The *re*NeW*ed* Economy

Business for a dynamic Europe

UNICE

The UNICE Benchmarking Report 2001

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Foreword

This is the fourth UNICE benchmarking report, and it focuses on "The *re*New*ed* Economy". It reviews some of the major themes of previous reports: "Competitiveness" (1998), "Entrepreneurship" (1999) and "Innovation" (2000). It stresses the importance of innovation and entrepreneurship for competitiveness in the new economy.

The new economy is much more than the generation of new technologies, particularly new information and communications technologies (ICT). It includes the widespread diffusion and adoption of these technologies, the development of new skills in the work force and the use of new forms of work organisation. The report concludes that the new economy provides a unique opportunity for Europe to improve its living standards, increase employment and speed up growth.

The stock-market fortunes and failures of the new "dot.coms" make the headlines every week, yet the new economy permeates more deeply into the old. The impact of the new technologies will have a long-lasting effect on the whole of our economy, even if the initial enthusiasm about the most prominent features of the "new economy" fades.

At the European Union summit in Lisbon in March 2000, governments made a commitment to build a competitive and dynamic knowledge-based economy, through measures to facilitate the development of the information society, to increase the level of Research and Development, to stimulate the growth of innovative small and medium-sized enterprises, and to create jobs. The Lisbon conclusions are a good first step on the road to greater European competitiveness in the new economy, but there is still a long way to go.

Measures need to be taken on a European and at a national level to create a single market for entrepreneurship and innovations, a single financial market, and a world-class ICT infrastructure. The new economy may have appeared first in the United States, but that country is not the only benchmark. The report also shows that progress has been made in several European countries. Other countries can benefit from their experiences, in particular how to combine economic change with social cohesion.

The Stockholm Summit in March 2001 provides the first opportunity for heads of state and government to take stock of the progress made in implementing the Lisbon recommendations and to maintain momentum and direction in the process. If the conclusions of Lisbon are to remain credible, the targets set by Member States should be implemented as promised. Governments, business and citizens have a common interest in their success.

Georges Jacobs
President

The EU's strategic goal for the next decade is: "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion".

Presidency conclusions of the Lisbon summit, March 2000

"...when technology reshapes society, it is not the result of a single invention but of a host of additional, completely unanticipated inventions.."

Herbert A. Simon, 1987 The Steam Engine and the Computer: What makes Technology Revolutionary.

Introduction

The term the "new economy" is often used to describe the remarkable performance of the US economy during recent years - consistently high rates of growth, strong productivity growth and rising employment but with stable, low inflation. Yet the term means different things to different people.

It refers, in this report, not only to the emergence of the new information and communication technologies symbolised by "Silicon Valley" but also to the increasing use of these technologies in the "old economy". This enables individuals, companies and governments both to do new things and to do old things in new and better ways. It is the diffusion of a host of inventions throughout the whole economy.

The new economy is based on general-purpose technologies - symbolised by the memory chip, computer, Internet, and the mobile phone - that have dramatically reduced the cost of storing, processing and communicating information. Fuelled by deregulation and globalisation, these technologies are transforming the way markets, companies and individuals work, leading to new business strategies and new methods of organisation - in short, to a renewal of the whole economy.

These changes may well be sufficiently extensive to add up to a third industrial revolution. Like the first (steam power) and the second (electric power), the third (automated brain power and the "death of distance") will transform industry and the economy. This transformation will take time. It will be unpredictable and have widespread ramifications for society.

Governments today cannot foresee its timing, course or effects any more than their predecessors could two hundred years ago. What they can do is to provide the framework conditions necessary to allow human ingenuity to flourish and the opportunities offered by the new technologies to spread throughout the economy within a modernised European social model. This is the challenge that European governments accepted at Lisbon.

Much is at stake. The speed of change is faster than before, with a commensurate increase of risk. Companies that are slower than their competitors to adopt new technologies will disappear. Societies that fail to adapt to new technologies as quickly as others will suffer a fall in relative living standards and a rise in unemployment.

If Europe is to catch up and compete with the USA, governments must provide companies and individuals with stronger incentives to innovate, and to adopt and adapt innovations made by others. Entrepreneurs must be better rewarded for risk-taking. Employees must be more motivated to update their knowledge and skills continually. Private and public organisations must be both willing and able to adapt their strategies and their structures to changing circumstances and new opportunities.

This report compares and contrasts the spread of the new technologies in Europe, the United States and Japan. It concludes that if Europe is to be a dynamic and competitive knowledge-based economy, it needs to have:

1. A stronger spirit of enterprise

- Governments must acknowledge entrepreneurship as the key to growth. The creation - and destruction - of firms is the vehicle for technical progress.
- Start-up costs for new businesses must be competitive, and regulations must be simple and cost-efficient.
- Society must reward entrepreneurial success and view occasional failure as a learning experience. High risks must be offset by high returns.
- Governments must lead by example, providing public services electronically.

2. A more competitive environment

- Labour markets must be sufficiently flexible so that companies can obtain the right skills, at the right times at competitive costs and change their work organisations in response to changing circumstances.
- Capital markets must be sufficiently large, diversified and competitive to provide firms with attractive financing options.
- Markets for all goods and services, including public utilities, should be sufficiently flexible to encourage the entry of new competitors and new ways of competing, and to ease the exit of inefficient companies.
- New legislation must facilitate e-commerce and provide cost-efficient dispute settlement between buyers and sellers: the citizen must be protected in the information society through secure communications and databases, which maintain personal integrity.

3. A world-class knowledge infrastructure

- Educational and training systems must provide people with useful knowledge and skills throughout their working lives.
- Research and development institutions, private and public, and individual researchers must have strong incentives to pursue new knowledge and to commercialise it.
- Infrastructure must be deregulated and exposed to competition.
- Access to high bandwidth services must be efficient and affordable, across Europe.

4. A society more supportive of change

- Governments and companies must implement policies to improve employability, so that individuals are able to adapt to the changes involved in technical progress.
- Governments must encourage individuals and organisations to experiment with new technologies and with new products and services.
- Social security must be provided in ways that encourage individuals to adjust to change, not to resist it.
- Individuals must be more flexible: in a changing environment the ability to adjust is the individual's only true security.

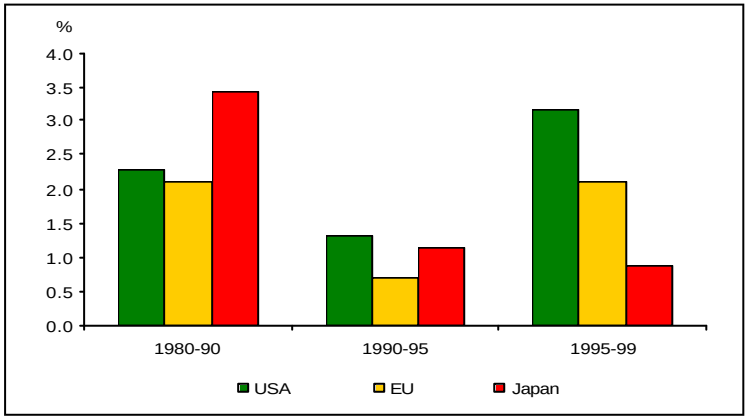
Per Magnus Wijkman
Chairman,
Competitiveness Group

Chapter I - The emergence of the "New Economy"

The USA pulls further ahead

Since 1991 the US economy has experienced one of the longest periods of sustained growth, in living standards and in employment, in its history, with acceleration in economic growth since 1995. The recent slowdown does not detract from the fundamental changes that have taken place in the economy. The development and diffusion of new information and communications technologies (ICT) and associated structural changes have led to major improvements in productivity, output and employment, without inflation. This combination is, in the view of many, at the root of a new economic paradigm.

Indicator 1: *Annual growth of real GDP per capita since 1980*

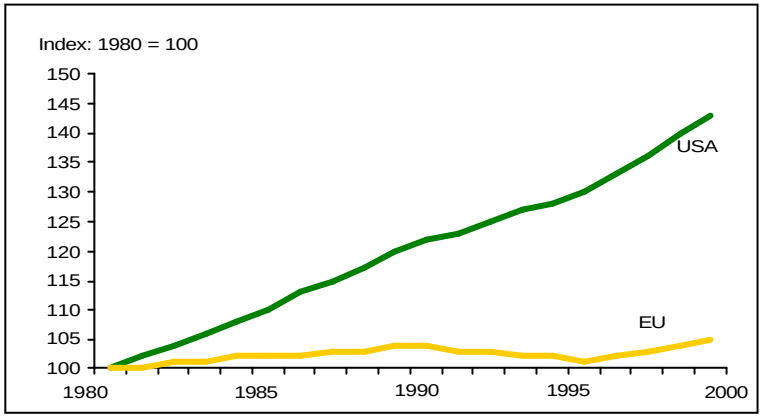


Source: OECD Economic Outlook 2000.

Since 1995, living standards have increased much more rapidly in the USA than in the EU and Japan. The motor of growth has been the American business sector, where output has grown at a much faster rate than it did during the early part of the decade, and indeed in the 1980s. The rate of growth in the European business sector has lagged behind that of the USA, only regaining 1980s levels in the second half of the 1990s.

A larger share of the population works in the USA and, on average, each person works more hours and produces more output per hour. Hence, US residents enjoy 50% more purchasing power than their EU counterparts.

Indicator 2: *Employment growth in the business sector*

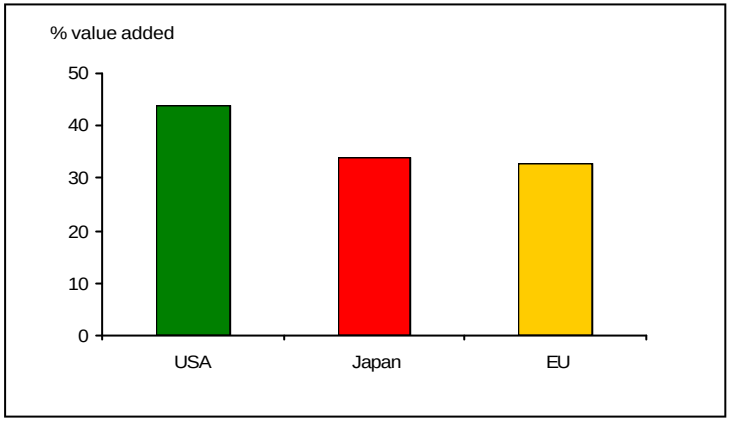


Source: OECD, 2000.

Total employment has grown twice as rapidly in the USA as in the EU, in the last two decades. Behind this lies job creation in the US business sector. The level of employment in the business sector has grown by more than 40% in the last twenty years compared with only 5% in Europe. Demographic factors have also played a part in this, linked to faster population growth.

Although unemployment in the EU has fallen since 1998, the employment rate has failed to increase, and the population is ageing. This puts a high burden on the working population to finance welfare systems and threatens their sustainability.

Indicator 3: *The share of knowledge-intensive sectors in total value-added, late 1990s*



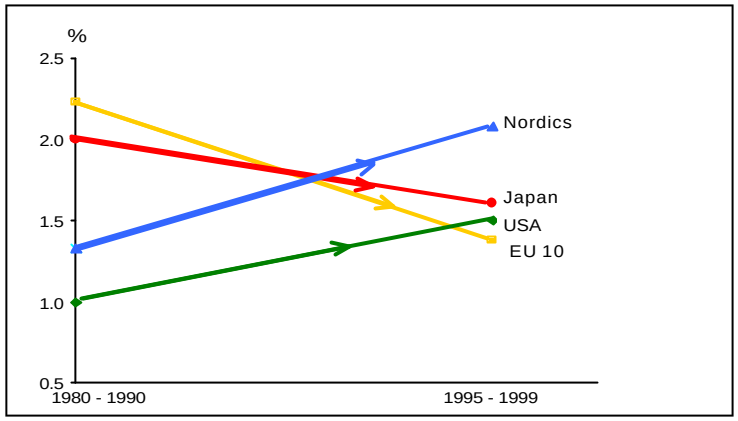
Source: OECD STI (Science and Technology Indicators) Outllook, 2000.

Note: OECD definition of knowledge-intensive: high-tech + medium-high-tech + communications services + finance, insurance and other business services + community, social and personal services.

One factor that explains the more rapid growth of per capita income in the USA is the increasing share of knowledge-intensive output in total GDP. These sectors now constitute 44 % of GDP in the USA compared to 33 % in the EU.

The shift towards high value, knowledge-based output is illustrated by the growing importance of ICT companies. In 1997, only five of the 25 highest valued companies in the world were ICT companies. By 2000, 15 out of the top 25 were ICT companies. Of these 15 companies, seven were American, four European and three Japanese.

Indicator 4: *Evolution of total factor productivity growth*



Source: OECD, 2000.

Note: Nordics refers to Denmark, Finland, Norway, Sweden.

Another reason for the faster rate of growth of the US economy is the use of more efficient production methods. This results in more rapid total factor productivity growth, i.e. growth that is attributed to better use of existing stocks of capital and labour. Total factor productivity growth has increased in the USA from 1.1% per annum in the 1980s to 1.6% since 1995. At the same time, inflation has fallen from 5.5% to 2.5%.

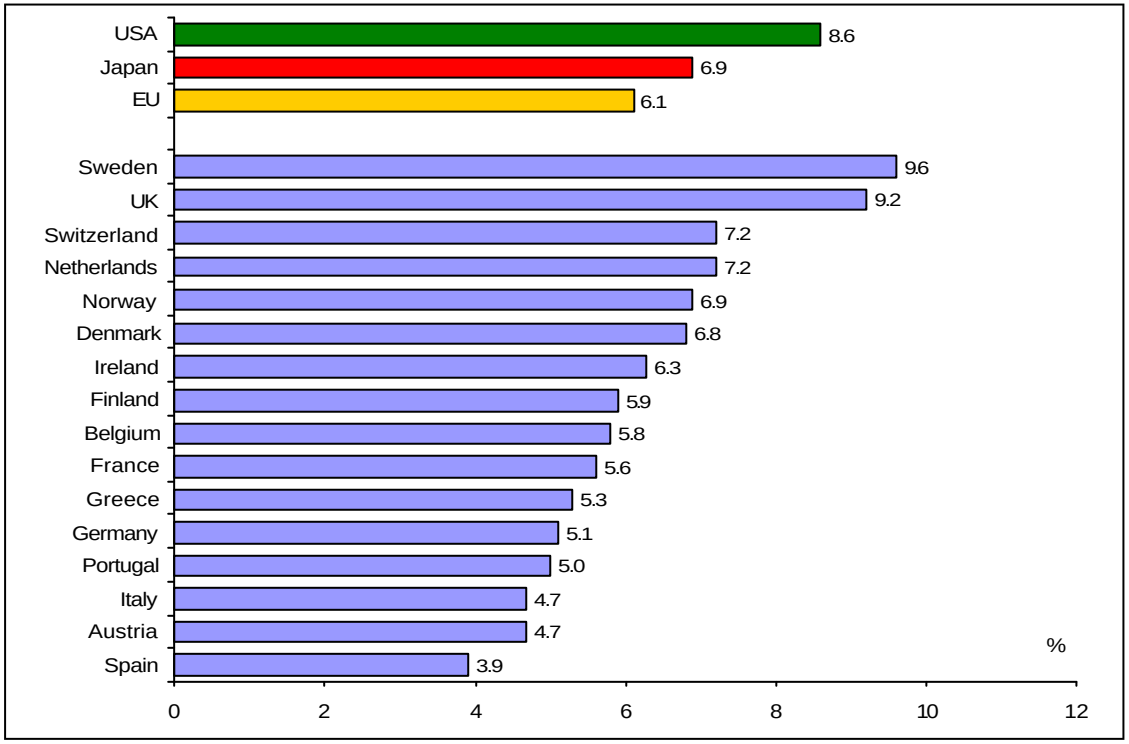
In recent years, in Japan and in most EU countries the picture is different. Total factor productivity growth has in fact *slowed down* rather than increased. Structural reforms have, as yet, been insufficient to allow the new technologies to increase total factor productivity growth in Europe as much as in the USA.

