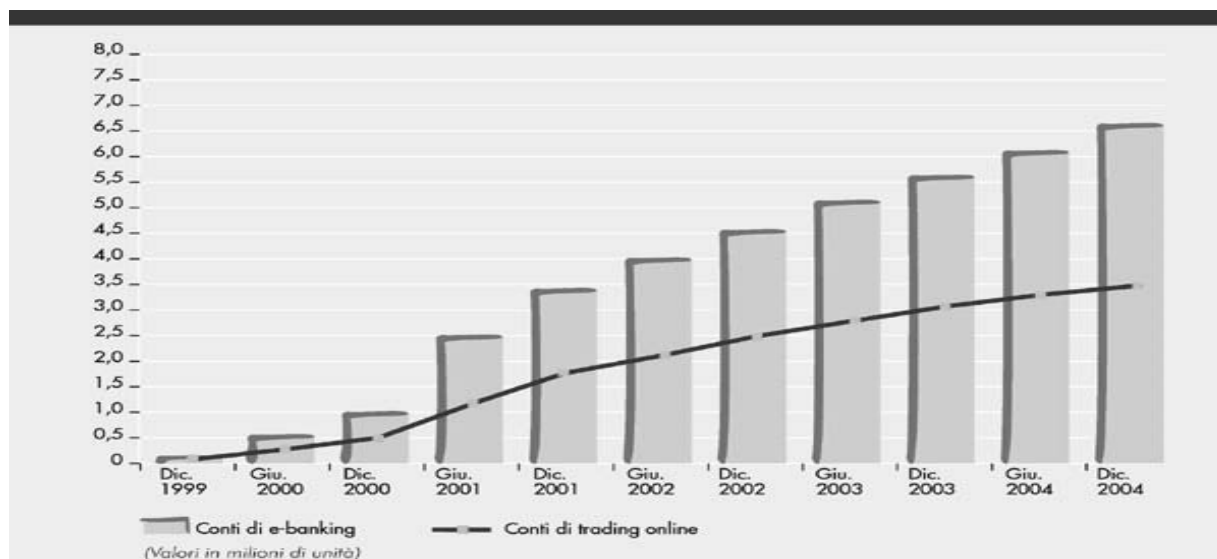
#### ***Banking***

The banking industry provides an important case for analysing the effects of ICT use at national level because of its importance (financial services make up 5-10% of GDP in industrialised countries) and because most financial services activities are based on the management and transmission of information.

The last few years have seen a radical overhaul of the banking sector in Italy following new legislation, privatisation and extensive concentration. Banks will continue to face market challenges as well as the transition to Basle II, which will involve major changes to their activities, systems and interests regulating the capital allocated to back their operations. Within this framework, the intensity of technology investment is closely correlated with the profitability of the Italian banking system; econometric analysis shows that banks with the greatest operating efficiency are those with the highest ICT investments (Rossi, 2003).

Very large investments in computerising internal banking processes have been accompanied by substantial changes in the way banks deliver services. The guiding principle has been multi channel access, and banking and financial services are now delivered through a variety of media: PCs, mobile and fixed-line telephones and multifunction automatic teller machines. These offer alternatives to delivery through traditional branches, and have reduced operating costs. Banks have also invested considerable resources in making these new services attractive to customers by reducing charges and raising interest rates.

**Figure 15. Growth in online current accounts and online trading accounts  
millions**



Source: KPMG Consulting.

The rate of uptake of electronic banking has been rapid. By June 2004 Italy had over 6 million online accounts, more than one million up from the previous year and well up from 2.5 million in June 2001 (Figure 15). Overall, one in five of the 34 million bank accounts are accessible via the Internet, and the increase of clients with more than one online bank account corresponds to the number of clients who have closed their traditional account. However, account usage is still low, with around 80% of these accounts showing little activity.

### *Tourism*

Italy has the second largest tourism capacity in the world with 35 000 hotels and an equal number of other types of visitor accommodation providing a total of two million beds. The Italian tourism industry is worth EUR 142 billion, equal to around 11.4% of GDP, and is growing at a rate of 4% per year. In terms of tourist arrivals, however, Italy comes only fourth in the world, behind France, the United States and Spain. Further, tourism revenues in those three countries is growing faster than in Italy, which suggests that they have been more successful at targeting the upper end of the tourism market even though Italy is home to a very high share of the world's cultural attractions.

Compared with these countries, Italy uses fewer electronic applications to manage its tourism flows and to maintain B2B links with major world marketplaces – Global Distribution Systems (GDS). GDS were originally created from airline booking systems (Galileo, Sabre, Worldspan, Amadeus) and progressively expanded services to include hotels and the entire tourism industry. In the international hotel sector a Central Reservation System gathers information on the availability of rooms that is fed into the

GDS. As travel agencies across the world make increasing use of GDS, countries such as Italy that are not sufficiently integrated into the network risk being sidelined.

Downstream at the B2C level Italy is also lagging in the use of electronic customer management systems. An examination of e-commerce in the tourism industry reveals that in the United States 50% of Internet users have bought at least one trip on the Internet and more than 25% do so regularly,<sup>7</sup> while 57% of travellers use the Internet to book hotels.<sup>8</sup> European Union estimates show that in Italy only 3% of the population buy a tourism product after consulting the Internet, compared with a European average of around 24%. In Italy, online sales made up a mere 0.25% of the tourism market in 2002,<sup>9</sup> compared with a European average of 2.8%.

Even so, Italy has started digitalisation of its tourism industry. Around 10% of Italian Web sites are dedicated to tourism, in line with other European countries. However, many Italian tourism Web sites lag behind the far more complete and attractive Web sites offered by countries such as Switzerland, the United Kingdom and Austria (Baggio, Website analysis of European Tourism Organisations, 2003).

### **Summary**

Overall the uptake and use of ICTs in business has been slower and less widespread in Italian business, with more advanced uptake being led by large firms with particular obstacles linked to the digital divide between small and large enterprises. This is in part due to structural factors (dominance of SMEs, the sectoral composition of industry) combined with the recent cyclical slowdown. Despite these factors, recent growth in business uptake has been rapid, the telecommunications infrastructure is well-developed and broadband uptake has been accelerating.

### **Policies for the diffusion of ICT to business: General approach**

*“The Italian Government is committed to making Italy a leader in the digital age, modernising the country through the widespread use of new information and communication technologies in both the public and private sectors and boosting its competitiveness by accelerating the spread of the online economy and developing a model of the information society based on innovation and knowledge that improves the quality of life and prevents exclusion”.*<sup>10</sup>

Taking into account the high priority attached to these goals the Italian Government established a specific governing body – the Ministry for Innovation and Technologies – to promote, encourage and co-ordinate government activities in the ICT sector.

More specifically, the Government has given top priority to removing obstacles that slow the spread of technology and its exploitation. The Government is well aware of the strategic role played by ICT in the competitiveness of Italian enterprises and is promoting initiatives that aim to increase competitiveness on international markets and improve the performance of the Italian economic system in general. The Government is also aware that ICT has an impact on the economic system as a whole. Thorough exploitation of any new technology is only feasible when this technology is accompanied by innovations in procedures, organisations and working methods, and linked with culture, skills and training.

### **Policy co-ordination**

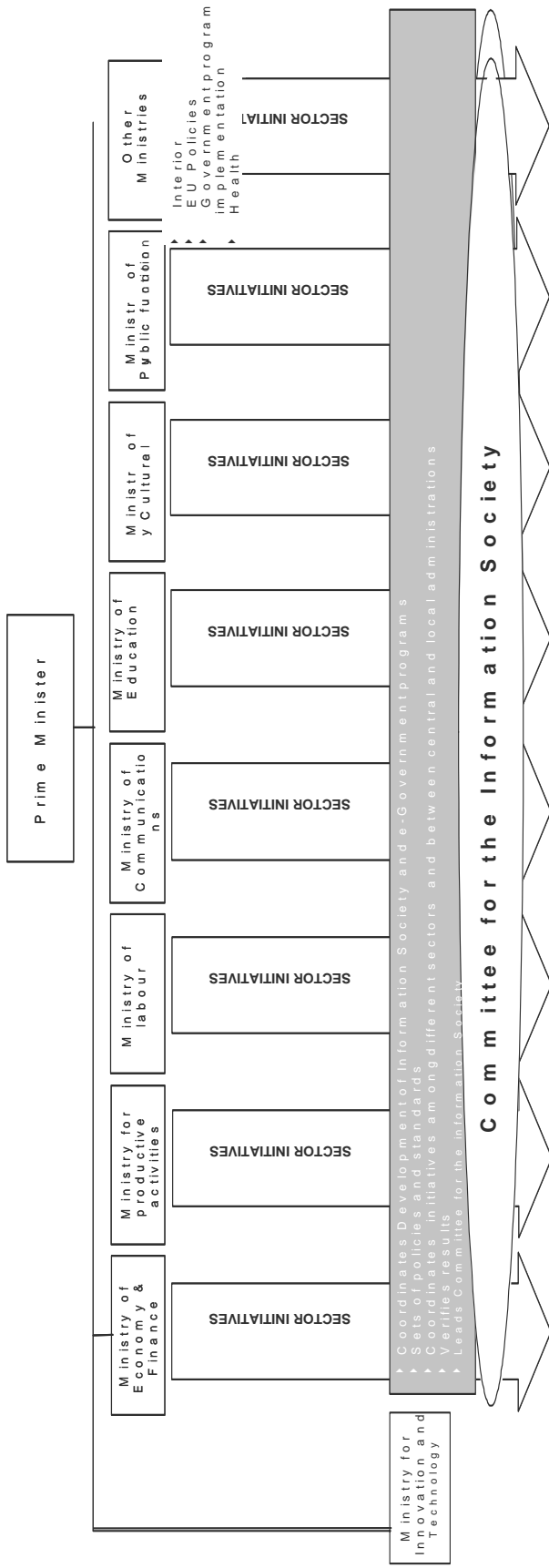
The role of the Ministry for Innovation and Technologies (MIT) is to steer, co-ordinate and encourage actions by other Public Administrations. The aim is to define specific projects, action plans and programmes for the deployment of information technologies in order to improve services to citizens and business and, generally, to enhance the economic, social and cultural conditions of the country. In order to

promote the development and use of information and communication technologies in the various sectors, a "Committee of Ministers for the Information Society" has been set up. Its tasks are:

- To oversee consistent strategies for the development of the Information Society and related policies.
- To co-ordinate the initiatives of the Public Administrations.

