



**T**RANSFORMATION, **i**NTEGRATION and **G**LOBALIZATION **F**ECONOMIC **R**ESearch  
CENTRUM BADAWCZE TRANSFORMACJI, INTEGRACJI I GLOBALIZACJI

## **TIGER Working Paper Series**

**No. 61**

# **Three Challenges for the Future Development of the Information Society in Europe**

**Marc Bogdanowicz, Clara Centeno,  
Jean-Claude Burgelman**

**Warsaw, August 2004**

---

Marc Bogdanowicz, Institute for Prospective Technological Studies IPTS, DG JRC, European Commission. Email: [Marc.Bogdanowicz@cec.eu.int](mailto:Marc.Bogdanowicz@cec.eu.int)

Clara Centeno, Institute for Prospective Technological Studies IPTS, DG JRC, European Commission. Email: [Clara.Centeno@cec.eu.int](mailto:Clara.Centeno@cec.eu.int)

Jean-Claude Burgelman, Institute for Prospective Technological Studies IPTS, DG JRC, European Commission. Email: [Jean-Claude.Burgelman@cec.eu.int](mailto:Jean-Claude.Burgelman@cec.eu.int)

**Marc Bogdanowicz, Clara Centeno, Jean-Claude Burgelman**

**Three Challenges for the Future Development  
of the Information Society in Europe**

**Summary**

This paper is based on past and current research about Information Society developments in an Enlarged Europe, and in particular in the New EU Member States and the Candidate Countries, carried out at the Institute for Prospective Technological Studies, a research institute of the Joint Research Centre Directorate General of the European Commission.

The research aimed at understanding and identifying Information Society strategies for the European countries that would support their economic and social development towards the so-called European Lisbon objectives. This paper presents some of the conclusions of this work, by focusing on one of its achievements: the identification of ten past determinants and three future challenges for Information Society developments in and Enlarged Europe.

## 1. Introduction

This paper is based on past and current research about Information Society developments in an Enlarged Europe, carried out at the Institute for Prospective Technological Studies, a research institute of the Joint Research Centre Directorate General of the European Commission.

The research aimed at understanding and identifying Information Society strategies for the European countries that would support their economic and social development towards the so-called European Lisbon objectives<sup>1</sup>. This paper presents some of the conclusions of this work, by focusing on one of its achievements: the identification of ten past determinants and three future challenges for Information Society developments in and Enlarged Europe.

The analysis, and its broad discussion across a series of papers and expert workshops, identified ten factors which, taken together, help to better understand the dynamics that have led to (more or less) successful Information Society -related developments since the mid 90. Eighteen country cases have been completed while this report focuses mainly on the results relevant to the New EU Member States and Candidate Countries<sup>2</sup>.

First, an analysis of both ICT production and ICT use in those countries, together with the assessment of national contextual factors, shows that five countries in spite of numerous differences can be assessed as more involved in both ICT usage and ICT production. These countries are Estonia, Malta, Slovenia, Hungary and the Czech Republic.

In all cases, the rise of an ICT production capacity resembles rather one of catch-up than of leapfrogging, even if much has been written in related literature about the tremendous growth and potential of mobile telecommunications, about the excellence of the local skilled workforce as attractive factor for investment and entrepreneurship or about the importance of FDI flows for the emerging ICT industry. The European Enlargement cannot generate a radical change in Europe's position on the Information Society front: the ICT production capacity is proportionally too small in New EU Member States and Candidate Countries as compared to the global world capacity, while, reversely, the ICT use patterns have caught-up sufficiently in New EU Member States and Candidate Countries as to avoid any significant collapse of existing access and use figures across the newly Enlarged Europe.

---

<sup>1</sup> See the Conclusions of the European Council, Lisbon, March 2000. Expanded at Gothenburg and refined at Stockholm and Barcelona.