The Nordic countries of Denmark, Finland, Norway and Sweden are the exception. These small open economies have been quick to deregulate key markets, particularly the ICT infrastructure, and benefit from the opportunities offered by the new technologies. They have managed even faster increases in total factor productivity while reducing inflation. Through these countries, the "new economy" is arriving in Europe.

How Information and Communications Technology drives the "new economy"

The new Information and Communications Technologies (ICT) have a threefold impact. First, ICT is a high value-added industry producing new goods and services and creating new wealth and jobs. Second, the output of the industry embodies a general-purpose technology that can be used as an input in most existing industries. Investing in ICT provides workers with more capital, making them more productive. Finally, ICT changes working methods, organisational structures and business strategies, raising the productivity of all factors of production.

Indicator 5: *Total ICT expenditure as % GDP, 1999*

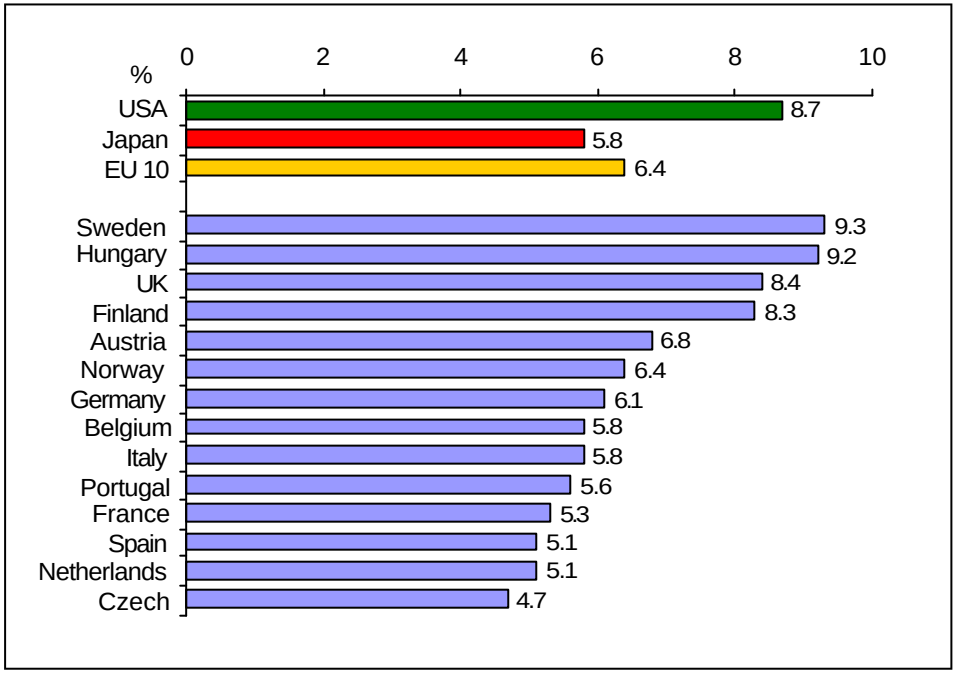


Source: IDC "Digital Planet".

Investments in new ICT hardware, software and telecommunications help to increase productivity throughout the economy.

In 1999, for example, expenditure on ICT investment was equal to 8.6% of GDP in the USA, but only 6.1% in EU. On an annual basis, EU expenditure on ICT is only three quarters of the level in the USA. Only Sweden and the UK exceeded US levels in 1999.

Indicator 6: *Share of ICT value-added in total business sector (%) 1997*



Source: OECD, 2000 (Spain: CEOE).

Note: Spain is not included in EU10.

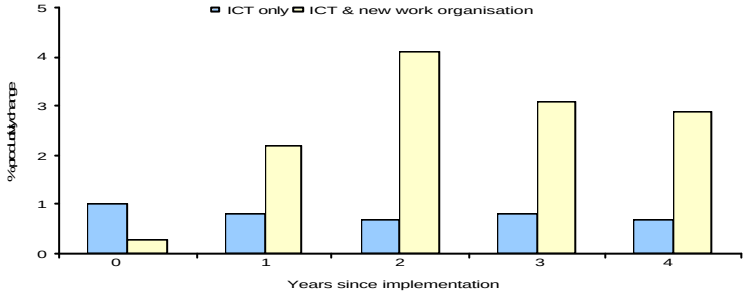
ICT industries (computer hardware, software and telecommunications) are an important component of business sector growth in the USA. In 1997, their share of total value added was almost 9%, compared to a 6% share in the EU, although a few European countries - such as Sweden, Hungary, UK and Finland - have an equivalent share.

The ICT industries account for over 40 % of the acceleration in US productivity growth since 1995. They are one of the principal motors of economic growth in the USA and in the Nordic countries.

Box 1: *ICT and new organisational structures*

Full benefits of investments in the new information and communications technologies are only realised if companies also adopt new operating methods, new organisational structures and new business strategies. Without such changes ICT remains a toy rather than a tool.

Productivity gains of ICT with and without organisational change



Source: European Commission, 2000, based on a 1996 Danish survey of 1000 manufacturing companies.

A study of 1000 Danish manufacturing enterprises shows that productivity gains are 4 to 5 times larger in companies that introduce new work systems together with ICT, than in firms that introduce ICT only.

Another study (Brynjolfsson & Hitt, "Paradox lost? Firm-level evidence of high returns to Information System spending", MIT Sloan school 1994) reveals that the biggest productivity gains from IT arose in those US firms that coupled IT investments with changes in organisational structure. A Norwegian study (Sitma & Econ, Norwegian Research Council 2000) shows that return on own capital is about 50% higher in companies that also introduced a comprehensive ICT strategy integrating new production and distribution logistics.

- ICT has been credited for much of the recent increase in economic growth in the USA and a similar development can be seen in parts of northern Europe.
- The new economy is characterised by increased output in the new IT hardware and software industries and in telecommunications; by the use of these outputs as inputs in existing industries; and by reorganisation at the firm level of work structures and of business strategies.
- The greatest macroeconomic impact of ICT can be expected in countries where each of these three factors is strong.

Chapter II - New technologies transform the economy

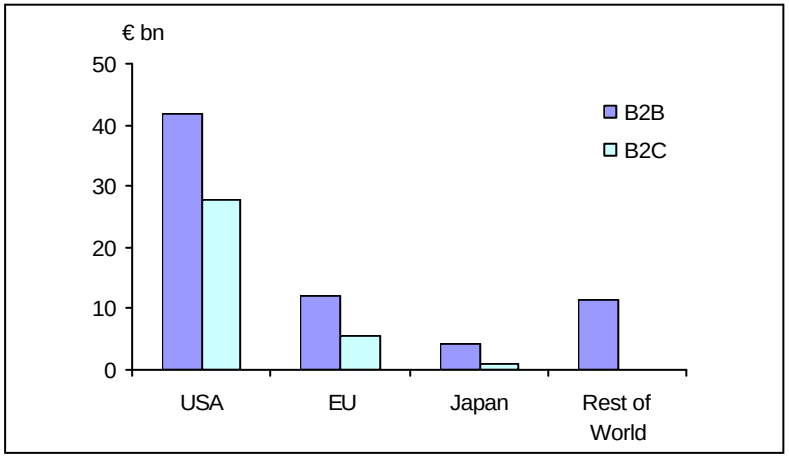
ICT improves markets, expands the global reach of companies and allows the customer greater market power. Increased global competition passes the benefits of innovations on more quickly to consumers through lower prices and to employees through higher incomes. Market deregulation, increased globalisation and restructuring of companies, are transforming the business environment and society.

In this structural transformation, most EU countries lag behind the US. While firms, households and governments in some European countries have adapted quickly to the new environment, many others still have far to go.

Markets and companies are reorganised

Markets are evolving. The most dramatic changes to date involve business-to-business (B2B) and business-to-consumer (B2C) transactions. There are also websites for consumer-to-consumer activities. Governments, however, have been slow to establish electronic relations with business and households.

Indicator 7: *e-commerce in major regions, 1999*



Source: Booz-Allen & Hamilton, 2000.

Note: Rest of World shows B2B+B2C combined.

"Reaping the benefits of innovation will require profound reorganization of firms, industries and markets."

Thomas Andersson, OECD, "Is there a new economy and has Europe joined it?", May 2000.

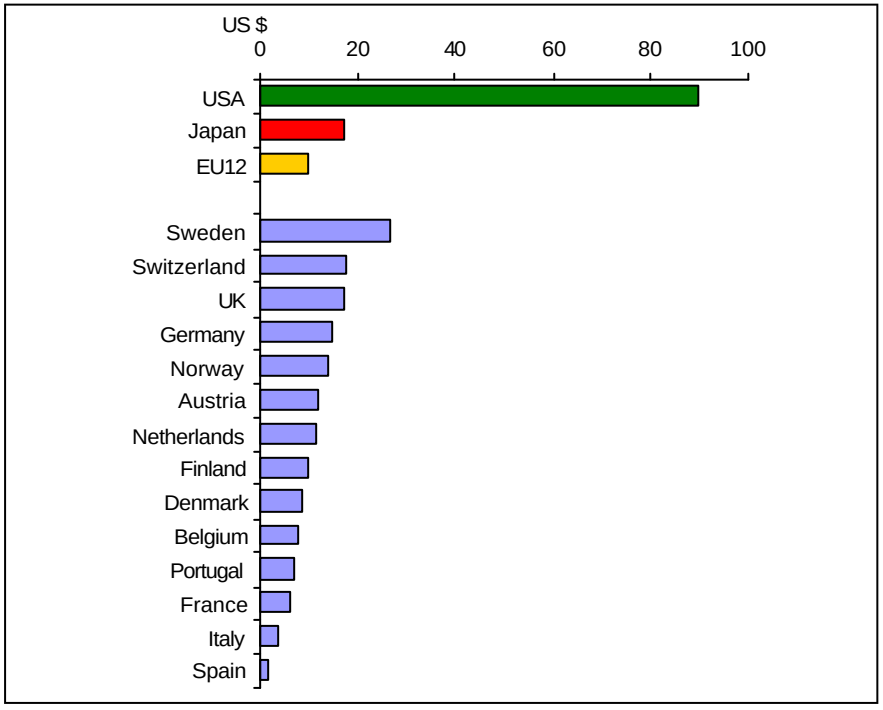
The value of global e-commerce (B2B and B2C) was estimated at €100 billion in 1999. This represents a very small share of the global economy but e-commerce is developing quickly. All told, e-commerce in the USA represents less than 1% of retail trade. The USA accounts for two thirds of total e-sales. This reflects its pioneering role in e-commerce.

B2B transactions account for approximately two thirds of the total, and represent a relatively larger share of on-line markets in the EU and Japan. B2C accounts for a much greater proportion of e-commerce in the USA than in the EU and Japan.

E-commerce changes the relationship between business and consumer by:

- Increasing the speed and quality of information on products and prices
- Allowing small companies access to international suppliers and customers
- Making geographical distance less important
- Giving consumers more choice

Indicator 8: *Value of business-to-consumer transactions per capita, 1999*



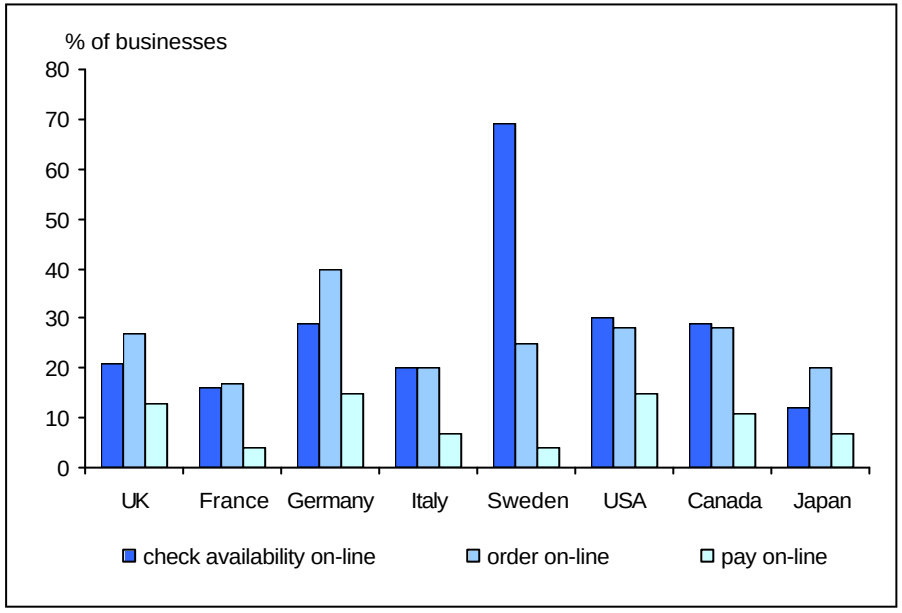
Source: OECD STI Department, 2000.

B2C is growing rapidly, and is expected to continue to do so, particularly in Europe where uptake has been slow to date.

At present, the value of B2C transactions per capita is ten times larger in the US than in Europe, reflecting a greater openness to on-line activity, more frequent use of credit cards, and a more integrated home market with a common currency. Sweden, Switzerland and the UK lead in Europe, though they lag far behind the USA.

B2C has grown most rapidly in products and services that can either be ordered and delivered digitally on-line, or where off-line delivery is cheap, rapid and reliable. Examples of such products are financial brokerage, computer hardware and software, books, and event tickets. These have a retail sale penetration ratio in the USA of between 5-15 %, more than twice that in Europe. Sweden, the Netherlands and the United Kingdom have penetration rates similar to those in the USA.

Indicator 9: *Percentage of businesses that allow business-to-customer interaction on-line*



Source: UK DTI, 2000.

An indicator of the scope of supply chain management is the extent to which companies use electronic means to interface with suppliers and customers (such as e-commerce and the Intranet).

German companies lead in the capability to place orders on-line and accept payments on-line, while Swedish companies lead in providing customers with a capability to check on-line stock availability.

Few companies in any country yet provide customers with interactive services across the whole range of their business operations.

However, a recent CBI survey on e-business ("The Quiet Revolution", February 2001) reported that 38% of UK companies expect e-business to account for more than 20% of their overall turnover in the next 2-3 years.

The same survey identified three stages in the evolution of e-business within companies. First the Internet is used as a tool for information and marketing. Second, companies use ICT for customer relations management, and the final phase is the integration of the supply chain.

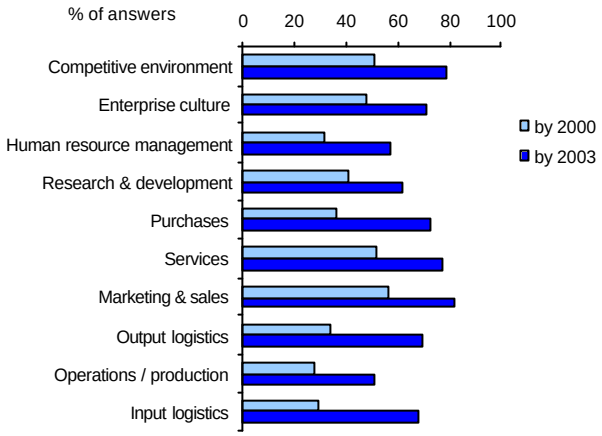
Box 2: *Supply chain improvements*

ICT enables companies to control and coordinate the supply chain better. They can outsource components to subcontractors for just-in-time delivery and focus on those activities where they have their core competences.

ICT facilitates better quality forecasts of demand and supply, closer relationships between customers and suppliers, faster and more accurate ordering, access to a wider range of suppliers, and lower costs in order handling and procurement processes. Electronic data storage makes it easier to identify defects earlier, to customise products more extensively, to reduce overheads, and to lower inventory. The demands of e-business often lead to flatter organisations, new logistics and changes in management style.

Potential cost savings from B2B have been estimated to vary from small savings in the food and healthcare industries (less than 5%), to large savings in the manufacture of electronic components (in excess of 25%).