The Committee, chaired by Minister Lucio Stanca, is composed of the Under-Secretary of State to the Prime Minister's Office and the following Ministers (Figure 16).

Figure 16. Co-ordination between Ministries



### ***Standing Committee for Innovation and Technologies with the Regions***

In 2002 the Minister for Innovation and Technologies and the President of the Conference of Regional Presidents signed a protocol of understanding establishing the Standing Committee for Innovation and Technologies with the Regions. This initiative significantly strengthens national-level co-operation. The Standing Committee promotes the implementation of effective policies and consistent strategies in the areas of the information society and e-government by regional governments and acts as the focal point for central government departments on policies in related areas. It is composed of a Strategy Committee, which establishes policy guidelines and monitors their implementation, and a Technical Committee, which acts at the operational level on the basis of a six-monthly agenda of activities. In 2003 the Committee approved several joint projects for technological and digital modernisation and allocated a total of EUR 125 million, and in 2004 the Committee financed projects for a total of EUR 277 million. Details of projects are described below.

### ***Regional Competence Centres***

To facilitate and accelerate the development of the information society at regional level, the Department for Public Administration (DPA) and the Department for Innovation and Technologies (DIT) have established Regional Competence Centres (RCC) to develop e-government and the information society. The Regional Competence Centres encompass organisational and management aspects of e-Government, development of skills and competencies, institutional changes and other elements contributing to service innovation. Each Centre develops its own activities, with its own *modus operandi* and objectives responding to local circumstances. All centres are linked in a network to draw on a shared pool of services and assistance.

The objectives of the RCC initiative are to:

- Enhance co-operation between the Department for Innovation and Technologies and regional bodies by linking the RCCs in a national electronic network reflecting the new federalist structure, and providing support for the Standing Committee for Innovation and Technologies.
- Lend support to local government bodies and increase their competence at defining and implementing e-government and Information Society programmes and projects.
- Create and distribute integrated and shared models, instruments and approaches regarding the most critical aspects of innovation processes.
- Develop co-operation and co-ordination between various tiers of local government within regional systems and encourage inter-regional joint actions and resource-sharing.

There are 19 Regional Competence Centres in: Liguria, Calabria, Emilia Romagna, Friuli – Venezia Giulia, Sicily, Basilicata, Marche, Puglia, Tuscany, Veneto, Umbria, Sardinia, Lombardy, Campania, Abruzzo, Piedmont, Aosta, and the Autonomous Provinces of Bolzano and Trento.

### **Specific initiatives**

The Ministry for Innovation and Technologies has the role of stimulating, co-ordinating and directing government actions related to ICT. A large part of the strategy has been focused on the private sector, with the following objectives:



- Support of development and diffusion of ICT amongst small and very small companies.
- Digitalisation of industrial districts.
- The South of Italy.
- Infrastructure deployment (broadband).
- Legislative measures.

The government has directed its efforts, through the Ministry of Innovation and Technologies, at setting up and directing each initiative within a general scheme of action.

The diffusion of broadband infrastructure is one of the main goals. The strategy foresees two lines of action: incentives to stimulate investment in infrastructure, and demand stimulation through development of digital content and online innovative services. Sviluppo Italia (the National Agency for Enterprise Development and Investments) has the task of developing digital content, services, applications and broadband infrastructures, and bridging the digital divide and infrastructure gap that penalises Southern Regions. To this end the Government and Sviluppo Italia have jointly created two agencies for the promotion and rollout of broadband services and infrastructures: *Innovazione Italia* and *Infratel Italia*.

At the end of 2003, the Ministry for Innovation and Technologies and the Ministry for Productive Activities launched the “Action Plan for ICT Innovation in Enterprises”. The aim of the Plan is the promotion of ICT adoption in Italian firms with strong co-ordination of the Ministries involved.

### ***Innovazione Italia***

*Innovazione Italia* – a company entirely owned by Sviluppo Italia - was set up by the Ministry for Innovation and Technologies (MIT) to achieve the Information Society’s objectives. The company supports regional and local innovative initiatives and promotes consistency with regards to the rollout of the Information Society and e-government. *Innovazione Italia*’s objectives, projects and activities have been established in collaboration with the Ministry for Innovation and Technologies, and technical aspects and standards for projects are defined together with the National Centre for Informatics in the Public Administration (CNIPA).

*Innovazione Italia* completes, together with the DIT and the recent establishment of the CNIPA, the framework that supports the MIT for the fulfilment of the Information Society’s objectives. A steering committee formed by MIT and Sviluppo Italia representatives co-ordinates, together with the Ministry of Communication and the Ministry of Economy and Finance, the strategies for development of broadband in under-developed regions.

*Innovazione Italia*’s objectives include:

- Projects under the research programme for the Information Society and within the Broadband Programme to increase demand, and implementation of plans for the development of the Information Society (Committee of Ministers for the Information Society).
- Identification and evaluation of innovative initiatives to supply high added-value public services in collaboration with regional and local administrations and private operators. The company also acts as an incubator for new business initiatives in the high-tech sector.

- Support initiatives by Sviluppo Italia, making the most of overall resources and competencies to achieve objectives.

The Action Plan is funding the following projects: EUR 126 million for e-government and Information Society projects such as Public Access Centres for integrated online services, e-health projects and local e-government initiatives in small and medium-sized towns. EUR 150 million has been allocated to support demand for the development of broadband in the fields of e-learning in schools and the promotion of ICT in industrial districts. The aim is to develop major national projects more rapidly, together with the roll-out of large-scale policies (*e.g.* for the development of e-medicine) and increase the support offered to businesses, especially SMEs.

These projects will complement those linked to the diffusion of e-government being implemented both in Local and Central Administrations, and contribute to the promotion of more efficient federalism.

### ***The development of infrastructures and the diffusion of broadband***

In 2001 the Ministry for Innovation and Technologies and the Ministry for Communication established a Broadband Taskforce that made recommendations to reduce the digital divide. Early in 2002, the Task Force became a permanent committee to co-ordinate and direct broadband initiatives.

*Coverage of under-served areas* A five-year strategy for broadband development in Southern Italy was launched co-ordinated by Sviluppo Italia, costing EUR 1.93 million, with 60% public money. To monitor the development of broadband coverage in 2002 the Ministry for Innovation and Technologies together with the private sector established a ‘Broadband Observatory’, a three-year project.

*Financial incentives.* The Government provides a contribution to digital TV (EUR 150) and to broadband access (EUR 75). The Budget Law for 2003 contained a provision reducing the cost of buying or renting the equipment to access these networks. A subsidy of EUR 75 is available to individual or legal persons (limited liability company, stock company, partnership limited by shares, and associations, foundations, specific committees, public entities) who buy equipment for the transmission and reception of data on the Internet via broadband. The Government made the sum of EUR 31 million available for the year 2003, equivalent to some 410 000 broadband connections, and uptake was rapid. This provision was re-proposed for the Financial Bill of 2004 for EUR 30 million.

*Stimulating government usage.* SPC (*Sistema Pubblico di Connettività*) is the interconnecting network between public administrations. Currently around 20% of public administration offices have broadband and there is a target to take this to over 80% by end-2005.

*Connecting schools.* The objective is to have PC and ADSL access in 70% of the 11 000 schools by end-2005.

### ***Trust and security***

In January 2002 Minister Stanca in a directive called upon all central administrations to highlight the strategic value of information systems within public administration and reiterated the necessity of a shared “minimum base of security”. A self-diagnosis questionnaire was used to set the foundations for the development of the national system of ICT security in public administration.

To enable unified development and safe usage of ICT in different sectors the “National Technical Committee on Security in Computer Science and Telecommunications within Public Administration” has been set up. The Committee works in conjunction with the Minister for Communications and the Minister for Innovation and Technologies. Its objective is to meet international security standards for the ICT

industry. The Committee also defines the reference framework of the national security plan. The proposals and initiative of the Committee have led to the financing and planning of:

- GOVCERT.IT (Computer Emergency Response Team) for central and local public administrations has the task of assisting service continuity in the event it is compromised by hacker attacks or viruses. GOVCERT was established in May 2004 (domain name recently registered); it is funded by the Presidency of the Council of Ministers, within the National Centre for Informatics in the Public Administration (CNIPA) and co-ordinated at national and international level by the National Technical Committee on Security in Computer Science and Telecommunications within Public Administration. Its main activities are:
  1. Support for data processing through:
    1. Precautionary information
    2. Help desk
    3. Technical operational rules
    4. Seminars
  2. Operational support
    1. Assistance in case of accidents
  3. Monitoring
    1. Data gathering
    2. Monitoring of content for security purposes
  4. Co-operation with:
    1. Similar national structures (CERT-IT; GARR-CERT)
    2. International organisations
    3. National security forces
  5. Research and development

In addition, each public administration (30 Central Public Administration bodies; 40 Local Public Administration bodies) shall create an internal structure/organisation for ICT security. Approval of the National Scheme for ITSEC Common Criteria certification has been achieved through the constitution of an Organism of Certification and of the Laboratories for Appraisal that will take care of the certification of systems/products.

- The “**Centre for Training and Awareness Raising in Public Administration**” will implement a plan to inform and spread awareness of ICT security at all levels of public administration (PA).

Main activities:

1. Awareness courses for managers.
2. Specialisation courses for Security Directors and Information Directors.
3. Courses for end-users.

*Other initiatives for the public administration*

In 2002 the Interministerial Committee for a Responsible Use of the Internet was set up by the Minister for Innovation and Technologies, composed of 11 Ministries and representatives of the Regions, to address the challenging task to educate citizens and Public Administrations on the Information Highway Rules. The Committee has published a code of conduct for Public Administration with clear “do” and “don’t” rules to teach civil servants and public officials correct use of the Internet and electronic mail.

*The Internet and children*

The Interministerial Committee for a Responsible Use of the Internet, together with the Ministry for Innovation and Technologies, the Ministry of Communications and the major Internet Service Providers Associations drafted a co-regulation code to diffuse a proper responsibility culture on the part of active network stakeholders. In particular, it addresses concerns about offensive and illegal material on the Internet to protect children from exposure to unsuitable material.