<sup>2</sup> The New EU Member States and Candidate Countries (NMS&CC) are the Baltic republics of Estonia, Lithuania and Latvia, the Mediterranean countries of Malta and Cyprus and the Central European countries of

Together, GDP growth, available revenues and resulting expenditure patterns explain – but only partly - the positioning of “better-off” countries in terms of impacts on ICT use. But the various indicators and qualitative observations clearly show that besides economic growth and level of income other factors have equally been important in the spread of ICT, both in use and in production. Additionally, no clear causal relationship or simple correlation can be drawn between the ICT usage and the ICT production sides: obviously ICT use necessitates a (domestic) supply side for equipment, maintenance and development of local services. Possibly also, the presence of an ICT industry influences positively on the use of such technologies through a variety of direct and indirect effects (skills upgrade, infrastructure and equipment improvements, awareness rising, lobbying, etc.). Still the available research does not demonstrate any clear-cut relation and contradictory examples abound.

These observations point at the importance of better understanding the contextual factors and conditions influencing Information Society developments. While economic growth and the level of economic development have, as expected, been strongly correlated with ICT spending, some countries show a different pattern in ICT use or production, due to other country-specific factors.

The following box introduces briefly to those ten factors which have strongly influenced the emergence of such patterns. It helps to better understand the dynamics of development and the scope and role of public policies that can lead to (more or less) successful Information Society-related development, as they did since the mid 90.

Box 1: The ten determining Factors for Information Society-related policies and developments in Europe

<b><u>EU25+ Common factors</u></b>	<b><u>NMS&amp;CC Specific factors</u></b>
<b>1. Economic structural changes</b>	<b>8. Growth, Macro Economic Stability &amp; Public Finances</b>
<b>2. FDI &amp; other financing tools</b>	
<b>3. Corporate Sector and ICT industry</b>	<b>9. Regulation and related institutional settings</b>
<b>4. Committed and dialoguing IS policies</b>	
<b>5. EU policies</b>	
<b>6. Education</b>	<b>10. Consumption patterns</b>
<b>7. Other intangible assets</b>	

---

Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia. These ten countries joined the EU in May 2004: Bulgaria and Romania are expected to join in 2007, while Turkey’s joining timing is under analysis.

These ten factors can be organized in two separate groups:

- **EU25+ Common factors:** Seven factors that determine strongly Information Society developments are common to all observed European countries. They are not specific to transition economies or countries in the process of accession, independent of them belonging or not to the European Union. Of course, the way those factors impact each of those countries is specific to their earlier economic, political and social history, up to the point that this might have affected positively or negatively their Information Society developments.

- **New EU Member States and Candidate Countries Specific factors:** Three factors are identified as specifically impacting the group of the thirteen New EU Member States and Candidate Countries. Their impacts are deeply rooted in the past or present political and economic history of those countries and have influenced until now their Information Society developments in a much more determinant way than in the EU Member States (of before 1<sup>st</sup> of May 2004).

Both **Common and Specific** factors might still impact Information Society developments in those countries in the next decade. Those are not factors “of the past”: their future impact depends strongly on the degree to which the forces behind each factor have lost or not their initial strength. Such appreciation has to be done on a permanent basis at each national, and sometimes regional, level.

Second, **three emerging challenges** determine strongly *the future*. They will impact in a variable way each and any of the countries of the Enlarged Europe by 2010, and additionally might impact them indirectly, depending on how their European partners will address those issues. Those are the political challenges to come. They were less acute during the last decade and emerge now as additional issues, on top of those inherited from the past that might have been partly solved or not, such as the legacies in the economical structure or the health of public finances.

Box 2: The three Emerging Challenges  
for Information Society-related policies and developments in Europe

- 1. Changing Competitive Pressure: the need for innovation**
- 2. Growing Social Divides: the role of ICT**
- 3. Emerging Growth/demography squeeze: Transitions in Education**

These three challenges are expected to have a strong effect on future Information Society developments during the coming decade and possibly beyond. They are thus essential new issues for research and for policy.

Additionally, while specifically identified by studies focusing on the New EU Member States and on the remaining three Candidate countries, these challenges are expected to impact Europe as a whole. All Member States are confronted to these three challenges, possibly in various degrees -, and all will be impacted by the way those challenges will be addressed by the neighbouring countries. The interdependency of European nations is such that while identifying the specificities of a country's context, we have to acknowledge that in an Enlarged Europe, these specificities and the way they are addressed impacts on us all.

These three challenges are a strong invitation for striking the right balance between Growth and Social cohesion across an Enlarged Europe, and between short term quantitative objectives and longer term generational processes. This will be the role of policy-making at European, national and regional level.

