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Does the European Union create the foundations of an information society for all?

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Abstract

In order to increase the use of information and communication technologies (ICT) in the European Union Member States, the European Commission, on the initiative of Commissioner E. Liikannen, launched in December 1999 a bold programme called “eEurope”. Soon after its creation, the eEurope programme was integrated into the so- called Lisbon agenda for Europe to become the “most advanced knowledge based economy” in the world.

We try to assess if the programme is successful in achieving its stated objective of promoting a knowledge based economy through the development of an “information society for all”. First, we conclude that eEurope, due to its origins and its procedures, has intrinsic limits both as regards its scope and effectiveness. Second, we show how Member States have adopted different trajectories towards the “knowledge based society”. To identify these heterogeneous paths of growth, we have selected a set of variables that, combined together, represent the institutional arrangements specific to a country or a group of countries. We found sharp differences between two advanced models that we label, respectively, as Scandinavian and Anglo-Saxon. Without asserting the superiority of a model, we propose policy orientations to help Europe overcome those gaps hindering the move towards knowledge economies where information society technologies are widely diffused.

Key words: E-Europe, Information and Communications Technologies, Knowledge Based Economy, Institutions.

JEL Codes: L5, L8, O3.

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Introduction

During the years 1996-2000, the use of the Internet has brought about a lot of innovations, an impressive cycle of economic prosperity both in the USA and in several other countries. A debate among economists has emerged on the resolution of Solow's "productivity paradox"[1], along with the emergence of a "New Economy". Confronted with this turmoil, Europe seemed, with some exceptions[2], to have difficulties in grasping the benefits of the "Net Economy". It is thus no surprise that the European Commission, under the initiative of Commissioner E. Liikannen, has launched a bold programme called "eEurope" to catch up with the US.

The task seemed at first sight Herculean: not only was it necessary to catch up, but also to have a European policy taking into account national specificities, and at the same time bringing the Members States together the same development trajectory, the latter being based on a high information and communication technology (ICT) usage. But the current efforts of the Union's 25 Member States to increase their usage of ICT are, to say the least, quite heterogeneous. Some figures illustrate: in 2001 there were 56 PC (Personal Computers) for 100 inhabitants in Sweden, 54 in Denmark but only 7 in Lithuania, 9 in Poland. Internet access reached 52 users per 100 inhabitants in Sweden, 49 in the Netherlands but 7 in Poland, Latvia and Lithuania, 9 in the Slovak Republic. With such heterogeneity, a strong European intervention was deemed necessary.

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1 In 1987 Solow wrote in the New York Times that "computers are everywhere but in the statistics" meaning that the increasing use of computers did not lead to any productivity improvement, particularly in the US.

2 The Scandinavian countries, the UK and Ireland mainly, that is 5 countries out of 15 at that time.

The questions we wish to address in this Paper are thus the following: is it possible to give an evaluation of the "eEurope" programme? Will the promotion and stimulation of ICT usage be enough for Europe to become the "most advanced knowledge based economy"? What does this expression mean and what is its impact on Europe's development policy?

The layout of the Paper is threefold. First the functioning of the eEurope programme is briefly described and its limits emphasized. In the second part we show that Europe's heterogeneity is deeply rooted in different paths of growth: thus Member States adopt peculiar trajectories towards the "knowledge based society". Finally we shall propose policy orientations to help Europe overcome its development "dilemma".

1. The eEurope Programme

We claim that eEurope is too limited both in its scope and effectiveness. One reason stems from its origin, the other relies on its procedures. Finally, a global evaluation can be made, which shows the specific limits of this programme in relation with its real purpose.

1.1. The origin of the programme influences its scope and effectiveness

As the gap between the USA and Europe with regards to ICT adoption started to be visible, the European institutions initiated a programme attempting to extend ICT usage: the eEurope programme. This, however, has been the last metamorphosis of a long list of European initiatives initiated in 1982 with the Esprit Programme, all with the objective "to catch up" (with Japan, with the USA…).

The Esprit programme was implemented by the European Union to reduce the technological gap with Japan and the US in the field of microelectronics and related applications. Esprit tried to copy the "precompetitive" programmes initiated by MITI in Japan in the late 60's[3]. In 1984 this European programme was duplicated for telecommunications (Race Programme). Later on, Europe initiated several actions to improve the performance of the telecommunications industry: it liberalized the market for equipment and "value added" telecommunications services in 1990, harmonized the nascent market for cellular mobile telephones (1992) and decided in 1993 to fully liberalize the telecommunications market from 1998 onwards. Here Europe seemed to fill a "regulatory gap", and more specifically

[3] On MITI and the precompetitive programmes see for example Anchordoguy (1989)

with the US. Because of this gap, Europe was supposed to be less competitive, the use of telecommunications being too expensive for users, notably the firms.

At the initiative of J. Delors, the then President of the European Commission, a decisive macroeconomic programme was initiated in 1993, described in a White Paper on "Growth, Competitiveness and Employment". In this document, the "Information Society" was recognized as a major transformation of advanced economies, where "the management, the quality and the speed of information become an essential factor of competitiveness"[4]. In other words, the diffusion of information technology was seen as a key ingredient for sustaining the growth of the European Economy in the years to come. Not only was production of ICT goods and services considered fundamental for Europe's competitiveness, but ICT usage was also acknowledged as the key element of Europe's growth potential. The question of a possible shift of Europe's support from ICT producers to ICT users was thus implicitly raised.

The White Paper led a year later to the so called "Bangemann Report", which recommended to stimulate the use of Information Technology through the liberalization of the telecommunications markets, and to let the private sector finance the "information infrastructures" necessary for ICT, the "Information Super Highways". In that sense, the Report was the follow up of the liberalization policy undertaken at the beginning of the nineties. Removing any regulatory obstacle would in itself be sufficient to unleash the forces of the market on the production side and develop usage.

The Bangemann report, approved by the Council at the Corfu Summit of June 1994, also recommended the experimentation and testing of applications in ten pilot areas, which led to the "TAP" (Telematic Application Programme). As emphasized by Santucci (2002), this departure from "technology supporting programmes" such as Esprit, in the direction of "application supporting programmes" such as TAP, was a major inflexion in the European policy for ICTs in the nineties. Later on, TAP, Esprit and ACTS (the successor of Race) merged into the IST (Information Society Technologies) Programme (Santucci, 2002). TAP and later IST Programmes partially contradicted the free market option supported by the Bangemann report: Europe was not trusting the market forces fully on the supply side, but promoted limited, publicly funded "experimentation" to stimulate ICT usage.

[4] Quoted by Santucci (2002)

This attitude could be based however on sound theoretical and practical pillars. For example in 1990, Michael Porter of Harvard University published a best seller called "The Competitive Advantage of Nations", which showed that competitiveness relied on what he called a "diamond" : Those advantages could be built or reinforced by different actions that affect demand, competitive factors, industry and individual companies' behaviour. Works by B.A. Lundval, C. Freeman and others recognized the specificity of "National Systems of Innovation" to harness productivity and economic performance: supporting usage with public research programmes could be part of the institutional framework accompanying the promotion of innovation in Europe. At the same time, Bill Clinton and Al Gore's policy towards "National Information Infrastructures" (Aronson and Cowhey (1993), Catinat (2000)) mixed the deregulation of telecommunications and cable TV leading to the Telecommunications Act of 1996, with a support for local public initiatives.