Impact of Internet technology on the value chain: percent of enterprises who believe that the Internet has brought or will bring a medium to significant change by 2003.



Source: In Sites 2000, FEB-VBO.

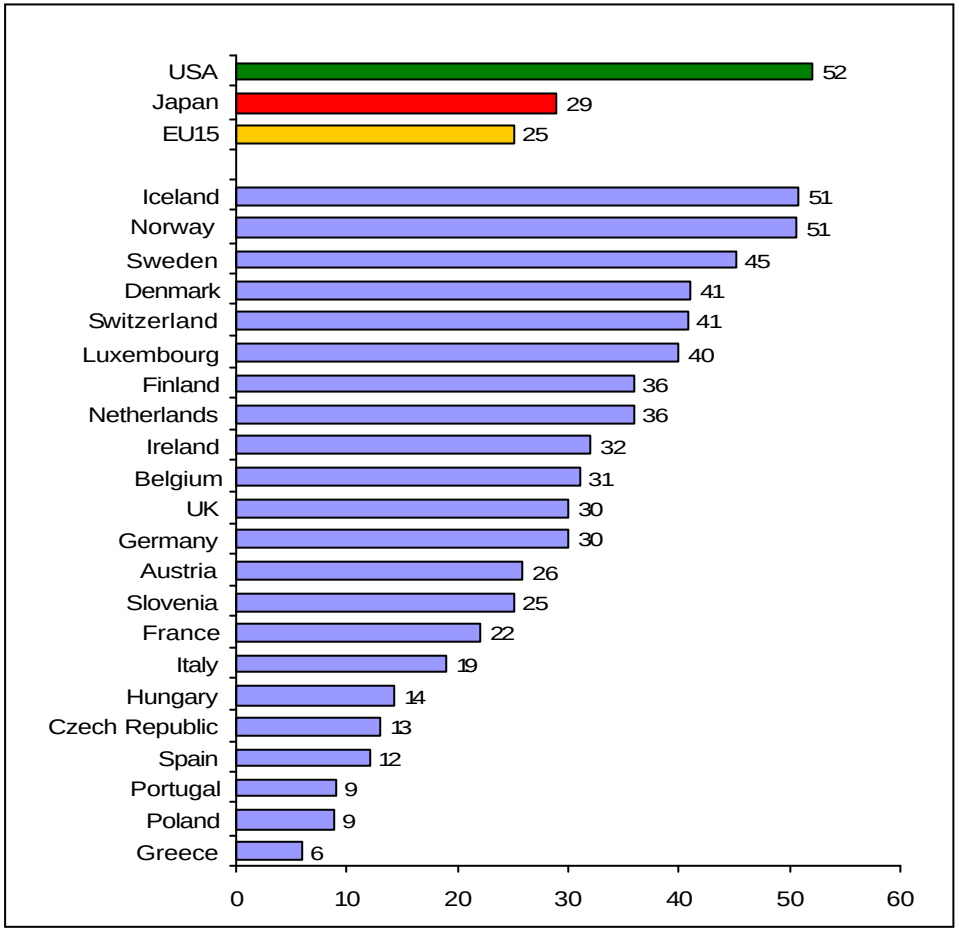
Note: Survey of top management of Belgium-based companies (163 respondents).

People are empowered

Individuals experience the impact of ICT in many ways. As consumers, they can benefit from better information, from a greater choice of goods and services and from lower prices through access to a global marketplace. As employees they can benefit from more independent work, both individually and in teams, and from greater responsibility and authority. As citizens, they can be better informed, more influential and learn new skills throughout their working lives.

The borders between leisure and work, home and office, public and private sectors become more fluid. New ways of working develop and lifestyles change.

Indicator 10: *Computers per 100 people, 1999*

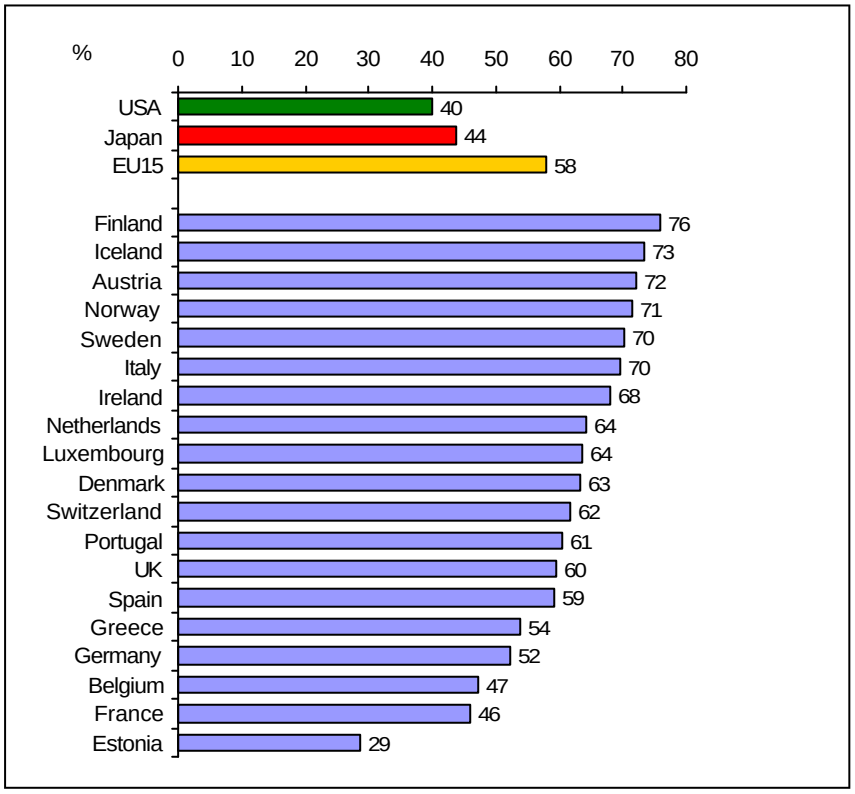


Source: Eurostat, 2001; Iceland, Norway, Switzerland, Slovenia, Hungary, Czech Republic, Poland, Turkey: Computer Industry Almanac, 1999.

The number of computers indicates the extent to which individuals are able to benefit from the opportunities offered by the new technologies - as consumers, employees and citizens.

The EU lags significantly behind the USA in terms of computers per head of population. Only the Nordic countries come close to the USA level. While there is an equivalent of one computer for every two people in the Nordic countries, there is less than one computer for every ten people in Portugal and Greece.

Indicator 11: *Mobile phone subscribers (% total population), October 2000*



Source: Global Mobile, 2000.

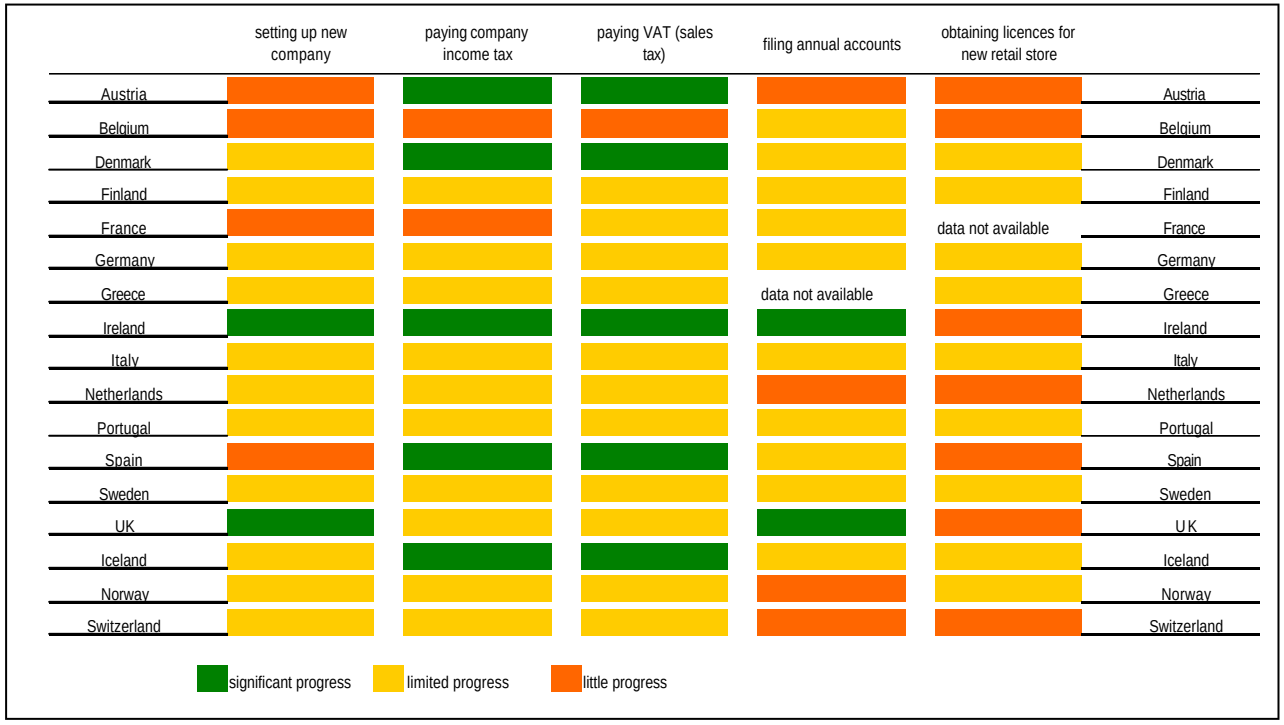
The potential for mobile-commerce is largest in countries with a high mobile phone penetration. The EU leads the US in this area, with nearly two thirds of the population in October 2000 subscribing to a mobile phone, compared with 40% in the US. One reason for this is the more efficient pricing system (caller pays) used in Europe. Another is the early adoption of a common technical standard. Within Europe, there are large differences between Member States, with Nordic countries, Austria and Italy leading the field.

While accessing the Internet via a PC has been the normal method, alternative technologies may have greater appeal for users, such as mobile phone and digital television. The mobile phone is portable, giving immediate access to the Internet from almost anywhere, but its use for m-commerce is at an early stage of development. Various new technologies to connect the mobile phone and other portable devices to the Internet are emerging, including GPRS (General Packet Radio Services) and WAP (Wireless Application Protocol), with new market opportunities. However, excessively complicated procedures for granting Universal Mobile Telecommunications System (UMTS) licences in Europe have delayed development of the technology to the extent that the EU is in danger of losing world leadership in this area to Japan. European companies are still at the development stage of third generation mobile phones.

Governments can increase their efficiency

Governments provide labour-intensive services to citizens and companies and collect taxes and fees from them. New information and communication technologies allow public administrations to improve the quality of public services and to reduce the costs of these services, including the costs to business of complying with government regulations. This is especially important for small and medium-sized businesses.

Indicator 12: *e-Government: electronic capability and cutting red tape*



Source: UNICE, 2000, based on a survey of member federations.

"The time has come to move from pilot projects to real applications that bring real added value to the citizens, and which truly improve the productivity of public services"

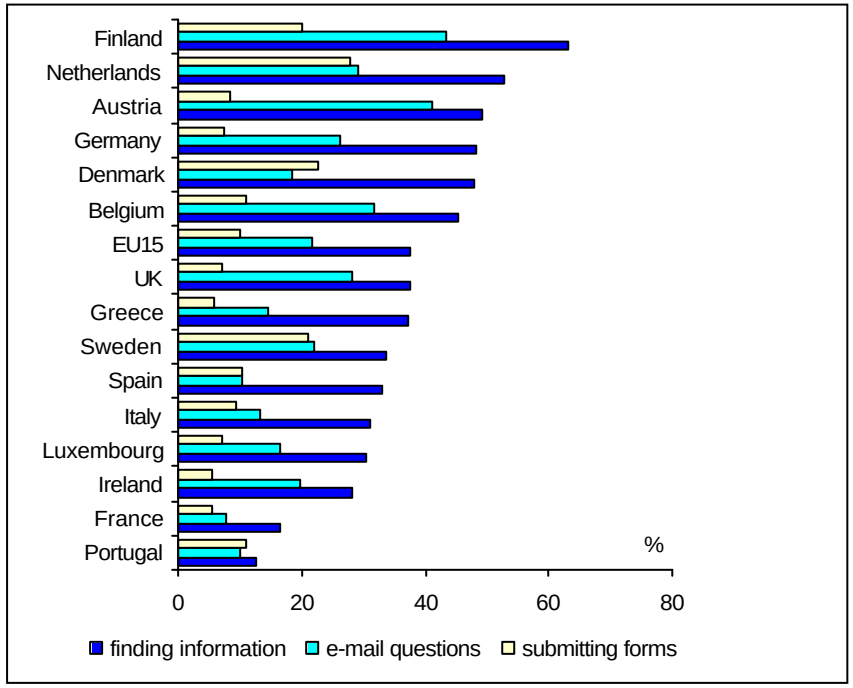
Erkki Liikanen, Member of the European Commission for Enterprise and Information Society, 31 January 2001

Governments are leading advocates of the information society. UNICE's survey provides an assessment of the progress national governments have made in exploiting the potential of the Internet. It measures the "capability" of companies and governments to use the Internet to complete mandatory administrative processes.

A few European countries (notably Ireland) are using ICT to reduce the cost and time needed to comply with government regulations. However, despite government enthusiasm for the new technology, implementation of on-line government services has been slow in most countries.

At the national level, most progress has been made in introducing electronic capability for submitting company income tax returns and VAT returns. Local governments, on the other hand, have made little progress in "computerising" the licensing process.

Indicator 13: *Citizens' interaction with public administration on-line*



Source: Eurobarometer, October 2000.

Half of EU citizens have already contacted their public administration on-line, but there are large variations between different Member States, from Finland to Portugal.

Of those who have interacted with government electronically, the majority have only done so to find information. In the Netherlands, Sweden, Denmark and Finland, a substantial minority have actually submitted forms on-line.

Box 3: *Examples of e-Government*

Local information society project "Learning Upper Karelia", in Finland, created a community information network in a rural community, with scattered and distant populations, aimed at preventing social exclusion, supporting social innovations, improving services and living conditions. After 2 years, 25% of the local population was registered as users, with the bulk of project activities focused on creating and supporting local capabilities for using computers and networks.

The Irish Revenue On-line Service (ROS) enables customers to use the Internet to file returns electronically, make payments and enquire about their current tax position and previous tax transactions. Those filing monthly and bi-monthly VAT and Employer PAYE returns are able to send their returns over the Internet. From April 2001 income tax and corporation tax returns will be added to the system. Customers are issued with digital certificates to enable them to sign legally enforceable tax returns on-line. www.revenue.ie

The German government has a programme "BundOnline 2005", for the provision of most federal services on-line by 2005. Today, citizens can apply for driving licences and identity cards on-line. Some 130,000 personal income tax declarations have also been made on-line, with eight federal states offering the same possibility for wage and salary tax declarations. www.bund.de

The UK government has launched its citizens' portal for government services. UK citizens can access a range of information and advice, for example from the Community Legal Service, the National Health Service. Citizens can fill in self-assessment tax returns and submit them to the Inland Revenue on-line, and can receive most benefit payments electronically. A full programme of services is planned for implementation by 2005. www.ukonline.gov.uk

The Estonian government has introduced a "Ministers Session Infosystem", whose objective is to provide modern ICT tools for the Estonian Government Cabinet meetings and thus to increase the quality of Government decisions, improve intra-governmental communication, lower the State Chancellery's costs and develop democracy.

The Latvian government initiated in 1998 an e-government project called Megasistema. This aims to create an integrated electronic system of public information linking together the population register, company register, real estate register, vehicle register, state revenue service information system. It is open to citizens and capable of two-way communication.

- Markets are faster, larger, and provide more information
- ICT generates cost savings for firms of all sizes
- Governments have large scope to lead by example in fostering and facilitating e-relations. The introduction of on-line public administration services would facilitate an effective provision of services to both businesses and individuals

Chapter III - Policies to realise the full potential of the new economy

All innovations pose the same policy challenge for European governments: how to ensure that their economies are responsive to change.