The sequential presentation of these factors is, of course, artificial, and does not acknowledge sufficiently their effective interaction. Still, there is no *ideal modelling of societal change*: the future is not predictable.

## **2. Challenges for the Future: Three Emerging Challenges for Information Society Developments and Policies in Europe<sup>3</sup>**

The analysis of the New EU Member States and Candidate Countries national reports points at three emerging challenges, that are expected to have a strong impact in future Information Society developments during the first decade of the new millennium, and possibly beyond. Hence, these three challenges are essential *contemporary* debates for research and policy towards the European Information Society development, for this first decade of the XXI century.

---

<sup>3</sup> This section is largely inspired by the conclusions of an international Expert Workshop held in Sevilla in February 2004, the Synthesis Report of the New Entrants Research and the thirteen associated national reports (See Annex 1 under: "New Entrants Research Consortium Reports")

Box 3: The three *Emerging Challenges*  
for Information Society-related policies and developments in Europe

- 1. Changing Competitive Pressure: the need for innovation**
- 2. Growing Social Divides and the role of ICT**
- 3. Emerging Growth/Demography squeeze: Transitions in Education**

**Emerging Challenge 1: The Changing competitive pressure: the need for innovation**

The Lisbon objective specifically includes Competitiveness and Growth as an objective to be aimed at in Europe. Such progress cannot be taken for granted. Further productivity and competitiveness gains might have to build upon the modernisation of the economic structure and of the innovation systems. The challenge is to understand under which conditions and in which (sub)-sectors ICT could play a relevant role for modernising (sub)sectors and improving their competitiveness at a level that would be meaningful for the domestic economy.

**(a) *Today's changing competitive pressure***

The trends towards globalisation – not least the Single Market – puts further competitive pressure on all national economies, in transition and non-transition countries. A technological and managerial answer to this pressure, aimed at improving productivity, is necessary and possible when considering the use of ICT in advanced economies. In some New EU Member States and Candidate Countries, there are observable trends in that direction. For example, the “re-industrialisation” process, topical in transition economies, can be seen as a historical opportunity for the technological modernisation of the economic production in industry.

Second, the decade of the nineties showed in most countries an impressive increase in labour productivity in the industrial sector due to labour shedding in restructuring companies (which in turn resulted in steadily increasing unemployment in spite of positive growth rates of the whole economy). In particular in the manufacturing industries of New EU Member States and Candidate Countries, much of the catch-up process has been driven during the past decade by cost-savings on labour and restructuring.

Finally, in the nineties, the New EU Member States and Candidate Countries have also benefited from a wave of accession-related foreign investments, as well as from simultaneous plants relocation. These moves do find much of their explanation in the benefits

to companies resulting from cost differentials: low wages and well educated workforce generated a major competitive advantage located in the New EU Member States and Candidate Countries. Other factors have of course also played an important role in these investment trends such as the privatisation process itself (allowing the restructuring and the labour shedding), liberal taxation schemes, attractive conditions for FDI, proximity to markets, etc.

No doubt also that many of those business-related investments have brought with them a series of other benefits in terms of knowledge and technology transfer, improved management, production processes, etc. While less quantifiable, the higher productivity stems also from a higher quality of management and overall human capital, partly related to these foreign investments.

While an important driving factor of FDI inflows was the comparatively low wage level of New EU Member States and Candidate Countries, some of them have already lost partly this advantage due to the progressive increase of real wages and income levels. The strongest wage increases have been observed in the Central European and Baltic states, and there the outflow of FDI has already occurred to lower wage level countries such as in particular the Former Soviet Union, South-eastern European countries (Romania, Bulgaria, but also Ukraine, Moldavia) and further to Asia (China).

Still, the New EU Member States are seen as having greatly benefited from the earlier various flows to the extent that they are sometimes perceived among EU15 “former” Member States as a threat to industry and services for their western neighbours: the new EU Member States are then portrayed as Trojan competitors, competing on the basis of unfair conditions of labour costs and FDI incentives.

But obviously, globalisation is knocking at everybody’s door. Observable industry relocation across Europe - from Western to Eastern Europe - is rather a consequence of the necessary restructuring of our European economy towards the XXI century. Geographically speaking, more relevant moves are those transforming radically the global division of labour, reallocating in Asia many essential (manufacturing) industries and leaving the Enlarged Europe as a whole with the challenge of specialising on knowledge and technology-intensive economic activities, on services and niche markets, on quality and tailoring, etc..