However, the eEurope programme launched in 1999 was, to some extent, a major evolution of IST, provoked by the formidable success of the "dotcoms" in the US, the bright perspectives seemingly offered by electronic commerce, and the spectacular expansion of financial markets linked with ICT product and service creation ("the Internet bubble"). European governments felt that Europe could not lag behind the US in such a context. As a result, the eEurope programme was presented by the European Commission on December 8 1999, and was soon integrated in the objectives decided during the Lisbon summit in March 2000[5]. The "Lisbon objective" was to create by 2010 "the most dynamic and competitive knowledge based economy in the world".

Hence, eEurope comes after a long series of European programmes. But while the other focused more on R&D and provided financial support to European companies on the supply side, eEurope is a reformulation of the perception of a "gap" with more advanced countries, targeting users rather than producers. Its limits are obvious: filling the gap on the production side can be attempted with subsidies to the firms of the sector, while in the case of access and usage, such public instruments are not suited for at least two reasons. First, the community of potential recipients is quite large and selecting the winners among them, may prove too difficult. Second, this task is in any case part of the government's competence.

[5] eEurope was adopted in March 2000 during the extraordinary European Council on Employment, Economic Reform and Social Cohesion Towards a Europe of Innovation and Knowledge in Lisbon and improved further in April 2000 during the special ministerial conference on the Information Society in Lisbon.

Another feature of eEurope is the perception of an *urgency* created by the "Internet bubble": reactivity seemed a key element to achieve the long-term objective of growth. But this perception was purely political, and not based upon economic considerations. Indeed, demand and usage are triggered by complex, slow moving decision making processes at both the individual and firm level. In the case of end markets, ICT usage depends not only on revenue, computer literacy, age, all factors on which political decision can hardly impact in the short run, but also on neighbourhood (see LeGuel, Penard and Suire (2004)), something which could not be perceived at that time. In the business sector, ICT adoption and usage is even more complex, depending on the sector of activity, the internal organization of the company, the enthusiasm of its boss, the degree of opposition by manpower, reengineering (see Askenazy (2000), Brynjolfsson and Hitt (2000)), the capacity of innovation in usage (Bresnahan and Trajtenberg (1995)).

This urgency can be explained: the Internet seemed to be an explosive phenomenon, and the "winner takes all" argument was constantly put forward. European programmes such as IST were encouraging testing and experimentation, a too lengthy process, however, to achieve quick diffusion and pick up European champions for the "Net Economy".

1.2. The procedures of eEurope limit its efficiency

In the beginning of the year 2000, the European Commission, in charge of the execution of the eEurope programme, established short term objectives to be fulfilled by 2002. This first eEurope programme was therefore called *"eEurope 2002"*. There were ten broad areas of intervention and 65 eEurope detailed objectives. The key idea was *"connectivity"* or *"access"*. Europe overall was to be connected, namely households, companies, hospitals, schools, etc. In the Commission's wording, "If Europe can succeed and realise the enormous potential of the new economy, a prosperous future is possible for all Europeans"[6].

Each of the actions announced in the framework of eEurope was supposed to rely on several instruments: first, the quick implementation of "an appropriate legal environment", namely the implementation of directives to strengthen competition in the ICT sector, such as the "telecommunications package"; second, a support to new infrastructures and services across Europe, relying on the private sector but also on "actions by Member States"; and finally the

[6] "eEurope: an information society for all" Communication on a Commission Initiative for the Special European Council of Lisbon 23 & 24 March 2000.

promotion of "an open method of coordination and benchmarking to ensure that actions are carried out efficiently and have the intended impact"[7].

Among the three instruments advocated by eEurope, the third is the most innovative and deserves some analysis in consideration of the intended objective to eliminate the so-called "digital divide" among European countries. When it was launched in 2000, benchmarking seemed to have two main advantages. On the one hand, it would have provided all Member States with thorough information about the use of ICT throughout Europe, giving them elements for comparison with most advanced countries[8]. On the other hand, benchmarking would have shown where the digital divide was likely to be the largest. Also, the collection of "best practices" would have brought a common knowledge on the best way to reduce the divide both within and across Member States. But the method of benchmarking had other advantages:

- It was not financially compelling, given the scarce resources of the European budget devoted to R&D, compared to national or regional funds.

- It focused on quantitative measures of ICT diffusion (e.g. broadband access) and ICT usage (e.g. degree of usage of administrations, or SMEs, or households, degree of "eInclusion", etc.) thereby ensuring the visibility of its results[9].

Benchmarking can be termed as "soft regulation", referring to a form of "non-binding regulation". This mode of EU governance includes mainly: the definition of objectives, the spread of use of best practices, and the review of the results achieved by single countries after a given period of time.

Beyond this however, there were and still are, *at the Union's level*, no personalized programmes, compelling rules or sanctions for those that were or are lagging behind. The design of the eEurope programme has always been consensus driven and advisory. Although an access for all was really the basic issue of the eEurope 2002 Action Plan, there were no recommendations or incentives to ensure that the private or the public sector would play a greater role in generalizing access in EU countries and would reach specific, well-targeted

7 "eEurope 2002 Action Plan" prepared by the Council and the European Commission for the Feira European Council, 14th June 2000.

8 For example, the comparative progress evaluation of eEurope Action presented by the Commission to the Parliament reviewed 23 indicators of measure for this access, see "Communications from the Commission to the Council, the Parliament, Economic and Social Council and the Region Committee Com (2002) 62 final."

results. Ever since the beginning, there has been no significant budget dedicated to eEurope objectives: "eEurope is not a public expenditure programme and does not make new funds available. It rather aims to provide a policy framework within which existing expenditure, such as the 6th Framework programme for research, the eTEN, the Structural Funds, can be better focused and to accelerate the adoption of relevant legislation".[10] More generally, as highlighted in a report by the consulting firm ECOTEC (2005), the information society policy in general is limited in its budget and possibility of action

After the 2002 Review, a new programme was to follow. New priorities were decided for the launch of an "eEurope 2005 Action Plan". But ruling, implementation and evaluation were the same as in the eEurope 2002 Action Plan. However, whereas the previous eEurope objectives were concentrated on connectivity, eEurope 2005 was designed to enhance *"Uses and Services of ICT"*. This time, the objectives amounted to seven, but the ambitions were not scaled down. The time span was again very short: three years. Four of them were defined to target the content: public services, training, eHealth and ebusiness. There were also three objectives aimed at increasing the usage: generalising broadband, improving security and enabling multiplatform solutions. 37 indicators this time had to be built and benchmarked across Europe. In the mid-term review of eEurope 2005 Action Plan[11], these indicators were examined in light of the forthcoming enlargement. They were supposed to assess the degree of access to ICT for citizens and businesses, the level of secure and fast (broadband) access, the best practices. But the usefulness of these indicators was questioned: "Indicators do not show to what extent the targets of eEurope have been achieved."[12]

On the whole then, one may wonder whether eEurope could have reached its objectives, given the absence of both "carrots" (financial support to reach the objectives) and "sticks" (sanctions for laggards). But even stronger reasons may explain the failure of eEurope.

1.3. eEurope could not reach its objectives at any rate

The results of eEurope are lauded. Whereas the Lisbon agenda is regularly said to be too ambitious and unachieved, the eEurope programme is considered to be successful. "The eEurope initiative (launched in 1999) has been a great success for promoting an all inclusive

[9] See the 23 indicators of eEurope 2002 and the 34 indicators of eEurope 2005.
[10] Source: European Commission website (www.europa.eu.int)
[11] Communication from the Commission to the Council, the Parliament, the Economic and Social Committee, the Region Committee "Mid-term Review of eEurope 2005 Action Plan" Com (2004) 108 final

electronic society"[13] states the PRISMA report. The 2002 report emphasizes that: "It is providing opportunities for people to participate in society and helping the workforce to acquire the skills needed in a knowledge-driven economy. It is bringing computers and the Internet into schools across the Union, bringing governments on-line and focusing attention on the need to ensure a safer on-line world."