Governments must ensure adequate and competitive infrastructure; easy entry and exit in product markets; legal frameworks that facilitate acceptance of changing product markets and changing labour markets; and capital markets that enable entrepreneurs to invest in risky ventures. While all this was true in the old economy, it applies to an even greater degree in the new economy, because the speed of change is faster, and geographic mobility of people and companies greater.

ICT technologies pose specific policy challenges. Economies of scale, economies of networks, and the importance of standards all foster natural monopolies, making competition policy key. External economies make coordination of public policies and private plans important. Huge costs of research and development, rapid speeds of technical change and shortening product life cycles give the first mover an important advantage but increase risk, making tax policies to reward risk and effort critical.

This chapter focuses on six elements of the business environment where government policies can improve the pre-conditions for commercialising and using new, enabling technologies.

"I think that as structural rigidities in the euro area economies are being remedied the full benefits of the new technological possibilities can be reaped over time. The introduction of new technology requires flexibility of other factors, including labour, if production processes are to be reorganised more efficiently."

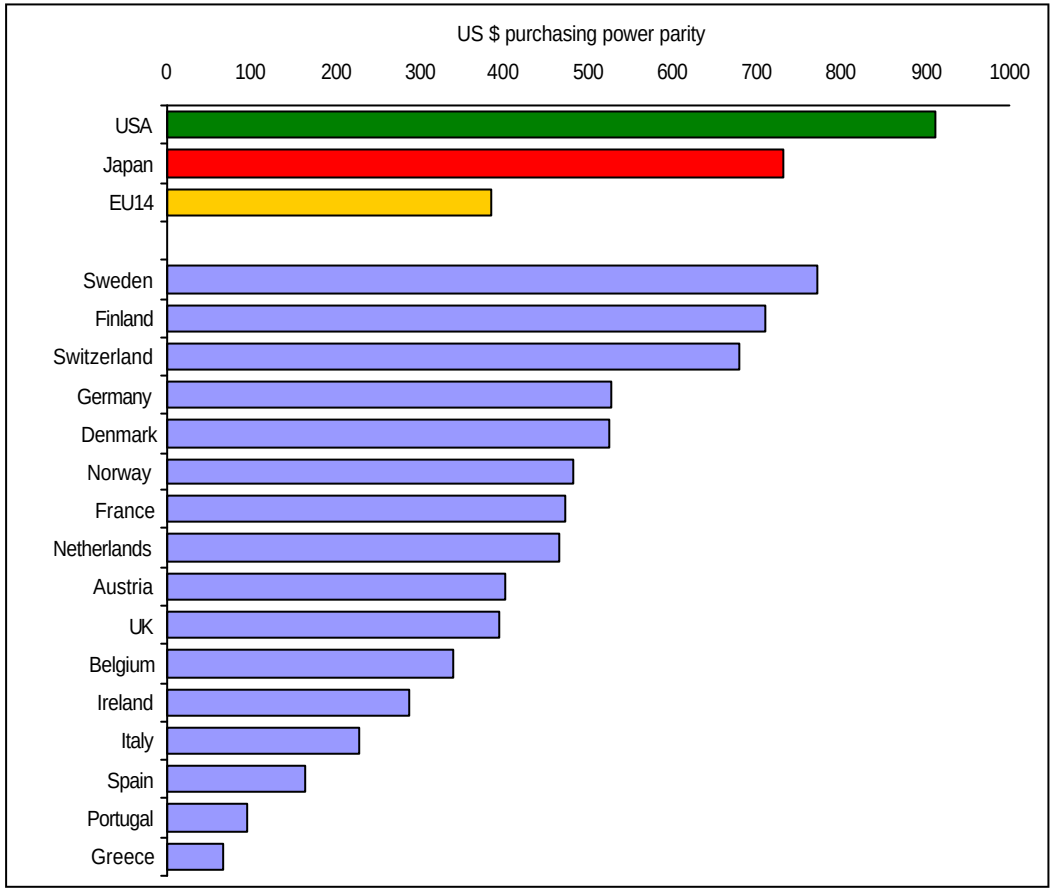
Professor Otmar Issing, European Central Bank, to the CBI National Conference, 7 November 2000

Stimulate development and diffusion of new ideas

Growth in the scale and efficiency of the specialist ICT sector is one of the principal ways in which new information and communication technologies create jobs and wealth in the new economy. Innovation in ICT is, in turn, closely linked to advances in basic science and the capacity of national "innovation systems" to create, disseminate, and exploit new knowledge.

The US ICT sector is much larger and more productive than that of the EU because it invests more in the generation of new knowledge and it diffuses new knowledge more effectively. In contrast, fewer resources are allocated to developing new ideas in Europe and linkages between companies, the science base, and governments are less intense and less effective.

Indicator 14: *Research and Development expenditure per capita, 1998*



Source: OECD, STI, 2000.

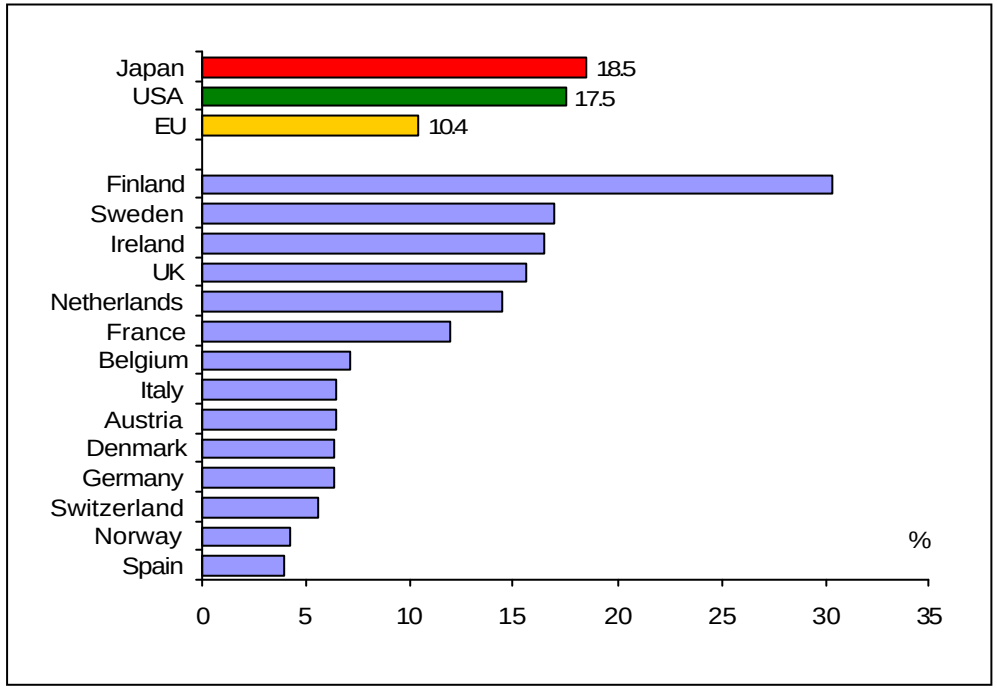
Expenditure by governments and companies on R&D is the single most important input for the development of new ideas. Expenditure on R&D in the USA is considerably higher than in Europe. Only Sweden, Finland and Switzerland approach the level of investment on R&D made in the USA.

The largest gap between the EU and the USA is in R&D financed by companies, but major differences also exist in the level of government funding. In the USA almost twice as many public resources are invested in R&D each year compared to the EU. Expenditure by governments on R&D is important for the development of the ICT sector because it influences basic scientific progress in areas such as computer science and mathematics.

Investment in R&D also affects the creation of "spin-off" companies, a critical means for the exploitation of new ICT knowledge. In the USA the rate of formation of such companies is four times higher than in Europe, and many of the world's leading ICT companies began life as spin-offs from US universities.

Europe's potential for turning innovative ideas into economic opportunities has not yet been fully realised. To meet this challenge, it is essential that cooperation between industry and academia on research and development be increased. This should be a specific objective of the European Commission's 6th Research and Technological Development Framework Programme for 2001-2006.

Indicator 15: *Share of ICT patents in total awarded by US Patents and Trademarks Office, 1999*



Source: OECD STI 2000.

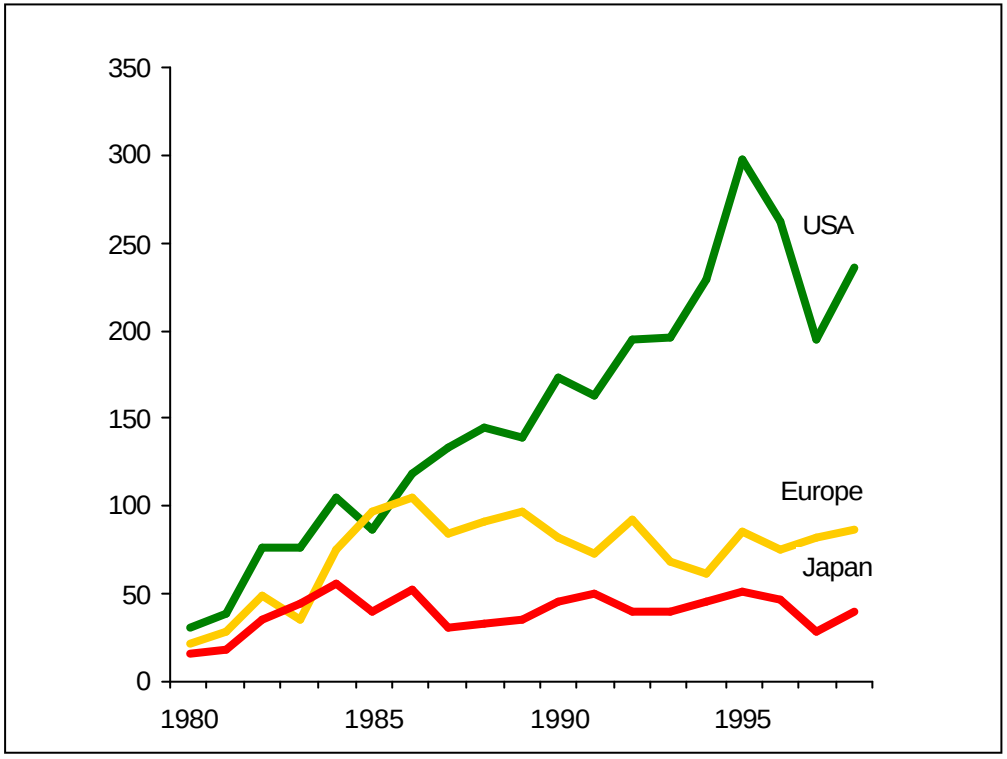
To create a climate of innovation, governments must ensure that companies can protect their scientific know-how.

Patenting activity is one important measure of inventiveness, especially in science-based industries. Patents from the public sector also enhance the diffusion of new knowledge because they provide information about the existence and location of commercially relevant research results.

Since the 1980s, there has been an explosion in patenting activity in Europe and the USA, and ICT has been one of the fastest growing areas of activity.

However, the share of ICT in patenting activity is significantly lower in EU companies. For example, only a tenth of patents awarded to EU organisations in the USA, in 1999, were for ICT-related activities, compared to almost double that for Japanese and American organisations. Yet Finnish companies led all others in this field.

Indicator 16: *Number of strategic ICT technological alliances*



Source: National Science Board "Science and Engineering Indicators 2000"/Merit.

Because of the multi-disciplinary nature of ICT and the increased knowledge-intensity of innovation, technological alliances between companies, at a pre-competitive stage, are an important mechanism through which advances in science are converted into new products and services. Alliances allow companies to gain access to complementary scientific or technological knowledge, to share development risks, to reduce time-to-market, and to gain access to new markets.

Since 1980, the number of new strategic technological alliances in ICT has risen dramatically in absolute terms. European-based companies, however, establish far fewer alliances than their counterparts in the USA. In 1998, the scale of alliances in Europe was only a third of that in the USA.

RECOMMENDATIONS

- Facilitate exchanges of researchers between European countries, and encourage links between companies and academia
- Increase public research budgets, particularly in areas of strategic importance for business, and ensure that procedures for company participation in Community research programmes are kept simple
- Simplify procedures for business access to the EU Research and Technological Development Framework Programme
- Ensure rapid adoption of a Community patent and a Community design
- Reflect the needs of new technologies, especially regarding the patentability of software-related inventions, in the European framework for intellectual property protection
- Improve the judicial framework to ensure adequate enforcement of intellectual property rights

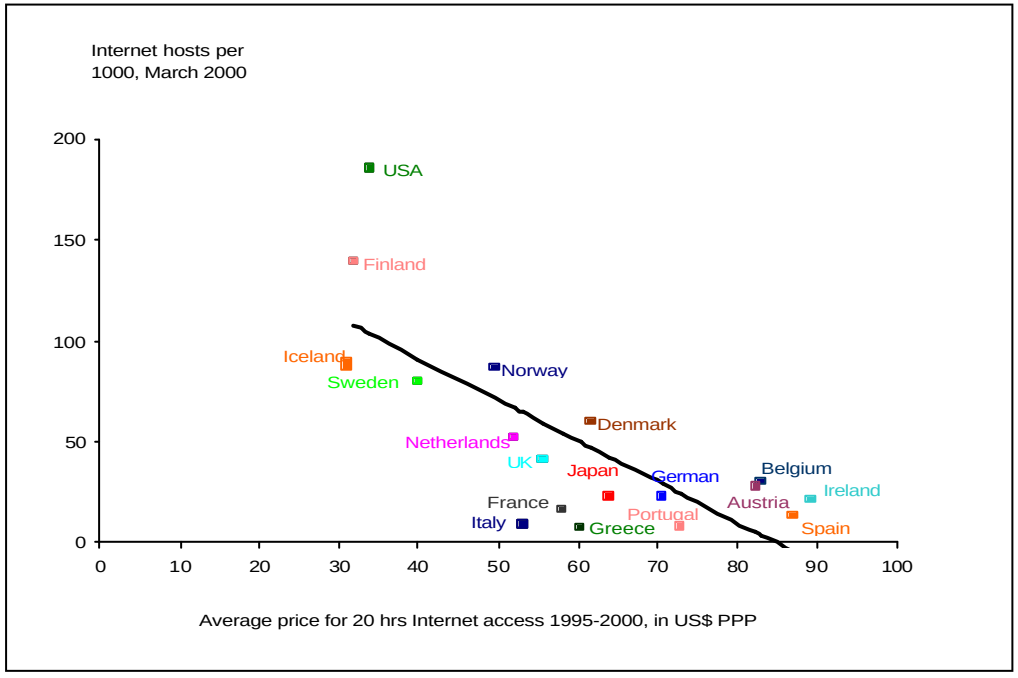
Create a supportive infrastructure

The telecommunications infrastructure is the backbone of the information society.

Governments play a key role in the organisation of the supervision of the market for infrastructure services, through regulators. Moreover, many of the infrastructures are trans-national in scope so that planning and financing on a European scale are important pre-conditions for an effective infrastructure.

However, the slow pace of effective liberalisation of telecommunications in Europe has hindered the development of new services and the new economy.

Indicator 17: *Price of Internet access and Internet host penetration, 1995-2000*

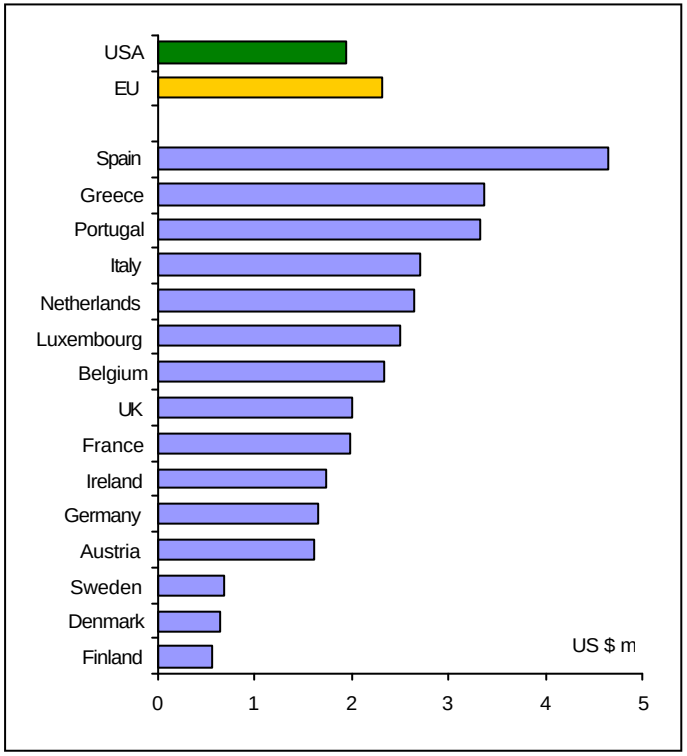


Source: OECD, Telecordia Technologies, 2000.