Assessing the past decade, it is also essential to acknowledge that, while struggling with an important set of issues related to Transition and to the EU Accession, the New EU Member States and Candidate Countries have had little opportunity to focus their human and financial resources, their political priorities and even their companies’ business plans on those issues

that show to be relevant for tomorrow: adapt the innovation systems , for example by boosting the R&D, framing FDI flows in longer term development patterns, concentrating on high-end production , etc.

It may also have been assumed that the effect of integration to the Single Market and the emerging competitiveness pressures from further globalisation would “naturally” become a supply side factor that would increasingly influence the spread of ICT at corporate level as these technologies are a source of productivity supportive to competitiveness. But the competitive pressure is rather a challenge than an opportunity: as such it will not generate the relevant reaction.

***(b) Tomorrow's challenge: restructure, reorganise, innovate***

The new challenge facing today the New EU Member States and Candidate Countries is to sustain high Growth in other ways than those of the nineties. While real convergence is happening, further dislocation of FDI and unfavourable relocation could occur. The progressive loss of wage-based competitiveness, due to the success of the convergence trajectory, induces the necessity to shift to higher value added production.

Competitiveness will now have to match another type of criteria: those of the knowledge-based competition, of innovation, of product and service development, of quality, of niche markets. This gives a particular role to the ICT, not as much as an industry but as a modernising pervasive technology.

The structural transformation of the New EU Member States and Candidate Countries offers a wealth of opportunities for the technological modernisation of various (sub)sectors, a modernisation that has not yet fully happened. There are three likely developments shaping this technological modernisation.

First is the growth of the service sector. Beyond the expected ICT-intensive using activities of telecommunications or banking, less technology intensive service sectors could benefit from ICT investment and innovation, be the general business conditions correctly set. ICT-using services could provide a large potential for exploiting the growth potential which so far has been largely unrealised.

Second, the observed re-industrialisation of several countries offers the same opportunities, with possibly some room for global high tech industries if those activities succeed in integrating transnational networks of production and sale, or if they succeed in identifying niche markets with specific competitive advantages. ICT have their role to play here also, offering a potential for modernisation at all stages of the production and sales process.

For all such industrial and services initiatives, the observable productivity gap, the size of the sector in the domestic economy, its level of technological development and its sensitivity to such development, its prospective economic potential at national and global level are among the criteria that can help identifying the potentially most beneficial sub-sectors for ICT-based modernisation in each country.

Third, the New EU Member States and Candidate Countries all need to reform the provision of public goods and proceed fast with public finance reforms. There is a great opportunity in these countries to connect the reform of the health sector, of the public administration, of education, of the public sector employment, or of transport with the more extensive use of information and communication technologies. These could simultaneously free the domestic economies and public finances from the burden of financing the current level of public goods, as well as improve the quality and efficiency of public services to households and businesses. In this case, the impact of ICT on growth will have to be appreciated rather indirectly.

To address the challenge of growth through technology-related productivity increases or innovative products, New EU Member States and Candidate Countries need to develop the right mix of industrial policies, managerial awareness in the corporate sector, supportive and knowledge-intensive FDI flows, private sector's relevant position in global corporate networks, R&D and investment capacities, managerial and technical skills, supportive policies for technology related investments and for innovation, etc. Obviously, there is room for governmental action as to create the right conditions for businesses to be innovative and improve their competitiveness on a technological basis.

The question is on how to identify the sectoral assets (the issues of potential and criteria of choice) and on how to develop them (the issue of conditions). At the turn of the Millennium, the New EU Member States can be seen as insufficiently prepared - in particular in terms of integrated Innovation policies - for the new competitive pressure that will result from both accession and (progressive) convergence.

### **Emerging Challenge 2: Growing Social divides and the role of ICT**

The Lisbon objective specifically includes social cohesion as a value to be preserved and enhanced in Europe. As progress is made in terms of greater economic dynamism and competitiveness, social cohesion cannot be taken for granted. In particular, from the perspective of Information Society policies: what is the effect of the increasing pervasiveness

of ICT on social cohesion in Europe - the aim of an 'inclusive Information Society' - especially in light of the recent round of Enlargement?