But the picture is not as bright as depicted in consultants' reports. When eEurope was launched in 1999, the Internet was less developed in Europe compared to the United States. Since then, the catching up process has occurred at different speeds all over Europe as we have mentioned in the introduction. We can thus speak of a still ongoing "digital divide"[14] in Europe; eEurope aims at reducing it, but it has not been an overwhelming success so far[15]. Even the evaluation report quoted above[16] mentions that many Member States are too far away from leader Member States and that this gap is more or less a North/ South gap. The report also states that less affluent social groups are still lagging behind as far as access and ICT training are concerned. But no specific measure has been proposed to fix these problems.

One main reason for such an impression of failure lies obviously in the procedures, as mentioned above. Another reason is rooted in eEurope's very essence. The programme addresses the issue of general access and usage to ICT, which conveys the feeling of a "universal service". ICT appears, in that context, to be a *quasi public good*: in fact eEurope 2005 claims to favour *general* broadband access, access and usage by SMEs (supposed to be less favoured than large firms and thus suffering from a "competitive handicap") e-learning, e-health, "e-inclusion". All of these can be considered as *social services provided by electronic means*[17], more than economic obligations needed by the Union to foster competitiveness. The programme has thus a strong allocative and redistributive component. The only "market driven" policy within eEurope concerns "digital rights management" which

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[12] Idem

[13] Prisma (2003), Future requirements for e-services, "eServices for all – treating all users equally", Prisma strategic Guideline 3

[14] "The term "digital divide" refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities." OECD (2001), "Understanding the digital divide"

[15] The Commission itself recognizes this, stating that "in many areas progress is limited by technology, applications and initiatives". Com (2004) 108 final.

[16] See footnote 9.

[17] There is an area "Security" where both social (individual protection) and economic (protection of transactions) concerns coexist.

refers to the protection of intellectual property rights. All the rest has, as we said, a taste of "public good".

In this context, the policy instruments, namely EU law accompanied by soft regulation, are addressing principally the limitations of market development, not the provision of a quasi-public good. As a result, the way the EU approaches ICT policy, with a regulatory standpoint accompanied by "light incentives to redistributive action", creates a strong bias towards market mechanisms, for an objective which is far from economic considerations.

In general, the promotion of public goods may require public intervention in order to limit some forms of market failures, in particular free riding. With eEurope, public intervention is instead voluntarily excluded, albeit at the European level. National or regional intervention is encouraged, in application of the Subsidiarity Principle: the local authorities have to provide access and to encourage usage in the areas or for the people that the market forces will exclude from such access and usage[18]. The risk stands then, to have the "quasi" public good provided to the most affluent individuals or companies, or regions, or Nations. This is incompatible with the principles of universal provision of access and universal usage of services, independently from the economic conditions underlying such provision.

Finally, eEurope hypothesizes that the wide use of ICT in public action (the so called e-administration, e-health, etc.) makes it more effective and efficient: paying taxes through Internet for example, will decrease the cost of collecting taxes. But Soete and Caracostas have shown that the quality of public service, which is often not linked with cost, does not depend, in many cases, upon the use of ICT. It relies much more on a collective attitude of the public administration which probably needs organisational innovations (hence collective knowledge) to improve the public service. This leads us to questioning the meaning of "the knowledge based society".

1.4. From "Information Society" to "Knowledge Based Society"

Even if eEurope is not a political instrument suited for the political objective of the Lisbon Agenda, it remains a part of Europe's initiative to promote a "knowledge based society". Rodrigues (2002) lists other EU public policies which accompany but are not part of the Information Society programme, namely research policy, innovation policy, education policy,

[18] See Kosmidis, (2002)

employment policy, social inclusion policy etc... She defines information society policy as "focusing on spreading access to the Internet and the broadband, fostering knowledge intensive products and services in health, education and transport and encouraging content industries in different languages".[19].The link between "Information Society" and "knowledge based society" should first be clearly established. To do this, the concept of "knowledge based society" itself first deserves some clarification.

Foray (2004) has synthesized the different conditions that come into play in building a "knowledge based society": investment in information and communication technologies are to be coupled with investment in knowledge. But, in addition, *adequate institutions* are necessary to contribute to favouring the creation of spillovers.

While it is without discussion that investment in knowledge and education are conditions for innovation, the role of "institutions" and "spillovers" may be more debatable. Once again, the issue stems from the very public nature of knowledge. The right balance between knowledge protection and knowledge dissemination via free access is an institutional issue: patents and property rights, joint ventures, "precompetitive" programmes, academic research are among the institutional arrangements to solve the cooperation/ competition dilemma that the accumulation of knowledge carries[20]. Institutions may thus differ in accordance with the balance that a government puts between knowledge protection on the one hand, and diffusion of knowledge on the other hand.

"Spillovers" are the non-market and non-voluntary mechanisms through which knowledge is disseminated: imitation, embeddedness and commerce of high tech products, and today Internet (as a giant database, distributed all over the world) are some examples of dissemination. These mechanisms are perceived as positive externalities from a societal point of view, but they might have a negative external effect in terms of missed profit opportunities for the knowledge private producer.

Thus, "knowledge based society" raises issues about the "right" combination of institutional arrangement to promote the diffusion of knowledge while giving the incentives to produce it privately.

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[19] Rodrigues, Maria João (coord. With the collaboration of Robert Boyer, Manuel Castells, Gosta Esping Andersen, Robert Lindley, Bengt-Ake Lundvall, Luc Soete and Mario Telò) (2002), The new Knowledge economy in Europe – A strategy for international competitiveness as Social Cohesion, Cheltenham and Northampton, MA, Edward Elgar

[20] For a very good summary of the issues raised here, see D. Foray (2000)

One may ask the question: to what extent does the information Society (i.e. the widespread use of ICT) lead to a knowledge based Economy? Several channels can be identified: first, by their very nature, Information and Communication Technologies process and transport information to almost anybody, in particular in the business sector. With better information, decision making is supposed to be improved, as well as economic performance. Recent evidence at the macroeconomic level has shown that with higher investment in ICT, the USA have had, during the years 1992-2002, a much higher growth rate than Europe and Japan (O'Mahony and van Ark (2003). Also according to most economists [21] their labour productivity has significantly improved, as well as the employment rate. However, the link between investment in ICT and economic activity is not so clear-cut at the micro (namely the company) level, as works by e.g. Askenazy & Gianella (2000), Brynjolfsson & Hitt (2000) have shown. Generally, firms, which grasp the largest benefit from investment in ICT, are those which also have implemented organisational reforms such as total quality management, reengineering, coaching, etc. Hence, it is not sure that the productivity gains, if any, are due to ICT investment or to organisational improvements: indeed a mere correlation between growth and ICT investment is not a sufficient explanation for causality.