*Data Protection Code*

The regulatory framework applying to the processing of personal data online has undergone major changes that are related to: *i*) the recent adoption by Italy’s Government of the New Personal Data Protection Code – which contains systematic regulations for this sector as well as transposing EC Directive 2002/58 on the processing of personal data and the protection of private life in the electronic communications sector, and *ii*) the work in progress to adopt a code of conduct and professional practice for the processing of personal data by providers of communication and information services supplied via electronic networks. Provisions regarding off-line personal data protection also apply to online activities (access, erasure, updating, objection to processing of personal data and the remedies provided therein).

The new data protection Code contains a Section (133) that specifically addresses the Internet and electronic networks. It provides that a code of conduct will have to be adopted to enhance and streamline adequate information and awareness by users of public and private electronic communication networks as to the categories of personal data processed and the mechanisms for such processing. In particular, this will operate by providing information notices online in a user-friendly, interactive manner, to enhance openness and fairness and with a view to certifying quality of privacy mechanisms and the level of security afforded. This provision will make the code of conduct a strong, innovative and flexible tool to cope with the requirements of sectors, e.g. electronic communications, liable to rapid developments that cannot be easily managed by strict regulatory instruments. Relevant operators and users will co-operate in drawing up the code, whose compliance with the data protection principles will be verified by the National Authority for privacy protection.

Finally, concerning spamming, the National Authority has ruled that sending e-mail messages is only allowed with the data subject’s express consent (opt-in principle). Following user complaints, the Authority blocked data banks of companies that had sent several advertising and promotional e-mail messages without previously obtaining the recipients’ express, specific and informed consent.

*Digital signatures*

The introduction of digital signature is one of the principal initiatives in the area of trust and security. Italy has recently adopted European regulations revising the law approved in 1997. The potential impact of the digital signature is in terms of efficiency and effectiveness for the enterprises and individuals that adopt it, and above all for the public administration.

In 2003 the MIT objective of issuing over 1 million digital signatures was achieved, and initiatives aimed at stimulating diffusion are increasing. End-2003 1.12 million digital signature tools had been distributed by Certification authorities, in part due to new laws which systematically introduce electronic documents as the sole work-tool for the PA, enterprises and citizens.

The main users of digital signatures are enterprises, officials of the central PA, and notaries. The use of digital signatures is compulsory for enterprises registering with the Companies Register and guarantees standard processes and faster procedures. It is estimated to bring savings for companies (on archiving, postal and travel expenses) of approximately EUR 260 million per year. In 2003 the Chambers of Commerce and the professional and trade associations issued 590 000 certificates, more than twice as many as the previous year (278 000); the National Forensic Council has distributed over 130 000 digital signatures to registered lawyers, for accessing electronic records and exchanging electronic trial documents with the Law Courts and legal representatives of the interested parties.

In the public administration, the *Carabinieri* Corps has distributed over 10 000 digital signatures for updating the local regimental roll-books; the Ministry of Economy and Finance has distributed over 2 000 digital signatures for electronic payment of wages and is experimenting in the pre-legislative activity of its Accounting Office and for the IT protocol; the Ministry of Justice has distributed over 4 000 tools to its officers for e-justice procedures. Other users include the Presidency of the Council of Ministers, the Ministry for Culture and the Italian Civil Aviation Authority, which also use the tool for identification purposes (source CNIPA). A new initiative in the health field regards the electronic transmission of medical/case history reports between hospitals, local national health service offices and General Practitioners, from whom it will soon be possible to pick up the reports directly.

The government has also launched other initiatives to diffuse the use of electronic signatures:

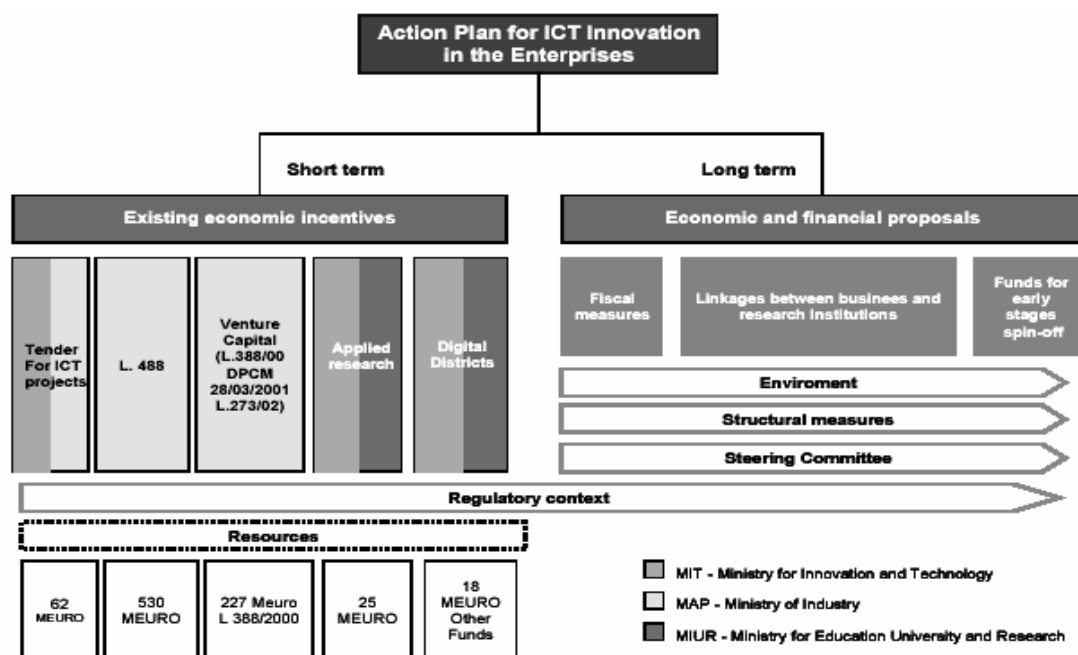
- The online publication of calls for tenders and notices of competitions amongst public administrations to substitute their paper publications.
- The diffusion of electronic post that has been assigned an electronic signature.
- The possibility of associating the digital signature with an electronic ID card.

#### ***Small firms: The Action Plan for ICT Innovation in Enterprises***

The Plan was introduced at the end of 2003 and includes legislative measures and projects aimed at promoting the diffusion and adoption of ICT with priority to small businesses (see Diagram below and [http://www.innovazione.gov.it/ita/documenti/Piano\\_innovazione\\_digitale\\_impresa.pdf](http://www.innovazione.gov.it/ita/documenti/Piano_innovazione_digitale_impresa.pdf); [http://www.ipi.it/allegati/quartino\\_ING.pdf](http://www.ipi.it/allegati/quartino_ING.pdf)).

The main objectives of the Plan are to:

- Increase innovation in the ‘made in Italy’ sectors through the use of ICT to stimulate competitiveness.
- Implement a policy of support for the development of selected high-tech sectors.
- Improve the functioning of the Italian business system, turning it into a fertile environment for research, technological development and innovation.
- Facilitate technology transfer from public research centres to enterprises.



The Plan foresees legislative, financial, procedural, organisational, training and promotional measures. It is designed to be user-friendly for SMEs, and applicable to specific investment to help encourage locally-based aggregation or vertical integration among SMEs. The Plan has four priorities:

1. Provide support for investment spending on digital innovation.
2. Promote co-operation between the private sector and universities and R&D institutes to boost technology transfer.
3. Provide innovative financing schemes, the use of market financial tools and private-public partnerships.
4. Co-ordinate different policies and different levels of Government to insure that the administrative resources of local and central Government are better used.

#### Main initiatives

Short-term interventions include economic/financial and regulatory measures. The following are particularly significant for the development of ICT investment and applications:

- *Fund to boost innovation in the ICT sector* (call for tenders for innovation amongst small and medium industries – L. 46/82, Ministry for Productive Activities together with the Ministry for Innovation and Technologies). This new kind of intervention is aimed at financing projects focused on efficiency improvement of SMEs, by the application of ICT to their organisation. To finance this scheme the sum of EUR 62.8 million has been allocated for initiatives selected on the criteria of innovativeness and impacts on productivity. The initiative has been very successful in terms of uptake with more than 2 000 firms and 500 universities/research laboratories and other institutions participating with total project costs of EUR 1 billion (Table 8).

**Table 8. Enterprise participation in the ICT innovation fund**

Geographic area	No. of projects	Total costs (EUR million)	No. of companies	No. of universities
Centre	232	261	661	134
North	504	529	1025	262
South	142	207	508	89
Total	878	997	2 194	485

Source: Ministry for Productive Activities.

- *The law no. 488 of 22 October 1992* (Ministry for Productive Activities) provides investment incentives to firms located in areas ranked to be objectives 1 and 2 (Southern Italy and depressed areas of the Centre-North). The law aims at increasing productivity and employment in productive sectors through long-term funding. Projects focus on: construction, enlargement and upgrading of productive plants; enterprise restructuring; the activation of inactive plants; delocalisation. To increase ICT investments, projects must be evaluated and awarded using a new ICT indicator in addition to existing indicators. Project ranking is determined by an indicator that measures the innovative technology content. The ICT indicator is the ratio between the total amount of ICT and patent expenditure eligible to be financed and the investment. Special attention will be devoted to projects that increase skilled staff. The allocation of incentives is shown in Table 9.

**Table 9. Allocation of investment incentives for 2003: Law 488/92**

General Industry			
Number of applications	Investment (EUR millions)	Incentives (EUR millions)	Employment increase
2.919	7 180.31	1 557.96	43 674
Tourism sector			
757	1 844.24	441.34	13 064
Commerce			
441	226.39	65.12	3 299

Source: IPI (Institute for Industrial Promotion) based on data from the Ministry for Productive Activities.