***(a) Today's situation in terms of social cohesion***

Economic growth in itself is no social panacea. While the EU project is rooted from its early years in the ambitions of social cohesion, social divides undermine the credibility of the EU model and (more pragmatically) that of the governments in place. In this light, Member States have an immense responsibility in avoiding Europe having to confront social divides that would contradict its own basic principles.

In particular, there are widespread disparities across all New EU Member States and Candidate Countries. They include gaps in levels of income and in access to jobs, education and basic infrastructures, and are present across different regions, generations, ethnic groups, and gender divisions. Unequal access to ICT and its benefits (i.e. the digital divide) is another such disparity, which, from the point of view of the Information Society developments, is the most significant one.

With the possible exception of Cyprus and Malta, regional and social disparities have been increasing in all New EU Member States and Candidate Countries in the last decade. Due to the presence of structural problems, the need to reform and streamline the provision of public services and the inequalising effect of EU accession, all countries will continue facing a period of increasing social disparities and associated tensions. The extent of this depends on the speed of structural adjustments, the efficiency of the relevant policies and, to minor extent, the ability of countries to absorb external funds, both private and public ones.

Most of those countries have witnessed (and are still witnessing) deep reforms in their social systems. Their weak public finances could not sustain the growing pressures of unemployment, poverty, health and pensions allocations while having simultaneously to invest in the future by transforming their own administration, boosting education, reorganising their taxation schemes or attracting foreign investment. While reforming the pensions, labour, education or health systems, the New EU Member States haven't been in a financial or political position for maintaining earlier social programs or guaranteeing immediate solutions to social distress.

Even in a fast "catch up scenario", one may not expect a fast decline of those disparities. Just to the contrary broader disparities are likely to emerge. As a general rule, free market-led economic growth will not, on its own, bridge the gap between rich and poor. This requires a conscious effort on the part of governments.

Convergence is not expected to reduce regional and social divides. If the claim is valid that national convergence in the EU has often implied greater regional divergence, one may expect that countries successful in “catching up” will increasingly witness broadening social and regional disparities. In New EU Member States and Candidate Countries, the growth trend has already struck in an uneven way. It concentrates on major cities - in particular capitals - and diffuses little if at all to the peripheries. What has been observable is a growing regional divide, affecting rural areas, provincial towns constituted around old industrial legacies and border regions. At times, this divide has simply reactivated ancient divisions, but in most cases it is the product of lack of production resources, human capabilities and investment attractiveness interacting in a ‘vicious circle of impoverishment’. The corresponding regional and local political institutions often lack the effective status and resources to mobilise and coordinate the necessary activities of redeployment.

With enlargement it is estimated that, statistically speaking, the income inequality between regions in EU will double relative to that existing in the current EU15. In addition, the disparities between countries in terms of their urban vs. rural population ratio, regional situations and demographic trends, is expected to be such that it could endanger market growth, social cohesion, inclusion and democratic participation.

In a similar way, several observations in the former EU15 Member States tend to also point at growing disparities in terms of GINI coefficients, poverty line rates distribution, revenue distribution, etc. It is sometimes stated that the Information Society developments are accompanied by (negative) social counterparts in terms of disparities.

***(b) Tomorrow’s challenges in the development of an inclusive IS***

The role of ICT in such a context merits close attention. Social disparities in computer usage are a fact. There is a risk of developing a growing digital divide between and within countries, across different industries, generations, cultures, gender groups, and social classes. Such a divide need not necessarily map onto existing social divides, established along dimensions such as levels of income or access to employment.

If the premise of the Information Society is that access to information is a main determinant of economic and social well-being, then those who do not have access to ICT, which facilitate access to information, will not reap the rewards of greater information.

What can Information Society policies do to avoid such a scenario?

ICT alone will not bridge existing social divides. An unequal social structure is already in place, and technological innovations fall within that existing unequal structure. The first aim is not to create another dimension for inequality. Therefore, policies could aim to ensure

greater access to ICT. This is what might be considered the traditional approach to the digital divide. A second and legitimate goal is to avoid creating an extra level of social disparity based on technological illiteracy or upon the absence of ICT use. A third way of sharing the benefits of the information age builds on the distinction between ICT use by the population at large and ICT use by governments or other institutions, which then have an effect on the population. Aside from ensuring people have greater access to ICT, governments can seek to improve the efficiency of public services (e.g. health, education, transport, policing) through ICT. This would have an impact on the wider population, including those without access to ICT.