Some authors (e.g. Bresnahan and Trajtenberg (1995)) have suggested that ICT is a so-called "general purpose technology" not unlike electricity, chemistry or fossil energy in the past[22]. ICT is supposed to generate a high level of demand because, embedded in other products and services, it improves the latter's quality and performance and sustains the demand for them. But for this to be achieved, the time span has to be quite long. Generally referred to as "Kondratiev business cycles", this long-term growth opportunity is supposed to last roughly fifty years. Hence, ICT may perhaps be a real engine of growth, but not in the short or medium term (1-5 years) contrary to what was believed during the Internet bubble. This may occur in the long term (within at least 10 to 20 years), even if its adoption is quicker than electricity or fossil energy. We, thus, cannot expect that the large diffusion of ICT across Europe will be sufficient to quickly achieve the most advanced "Knowledge based Economy".

Finally, the real complementarity between ICT and "knowledge based society" can be shown conceptually, when one makes the clear distinction between what is exactly information and what is knowledge: information is given by "signals" of change in the human and natural

[21] There is no full consensus in the profession on the impact of ICT on growth; Gordon (2000) has long claimed that such investment boosts productivity in the ICT sector only.

[22] This idea itself draws from earlier works by Freeman and Soete, or Freeman and Perez.

environments, that all sorts of ”sensors” or “captors” provide in permanence to mankind: visual, audio, atmospheric, economic (such as price variations, or rate of employment), social (such as strikes, elections or wars) etc. With ICT, this information can be given a digital form, to be transmitted or stored everywhere. Knowledge is a different thing; it is the human capability (sometimes helped by machines) to process this information, in order to make better decisions: Knowledge is ultimately deposited in human brains to improve human actions, while information is merely a change of state in social and natural environments. Of course, knowledge as much as information may get a digital form and be stored in electronic memories, and this can create confusion between the two. However, while it is very easy to get information, it is much more difficult to get knowledge, because the latter has to be learned by human beings with limited cognitive capabilities[23].

With this distinction in mind, we can better understand why ICT is partially complementary to the “knowledge based society”, although it is not an essential part of it. ICT can provide a huge amount of digitized information and this will improve the decision making process of knowledgeable individuals, and ultimately welfare. But without knowledge, this information is useless.

Knowledge is not merely an issue of individuals, however. Several authors, in particular evolutionary and evolutionist economists[24], have emphasized that individuals, through their interactions, can also create “collective knowledge”[25] of a social group, beyond the individual knowledge of its members. The role of social institutions is thus to frame these interactions optimally[26]. Hence, the design of suitable institutions may be part of the achievement of a “knowledge based society”. This design may be an ongoing process however, since individual and collective knowledge becomes easily obsolete in our fast changing environment[27]. The key point of “knowledge based Economy” is thus to accumulate and rejuvenate individual and collective knowledge.

Therefore, the eEurope Action Plans, encouraging and stimulating the general usage of information and communication technologies, answer a valuable public policy challenge. But

[23] For a similar but slightly different presentation of knowledge and information, see Foray, 2000.
[24] For an introduction to evolutionism see: Freeman C., (1987), Technology, policy and Economic Performance, Pinter, London.
[25] The best example of collective knowledge of otherwise stupid beings is the collective organization of insects such as ants or bees.
[26] See Williamson (1985)
[27] Lundvall (2003) speaks of a “Learning Society” rather than a “Knowledge based Society”.

a much more difficult policy objective is to create new individual and collective knowledge. In such circumstances, and given the public feature of knowledge, the balance between cooperation and competition, between market and non-market mechanisms, may move with the passing of time. Market and non-market mechanisms contribute together to the objective, but in which proportions? There is no definitive answer. Hence promoting the establishment of a knowledge based society raises institutional challenges, which go much beyond the eEurope Programme.

Moreover, the evolution of a "knowledge based Economy" may indirectly influence the issue of the "digital divide": some forms of digital information and knowledge may be better suited to cooperation, and therefore to the diffusion of "public" knowledge, while other may grow in a context of competition and private ownership. In the first case, reducing the digital divide becomes not only a social but also an economic objective: there is an *alignment* between the two. The reduction of the digital divide simultaneously improves the overall performance of the economic system. In the other case, there is a *contradiction* between the social and economic objectives: broadening the digital divide will promote efficiency and growth. For example, knowledge creation in advanced, innovative areas or by innovative people, may lead firms and local economic systems to remain always ahead in ICT usage, as a prerequisite for maintaining their competitive advantage. This creates "gaps" with other regions or areas in Europe or elsewhere.

Finally, knowledge may take various forms; in particular a distinction is traditionally made between "tacit" and "codified" knowledge. The former often needs geographical and cultural proximity; the latter can be transmitted at distance in digital form, precisely because it is codified. Hence, some models of development may rely heavily on local interactions and tacit knowledge, while others will need a global range of diffusion. That, for example, is why Lundvall (1992) has coined the expression of "National Systems of Innovation" (NSI). In our context, these NSI seem to be national variations upon the theme of the "knowledge based society".

Montobbio (2000) suggests to define the NSI with 5 elements: the vertical interactions of innovative firms with their clients and suppliers, the horizontal links among such innovative firms (oligopoly of large firms, versus network of small firms, versus stand alone "Schumpeterian" firms), the nature of the financial system (stock based versus bank based), the system of training and scientific research, and finally the technological policies by

governmental, local or supranational public authorities. The idea behind NSI is that growth and development in a knowledge based society is *systemic* by nature, that is encompassing cooperation and competition, public / private sector interactions, policies for education and technology promotion. Moreover Lundvall claims that different systems, with different institutional arrangements may perform equally well.

These complex features will condition the national implementation of the "knowledge based society" and, indirectly, the process of adoption of ICT: for example countries, like Ireland, which have welcomed inward investments and the location of plants, need ICT to enable these factories to keep in touch with headquarters located abroad. But it is not sure whether a large diffusion of broadband access in the population is really necessary for them and for Ireland's competitiveness.

On the other hand, ICT may help to exploit cultural proximity handicapped by geographical distance. This is for example how the scientific community works. Some areas with large public and private research centres may thus be characterised by a large diffusion of broadband access and complex usage, because the population requires this. A uniform model of adoption of ICT may thus be completely at bay.

To summarize our argument: the link between the diffusion of ICT and the achievement of a "knowledge based society", is defined by a clear complementarity between the access to digital information that ICT enable, and the accumulation and diffusion, by a nation or group of nations, of individual and collective knowledge. However, the latter is a complex process, conditioned by institutional factors this nation or group of nations have designed and are still designing. And because of this, the adoption of ICT may differ from one country to another. Such national variations in the trajectory towards the "knowledge based society" rely on NSI. It may not be a surprise to find that these variations exist within Europe.

2. National trajectories towards " Knowledge Based Society"

Our intuition is that a NSI creates the conditions for a country or a region to evolve specifically towards a "knowledge based society". To confirm this, we have conducted an empirical investigation focused on several dimensions of NSI presented by Montobbio. We have indeed assumed that the institutional features which shape access to the information and the knowledge based society are[28]:

- a large effort to promote R&D
- a good rate of innovation
- a good access to education
- an easy access to capital markets, in particular for small and medium firms
- a freedom to trade, in particular in ICT services
- social cohesion
- a good access to ICT

The last two variables are not explicitly included in Montobbio's definition of NSI. However, the first may be a prerequisite to avoid the digital divide and the second derives from the complementarities between ICT usage and the evolution towards a knowledge based society.

2.1. The empirical evidence

To characterize the peculiarities of countries relating to a knowledge based society, we have selected eleven variables linked to the institutional prerequisites listed above:

- One is the "digital access index" provided by the ITU (International Telecommunications Union)[29] taking into account the extension of infrastructures, the degree of usage, the quality of access to ICT (in particular Internet), and the price; the idea is to use this variable as a good summary or at least a proxy for the familiarity and usage of ICT.