- *Calls for tenders in R&D* (ex art. 56 Budget Law 2003). The budget law of this year provides for a fund for applied research. The Ministry for Education, University and Research in collaboration with the Ministry for Innovation and Technologies has published a tender of EUR 25 million which draws from the FAR (Fund for Research Aid) funds, for projects for the promotion of digital innovation technology in enterprises – in particular in SMEs, to enhance their competitiveness. In order to be eligible for the funding enterprises need to feature technologies aimed at redefining organisational and technological processes of the industrial districts, as well as of integrated logistics systems for networks of SMEs. The proposed research themes are:
  - Development of innovative ICT platforms aimed at new processes and technologies for districts and industrial supply chains.
  - Intelligent logistic systems for SMEs.
- *Innovation in depressed regions*: (May 2004). The Ministry for Productive Activities has funds of EUR 380 million for promoting innovation in enterprises in depressed areas. Two Plans have been developed. The first, PIA (*Pacchetto Integrato di Agevolazioni* – Integrated Incentives Plan), is directed at the South and is aimed at helping enterprises through the various phases of innovation technology, from research to the industrialisation of the results, to staff training and development. Resources: EUR 335.4 million, of which 70% for SMEs. The second, call for

tenders – L. 46/82, is aimed at sustaining programmes of highly innovative pre-competitive development in SMEs in the depressed areas of the Centre-North, with the exception of Lombardy, which has a separate plan. Resources: EUR 41.8 million for medium/high technology sectors.

- *E-commerce and Quick Response Thematic Tender* Law 388/2000 art. 103 c.5 and c.6 (27 February 2003). The Ministry for Productive Activities programme encourages enterprises to adopting e-commerce (B2C and B2B) and electronic connections. The aim is to close the “infrastructural” and “cultural” gap of Italian enterprises concerning e-commerce and e-business. In 2003 for the e-commerce tender there were 6 193 applications submitted by a total of 8 482 enterprises (6 378 small, 1285 medium, 819 large) for EUR 88 million of investment. For the Quick response tender there were 602 applications submitted by 932 enterprises (504 small, 270 medium, 147 large) for a total of EUR 92.7 of investment.
- *Venture Capital*. The Action Plan includes special short-term measures aimed at facilitating access to venture capital for new business and for SMEs in disadvantaged areas. The government-supported venture funds to finance innovative ICT projects are allocated to banks or other financial institutions to acquire small or temporary holdings. The Ministry for Productive Activities has allocated EUR 202 million of which EUR 70 million for the ICT sector.
  - Shares must be acquired in new enterprises, or in SMEs located in objective 1 and 2 areas (Southern Italy)
  - Enterprises must be public limited companies and be able to face financial obligations as foreseen in investment plans.

Eligible projects:

- 1) In the case of the new enterprises:
    - Innovative development projects with a high technological impact.
    - Projects to develop ICT products and services, including network software, innovative software, and development of multimedia content and interactive distance training.
  - 2) In the case of SMEs located in objective 1 and 2 areas:
    - Funds are advanced to acquire temporary or minority shareholdings. These must be newly emitted and represent at least 20% of the social capital and can be held for a period up to seven years. Funds cover 50% of the holding up to EUR 2.06 million for any single investment. When holdings are realised borrowers repay 50% of their profits.
    - Funds can be used by banks, financial intermediaries and Financial Enterprises for Innovation and Development (*Società finanziarie per l'Innovazione e lo Sviluppo* (S.F.I.S.)).
- *Central Guarantee Fund for SMEs*: This guarantees medium-term investments in innovation and technology in the organisational and commercial fields. Funds available: EUR 60 million to guarantee investments of EUR 1.5 billion by at least 7 000 enterprises. The guarantee *can* be cumulated with other incentives within EU limits, allowing greater leverage for investment funding.



*Regulatory measures* include:

- A consolidation act for patent rights to improve the functioning of the current complicated system.<sup>11</sup> Measures include: *a)* an Act on industrial patent protection to provide a simplified and unified framework; *b)* establishment of 12 special courts for dispute on industrial patents (Law 168/2003); *c)* reorganisation of the Italian Patent Office (EUR 5 million allocated). The Ministry for Productive Activities has also a number of initiatives for completion within two years with the following objectives:
  - Electronic patent filling. The simplification of procedures and creation of an online patent system available to users.
  - Publication of a patents and trademarks gazette.
  - Activation of the opposition procedure (for trademarks).
  - An electronic trademark registration procedure is being elaborated with the aim to speed up registration and to protect against forgery.
- An Interministerial Commission has been established with the aim of reinforcing computer anti-piracy legislation for intellectual digital products. The Commission will draw up a report on sector problems, as well as suggestions for legislation that is increasingly necessary.

#### ***Other initiatives***

These initiatives are not part of the Action Plan for ICT Innovation in Enterprises.

#### ***The “Tecno-Tremonti” Act***

The measures included in the “Tecno-Tremonti” Act aim at facilitating R&D investments, stock exchange listings, exports and student internships. The Act’s tax incentives start from 2 October 2003, when Decree 269/2003 came into force. All parties in business (*i.e.* subjects with corporate revenues) at that date may benefit from the Decree; craftsmen and professionals are excluded. The reduction consists in a tax cut on corporate revenue for the following costs:

*Investments in R&D.* The Act introduces a new tax-cutting package for investments in R&D, with the deduction from the taxable base of 10% of reinvested profits and 30% of the amount exceeding the average investments made in the previous three years. Comma 6 of the Act establishes a maximum limit to such benefits: the tax cut can only be applied to 20% of the average taxable revenue of the 3 previous years, without counting loss-making periods.

**Example:** a taxpayer’s revenues for the tax period 2001-2002 are 20 and 80 respectively, with a loss of 40 in 2003. R&D investments in 2004 amount to 30, whereas in the previous 3 years there is no R&D. The tax cut therefore is:

- 10% of R&D costs = 10% of 30 = **3**
- 30% of the amount exceeding average R&D in the previous three years (equal to 0) = 30% of 30 = **9**

Total tax cut = **12**

Maximum limit = 20% of the average investments made in the previous 3 years excluding the loss period = 20% of  $(20 + 80)/2 =$  **10**

The taxpayer will benefit from a tax cut equal to **10**.

- *IT innovation investment carried out by consortia of SMEs.* The same measures that apply to R&D investments are applicable to the costs incurred by SMEs (as defined by the EU) that aggregate in clusters of at least 10 in order to develop synergies in IT innovation. The tax cut must be approved by the EU Commission (as per art. 88, par. 3 of the Treaty of the European Community).
- Expenses for participating in fairs/exhibitions abroad.
- *Costs incurred in internships for students.* The tax cut is equivalent to the total amount of incurred expenses, including the students' remuneration (for which there is also the ordinary corporate tax reduction).
- Costs incurred for listing on the Stock Exchange.

*Sectoral projects: Innovation in the tourism industry - Italy.it*

Because of weaknesses in digitisation of the Italian tourism sector (see above) *Innovazione Italia* is implementing an integrated digital tourism system (Italia.it) proposed by the Ministry for Innovation and Technologies, Ministry for Productive Activities, Ministry of Economy, and Ministry for Cultural Heritage in the Committee of Ministers for the Information Society. It has funding amounting to EUR 140 million for its start-up phase (2004-2006). The project aims at:

- Aggregating operators and resources within tourism areas which are highly fragmented.
- Promoting more attractive territorial marketing.
- Intercepting demand in real time.
- Creating Web-based business intelligence (a Tourism Observatory).
- Reducing seasonal fluctuations in the industry.

*ICT and micro-enterprises*

Because of particular weaknesses in micro-enterprises (see above), within the Committee of Ministers for the Information Society, the Ministry for Innovation and Technologies, the Ministry for Productive Activities and the Ministry of Economy, a project is proposed with funding of EUR 13 million for the period 2004-2006, aimed at:

- Boosting B2B e-commerce with technical, organisational and managerial training, and consulting through sector associations.
- Fostering the digitalisation of micro-enterprises in their transactions with the Public Administration through electronic one-stop-shops.

*Digitalisation of districts in disadvantaged areas*

The Ministry for Innovation and Technologies with the funding from the Interministerial Committee for Economic Planning (CIPE) is implementing measures in favour of *digitalisation of districts* in disadvantaged areas focused on the textile, clothing and food sectors. These provisions aim to promote the spread of new technologies for redefinition of production procedures, and exchange of information between enterprises. This is supported by EUR 19.5 million for textiles and EUR 19.4 million for food.

***E-procurement: CONSIP***

Consip SpA, wholly-owned by the Ministry of Economy and Finance, provides consultancy, assistance and IT solutions aimed at innovation in Public Administration. Goals are to:

- Promote change and modernisation in the Public Administration at both the state and local levels.
- Support the development of the Information Society in Italy through the widespread use of information and communication technologies (ICT).
- Innovate and rationalise the information system, the procedures and the organization of the Ministry of Economy and Finance and other Ministries.
- Implement an e-procurement model, improving the efficiency and the effectiveness of public procurement, through strategic use of ICT.

The programme brings digital innovation to both the public sector and suppliers, speeds up the procurement process and reduces average prices with direct benefits for both public and business sectors.

***Government procurement services***

Government employees can select and purchase online many categories of goods and services. Consip uses advanced e-purchasing models (electronic catalogues, online auctions, marketplace) as well as standard framework agreements, and provides buyers and suppliers with technology, knowledge, consultancy and technical support using complementary approaches:

- Electronic marketplaces. Consip chooses product categories, manages the technical platform and qualifies products that allow any supplier to participate.
- Online auctions.
- General contracts, to procure ICT goods and services such as fixed and mobile telephony, PBX, VA services, LAN etc.
- Targeted consultancy on procurement and governance strategies.

***Environmental measures***

Contextual measures aim at developing an environment into which new technologies can be easily introduced, and at removing obstacles that hamper their diffusion, promotion and optimum use. These include measures aimed at diffusing a digital innovation culture and increasing awareness of benefits derived from new technologies. The most significant of these initiatives are:

- The Ministry for Productive Activity's plan for the promotion of e-business involving the principal means of communication in 2004.
- A programme of raising awareness and providing information and training for small and medium enterprises.

Finally, are the organisational/management measures to co-ordinate and manage policies both at central and local level of vital importance. These include:

- Stable co-ordination between the ministries responsible for innovation and the development of technology.
- Co-ordination between regions and local governing bodies that are becoming increasingly important with federalism.

- *e-Business committee* for *e-business* promotion. The Ministry for Innovation and Technologies and the Ministry for Productive Activities are committed to implement legal and financial measures aimed at sustained diffusion of *e-Business* innovations amongst SMEs and citizens through partnerships between business, consumers, trade and industry associations, and public authorities.

### ***Support for internationalisation and market access***

The loss of competitiveness in international markets has led to a reduction in exports and the Italian market share of international trade. The current economic situation is a partial explanation. But it is also due to the difficulty of Italian companies, especially small businesses, in gaining access to international networks due to lack of information and adequate structures to exploit market opportunities. The Internet is an extremely effective instrument of information and communication to help overcome these difficulties.