Social divides have always existed, and technological developments or improvements have tended to fall within the pattern of existing divides. This is the innovation paradox<sup>4</sup>: the poor cannot afford to buy a computer and therefore we can assume that ICT use will benefit the better off. However, it will be necessary to seriously challenge the premise that ICT will perpetuate existing social divides and, on the contrary, demonstrate that it can help overcome these gaps. The relevant issue, from this perspective, is to explore whether ICT use can help bridge social divides, and how.

### **Emerging Challenge 3: The Growth/Demography squeeze: Transition in Education**

Considering the Lisbon and the Convergence objectives, average economic growth annual rates of 2% for the fifteen former Member States, and of 5% (high scenario) for the ten New EU Member States are expected. Such Economic Growth rates translate into economic structural changes across all Member States, with a general trend towards more services, fewer (and new) industries and less agriculture. If one considers the “engine” of economic growth being those structural changes, by analogy, the available workforce and its level of Education can be seen as the fuel for that engine. Finally, the demographic trends in all EU25 point at the more or less rapid emergence of an ageing - if not aged - society. In such circumstances, the challenge is meeting the needs for a sufficiently skilled and young workforce due to high Economic Growth rates in a restructured economy. This problem might be more acute in the New EU Member States because of their expected higher rates of Economic Growth, their lower Educational outputs and their demographic trends.

---

<sup>4</sup> Rogers, E. M. (1995) *Diffusion of Innovations*. New York: The Free Press.

***(a) Today's situation in Education***

An important documented strength of New EU Member States and Candidate Countries is the good supply of human capital. Compared with economies at similar levels of economic development these countries have much better and more equally supplied human capital, well-trained labour force and a highly skilled population.

This is an asset clearly inherited from the past institutional settings in the educational area, supported by a high share of GDP devoted to education, compared to the former EU15 average.

Close observation of the educational system also shows that New EU Member States and Candidate Countries at least match Western European standards in technological education. Some further good news relate to the progressive introduction of ICT in education, planned efforts to improve the quality of education, or the EU targeted 3% spending on R&D.

Current trends in Education inherited from the nineties- such as privatisation, higher enrolment, shifts in the vocational and on-the-job training system, brain mobility and ageing teaching personnel, public funding crises, etc. - demonstrate opportunities as well as weaknesses of the recently reformed systems. The research area also is going through radical transformations, and with often weak resources and old fashioned institutions, confronts much criticism. Also, it is observed that insufficient budget is spent on primary and secondary education in favour of high level education leading to worsening of quality and results in those initial levels. This is a serious problem as the cost may emerge only after years and it may take also lots of resources and also time to reverse such trend. Educational systems in general appear also to be increasingly underfinanced as % of GDP.

***(b) Tomorrow's challenge to Education: The Growth / Demography squeeze***

The economy of the twenty-five EU Member States is expected to show positive growth rates in the next decade. Considering the Lisbon Objectives on one hand, the Convergence objectives on the other hand, average GDP growth rates of 2% per year for the fifteen former Member States, and of 2% (low scenario), or 7% (high scenario) for the ten New EU Member States are expectable. Such growth rates translate into economic structural changes across all Member States, with a general trend towards more services, less (and new) industries and less agriculture. Beyond those general trends, each country has its own "starting" profile: hence the speed and characteristics of the structural changes can be expected to be path dependent and thus country specific.

In particular, it is assumed that the New EU Member States show, as they did in the nineties, a more rapid and more specific structural evolution than the fifteen initial Member

States which have reached a more stable configuration. Still, such (West / East) “differentiation” is not necessarily the only possible: it can be assumed that some structural transformations show similar patterns across EU25 within other clustering trends (North/South, large and small countries, etc.).

If one considers the “engine” of Growth being those structural changes, by analogy, the available workforce and its level of Education can be seen as the fuel for that engine. The present structural changes, both in Western as in Eastern Europe, need to be and are accompanied by a progressive adaptation of the workforce in terms of skills. In particular it means that the move towards a Knowledge-based society - with its growing services sector and its higher share of added-value type of industries - necessitates a progressively growing share of tertiary educated workforce.