- The second basic element is the propensity to innovate, and the innovativeness of the country, testified by three variables: first the number of European patents per inhabitant; second the number of researchers employed by the private sector and third

[28] Choosing these variables merely reflects what is written in the "Lisbon Agenda"

the number of researchers employed by the public sector (universities and research centres)[30]. These two last variables measure the efforts performed within a country to innovate, and the first variable is the outcome of this effort. Note however that not all the research efforts do lead to patents, particularly in the public sector.

- The third element is the education of manpower, an accepted index of the quality of the workforce. According to the well known work of Mincer undertaken in the mid seventies, one year more of education leads to a 6-7% increase in the payroll of an employee, all remaining elements identical. To measure this level of quality, we used the percentage of population between 25 and 64 having reached a secondary level of instruction; this is a standard index collected in particular by the OECD.

- The fourth element of the trajectory is social cohesion. In our sample, it is by two variables: first the difference in revenue between the upper and the lower 20% of population (a measure of inequalities); second the public social expenses, expressed in proportion of GDP. The idea is that social cohesion strengthens the spillovers across the population and contributes to reducing the digital divide.

- The fifth element is the openness of markets, in particular ICT markets. Here we have followed the EU and used the market share reached in 2002 by the so-called "historical operator" (the former monopoly in telecommunications). Many other indicators should be employed here, and we collect them within the framework of further research. But the one chosen was easily at hand.

- The sixth element is the availability of financial instruments for companies, in particular the "start-ups". This is given by the proportion of GDP provided by venture capital to start-ups in the "initiation phase" and the "consolidation phase". These figures also are provided by the European Commission.

- The seventh element is the transparency and breadth of the financial market. In order to measure it, we have constructed an index that is the total amount of financial assets owned by households divided by GDP. The source here is an OECD dataset.

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[29] ITU press release "ITU Digital Access Index: World's First Global ICT Ranking Education and Affordability Key to Boosting New Technology Adoption" Geneva, 19 November 2003

[30] Remember that one of the objectives of Lisbon is to have public and private research reach 3% of Member States' GDP.

To avoid a priori revenue or size effects, we have adopted ratios: generally percentage of GDP or a number per inhabitant. Hence there is a priori no direct impact of a country's state of development on the value of one of those indicators. We will see below that this "prior" does not hold when the data are analyzed.

The seven sets of variables have been measured in 15 countries of the EU less Luxembourg, plus four new members (Hungary, Slovakia, Czech Republic, and Poland). We carried out a principal component analysis on this 11 x 18 matrix to look for correlations among variables and proximity between countries. The following provide the results of the analysis in the plane of the two major components.

Figure 1:: Correlation circle of knowledge society variables in the EU

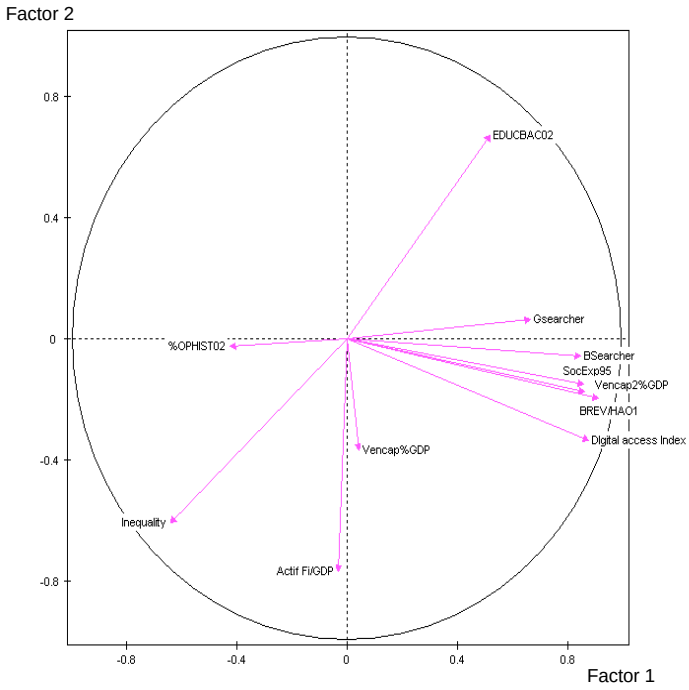


Figure 2: Proximity between EU countries in the way towards knowledge based Economy

The figures , read together, clearly show the structural differences among European countries. The first exhibits differences among variables, and the second distances between countries.

On the first principal component (axis 1), we see that the right hand side gathers variables to some extent linked with a level of development: social expenditures, number of researchers in the private sector, level of venture capital in the maturation phase, number of patents per inhabitant, digital access index. All these indicators, strongly correlated to each other and to the first principal component, are associated with countries showing a high level of wealth, the Scandinavian countries in particular (see Figure 2 in relation to Figure 1). We can thus say that the Scandinavian countries are on the way to building up a knowledge based society.

At the opposite (on the left hand side in Figures 1 and 2), we see variables that we can correlate with a low degree of development: the market share of the historical operator in telecommunication, the relative size of inequalities. Countries which are situated on the left hand side of Figure 2 are the transition countries (Slovakia, Poland, Czech Republic, and Hungary) and countries lagging behind in Western Europe (Portugal, Greece, Spain, Italy and Ireland). These countries also show a high level of inequalities among people's revenues. Interestingly, Italy is *not* a country lagging behind in economic terms, but the variables selected here present this country *as if* it lagged behind: it shows poor records in patents per inhabitants, in number of researchers per inhabitants, in the digital access index, etc. Ireland also, although having caught up with the top level of the European Union, is still loosely belonging to this category of "laggards" (see Figure 2). To summarise our analysis of the first component, we can say that growth and development generally lead to the evolution of a "knowledge based society". In Europe, Scandinavian countries are ahead of others.

Whilst the first "principal component" is very easy to understand, the second (i.e. the second, vertical axis) is particularly interesting: it shows an opposition between, on the top of picture 2, the variable "degree of achievement of secondary education" and in the bottom of the picture, the level of inequalities and the degree of maturity of the financial markets (exemplified by the value of financial assets owned by households and the importance of venture capital in the early stages of financing "startups"). This opposition reflects the fact that some countries are in a better position to favour *private* initiative through an easy access to financial markets and the possibility to increase easily one's own wealth (thus deepening the inequalities in the country). Other countries instead could tap on a *collective* access to the

knowledge based society because of an evenly distributed access to higher education and a low level of inequalities in the country.

The following countries belong to the first category: the UK, Belgium, the Netherlands and to a lesser extent France, whilst the opposite class is merely made of former communist countries. But it is worth noting that countries (Portugal, Italy and Sweden) which seem far from the first category because of their location on the first axis, are, when projected on the second axis, very close to this category of "private initiative oriented" countries.

The software package used in this analysis[31] enables us to gather the countries in "proximity classes". This is done in Figure 2 where the 4 major classes are represented. They are easily characterized. The first class shows the countries (UK, Belgium, the Netherlands, France) which have a "private" orientation in their way towards knowledge based Economy. The second class is the group of Scandinavian countries, well ahead in the way to a "knowledge based society". The third class shows the group of eastern countries with poor financial markets, few inequalities but a high educational level. Finally, the fourth class is the group of "laggards" in the EU 15 (Portugal, Greece, Spain, Italy and Ireland) which rely on "private orientation" (opening and maturity of financial markets) to catch up with other countries more advanced in their way towards knowledge based Economy.