The Foreign Ministry and the Ministry for Productive Activities have set up a project to rationalise the supply of information to aid the internationalisation of Italian firms. The project foresees:

- The development of an information portal for Italian small businesses that are setting up projects for expansion abroad.
- Training activities dedicated to entrepreneurs, above all in underdeveloped areas in the country, on how to use computerised tools.

A feasibility study is already in an advanced stage. The implementation of the portal is foreseen before the end of 2004. Another initiative is the definition of a database and process re-engineering to simplify customs activities for import/export.

### ***Public sector use of ICTs: The enterprise portal***

The enterprise portal is part of the e-government plan for the modernisation of the Italian public administration. This is designed to facilitate and rationalise communication between businesses and the central and local administrations that regulate their activities ([www.impresa.gov.it](http://www.impresa.gov.it)). In particular the initiative is aimed at developing administrative “middleware”.

The system is jointly managed by the Chambers of Commerce, Ministry for Productive Activities and the Ministry for Innovation and Technologies and is being tested in three provinces (Milan, Verona and Catanzaro) by major professional associations: CNA (the national confederation of craftsmen), Confartigianato (General Federation of Italian Artisans and Craftsmen), Confcommercio (General Federation of Italian Merchants and Shopkeepers), Confesercenti (Confederation of Trade and Tourism) and Assolombarda, that operates on behalf of client enterprises.

Quantitative evaluation has shown that work time of the system users has decreased by 60% for identification data, and by 30% for the use of data already present in the public archives. Forms may be transmitted electronically, eliminating the necessity of physically delivering documents, floppy discs etc. Benefits achieved so far should increase substantially with the participation of other administrations (Finance, Health, Ministry for Productive Activities etc.) and the announced participation of more.

Finally, the completion of the e-government initiative will encourage the expanded use of existing infrastructures, and the achievement of substantial saving in administrative costs.

## Conclusions

The structural characteristics of the Italian economy have a major role in shaping policies for ICT diffusion to Italian businesses. The level and speed of diffusion of new technologies are determined by the sectoral distribution of industry, the small size of businesses, and major regional variations in industry structure and resources. Overall, the telecommunications infrastructure is good, the growth of the Internet and broadband has picked up and computerisation is spreading despite the poor economic performance and government budget constraints that have not favoured investment.

A major element in the policy setting is the government's awareness of the strategic importance of ICT to the Italian economy, and the decision to make ICT diffusion and adoption a policy priority. This new priority for ICT led to the formation of the Ministry for Innovation and Technologies to strengthen and focus policy co-ordination and guidance developed and promoted in the last two years. However, the task of the Ministry is far from simple, particularly because of severe budgetary constraints. Many planned projects have been deferred or scaled down, reducing the potential impact of new policies and programmes. A further element in the policy setting is the devolution of authority and fragmentation of responsibilities, which complicates decision-making and potentially reduces national impacts of policies.

The government can play a role in closing the gap between Italy and leading countries. The policy agenda must, however, focus on the main problems and identify appropriate actions within government budget constraints. The identified priorities are to: improve awareness of the benefits of ICT among entrepreneurs and small businesses; promote an environment that provides incentives for the growth and development of companies; ensure national broadband coverage to enable diffusion of new technologies and innovative services; develop frameworks that provide incentives for the diffusion and effective use of ICT.

## Strengths

Italy has a set of positive elements that can help diffuse ICTs to business, even if the economic structure is not everywhere conducive to diffusion. It can build on these strengths to accelerate the diffusion and effective use of ICTs by business. These positive elements include:

- Italy has established strengths in traditional industries, and well-established industry associations and networks to help diffuse new technologies through its small firm base.
- The diverse nature of the Italian economy, including the North-South divide, provides opportunities to learn from a very wide range of experience in policy design and implementation.
- The telecommunications infrastructure is well-developed, broadband is beginning to diffuse rapidly and uptake of ICTs is increasing.
- Diffusion of ICT has become a priority of the government's policy agenda, and the strategic importance of diffusion of ICT has been clearly recognised.
- ICT diffusion policy is co-ordinated and focused in the Ministry of Innovation and Technologies to improve policy delivery and strengthen the shift away from more traditional established industry policies.
- A range of new initiatives has been introduced aimed at accelerating ICT infrastructure coverage and increasing ICT uptake, including the broadband incentive to increase uptake of high speed connections more widely across the economy.
- The Action Plan for ICT Innovation in Enterprises is designed to diffuse ICTs and innovation more widely through the small firm economic base, focused on major weaknesses in traditional industries and the small firm sector.

- Digital signatures are being used increasingly and the government is experimenting with an enterprise portal designed to modernise and rationalise communication between business and central and local government, and there are various projects aimed at widespread diffusion of ICT (citizens, schools, health service etc.) that will also benefit business.

### **Weaknesses**

There is a range of constraints in the business environment and on policies to enhance diffusion of ICTs to business and improve business performance. These include:

- There is low willingness by entrepreneurs to invest in ICT, often due to weaknesses in the basic technical competence that is necessary for the diffusion and exploitation of new technologies, particularly more advanced applications.
- Lack of investment in business R&D is a problem. Business R&D stagnated over the last 10 years. Coupled with this, there is a shortage of financing of risk and new ventures particularly for ICT ventures.
- ICT education and the use of ICT in schools are low. In-firm training is weak and ICT-related in-firm training needs to be boosted to improve skills and exploit the potential of ICT.
- Lack of flexibility in labour markets. New kinds of labour arrangements may be needed to complement and help develop new kinds of professional skills and competences.
- The complex system of central and local administration is becoming even more complex with devolution and consequent fragmentation, potentially reducing the impact of national programmes.
- Budget constraints have led to the deferral and scaling down of already defined and introduced programmes. This is combined with unstable and temporary incentives, often one-off incentives lasting one year, which are difficult for businesses, particularly small ones, to benefit from in a coherent way.
- Rigorous monitoring and evaluation of impacts of policies is scarce, in part due to the lack of information and quantitative data on the uptake and impacts of ICT.

### **Recommendations**

Greater focus on the business environment and on the framework for diffusion is needed, to complement improved co-ordination mechanisms and micro policies already introduced. Specific recommendations include:

- *The co-ordination and direction of ICT policies* may need further reinforcement both among national government ministries and bodies, particularly in the light of the current devolution, which tends to fragment national programmes.
- *Increase the legitimacy of government programmes.* Lack of programme continuity and consistency is widely seen as an issue. Some of the current grant programmes could be replaced for example by longer-term tax incentives for in-firm training related to ICT upgrading.
- *Broadband access* needs continuing attention, to ensure widespread national coverage, and competitive conditions in broadband networks need careful monitoring.
- *Foster an environment that promotes development of digital content, applications and services.* The development and deployment of digital content, software applications, and other services

will help achieve the potential benefits of broadband, but it also requires adequate, effective and balanced intellectual property protection.

- *Incentives for business R&D need re-evaluation*, taking into account the structural features of Italian industry to ensure that any incentives are effective. Collaboration between industry and universities/government research bodies needs to be improved and the incentive structures for such collaboration reviewed and strengthened.
- *ICT education and the use of ICT in schools* need much greater attention and considerable upgrading. It is suggested that the experience with teacher training in other countries should be studied and adapted to Italian circumstances. Italy is lagging in terms of the scientific and technological training of the workforce, and specific training programmes need to be defined and implemented.
- *Foster awareness of the benefits of ICT among Italian businesses*. This can in part be achieved by simplifying government interactions with the business sector to improve efficiency, and provide demonstrations for small firms.

*Firms need to evolve towards more sophisticated business models and advanced applications*. Firms have focused on traditional investments and process innovation to reduce labour costs, and this needs to change towards growth-oriented investment and product innovation. There is a major problem of measuring and valuing intangibles/intellectual capital in small and new firms and there may be scope for government initiatives in some areas, particularly to encourage risk finance.

- *Public use of ICTs and broadband needs to be improved* in areas of major government responsibility including e-government, e-education, e-health. Co-ordination initiatives are slow and need to be more forceful. An area for further improvement is in firm entry and start-up, where a stable, transparent and simplified framework is necessary. The enterprise portal being developed is a good start but needs major extension to facilitate “one-stop-shop” approaches for company start-up, registration, etc.
- *More rigorous systems to measure and evaluate policies* are needed to improve policy design, delivery and impacts.

## NOTES

<sup>1</sup> ISTAT, *Annual Report*, 2002.

<sup>2</sup> Normann, R., *Reframing Business*, Wiley, 2001.

<sup>3</sup> ISTAT, *Annual Report*, 2002.

<sup>4</sup> ISTAT, *Annual Report*, 2003.

<sup>5</sup> ISTAT, *Annual Report*, 2002.

<sup>6</sup> European Commission, research conducted by 19 international research institutes.

<sup>7</sup> *Scarborough Research*.

<sup>8</sup> *Source*: Travel Industry Association (TIA).

<sup>9</sup> Magda Antonioli Corigliano, *Turismo e tecnologie dell'informazione e della comunicazione*, in *Italia.ICT*, SMAU, 2003.

<sup>10</sup> *The Government's Guidelines for the Development of the Information Society*, June 2002.

<sup>11</sup> A recent Eurostat *Statistics in Focus* Report showed that the share of the ICT sector in the total number of patent applications to the European Patent Office (EPO) from EU-15 was 2-3 times larger than that of 1991. In particular Italy has registered 259 ICT patents, of which 62% in the field of communications, and 10% concerning basic electronic circuitry. These are above the European average by 3 percentage points and 2 percentage points respectively.