There is a strong link between Internet access costs and the number of Internet hosts for private users. Countries such as the USA, Finland, Iceland and Sweden, with the lowest levels of access charges, have the highest density of Internet hosts. In general, however, Europe lags the United States in Internet host penetration because Internet access charges for private consumers and small businesses are significantly higher in the EU than in the USA.

To catch up, Europe must reduce access costs. More competition is needed among telecoms operators, especially operators of local loops. Quick unbundling of local loops, through the full implementation of the EC regulation, will give companies and consumers a real choice for both Internet and telephone access and allow the expansion of high-speed access technologies, at internationally competitive costs. The development of broadband capacity within the local loop will enable companies to transmit electronic information more rapidly and efficiently.

Indicator 18: *Leased Line: Private Circuit Tariff Comparison*



Source: Teligen T-Network (OECD) November 2000.

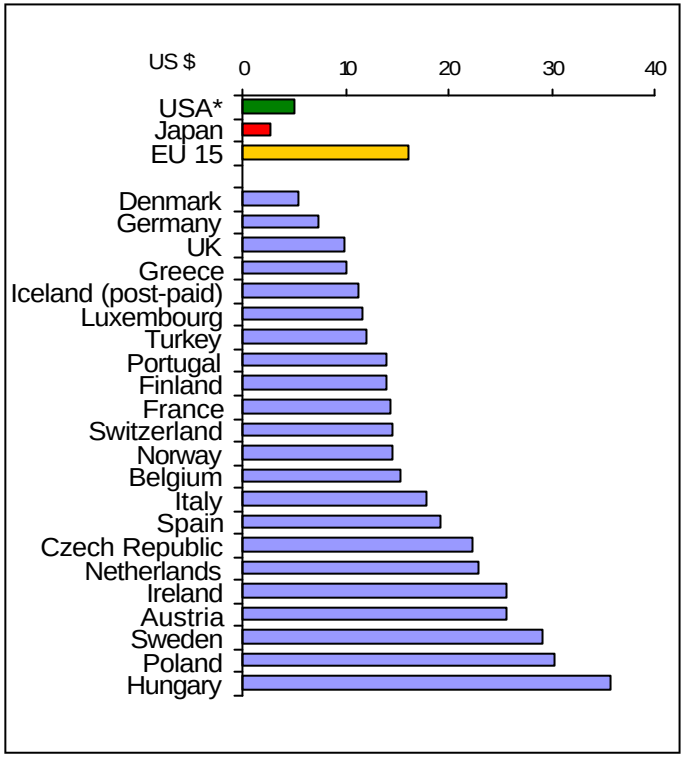
Note: Revised OECD basket of 6 distances, 2Mbits.

Leased telephone lines are a critical component of a modern ICT infrastructure, because they allow companies to control their own telecommunications facilities and to transport large volumes of voice and data traffic at low cost. They also allow companies to provide value-added services and Internet Service Providers to build networks to stimulate the growth of the Internet.

There is a considerable variation in the annual rental cost of a leased line in Europe. Costs in Finland and Denmark are less than half the level in Portugal, Greece and Spain.

In future, the availability of broadband services will be a key factor, although a critical mass of users is required for the significant necessary investment in network infrastructure.

Indicator 19: *Short Message Service (SMS) prices, 1999* per 100 messages



Source: OECD, 2000.

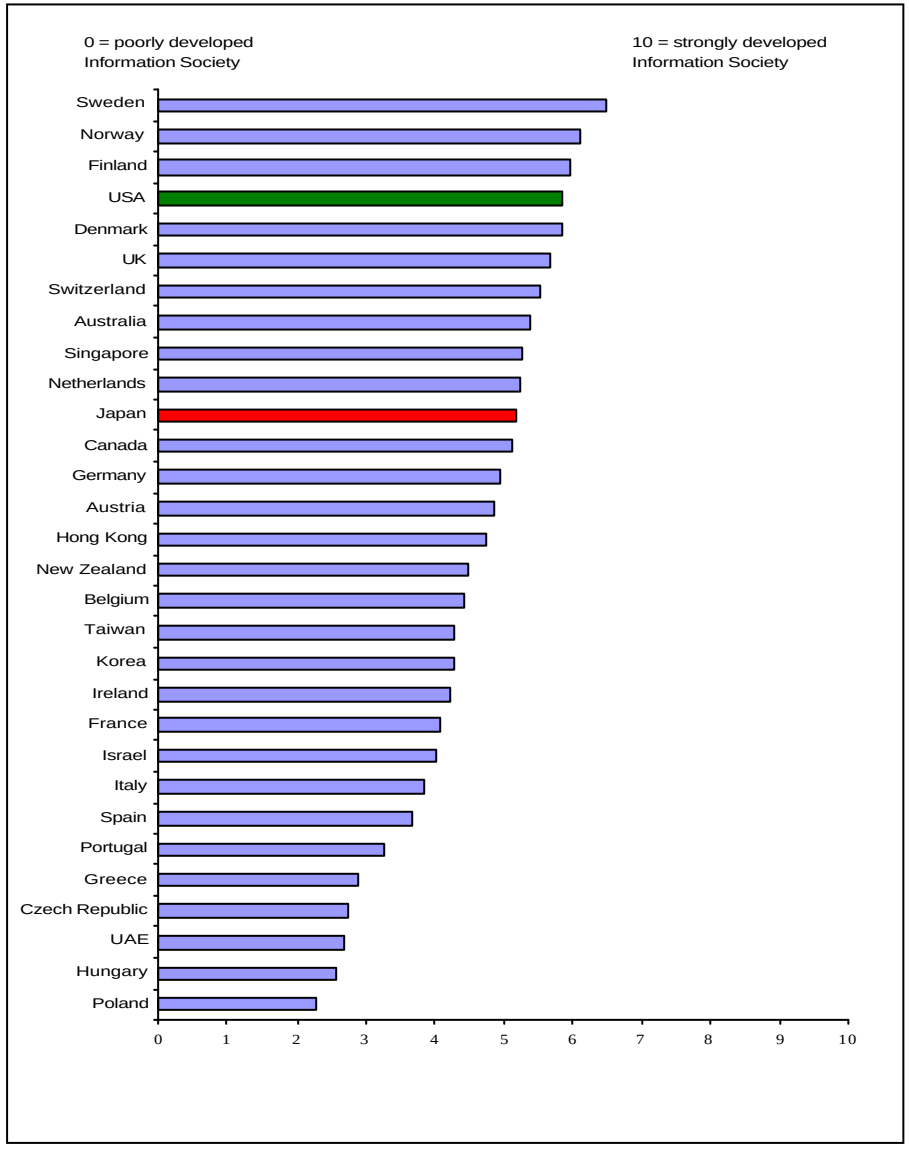
Note: * = USA - fixed monthly fee.

The new technologies connecting mobile phones to the Internet offer considerable opportunities for the growth of new consumer and business services.

SMS provides an early example of the potential for uptake of mobile text-related services, and the pricing of these, and other data services, will be a relevant component in the overall pricing, penetration and development of future mobile Internet services.

The cost of SMS is much higher in the EU than in the USA and Japan. Only Denmark and Germany come close to the US level, and the costs of SMS in Austria, Ireland and Sweden are more than three times the Danish level.

Indicator 20: *Information society infrastructure index*



Source: IDC, 2000.

This global comparison ranks countries on the basis of how well their infrastructure is adapted to the development of the information society. The indicators include computer and Internet linked infrastructure, as well as social infrastructure, such as education and newspaper readership. Six EU countries are ranked among the World's top ten.

RECOMMENDATIONS

- Complete the liberalisation of the telecommunications market: adopt the EU telecommunications package as quickly as possible, with priority given to the Framework and Access and Interconnection Directives
- Ensure independence of telecommunications regulators
- Apply minimum levels of regulation appropriate to telecoms sectors, necessary to enable Europe to be competitive in the global market
- Encourage market-led technical standardisation on a global basis
- Governments should be encouraged, using best practice principles, to provide an environment conducive to the effective roll-out of broadband infrastructure

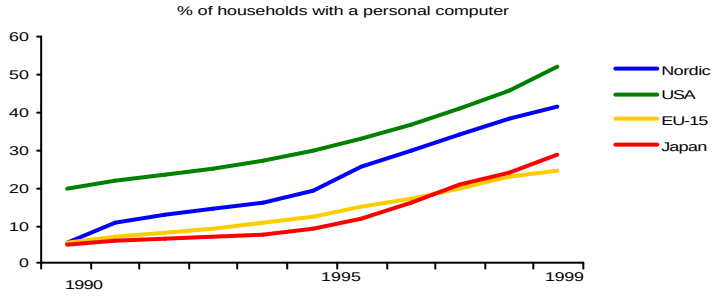
Increase customer acceptance

The willingness of consumers and producers to adopt new products, new processes and new methods of buying and selling, affects the pace of development of new technologies in individual countries.

Factors which cause reluctance to embrace e-business among customers and suppliers include: a general lack of Internet culture or awareness of the potential benefits; lack of skills; fears over security and costs of technology.

Box 4: *Adoption of new technologies*

Rate of adoption of the personal computer by households



Source: ITU (International Telecommunications Union).

Note: Norway is included in the Nordic average from 1991.

A critical mass of early adopters is essential for the viability of new businesses based on new ideas. Consumers must be willing to use new products, technologies and services. The diffusion of new technologies often follows an "S" curve, rising slowly at first but soon picking up speed before evening out. Economic, cultural and structural factors determine its starting point in individual markets.

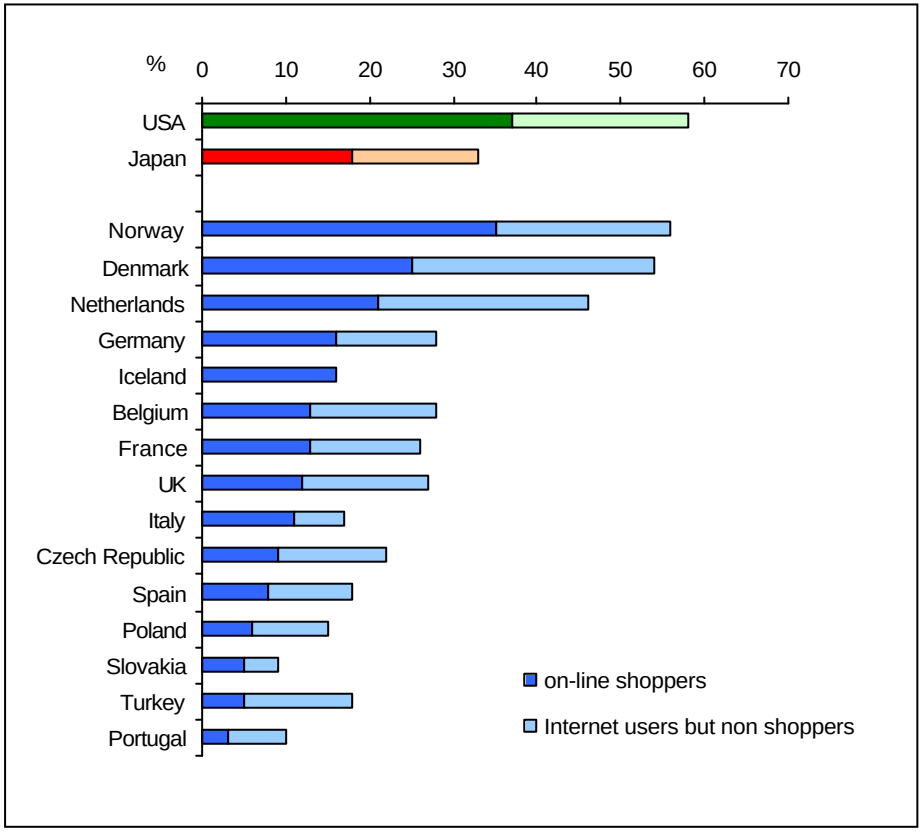
An example of this trend is the personal computer (PC), which was introduced into most European markets at about the same time. Only the Nordic countries have caught up with the USA. Japan surpassed the EU15 during the late 1990s. The cost of purchasing and using personal computers is an important factor determining the rate of diffusion. In Sweden, tax credits have been an important factor stimulating the purchase of home computers by employees.

Households in different countries have adopted the PC at different speeds. At one extreme, diffusion in France has been relatively slow, due perhaps to the early and extensive use of the Minitel system which locked households into an older technology. At the other extreme, uptake in Norway has been fast, while Finland followed the classical "S" curve of first gradual then rapid adoption.

Paul Saffo, Institute for the Future, California, USA, "The early bird may catch the worm, but it is always the second mouse that gets the cheese".

The Economist, New Economy Survey, September 2000.

Indicator 21: *On-line shopping habits amongst total adult population (%), 2000*



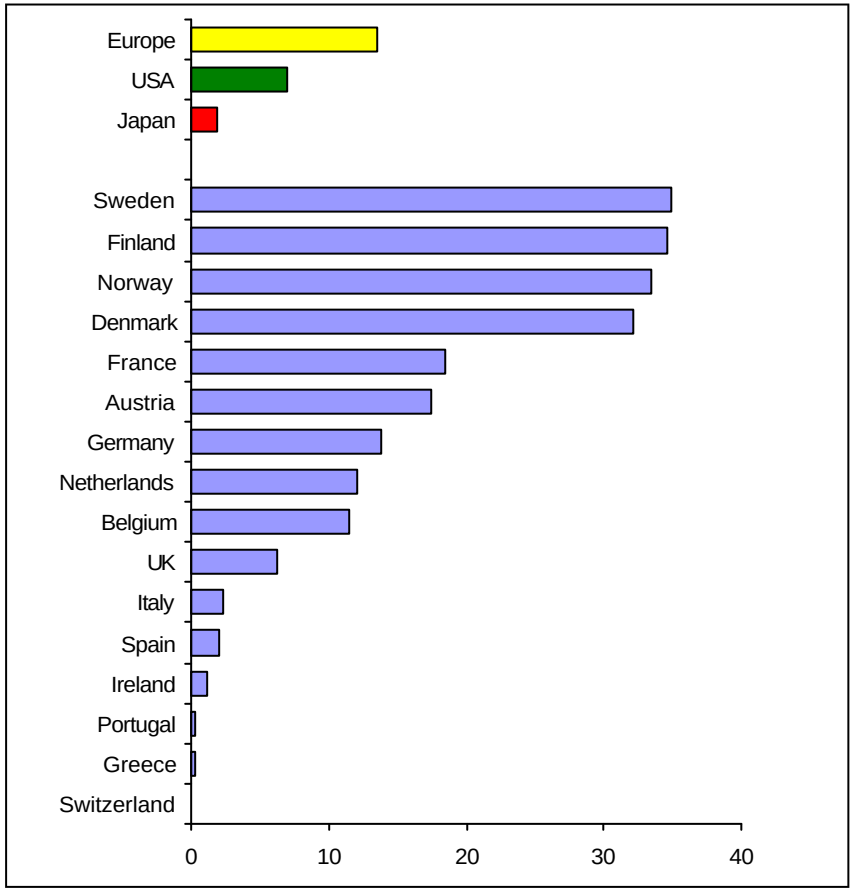
Source: Taylor Nelson Sofres, 2000: Iceland; Price Waterhouse Coopers.