Hence, two opposite models are schematically emerging, the "Scandinavian model" (including Finland Sweden and Denmark) as opposed to an "Anglo-Saxon" model including the UK, the Netherlands, Belgium and France. The Scandinavian model refers to a State in which the redistribution as well as innovation have a strong role, whereas in Anglo-Saxon countries, market driven policy making is more customary. Classes 2 and 3 in Figure 2 show the "Scandinavian option": Class 2 in an accomplished form and Class 3 in a "promising form" only. In the same way, Class 1 and 4 represent the Anglo-Saxon" model: Class 1 in a more achieved form, Class 4 in a state of development form.

The foregoing analysis shows a "regional digital and knowledge divide", maybe associated with a difference in general development[32]. If we now project our static vision of Europe

[31] This is "SPAD" produced by the French company Cesia to handle questionnaires. It is focused on multivariate data analysis.

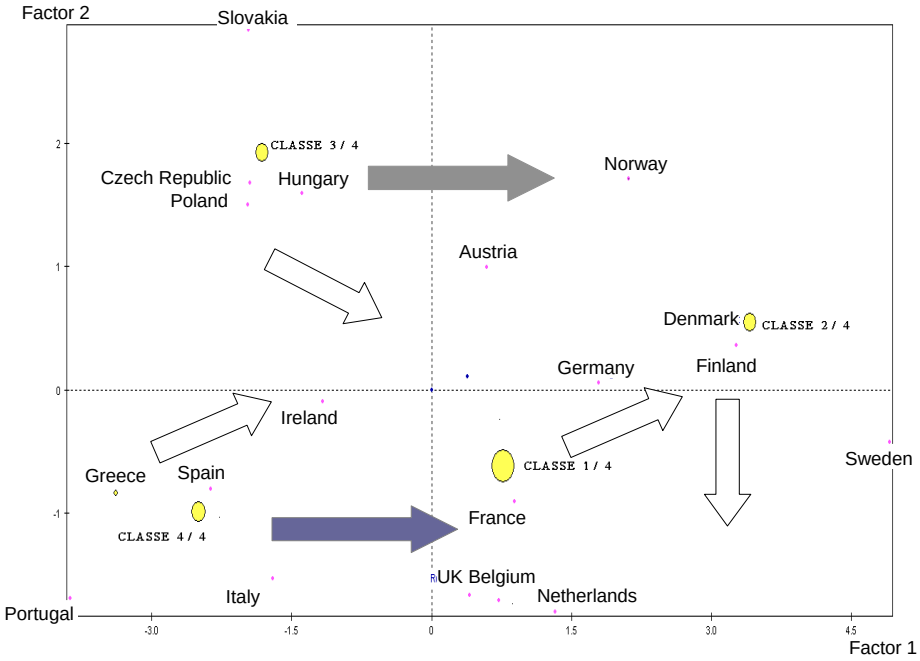
[32] This result confirms other analyses on the nature of the "divide". See for example Dumont and Poutineau (2004).

towards the achievement of the Lisbon objectives, we end up with two (and more) possible trajectories.

2.2. Two "natural" trajectories towards knowledge based society

When they analyse the ways to develop access and the use of the ICT, Rallet and Rochelandet[33] (2003) say that the countries have different trajectories. The term trajectory means that the diffusion of ICT can progress in peculiar contexts. Each represents a combination of national institutional, organizational and cultural features. Even in the limited list of EU Member States, certain countries are more advanced in terms of telecommunication liberalization whereas others have invested more in generalizing access to ICT with subsidies. Boyer (2003) and Amable and Petit (2003) for example, have exhibited a typology of countries similar to our conclusions[34]. Figure 3 can thus be used to depict the dynamics of transition towards the knowledge based economy.

Figure 3: Possible trajectories towards knowledge based Economy



The position of EU Member States will evolve with the passing of time. There are two natural trajectories represented by the grey arrows . Eastern countries may take stock of their

[33] « La fracture numérique: une faille sans fondement? » Alain RALLET and Fabrice ROCHELANDET, mimeo, workshop Marsouin

good level of education and backwardness of private institutions in financial markets to encourage public research and collective innovation. On the other hand, countries in Class 4 (Portugal, Greece and Spain) may evolve along the lines shown by Ireland, namely the development of institutions focusing on private initiative, in particular financial institutions. These are what we call the "natural" trajectories.

The more advanced countries (Classes 1 and 2) face a dilemma: they may strengthen their national system of innovation to achieve knowledge based society or they may choose to evolve towards the alternative model: towards the "Scandinavian model" for "Anglo-Saxon" countries and vice versa, in order to have a unified vision of Europe's "knowledge based society". This is exemplified by the white arrows in Figure 3 above. But in that case, it should be decided whether it is the "Scandinavian" or the "Anglo Saxon" model which should prevail, and for which reason[35].

Other considerations may also come into play, as far as implementation is concerned. For example, smaller countries can more easily implement e-government or measures towards ICT, while the difficulty to identify whether the effort and reforms have to be implemented at national or lower level, has been an obstacle in a federal country like Germany (Curien and Muet 2004). Hence the choice of "trajectories" will depend on the initial position of each EU country (our Figure 3), on policy decisions: the choice between the "Scandinavian" and the "Anglo-Saxon" model, but also on the implementation process itself.

3. How could eEurope provide a genuine European policy for a knowledge based society?

The eEurope programme raises a fundamental issue: is soft regulation the only way to consider the implementation of an EU policy towards a knowledge-based-economy for all? While the Lisbon process is entrenched in an open coordination mechanism, different policy designs and implementations could be envisioned to overcome the heterogeneity of national trajectories. We consider below three types of orientation. For each of them, we present its rationale, its possible implementation and its limits.

[34] An empirical work close to our's is Cuervo & Lopez Menendez (2004).
[35] In game theoretic terms, this is a "battle of the sexes" issue.

3.1. One Europe, one model of knowledge based society?

It is reasonable to assume that the initial Lisbon objectives summarised the intention of European Member States to create a kind of "European Innovation System" (Paraskevas & Soete, 1997), based upon the achievement of a "knowledge based society". As mentioned in Section 1, eEurope was only a part of this ambitious vision. As such, the eEurope Action Plan was supposed to be, in Montobbio's variables of an NSI, the "technology policy" component of the would-be European System of Innovation, a European model for "knowledge based society".

In the intention of the European Council of Lisbon in March 2000, building an exemplary "European model of knowledge-based society" would guarantee all European citizens the possibility of being part of this society. This would create, simultaneously, the conditions for sustained growth in Europe. Hence, in each country, the less developed "knowledge-based" dimensions would have to be strengthened. As a consequence, the most appropriate European innovation system would be close to the Scandinavian one (group 2) since it emphasizes social cohesion and the diffusion of knowledge for all, a programme strongly advocated in the current eEurope Plan.

The alternative scenario, moving towards the "Anglo-Saxon" model, could not be the objective of a reformed eEurope programme. First the "Anglo-Saxon" model does not ensure social cohesion and the diffusion of knowledge. Second, such a model does not need public intervention beyond enforcing market mechanisms. The rules of the Treaty may thus be sufficient to move towards this model at the European level. Then, all National Innovation Systems would have to move in the same direction and ultimately, a knowledge based society would be formed by the transformation of each type of European NSI into a Scandinavian archetype.