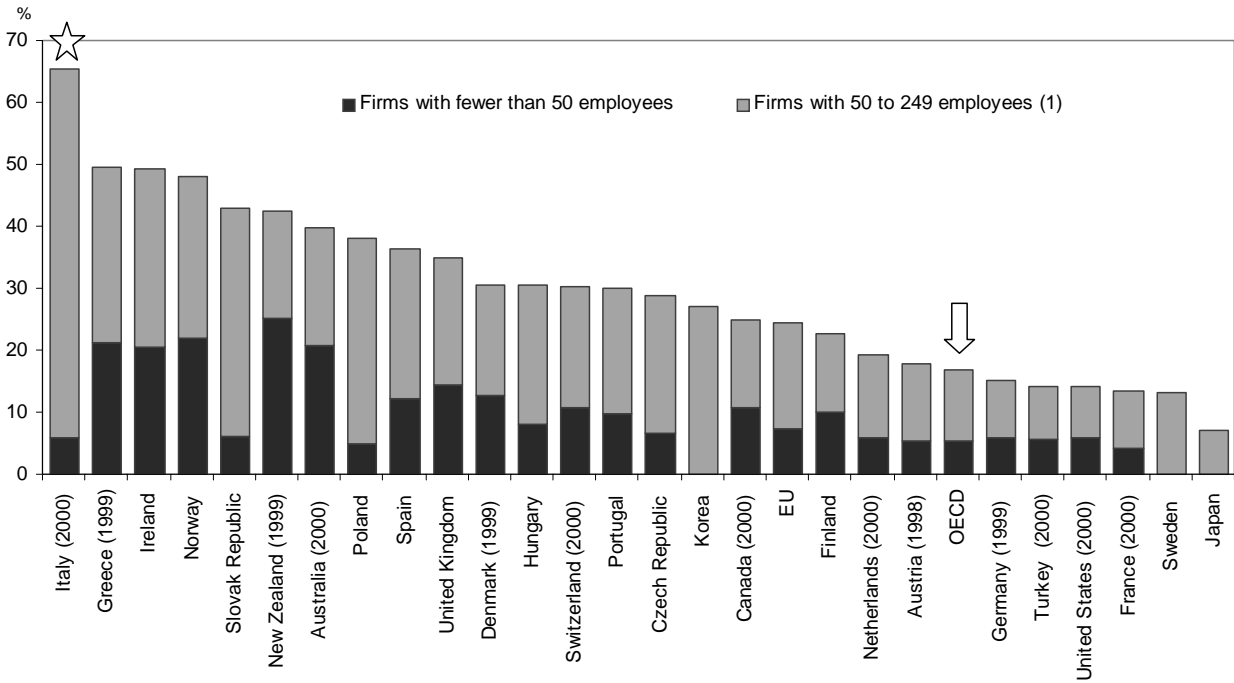


## BIBLIOGRAPHY

- Ciret Politecnico (2002), *Italy's New High-Tech Enterprises*, 1st RITA Report, 2002 edition.
- ISTAT (2002), Annual Report, Rome.
- ISTAT (2003), Annual Report, *La Situazione nel Paese*, Rome.
- Milana, C. and A. Zeli (2002), "Productivity Slowdown and the Role of ICT in Italy: a Firm-Level Analysis", ISAE Working Papers, Rome.
- MIT (2003), *Report on Innovation and Digital Technologies in Italy*, Research and Studies Unit of the Minister for Innovation and Technologies, Rome.
- MIT (2004), *Statistical Report on the Information Society*, Research and Studies Unit of the Minister for Innovation and Technologies, Rome.
- MIT (2002), *The Government's Guidelines for the Development of the Information Society*, June 2002, Rome.
- Normann, R. (2001), *Reframing Business*, Wiley.
- OECD (2001a), *Drivers of growth: Information technology, innovation and entrepreneurship*. Science, Technology and Industry Outlook Special edition, OECD, Paris.
- OECD (2001b), *The new economy: Beyond the hype*, OECD, Paris.
- OECD (2003a), *ICT and economic growth: Evidence from OECD countries, industries and firms*. OECD, Paris.
- OECD (2003b), *OECD Communications Outlook 2003*, OECD, Paris.
- OECD (2003c), *OECD Economic Outlook*. No. 74, December 2003, OECD, Paris.
- OECD (2003d), *Seizing the benefit of ICT in a digital economy*, OECD, Paris.
- OECD (2004a), ANBERD (Analytical Business Enterprise Research and Development) database. OECD, Paris.
- OECD (2004b), *OECD Economic Outlook*, No. 75, June 2004, OECD, Paris.
- OECD (2004c), *OECD Information Technology Outlook 2004*, OECD, Paris.
- Politecnico di Milano (2004), *B2B in Italy*.
- Rossi, S. (2003), *La nuova economia: i fatti dietro il mito*, Bologna, il Mulino.

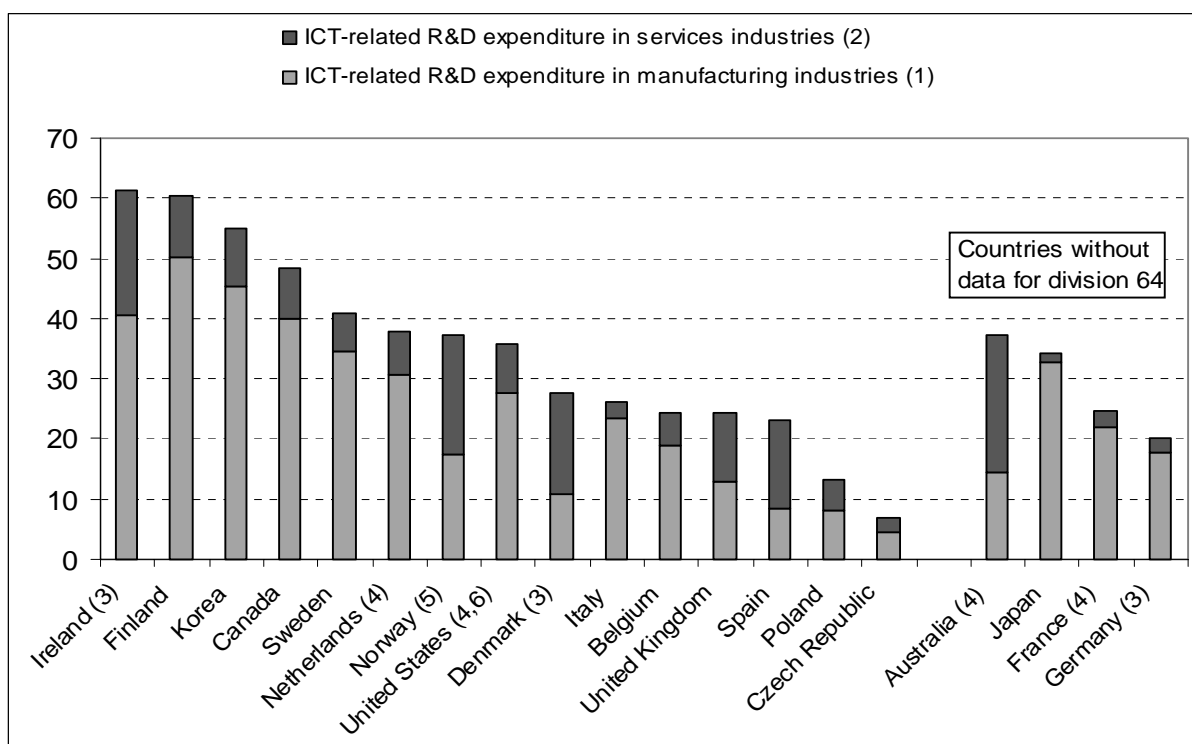
ANNEX

SMEs R&D expenditures, share of total business sector R&D



Source: OECD, ANBERD database.

## ICT-related R&amp;D expenditures as share of total business R&amp;D, 2001 or latest year available



## Notes:

1. 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).
2. ISIC, Rev. 3 divisions: 64 (post and telecommunications) and 72 (computer and related activities).
3. 1999 instead of 2001.
4. 2000 instead of 2001.
5. 1997 instead of 2001.
6. Due to unavailability of data for division 64, class 642 (telecommunication) is included in services ICT R&D as a proxy. Available information shows that in the United States class 642 accounts for about 97-98% of division 64 total.

Source: OECD, ANBERD database.

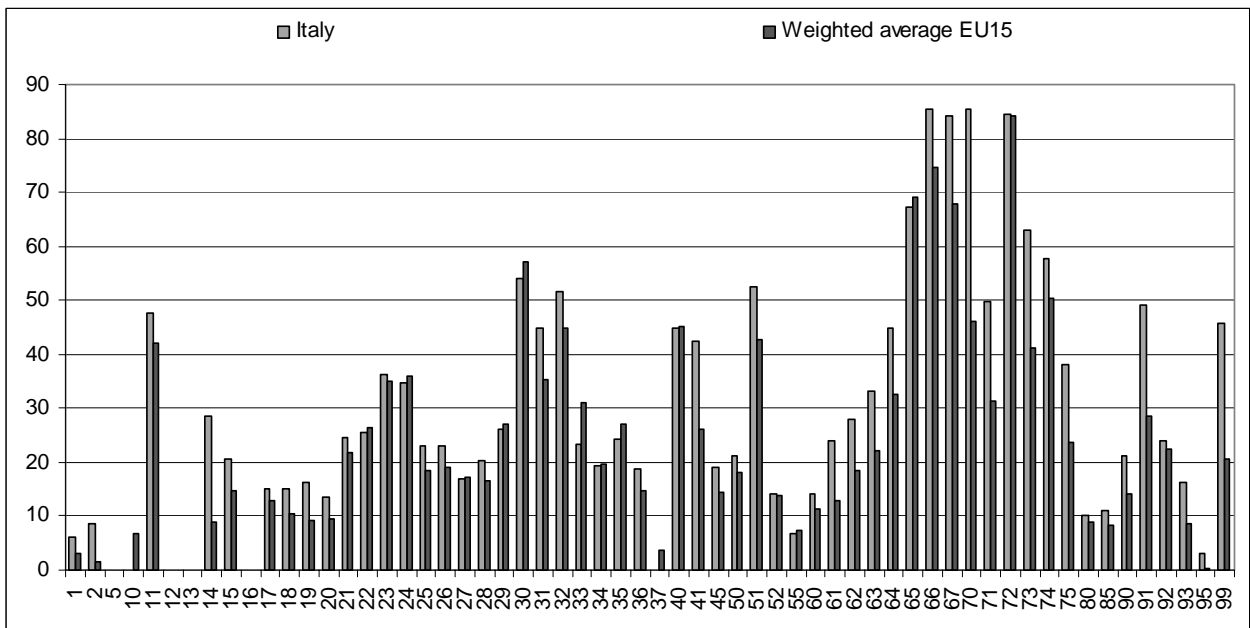
## Average percentage of upper secondary students attending schools where principals reported that various computer-related activities form part of students' assignments at least once a month

	Operating a computer (saving files, printing, etc.)	Writing documents with a word processor	Making illustrations with graphical programmes	Calculating with spreadsheet programmes	Writing programmes	Communicating via e-mail with teachers and other students	Sending, searching for, and using electronic forms of information
Finland	97	96	64	61	19	79	96
Italy	90	89	56	78	47	39	68
Korea	90	92	46	68	14	86	91
Netherlands <sup>1</sup>	99	99	39	63	9	48	82
Norway	99	99	66	82	21	67	88
Switzerland	93	91	57	70	14	52	82

Note: 1. Country did not meet international sampling requirements. The reported data are unweighted.