The educational systems in each of the 25 Member States do generate an evolving share of tertiary educated people, proportionally to the overall available youth in age of achieving tertiary level education in a given generation and in a given country. In the New EU Member States, the enrolment figures for tertiary education have been rapidly growing during the nineties, in particular in such a country as Poland, due to large reforms of educational systems. Nevertheless, it seems that the overall share of tertiary educated people in those countries stands still below EU15 figures.

Finally, the demographic trends in all EU25 point at the more or less rapid emergence of an ageing - if not aged - society. In particular in the New EU Member States, this demographic trend seems to hit the countries a little later than the present Member States, but possibly in a stronger way.

Taking in account the above, it is expected that in several or all EU25 countries, the demographic pressure (reduced young cohort) will prohibit from meeting the needs for a skilled (tertiary level) workforce to support high growth rates in the Economy. This problem would be more acute in the New EU Member States because of the complementary impacts of higher rates of Growth, insufficient Education outputs and negative demographic trends.

The reform of Education, including aspects that today are external to the traditional educational field and institutions, seems to be the optimal solution to avoid the squeeze resulting from high growth rates and an ageing population. While differences among countries are significant, a deep reform in most countries is deemed necessary in order to maintain competencies and skills, as well as the competitive advantages these bring.

While all countries have embarked on reforms within their educational systems, these reforms that far did not cover sufficiently the scope, the financing, the institutional and

ownership structure of the education systems to meet the upcoming challenges of the Growth/Demography squeeze. Further, Education reform is at risk of being postponed in countries which face public finance problems and political instability, because of the social and economic costs of such reforms: this may feed negatively back to human capital, Information Society development and finally Growth.

Hence, investments in Education are still needed to adapt to the expected structural shifts. Educational reform need to put a higher emphasis on primary and secondary education, *and* avoid tomorrow's skills mismatch in Services and high added-value industries<sup>5</sup>, by offering the relevant scope of educational options at tertiary level. Transitions to secondary and to tertiary educated populations, through traditional Education and through Lifelong training are the challenges to confront today in many European countries.

### 3. Conclusions

Today, three emerging challenges determine strongly *the future*. They will impact in a variable way each and any of the countries of the Enlarged Europe by 2010. Those are the European political challenges to come. They were less acute during the last decade and emerge now as additional issues, on top of those inherited from the past that might have been partly solved or not, such as the legacies in the economical structure or the health of public finances.

Box 4: The three Emerging Challenges  
for Information Society-related policies and developments in Europe

- 1. Changing Competitive Pressure: the need for innovation**
- 2. Growing Social Divides: the role of ICT**
- 3. Emerging Growth/demography squeeze: Transitions in Education**

These three challenges are expected to have a strong effect on future Information Society developments and policies during the coming decade and possibly beyond.

---

<sup>5</sup> The challenge of mobility is another answer to the local unavailability of a skilled workforce. But here, international agreements (Free movement) as well as national impediments (housing, labour regulation, ...) may show to be strongly constraining the opportunities.

Additionally, while specifically identified by studies focusing on the New EU Member States and on the remaining three Candidate countries, these challenges are expected to impact Europe as a whole. All Member States are confronted to these three challenges, possibly in various degrees -, and all will be impacted by the way those challenges will be addressed by the neighbouring countries. The interdependency of European nations is such that while identifying the specificities of a country's context, we have to acknowledge that in an Enlarged Europe, these specificities and the way they are addressed impacts on us all.

These three challenges are a strong invitation for striking the right balance between Growth and Social cohesion across an Enlarged Europe, and between short term quantitative objectives and longer term generational processes. This will be the role of policy-making at EU, national and regional level.