Internet shopping habits vary greatly between the USA and the EU. In the USA, nearly 60% of adults are Internet users and, of these, over two-thirds have shopped on-line. Thus, almost 40% of all adults have shopped on-line in the USA. In contrast, Internet use in Europe is lower, as is the proportion of Internet users that have made purchases on-line. Two thirds of on-line shoppers are estimated to abandon their purchase before finalising the purchasing process, which perhaps indicates a lack of confidence in the system. A recent Eurobarometer survey (October 2000) found that only 4.7% of EU citizens shop regularly on-line, and 13.8% occasionally.

There are significant differences between European countries. At one extreme, shopping on-line is as common in Norway as in the USA; but at the other, fewer than 10% of Spanish and Portuguese citizens have shopped on-line.

A number of factors explain why the EU lags behind the USA. These include a reluctance to shop at a distance, via a computer; concerns over security of payments and of personal details; worries about reliable delivery; and about redress in case of complaint. These factors are especially significant for cross-border transactions, making these issues important for the e-buyer in Europe.

Indicator 22: *On-line banking: % of total accounts*



Source: IDC (Bank of International Settlements).

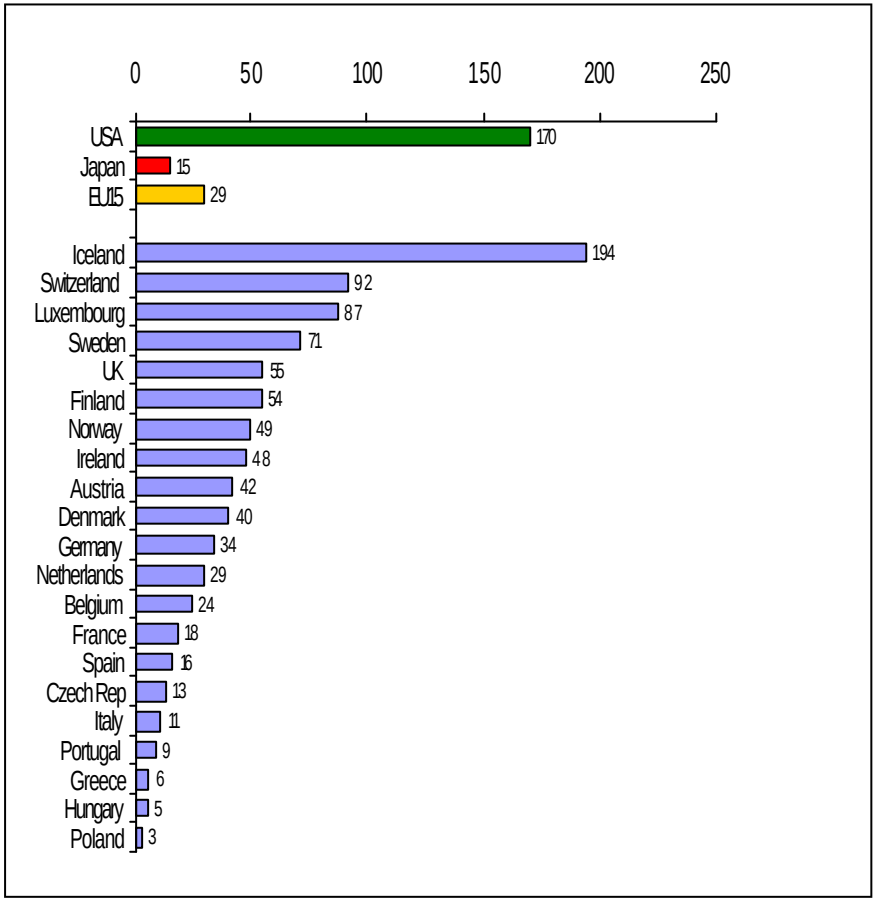
Note: Switzerland shows a low figure due to the exceptionally high number of total bank accounts. The Japanese figure only includes Internet accounts.

On-line banking is one area where consumer acceptance has been rapid in Europe. European banks and consumers lead in electronic handling of financial services. Internet banking cuts the costs and time of retail banking and, like telephone banking, enables customers to choose the time and place for transactions.

In Sweden and Finland, almost 35% of total bank accounts are already on-line, with the other Nordic countries following close behind. This indicator includes Internet, direct-dial, digital television and mobile phone banking.

In some countries, however, the increasing availability of an on-line dimension to a traditional high street bank account means that the distinction between the two is becoming blurred. In Belgium, electronic transferring (via self-banking ATMs, the Internet and telephone) accounted for more than 47% of total transfers made, at the beginning of 2000.

Indicator 23: *Number of secure servers by million people, March 2000*

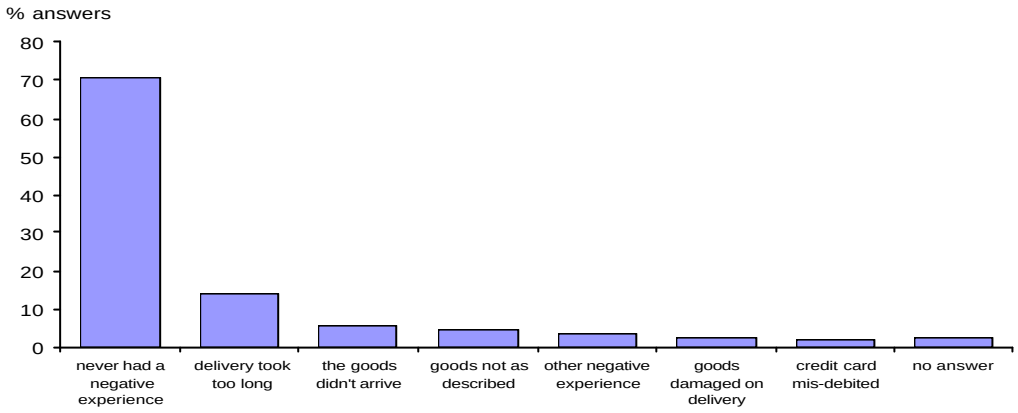


Source: OECD STI 2000.

Secure servers are an important factor for e-commerce, because they can ensure privacy and confidentiality and provide security of payments for the e-customer. They are especially important for Internet banking and trading.

The number of servers per person in the USA is twice that in most leading European countries, with the notable exception of Iceland, despite the fact that small countries and financial centres can both be expected to have a larger number of secure servers.

Box 5: *Experiences of purchasing on-line, EU 15, October 2000*



Source: Eurobarometer, October 200.

The majority of those in Europe who make use of on-line purchasing are positive about the experience. Their main negative experiences concern slow delivery. This emphasises the importance of both efficient internal company delivery logistics and national and international postal services.

Lack of consumer confidence in security of payments and privacy, particularly in cross-border transactions, is another factor holding back B2C in Europe compared with the USA.

RECOMMENDATIONS

- Work to overcome the barriers to consumer acceptance of e-commerce, through cooperation between governments, consumer organisations and business
- Remove regulations that restrict the development of new markets
- Liberalise postal services
- Support use of effective alternative dispute resolution (ADR) mechanisms in the context of e-commerce, to develop a framework to provide consumers with low cost and timely out-of-court settlements in case of problems
- Create a level playing field for EU companies in the global on-line marketplace, by establishing a clear legal and fiscal framework for e-deliveries
- Use codes of conduct and trust-marks for on-line trade, based on clear principles underpinned by all stakeholders
- Increase Internet awareness and support universal access to the Internet in order to build the culture required.

Improve labour markets

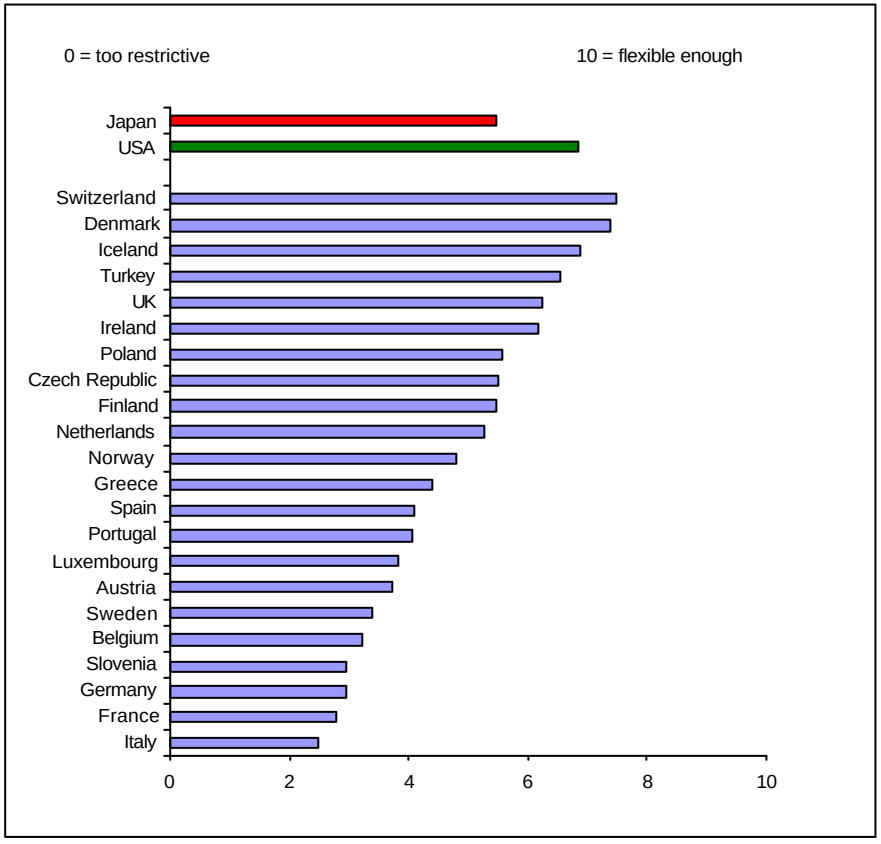
The new ICT-based technologies require more flexible labour markets. New companies start up and existing companies reorganise or close down. Companies must invest in new working methods, and introduce new organisational techniques and new forms of remuneration. The new technologies also increase the demand for skilled labour relative to unskilled labour, which requires appropriate wage structures. Economic incentives for higher education and vocational training must be sufficiently strong to provide updated skills.

Labour markets in the EU are less flexible than in the USA because of outdated labour market regulations, high taxes on labour, insufficient investment in relevant skills, and less geographical mobility.

"An intriguing aspect of the recent wave of productivity acceleration is that US businesses and workers appear to have benefited more from the recent advances in information technology than their counterparts in Europe or Japan. … The relatively inflexible and, hence, more costly labour markets of these economies appear to be a significant part of the explanation."

Testimony of US Federal Reserve Chairman, Alan Greenspan, on "Structural change in the new economy", before the National Governors' Association, July 11, 2000

Indicator 24: *Labour Market Regulations*

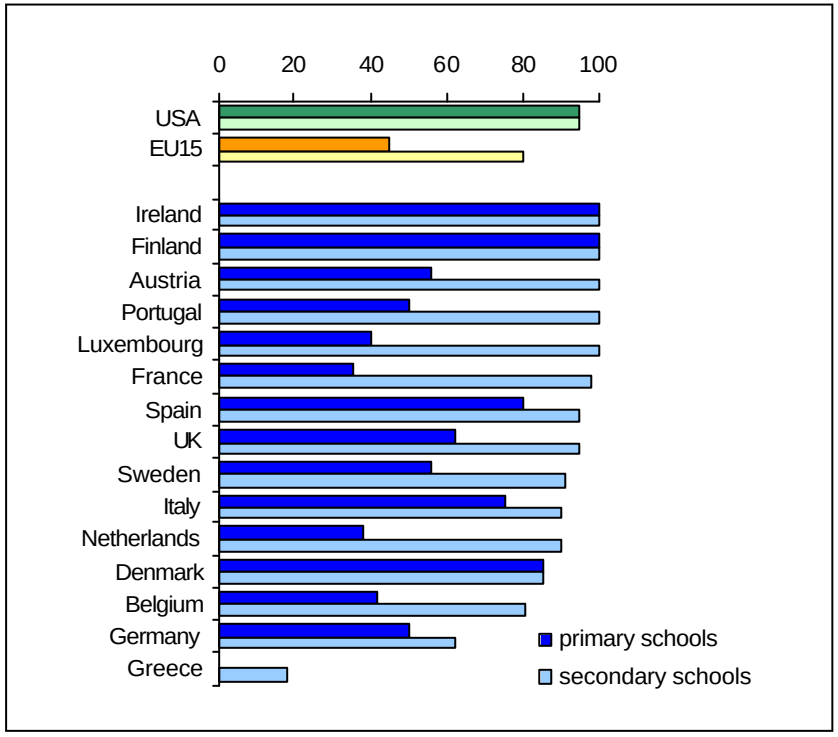


Source: IMD, World Competitiveness Report 2000.

Companies require flexible labour markets in order to respond to changing customer needs and changing competitive pressures in the new economy.

The latest survey of company managers, for the IMD World Competitiveness Report, concludes that labour market regulations are restrictive in most European countries. This confirms an earlier OECD study. However, there are some good examples within Europe, with countries such as Switzerland, Denmark and Iceland, where markets are deemed more flexible than in the USA.

Indicator 25: *Education: % of schools with Internet access, 2000 (2nd half)*

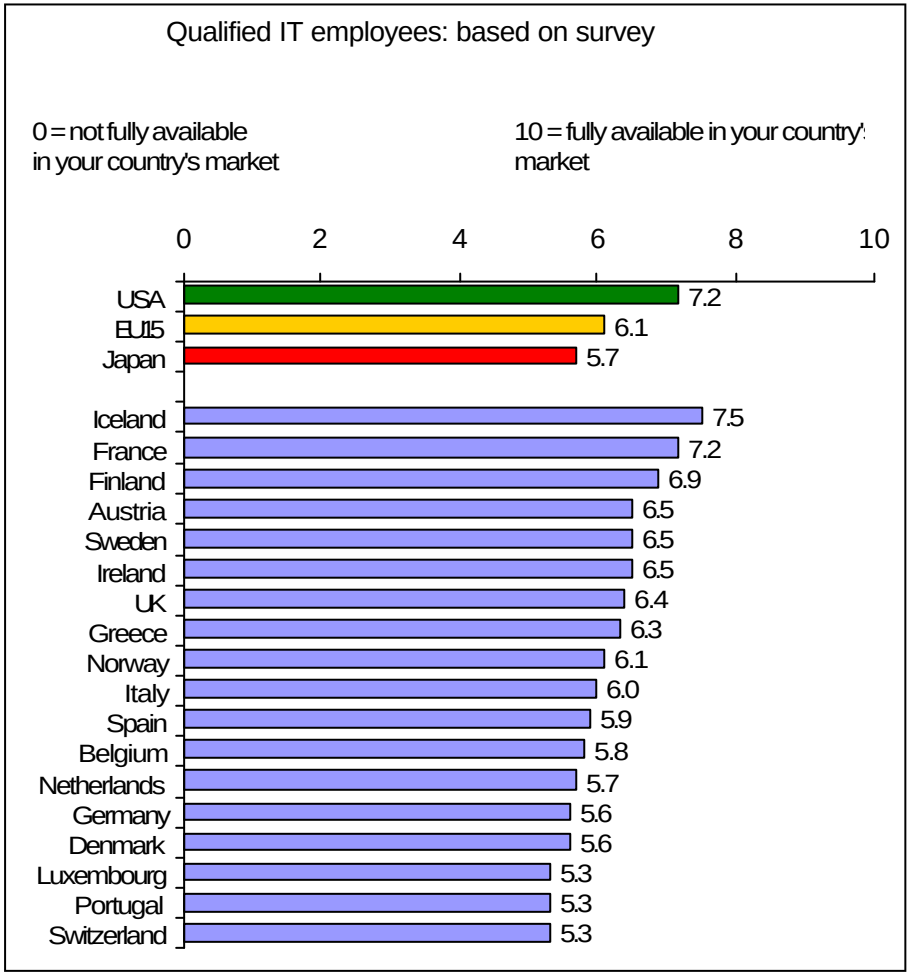


Source: European Commission, 2001.