Source: OECD, ISSUS database, 2003.

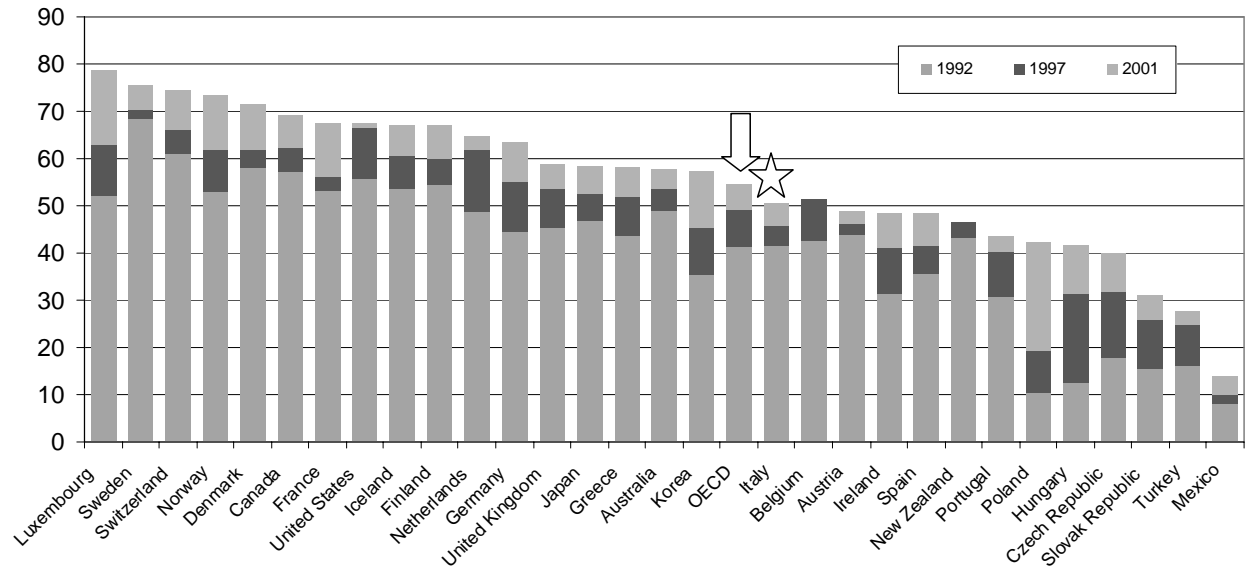
ICT-occupations as share of total employment, detailed NACE sectors



Source: OECD, ICPC Division, 2004.

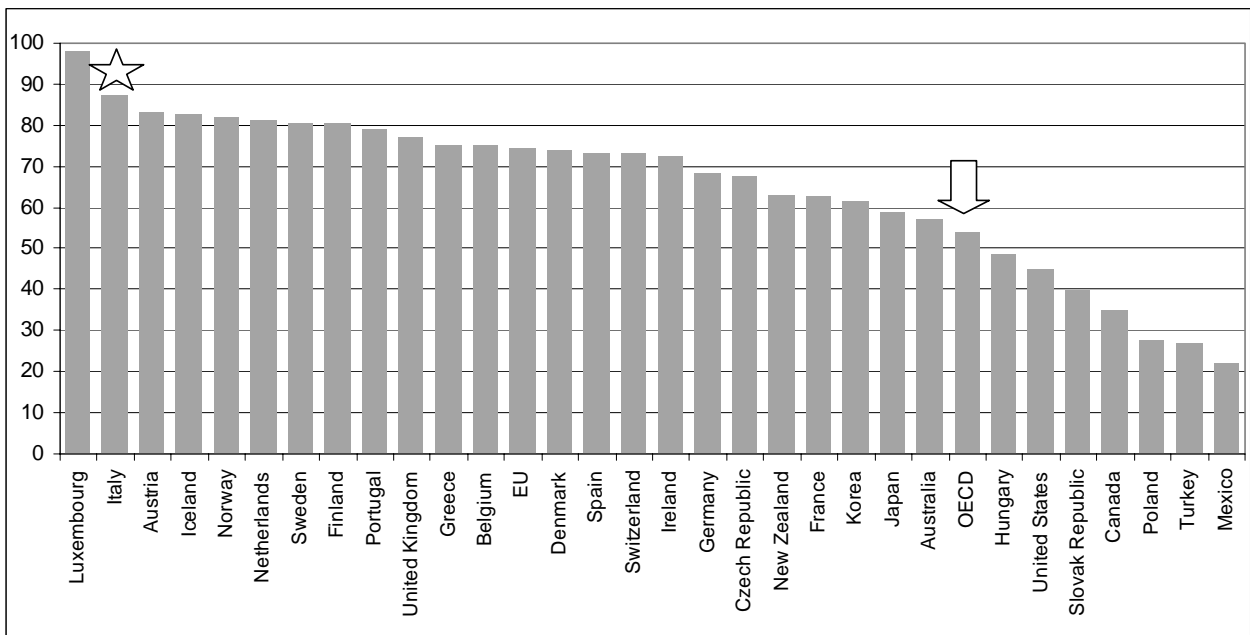
Telecommunications channels per 100 inhabitants, 2001

Access channels per 100 inhabitants



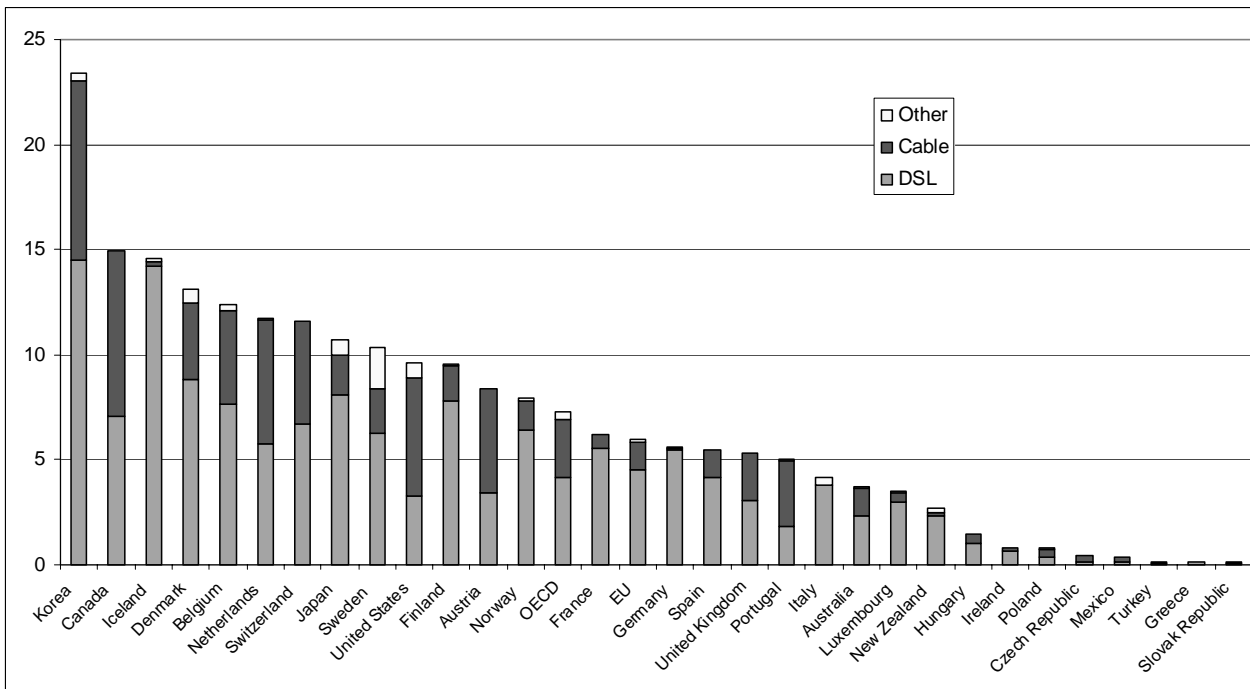
Source: OECD, Communications Outlook 2003.

Cellular mobile penetration per 100 inhabitants, 2001



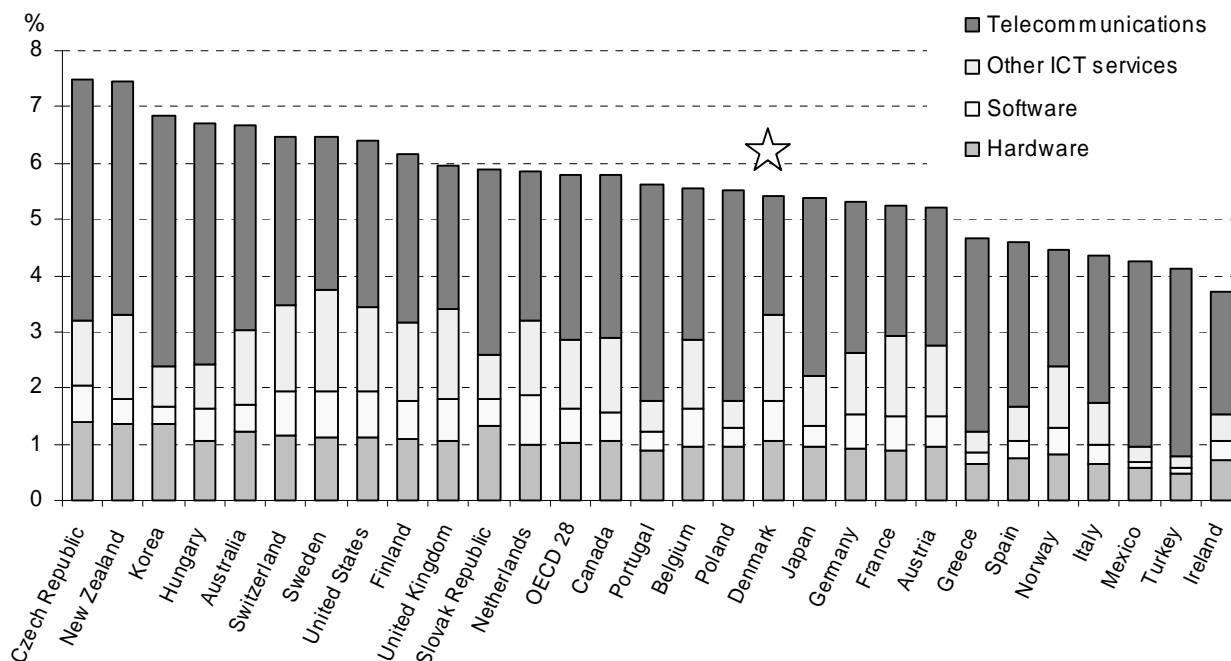
Source: OECD, *Communications Outlook 2003*.