The ambitious proposal of promoting one ideal model of knowledge based society presents many limits. First, can a best European model really be identified? Second, NSI are not that easily changeable. Third, there are no means at the EU level to impose a specific institutional design.

On the one hand, the Scandinavian model emphasizes an institutional composition that gives more importance to investment in education and social redistribution. But this model relies

on secular institutional changes and on millenary social evolutions[36]. Also, for this model to work properly, an efficient administrative system (in particular the educational and public research systems) is required. It is unlikely that all Member States would be able to reach this level of efficiency and the necessary social adaptation in so short a time span[37].

Moreover, the market-based model is largely recognized and favoured by the current institutions of the EU. The "acquis communautaire" from the internal market policy emphasizes the role of competition. While redistribution and education funding are dependent on national preferences, competition is largely initiated and managed at EU level. Intrinsically, the current EU institutions favour a specific type of NSI closer to the Anglo-Saxon type, easier to implement because it requires simple rules (to favour market mechanisms) and legal institutions to enforce them. In the past, the European institutions have largely proved to be able to perform this task, while the promotion of social cohesion does not show the same success[38].

Consequently the preferences, the initial position of the countries, their administrative organization and many cultural factors make it difficult to impose a predefined model, particularly the Scandinavian one. As said before, the Class 4 countries, namely Portugal, Greece and Spain may more naturally turn into private initiative models because of their initial positions and social structure, but also because of some political decisions and institutional arrangements.

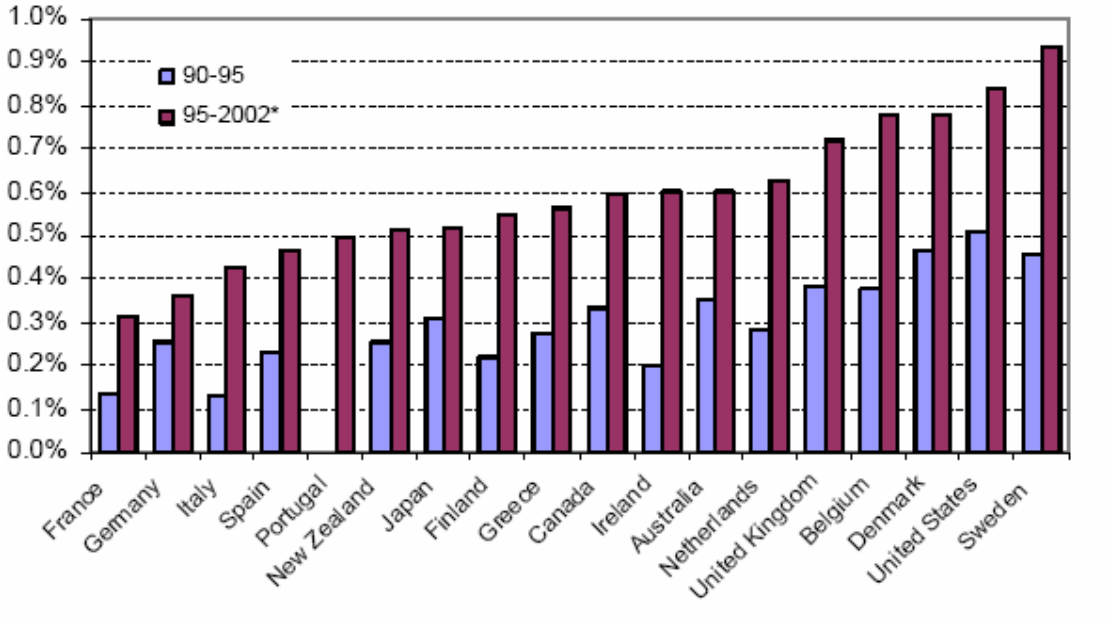
Now if we look at the recent evolution of productivity growth rates due to ICT, we see that the highest contribution of ICT to growth can be observed in countries that belong to totally different groups of the matrix. Therefore, the incentives to move towards the Scandinavian model are offset by similar high GDP and productivity growth rates in Anglo-Saxon countries: there is no proof of the formers' superiority, at least in the short run.

[36] Not only is the Scandinavian social system framed by years of social-democratic government designed to protect the weakest, but it also results from the agricultural type of society as E. Todd has convincingly shown.

[37] Remember that the Lisbon Objectives had to be achieved in 2010!

[38] See for example Pelkmans, (2003), chapter 15.

Figure 4 : Contribution of ICT capital services to GDP growth (%)



Source: OECD Productivity Database, September 2004.

In a recent paper, Alesina and Perroti (2004) ironically but convincingly emphasize this point: the Lisbon Objective is merely rhetoric which conceals incapacity of action due to the difficulty of harmonizing national policies and European interest. Soft regulation is the proof that the Lisbon objective relies on no other instrument than rhetoric because no one can imagine that the Lisbon objective can reasonably be achieved. The same holds true for the eEurope programme, as we have shown in Section 1 of this paper.

3.2. Supporting local models

From the foregoing discussion, we conclude that the decision-making and policies at the national level will be more critical than a unique, theoretically ideal knowledge based Model[39]. The institutional differences between the countries do not allow for a homogenous European action plan: Conceição and Heitor (2003) insist in saying that it is not possible to apply the same policy in the different European countries. Similar policies can be designed, but they have to be implemented according to the contextual and institutional characteristics predominant in each country. More generally, the subsidiarity principle set up with the

[39] "Innovation and technology policies are ultimately the expression of national policy priorities" (Luc Soete, speech to the Conference "Learning by Comparing: US and European Experiences on Innovation and Competence Building" Lisbon, 21-23 June, 2001.

Maastricht Treaty has institutionalised the fact that the policy making process is to be implemented at the level where it has the strongest effect.

The most relevant level of decision for supporting models of a knowledge based society would be more local and would differ from country to country. Independently from the choice of which type of model to choose, there are implementation issues which might create further difficulties. In more federal countries, decisions are made at a lower level than in more centralized countries. In Spain, for example, ICT policy has strong instruments at the regional level, so the latter has to be analysed more closely. If the analysis focusing on national levels become less relevant because in some cases decentralization is considered to be more efficient, then even the mapping presented in the second part of this paper would become more difficult to use: the evolution of the single Member States would depend on many more decision variables (the local ones) than those identified in our two "archetypes", the Scandinavian and the Anglo-Saxon. Hence, it might be sensible to accompany each country in its own construction of a knowledge based society. Now, because this option is "minimal", the European policy tools could remain the present ones. Hopefully, as soft regulation does not put any real binding constraints, market forces and the consultation mechanism would jointly create the convergence process.

The difficulties raised by this model are that a high number of possible levels of decision and a multiplicity of trajectories make it more difficult to really ensure a convergence towards a knowledge based society. Moreover, as said before, this type of coordination reduces the incentives to implement a distributive policy, and rather strengthens the market-based models. So, the critique of Alesina and Perroti also applies in a modified version: the rhetoric of the Lisbon objective would disappear with this option and the impossibility to coordinate the Member States' actions would be fully revealed. Convergence may be achieved in the long run, simply with the standard EU evolution towards more integration, an enforcement of EU's legislation, competition laws and the like. A "knowledge based society" becomes in that case, an empty concept.