The knowledge-based economy requires both good basic education opportunities and life-long learning, so that employees can continuously develop new skills and become more flexible in meeting changing demands for their skills. Students must be computer-literate when leaving secondary school.

Availability of Internet access in schools is one benchmark of how well educational systems prepare youngsters to benefit from use of ICT. Five EU Member States provide Internet access in 100% of secondary schools. This is true at primary school level only for Ireland and Finland. The EU as a whole lags behind the USA, especially at the primary school level.

Indicator 26: *Availability of Information Technology skills, 1999*

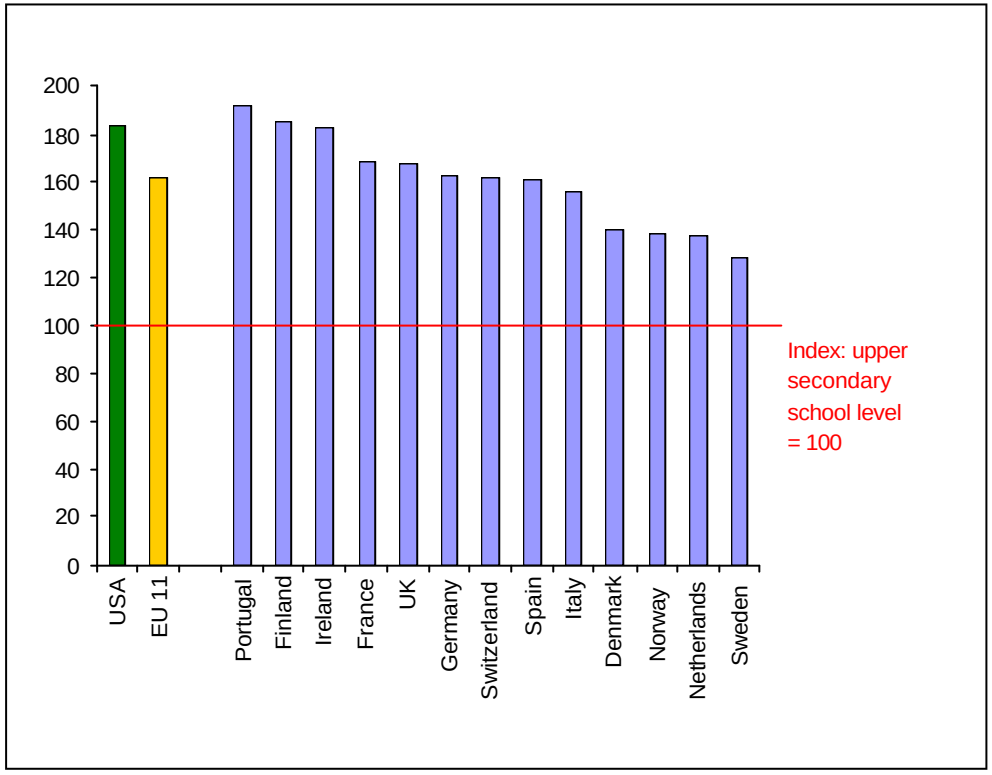


Source: IMD, World Competitiveness Report 2000.

New technologies demand new skills. Shortages of IT-specific labour skills are already being felt in certain EU and global markets. An European Information Technology Observatory (EITO, 2000) report estimates that the IT-skills shortage in the EU was 0.5 million in 1998, and that this will increase to 1.6 million by 2003.

IT skills are perceived by businesses as being more available in the USA than in all European countries with the exception of Iceland. Lack of skills also contributes to a lack of confidence in the new technology and a general absence of an Internet culture.

Indicator 27: *Wage dispersion between those with tertiary and secondary school education*

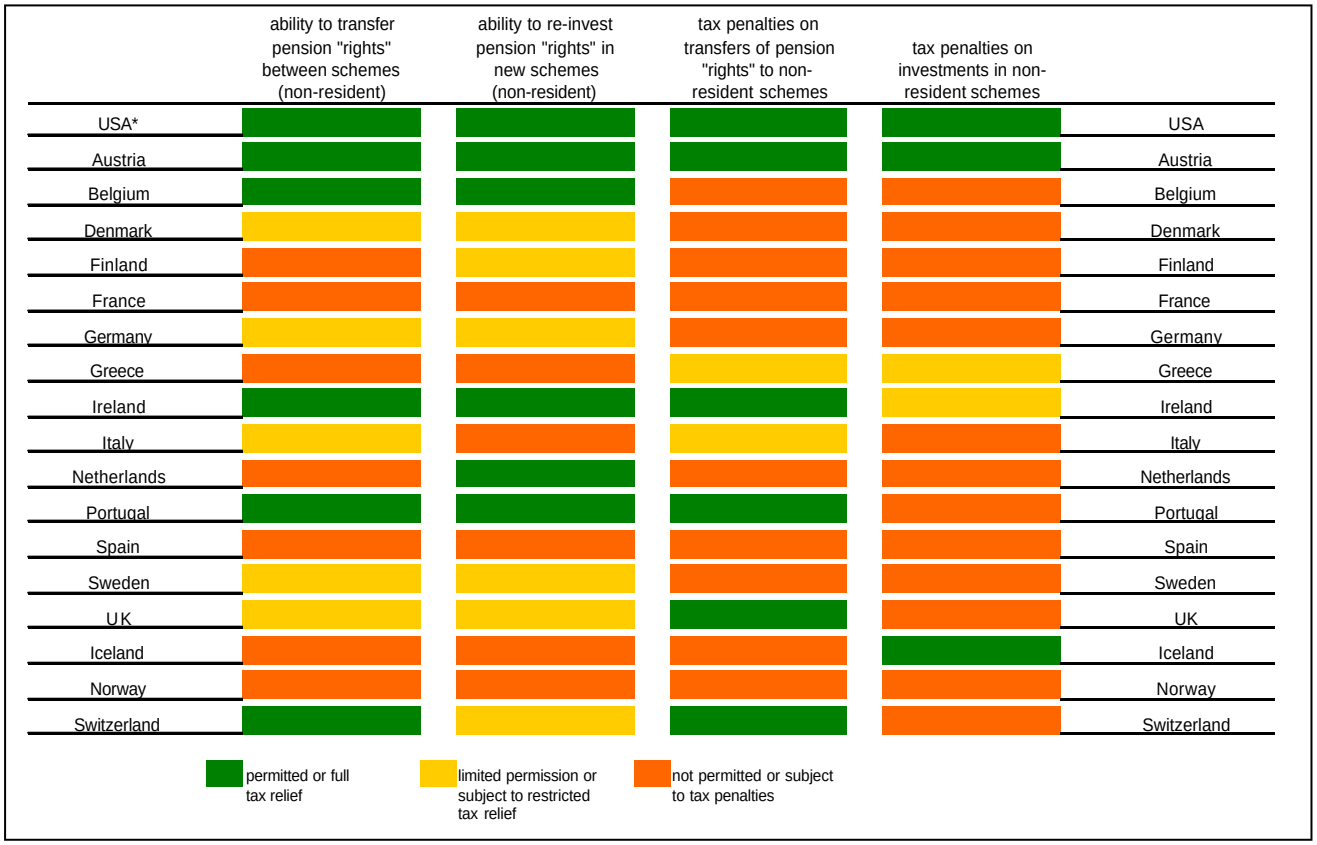


Source: OECD, Education at a glance, 2000.

Wage differentials, reflecting different skills levels, are necessary to encourage people to acquire better skills and accept the greater risks and responsibilities that go with them.

One measure of wage dispersion is the ratio between the average wage levels for people with tertiary education and those with secondary education. The differential is somewhat greater in the USA than in the EU, but within the EU the differential is significant. For example, Nordic neighbours, Finland and Sweden, respectively are high and low in the ranking.

Indicator 28: *Pensions and free movement of employees - a barrier to labour mobility*



Source: UNICE 2000, based on a survey of member federations.

Note:* In USA this refers to inter-state migration.

The mobility of skilled people between regions helps to reduce local imbalances in the demand and supply of labour. Mobility between different firms and sectors helps ensure the rapid spread of new, advanced technologies, providing all companies with access to best practice and new ideas.

Geographic mobility is more limited in Europe than in the USA, for a variety of reasons. Among the important factors that restrict the mobility of skilled labour are differences in national pension and fiscal legislation, which make it difficult for migrant workers to build up pan-European pension rights in private occupational or supplementary pension schemes. Moreover, legal and fiscal restrictions in most European countries limit the transfer of financial rights between supplementary pension schemes and limit contributions to non-resident pension schemes.

Increasing mobility of skilled labour within the EU and into the EU can alleviate the current skills shortages.

RECOMMENDATIONS

- Meet the Lisbon target of all schools to be on-line by 2002
- Ensure that school leavers have the essential basic IT skills, by providing the appropriate resources and teacher training
- Initiate targeted crash courses for IT skills, to alleviate the shortage of these key skills in Europe, within the framework of a greater emphasis on life-long learning
- Reduce barriers to mobility between EU countries for workers, including easier transfer of supplementary pensions and the avoidance of double taxation
- Facilitate immigration policies so the skills gap can be met in the short term
- Modernise labour market regulations
- Adapt social security systems to the realities of the new economy, in such a way that individuals are encouraged to adjust to change not to resist it.

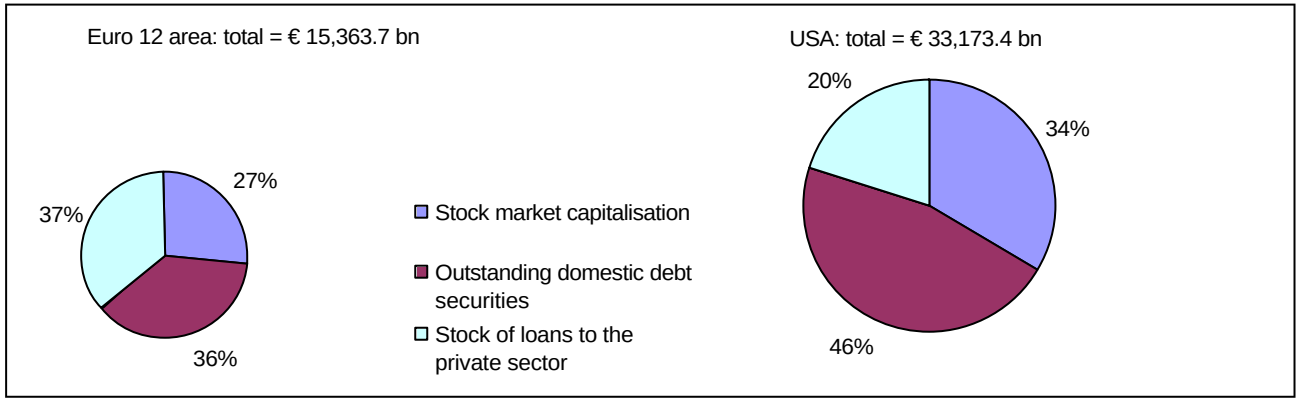
Integrate capital markets

Exploiting the potential of the new economy requires capital. Start-ups need equity-based risk capital, in particular venture capital. Existing companies, with more mature 'physical' assets, require a mix of different forms of capital, including equity and debt. Well-functioning capital markets and stock exchanges are necessary for a dynamic economy.

Although rapid progress has been made in recent years, all European countries are a long way behind the USA in all areas of venture capital.

Other factors which operate as constraints on the development of genuine pan-European corporate financing strategies are: the delay in creating a European Company Statute, obstacles to cross-border tax consolidation, and the lack of a single prospectus for issuers.

Indicator 29: *Structure of financial markets, 2000*



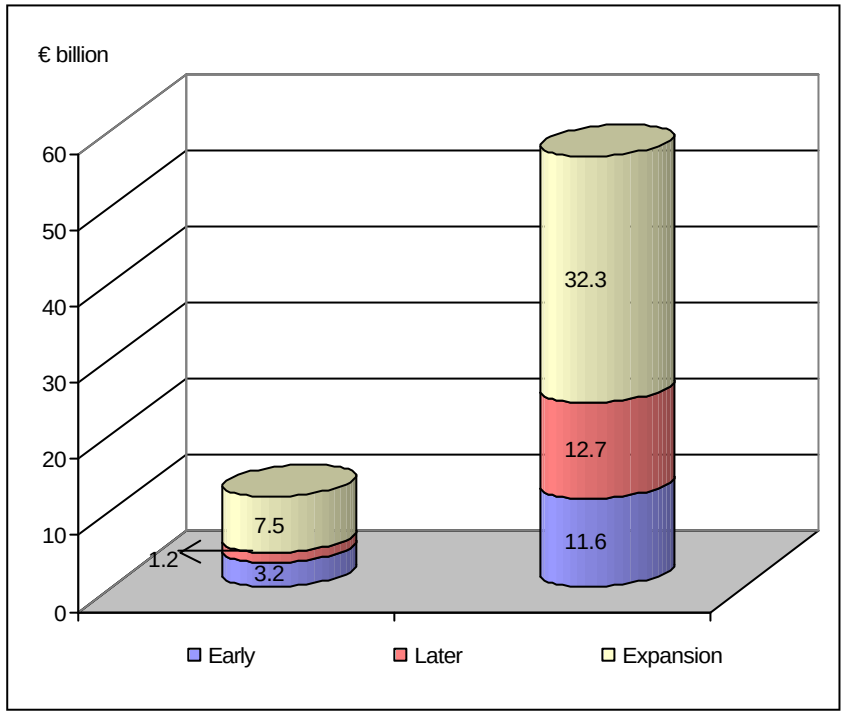
Source: ECB, 2001.

Investing in ICT-related entrepreneurial activities and in new economy businesses are high-risk activities, which need finance via equity capital markets. Hence, well-functioning capital markets and stock exchanges are of decisive importance.

The scale and structure of European capital markets hampers investment in the new economy. The markets for publicly quoted equity and debt are significantly larger in the USA than in the EU. Hence, bank loans account for a larger share of corporate finance in the EU (37% of the total), compared to the USA (20%). Bank loans are more expensive and less flexible than money raised through equity markets. They also require adequate collateral. Both these factors work against high-risk ventures based on intangible assets. The euro has helped to increase the overall liquidity of the EU's capital markets, thus reducing the importance of bank loans, but problems remain.

Indicator 30: *The venture capital market in Europe and the USA, 1999*

Other problems in Europe include the continuing presence of restrictions on the types of investments that financial institutions in many European countries can make. In most Member States there are limits on the ability of pension funds to invest in different domestic and non-domestic assets. These restrictions steer investment funds towards government bonds and away from equity and corporate debt. This puts European companies at a disadvantage compared with their competitors in the USA.