Broadband subscribers per 100 inhabitants, December 2003



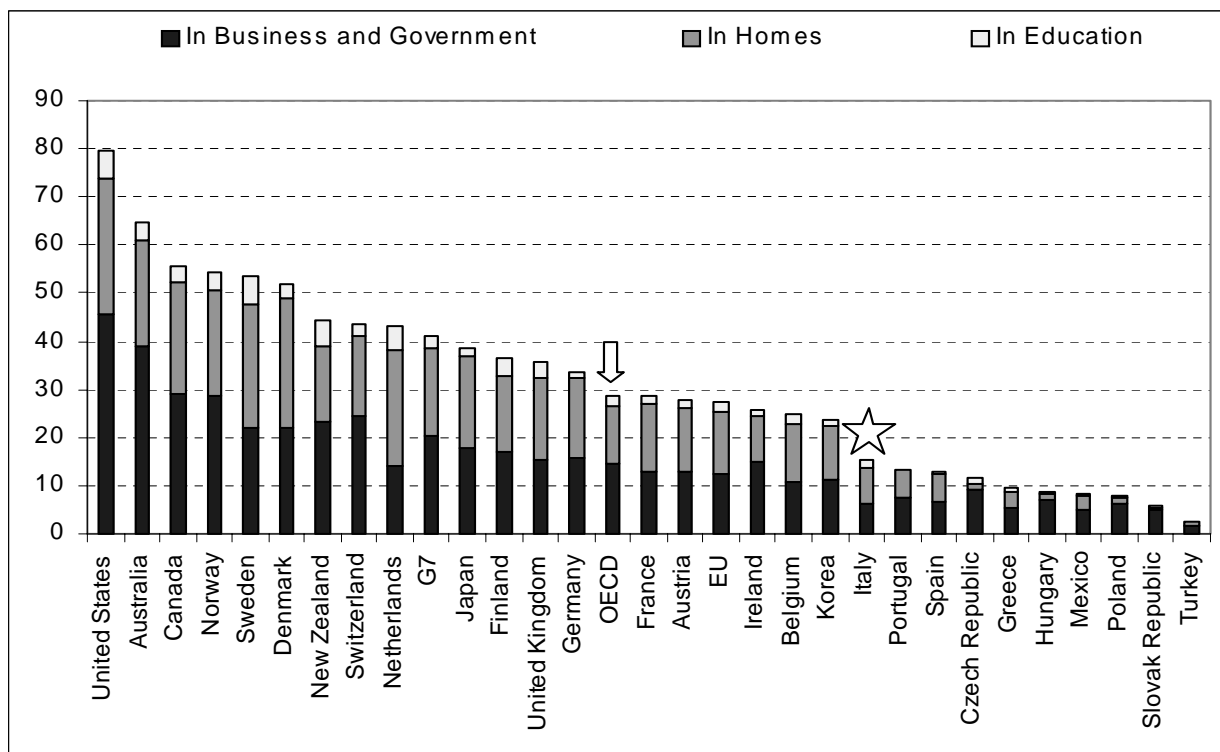
Source: OECD, ICCP Division, 2004.

ICT market intensities, 2003, percent of GDP



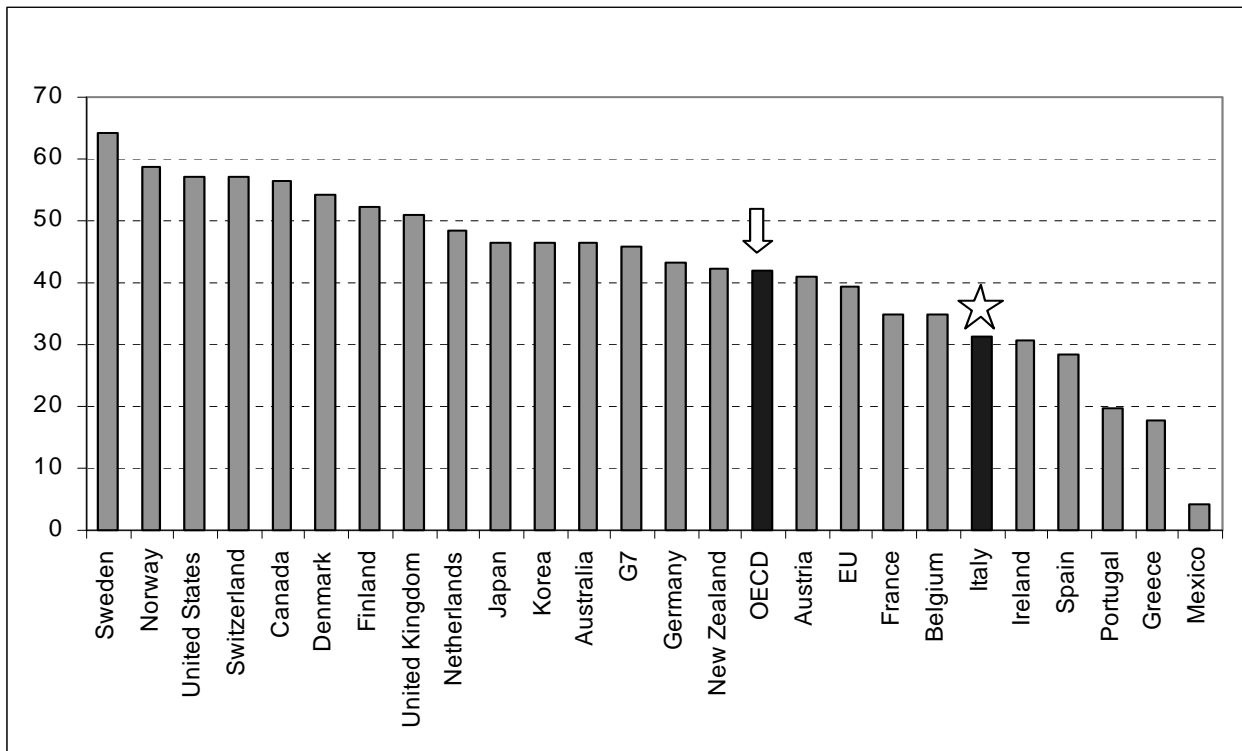
Source: OECD, based on data from IDC.

PCs per 100 inhabitants, 2001



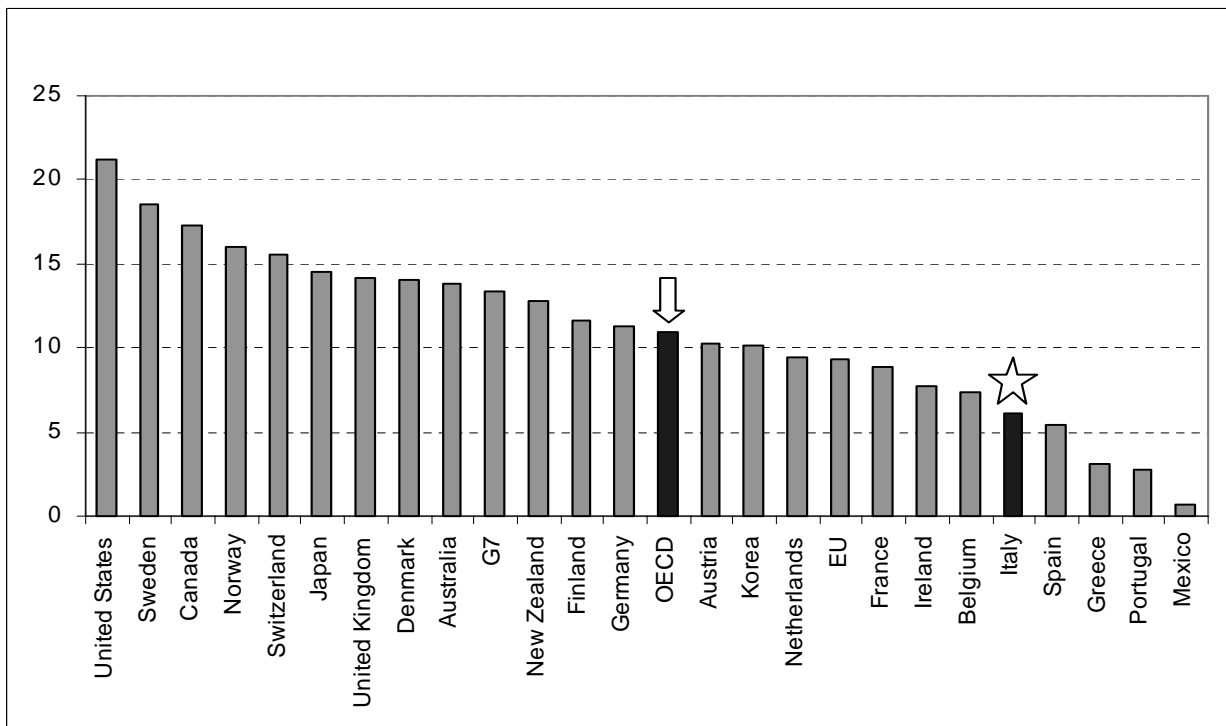
Source: OECD, based on Digital Planet 2002 (IDC and WITSA).

Number of Internet users per 100 inhabitants, 2001



Source: OECD, based on Digital Planet 2002 (IDC and WITSA).

Number of Internet buyers per 100 inhabitants, 2001



Source: OECD, based on Digital Planet 2002 (IDC and WITSA).