## References

- Bogdanowicz M., Burgelman J. C., Dunnewijk, T., Wintjes, R., Nauwelaerts, C., Weber, A., Dachs, B., Wagner, P., Ananos, M., Damvakeraki, T., Amanatidou, E., Landers, T. (2003) Identifying factors of Success and Failure in European IST-related National/Regional Development. Sevilla, Spain: IPTS, DG JRC, European Commission.
- Bogdanowicz M., Burgelman J. C., Centeno, C. (2003) Factors of regional/national success in Information Society developments: What information Society Strategies for Candidate Countries. Sevilla, Spain: IPTS, DG JRC, European Commission.
- Bogdanowicz M., Burgelman J.-C. (2003) Information Society Strategies for the Candidate Countries : Lessons from the EU15, IPTS Report No. 77, Special Issue, September 2003. Sevilla, Spain : IPTS, DG JRC, European Commission.
- Burgelman J.-C., Gourova E., Bogdanowicz M. (2003) Building the Information Society in EU Candidate Countries: Such a long way ahead. Contribution to A political Economy of Culture: Capitalism and Communication in the 21st Century. Calabrese and Sparks (eds). Rowman and Littlefield. USA.
- eEurope+ (2003) Progress report, February 2004. Prepared by the New Member States and Candidate Countries with the assistance of the European Commission.
- Gourova E., Burgelman J.-C., Bogdanowicz M., Herrmann C. (2001) ICT Panel Report. Enlargement Futures Report Series. Sevilla, Spain. IPTS, DG JRC, European Commission.
- Kalvet T. (2004) Insights into the ICT Manufacturing and Software Industry in Estonia, Sevilla, Spain. IPTS, DG JRC, European Commission.
- Pascu C. (2004) Insights into the ICT Manufacturing and Software Industry in Romania, Sevilla, Spain. IPTS, DG JRC, European Commission.
- Ozcivelek R., Zontul H. (2004) Insights into the ICT Manufacturing and Software Industry in Turkey, Sevilla, Spain. IPTS, DG JRC, European Commission.
- Weber A., When de Montalvo U., Bread, Broadband and the Benchmarking of eEurope in Candidate Countries, IPTS Report No. 77, Special Issue, September 2003. Sevilla, Spain : IPTS, DG JRC, European Commission.

« New Entrants » Research Consortium Reports :

Gáspár, P., Halász, A. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in the Candidate Countries, Draft Synthesis Report*, Budapest, January. International Center for Economic Growth, European Center.

Yonkova-Hristova, A. Stanchev, K., Bogdanov, L., Dimitrov, M., Angelov, G., Stoev G., Marinava, E. (2003) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, Bulgarian Monograph*, Draft, Sofia, December. Institute for Market Economics.

Margaritidis, C., Fákó, P., Kovács, A. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A report on Cyprus*, Draft, Hungary, January. International Center for Economic Growth, European Center.

Čermák V, (2003) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A report on Czech Republic*, Draft, Czech Republic, December.

Estonian Institute of Economics at Tallinn Technical University, *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A report on Estonia*, Draft, Estonia, January 2004.

Gáspár, P., Halász, A. Jaksa, R.A., Czakó, V., Antal, G. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A prospective Analysis in Hungary*, Draft, Budapest, January. International Center for Economic Growth, European Center.

Karnite, R., Klava, M., Karnitis, K. (2003) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, Report on Latvia*, Draft, Riga, December. Institute of Economics, Latvian Academy of Sciences.

Lithuanian Free market Institute, *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A prospective Analysis in Lithuania*, Vilnius, October 2003. Lithuanian Free Market Institute.

Xuereb, M. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, Malta*, Draft, February. Islands Consulting Services.

Piatkowski, M. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A prospective analysis in Poland*, Draft, Warsaw, Poland, January. TIGER, Transformation, Integration and Globalization Economic Research, Leon Koźmiński Academy of Entrepreneurship and Management.

Caragea, A., Gheorghiu, R., Miron, R., Turlea, C., Turlea, G. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, Report on Romania*, Draft, January. SOFTWIN.

Salner, A., Druga, P., Sirák, M. (2003) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A prospective Analysis in Slovak Republic*, Draft, Bratislava, September. Slovak Governance Institute.

Stare, M., Kmet, R., Bučar, M. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, Report on Slovenia*, Draft, Ljubljana, Slovenia, January. Institute of Macroeconomic Analysis and Development.

Sayan, S. (2004) *Factors and Impacts in the Information Society: a Prospective Analysis in Candidate Countries, A Prospective Analysis in Turkey*, Draft, Ankara, Turkey, January. Bilkent University.