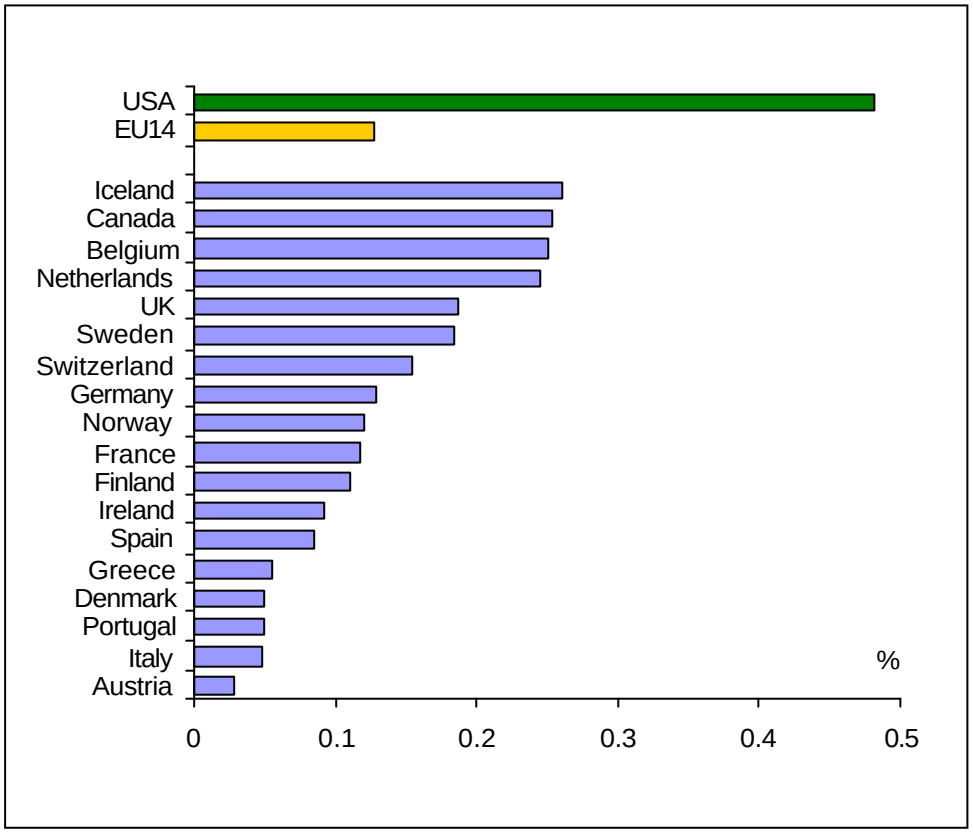
Source: EVCA, NVCA, 2000.

There is a close connection between the size of the national equity market and entrepreneurial investments. New economy start-ups, in particular, are highly dependent on local markets for finance, and therefore developing national venture capital markets is of prime importance.

European countries lag behind the USA, where venture capital markets are larger, more diversified and more efficient. Measured on a per capita basis new investment in 'pure' venture capital in Europe in 1999 was equal to only 15% of the level in the USA.

In the absence of fully functioning venture capital markets in the EU, other sources of funding are important. The European Investment Bank is an example of strategic funding for the development of the information society. It makes equity capital available to high-tech SMEs, sets up new venture capital facilities in countries where the market is less developed, provides a start-up facility for leading-edge sectors, and finances transnational broadband networks.

Indicator 31: *Venture capital invested in early stages and expansion as % of GDP, 1999*



Source: OECD 2000

The share of venture capital going to early stage and expansion in Europe is significantly less than in the USA. However, within Europe, Iceland, Belgium and the Netherlands invest relatively more in these key stages of company growth.

Venture capital has a significant role in developing ICT businesses, and again, the share of European venture capital going to ICT companies is low, compared to the USA. This lack of venture capital is a major obstacle to the rapid growth of the ICT sector in many European countries.

RECOMMENDATIONS

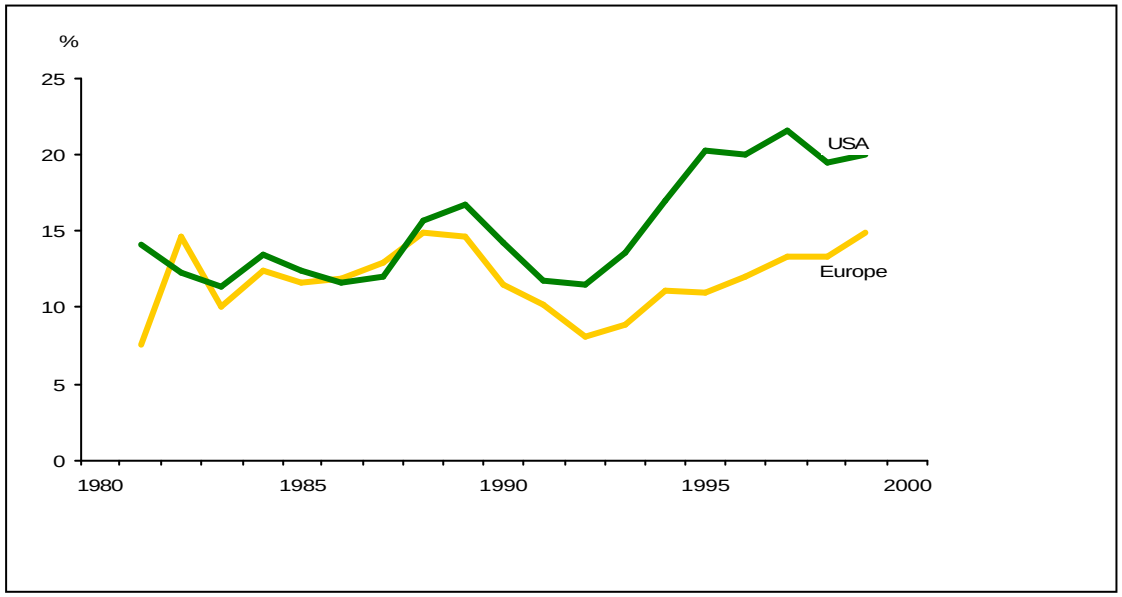
- Encourage development of a European venture capital market for new technology companies
- Stimulate the development of larger public markets for corporate bonds
- Allow freer portfolio choice for supplementary / occupational pension funds
- Implement measures to facilitate the pan-European operation of EU companies within the single market (update EU accounting strategy, introduce a common European company prospectus, ensure adoption of an appropriate European company statute in 2001, allow cross-border tax consolidation)
- Completing the single market in financial services is necessary to realise the full potential of e-commerce
- The target date for completion of the single market and financial services should be brought forward to 2003.

Reward risk and effort

Making the most of the opportunities provided by the developing new economy involves risk for entrepreneurs, investors and employees.

The rewards available to companies and to individuals are generally lower in the EU than in the USA. This means that European entrepreneurs and investors are less likely to invest in the new economy; companies are less able to recruit, retain and motivate staff; and employees are less likely to accept new (risky) opportunities.

Indicator 32: *Reward risk: returns on equity investment*



Source: Goldman Sachs, 2000.

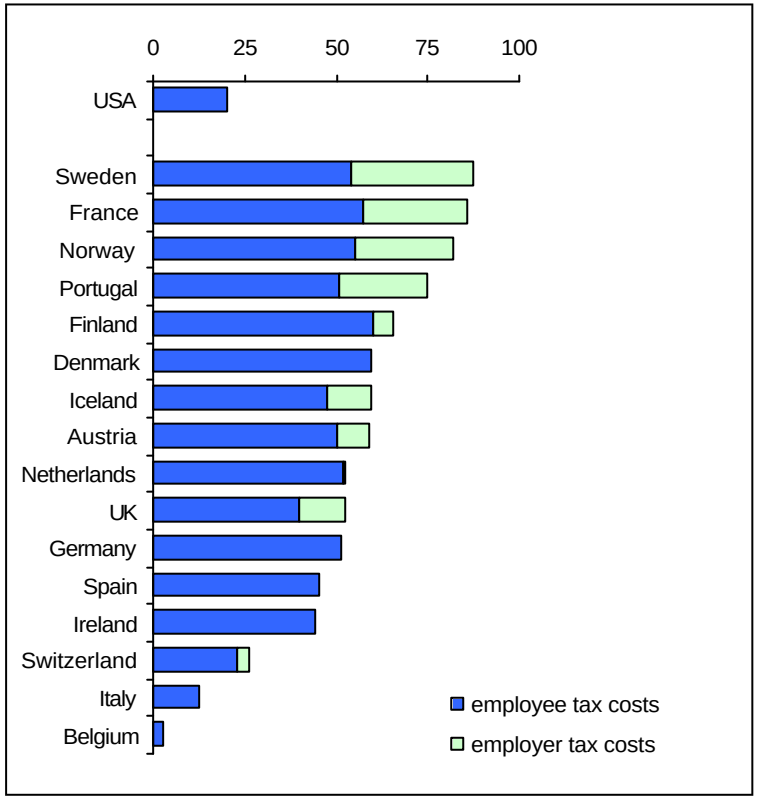
Returns on equity are a good indicator of the ability of established companies to generate cash flows to fund new investments internally. They also send a signal to investors about the profitability of investing in real assets.

For most of the period since 1987, the after tax return on equity for publicly quoted companies has been lower in Europe than in the USA, with the gap increasing over a ten year period. This is the result of a wide range of factors, including high taxation, high labour and utility costs, and less efficient use of capital and labour. Although the gap has narrowed in recent years, it remains large, making it more difficult for European than US companies to finance and exploit new, profitable investment opportunities based on new technologies.

"The race is not to the swift, nor the battle to the strong, neither bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happen to all."

Ecclesiastes, Chapter 9, verse 11.

Indicator 33: *Reward effort: stock options: % "gain" payable in taxes*



Source: UNICE 2000, based on a survey of member federations.

Note: Employee costs are subdivided into income tax, social security contributions and other taxes. The base case of this model is specific.

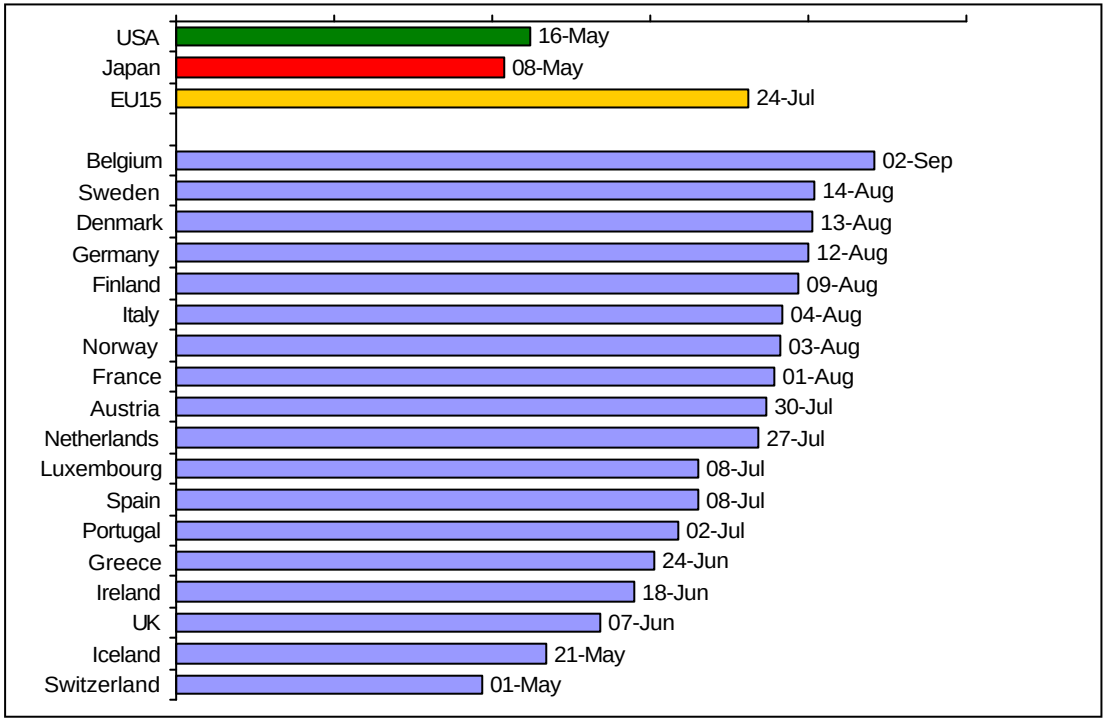
New, fast growth companies need to recruit, retain and motivate their staff if they are to exploit the potential of modern technologies. Stock options are a way of doing this.

In most EU countries fiscal legislation reduces the attraction of stock option programmes to both employers and employees. Gains are frequently taxed at high marginal rates of income tax and made subject to employers' and employees' social security charges, as though they were secure salaries rather than risky returns on invested effort.

Only 20% of the gains from a typical stock option programme for senior managers in small, fast-growth companies are paid as tax in the USA. By comparison, Swedish managers in a similar company would pay tax equal to 53% of the gains from the same programme, of which 33% are social charges. Belgium has the lowest tax on options.

High levels of taxation of stock option programmes in Europe reduce the incentives for employees in established companies to take risks and accept major changes in existing operating processes and business models.

Indicator 34: *First tax-free day, 2000*



Source: SAF, 2000, SA (Icelandic Business Federation).

Note: Definition: time needed to pay the year's total taxes (including income taxes, social security contributions and tax on goods and services) on labour for an average production worker.

Taxes on labour are significantly higher in the EU than in the USA, in part because most European countries provide retirement benefits through state-run "pay-as-you-go" schemes.

This un-funded pension liability of governments puts an excessive tax burden on individual employees and employers. In the EU as a whole, for an average production worker, it takes 202 days to pay off the year's taxes on labour, compared to 133 days in the USA and 125 days in Japan. Although this situation has improved in the EU as a whole since 1998, it has deteriorated in several EU Member States. High taxation reduces the incentives for employees to embrace new ways of working.

"The challenge is not to dismantle the European model, but to modernize it so as to provide Europe's citizens with security in support of change, instead of security against change."

Leif Pagrotsky, Sweden's Trade Minister, The Financial Times, 5 October 2000

RECOMMENDATIONS

- Lower the tax burden on equity investment
- Reform the system of taxation of stock options
- Reduce tax burden on labour, including marginal tax on labour
- Strengthen incentives for workers to embrace change, modernise labour market regulations and reduce indirect labour costs

"I'm all for progress; it's change I don't like."

Mark Twain

Chapter IV - Conclusions

Technical progress is the major driving force behind economic growth and can change society profoundly.

The USA is the first country to have taken advantage of the opportunities offered by the new information and communications technologies. During the 1990s, it grew at a faster rate, for a longer period, than ever before; and it achieved this through rapid productivity growth combined with low levels of inflation.

This report suggests that the new economy has developed fastest in countries that are innovative producers and users of ICT goods and services; where existing "traditional" industries have adopted the new technologies, for their own production and distribution activities; and where companies investing in ICT have restructured their work organisation and developed new business strategies. In short, companies - and the people working in them - must have a capacity to innovate, a willingness to invest in new production technologies, and a readiness to implement new organisational change.

The speed of development of the new economy has been slower in Europe as a whole. Yet some European countries have been successful and many European companies provide examples of best practice.

And there could be more European success stories if the overall framework conditions in more European countries were geared towards encouraging change:

- Labour markets must function more smoothly, so that individuals recognise change as an opportunity rather than risk;
- Product markets must be sufficiently competitive, especially telecommunications, so that Europe is able to exploit fully and rapidly the new technologies;
- European countries must reduce the overall burden of taxation on their citizens and their companies.

These conditions are essential for consumers, investors, employees and companies to become more willing to: adopt new technologies, support new entrepreneurs, develop new skills, invest in ICT, and adopt new forms of work organisation.

The speed of change has increased, placing greater demands on individuals, companies and societies. For these to respond positively, governments must act quickly - so that all Europe's citizens can benefit from the opportunities generated by the new, ICT-driven economy.

List of indicators, boxes and abbreviations

Indicators

Boxes

List of abbreviations

ATM	Automatic teller machine
B2B	Business to business electronic commerce
B2C	Business to consumer electronic commerce
CBI	Confederation of British Industry
CEOE	Confederation of Spanish Employers
e-	electronic
EITO	European Information Technology Observatory
EVCA	European Venture Capital Association
GDP	Gross Domestic Product
GSM	Global system for mobile communications
ICT	Information and Communications Technology
IDC	Part of International Data Group (IDG)
IDW	Institut der Deutschen Wirtschaft
IMD	International Institute for Management Development, Lausanne
ITU	International Telecommunication Union
NVCA	National Venture Capital Association (USA)
OECD	Organisation for Economic Cooperation and Development
OECD STI	Science and Technology Indicators
PPP	Purchasing power parity
SAF	Swedish Employers' Confederation
SI	Federation of Swedish Industries
SME	Small and medium-sized enterprises
UK DTI	UK Government's Department of Trade and Industry
UMTS	Universal mobile telecommunications system: the third generation mobile standard
UNICE	Union of Industrial and Employers' Confederations of Europe
WAP	Wireless application protocol

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The data used in this report are taken from a variety of official sources. UNICE alone is responsible for the use made of this data and the opinions expressed in the text.

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