3.3. Reaping economies of scale and concentrating on the laggards

To escape the dual deadlock created by the previous options and rejuvenate the "knowledge based society" concept, the EU could rely on its major trump, its size. Soete argues that for innovation, research and finance and possibly education, there are "economies of scale". As

he puts it, there is a "cost of non Europe" in research. In the past, there has been some cases where those costs have been overcome: the often celebrated Ariane and Airbus projects had the particularity to be "mission oriented" to use H. Ergas terminology, to involve only a couple of large Member States and to let aside the Community institutions. But in the field of education, the EU's Erasmus, Socrates and Leonardo programmes, the Bologna process in higher education which complemented these programmes have been much more "diffusion oriented" (in Ergas terminology) with a significant success as well.

A knowledge based society is based on the diffusion of knowledge as the main source for growth and development. As we have seen in Section 1 above, knowledge, although a quasi public good, is not that easy to diffuse since this depends on the cognitive capability of the recipients. But it also depends on institutional infrastructures (the educational system, the innovation incentives and protection, the opportunities of interaction between knowledgeable, partially knowledgeable and non knowledgeable individuals).

Given the institutional difficulties of Europe stressed for example by Alesina and Perroti, the European System of Innovation (ESI), if any, has to concentrate on "networking" between Member States' public and private, research and financial institutions, between educational institutions, between local systems of production. This is what scale is about: by multiplying the opportunities of contact, Europe may enhance the capability of learning, hence the diffusion of knowledge. Of course the completion of the internal market is driving this process, but with the objective of a "knowledge based society" this should be accelerated by European initiatives.

In Paraskevass & Soete (1997)'s framework, a knowledge based society needs a "knowledge Infrastructure", namely training and education, innovation transfer, and research and technological development diffusion, which all contribute to knowledge diffusion. From a European point of view, training and education are well handled in the Bologna Process (at least for higher education) and simply need additional financial means to make this European institutional arrangement fully effective: diploma recognition is a necessary but insufficient condition to have a homogenous labour market across Europe.

Innovation transfer on the other hand, is made possible in particular thanks to venture capital and sometimes public subsidies, but relies very much on local interactions. We develop further how a European initiative could help.

But it is probably in the area of research and innovation diffusion that the impact of a large European initiative could be the largest. Laredo (1994) has emphasized the point that public/ private research networks achieve three main tasks. Set up a network of competencies which create strategic prototypes that they later use privately for further research or development. Establish a network of actors which defend standards and technological options or as Caracostas and Soete term it, "market building mechanisms". This function is particularly relevant in ICT because the latter experience network effects, which quickly establish product selection. The third purpose of a research network (called "demonstration network") is to lobby for a technological choice by public authorities. The difference with the second category is that in this case public authorities have to commit financial resources and some credibility and researchers have only an influence power.

Scale matters for the third, second and even first category of research networks. The design of a European policy in that area could be: 1) to help Member States to jointly establish technological choices leading to European success[40]. This may be done in many areas, not only ICT, environment, pharmaceuticals and biology and high tech sectors, but also transportation and administrative services etc…; 2) to strengthen the European standardization bodies or financially help firms, particularly SMEs, and academic institutions to participate in international standardization institutions; and 3) to organize "competencies networks" in key research areas, in the way of Eureka, namely with "bottom up" perspective.

Now there is another area where the EU action could be the most effective in the promotion of "knowledge based society": this is the support of "laggards", namely "Objective 1 regions" and possibly Objective 2 and 3 regions as well[41]. As mentioned in Article 1 of the Treaty of the European Union, the task of the European Union "shall be to organise, in a manner demonstrating consistency and solidarity, relations between the Member States and between their peoples." In the case of access to knowledge, this could go hand in hand with an objective of efficiency, due to the quasi public good feature of knowledge. But at the moment, the European Commission only subsidizes information and telecommunication technologies in the regions where there are no incentives for companies to invest. Improving the general knowledge and the innovation system of these regions is still a Member State privilege.

[40] Examples of previous cases in point are GSM and even UMTS.

[41] Objective 1 refers to less developed regions, Objective 2, regions in decline, Objective 3 regions where education has to be supported to enhance employability, for details see Pelkmans (2001), p 311.

The European initiative for a knowledge based society could, for example, help firms and research institutions located in remote and underdeveloped areas, get access to financial instruments and venture capitalism. By helping venture capitalists to establish subsidiaries in these areas, the European Union would contribute to preserve local interactions while abolishing the extra cost of distance.

This is consistent with what currently exists through the regional funds, which already represent more than one third of the EU budget (Longhi, 2002). The EU structural and cohesion funds aim at increasing the convergence between regions with the purpose to achieve a certain degree of equity among them. So far, the criteria for selection of these regions are measured by macroeconomic aggregates, such as GDP per capita or the unemployment rate. They do not take into account the connections to information and communication technologies or the general level of education. In order to be more consistent with this knowledge society objective, it is necessary to add new criteria.

But there are some limits to this policy as well. First the results of the implementation will not necessarily meet the aim of convergence. It has already been shown that the multiplier effect of allocating funds is somewhat limited. Moucque (2000) has shown that only 33% of the catching up process of laggard regions in Europe is explained by the funds. Secondly, the allocation of funds is not part of the current eEurope policy, although the recent evolution of eEurope : "i2010 – A European Information Society for growth and employment" tries to link the former benchmarking method with support given to R&D in the 7th Framework programme.

4. Conclusion

If a real ICT policy exists in Europe, it is only at the national level. The same is even more true for a policy leading to a "knowledge based economy", where intentions and declarations are a substitute for policy: "Despite current strains on public finances, Member States and the European Union should create the conditions for more public and private investment in education, research and the knowledge economy, in particular to making full use of modern communication technologies and to ensuring further innovation. The Council and the European Parliament are urged to give their support to these actions as a key contribution to the Lisbon agenda."[42]. The official speeches and evaluations celebrate the advent of a "knowledge based society, but the current status is that the policy is only based on soft tools and regulation[43]. The EU model of governance is clearly restrictive. The only evolution might come from a new structure of the budget[44] that would dedicate more structural funds to ICT, education and research and innovation policies.[45,46]

[42] European Commission, Brussels, 11.2.2003 COM (2003) 65 final Communication from the Commission to the Council, The European Parliament, The economic and social committee of the regions: "Electronic Communications: the Road to the Knowledge Economy"

[43] "Providing a forum for exchange of good practice is one of the most important contributions of the Commission to policy development in Member States." P.25 Commission Staff Working Paper eEurope 2005 Mid-term Review Background Paper

[44] "In many rural and remote regions, geographical isolation and low density of population can make the cost of upgrading telephone lines to broadband capability unsustainable. Here, the Structural Funds can be used to increase infrastructure availability. As the mid-term review of Structural Funds programmes will take place in 2003, this would provide an opportunity for Member States to give greater emphasis to this priority on the basis of an assessment of the regional needs. By Spring 2003, the Commission will provide Member States with guidelines on criteria and modalities of implementation of Structural Funds in support of the electronic communications sector, notably broadband fixed and wireless infrastructure European Commission, Brussels, 11.2.2003 COM(2003) 65 final Communication from the Commission to the Council, The European Parliament, The economic and social committee of the regions: "Electronic Communications: the Road to the Knowledge Economy"

[45] " (..) Insufficient funding, notably from the EU structural funds. Public-private partnerships are cited as relevant instruments of e-government and various modalities are possible." Source: "Commission Staff Working Paper eEurope 2005 Mid-term Review Background Paper"

[46] "For its part, the Commission - which monitors the progress of Lisbon through structural indicators - has made a number of proposals to the Council in order to further improve the Strategy. First, it wishes to see more investments in education training and research." Source: EU observer – 22-Mar-2004

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