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EUROPEAN COMMISSION
Joint Research Centre



ENGLISH VERSION

A B O U T T H E I P T S R E P O R T

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The Report is produced simultaneously in four languages (English, French, German and Spanish) by the IPTS. The fact that it is not only available in several languages, but also largely prepared and produced on the Internet's World Wide Web, makes it quite an uncommon undertaking.

The Report publishes articles in numerous areas, maintaining a rough balance between them, and exploiting interdisciplinarity as far as possible. Articles are deemed prospectively relevant if they attempt to explore issues not yet on the policymaker's agenda (but projected to be there sooner or later), or underappreciated aspects of issues already on the policymaker's agenda. The multi-stage drafting and redrafting process, based on a series of interactive consultations with outside experts guarantees quality control.

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We shall continue to endeavour to find the best way of fulfilling the expectations of our quite diverse readership, avoiding oversimplification, as well as encyclopaedic reviews and the inaccessibility of academic journals. The key is to remind ourselves, as well as the readers, that we cannot be all things to all people, that it is important to carve our niche and continue optimally exploring and exploiting it, hoping to illuminate topics under a new, revealing light for the benefit of the readers, in order to prepare them for managing the challenges ahead.

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EDITORIAL

2
Anonymous criticism on the Internet

Dimitris Kyriakou, *IPTS*

A groundbreaking court decision in July 2001 in the US – by the appellate division of the Superior Court of the state of New Jersey, to be precise – on anonymous critical postings on the web has not perhaps received its fair share of attention in Europe, despite its potential significance. After all, the Internet community includes European users (both individuals and firms) who may post or receive criticism across borders and EU courts will be called upon to decide on similar issues – also across borders.

The issue was broadly as follows: there are often anonymous postings on the Internet which criticize the way firms conduct their business. The targets of such criticism occasionally try to unmask the author of the anonymous posting so as to take him or her to court. Internet service providers such as America Online (AOL), for example, receive many civil subpoenas seeking to identify their subscribers. The development of guidelines for the adjudication of these subpoenas is a crucial task for the courts.

In one such case, a firm which was criticized in an anonymous posting (among other things for changing its revenue recognition policy to make its financial statement look more attractive) sued the anonymous critic hoping to break his or her anonymity through the suit. The New Jersey Superior Court denied the firm the opportunity to identify the anonymous critic, finding that there was no hard evidence that the company had been harmed by these postings.

The firm appealed. The appellate division of the court took it a step further, and not only reaffirmed the first instance decision but also enunciated guidelines for courts to follow when faced with a subpoena aimed at identifying anonymous posters. The guidelines include: i) the plaintiff will be required to notify anonymous posters that their identities are being sought and give them the opportunity to oppose the request; ii) the plaintiff must exactly identify allegedly unlawful statements; iii) the court must decide whether there is a valid claim for relief and whether the plaintiff is able to adduce sufficient supporting evidence; iv) if all of the above are met, then the court must weigh the poster's right to anonymous free speech against the need to identify the poster.

Lest the reader think this is a case unique to the US and that it will be a long time before anything similar faces EU courts, in mid-July 2001 the Swedish Supreme Court ruled that a person who posted accusations about several Swedish banks on the Internet was merely exercising his or her freedom of speech. The defendant was accused of setting up a website on which he or she published serious criticisms about several Swedish banks and named individuals working at these banks, alleging that they had defrauded customers out of their money. The Swedish Supreme Court overturned the conviction in the lower court (which had been reaffirmed by the appeal court) and absolved the person posting the critical comments of all the charges. The Swedish Supreme Court took privacy

protections for the bank's employees to include private and family life, home and personal correspondence but decided that acts taken by bank directors in the course of their work were not subject to such privacy requirements.

Note that in a sense the Swedish court went beyond the US one: the decision was not on preserving anonymity and affirming a lower court decision, but rather it overturned a guilty verdict. In another sense, however, it is the US court that

took the extra step: regardless of any eventual verdict, the very identity of the individual user will not be unmasked unless very clear and specific tests are met.

In any case, to conclude, there are at least two cases on both sides of the Atlantic which will have substantial implications in both legal terms, and in terms of how businesses conduct themselves, for the means available to critics, and to firms targeted by them.

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Science and Governance in a Post Westphalian World: The Need for a New Paradigm

Kimon Valaskakis, *University of Montreal*

Issue: The advent of accelerated globalization in the second half of the twentieth century has severely undermined the world system of sovereign nation states (the so-called Westphalian system, after the treaty which ushered it in back in 1648). One area still labouring under the old Westphalian assumptions, however, is science policy. Although generally recognizing the existence of globalization, science policy-makers tend to underestimate the constraints it imposes upon the degrees of freedom of national governments in this important field.

Relevance: In the formulation of science and technology policy it is important that policy-makers realize that the rules of the game have changed fundamentally since the advent of globalization. In their attempts to democratize science policy at the national level, they are often forgetting that the battle is now global and biospheric and no longer only national. The passing of a law by a given parliament forbidding this or that scientific activity or regulating a specific technology may become meaningless as political borders disappear.

Since the treaty of Westphalia in 1648 the nation state has been considered the final arbiter of affairs within its territory. Globalization, however, has rendered some features of this model obsolete

Introduction

In 1648, the Treaty of Westphalia ended the Thirty Years War and introduced a new international order based on the "sovereignty" of nation states. "Sovereignty" was defined as absolute legal power against which no appeal was possible. An act of sovereignty was therefore, by definition, beyond challenge, unless by another sovereign state which would then have to go to war with the first one to back its claim. But short of war, every recognized state was considered the final arbiter of its own affairs. The Westphalian

System was ported over to the world stage with European expansion from the 17th to 20th centuries and is today the legal basis for the present international order.

The advent of accelerated globalization in the second half of the twentieth century has severely destabilized the Westphalian System, which is in danger of imminent collapse. Yet governments have been slow in accepting this possibility and have not been seriously preparing for a meaningful update. One area still labouring under the old Westphalian assumptions is science policy, which

has yet to take on a global outlook. Although generally recognizing the existence of globalization, science policy-makers tend to underestimate the constraints it imposes upon the degrees of freedom of national governments in this important field. Analysts focus on the process of science policy formulation, (democratic or not-democratic, whether the public interest is served, etc.) and tend to ignore the fact that these same national governments are losing their major player status in this area, and are being increasingly upstaged by international private consortia. Globalization has radically altered the rules of the game. In this short article we identify two aspects of the issue: the impact of globalization on (a) the *governance of science* and (b) the *science of governance* itself.

The Governance of Science under Conditions of Globalization.

Globalization may be defined as a historical process whose net result has been to make Planet Earth a much smaller place. All the world has now become the stage. Characterized by the "death of distance" and the high geographical mobility of factors of production it has also been marked by the trivialization of political borders, which are becoming much less meaningful. The domain of normal governmental authority has now been substantially reduced for a very powerful reason: *"Westphalian" sovereignty is exercised over chunks of geographical territory while an increasing number of governance challenges today are transnational.* The higher the mobility of factors of production (and, incidentally also of "factors of destruction" such as organized crime and international terrorism) the lesser the effectiveness of geographically based authority. These footloose agents may move effortlessly from one jurisdiction to the other. In addition to that mobility which allows them to dodge regulation the emergence of a huge new biospheric no-man's land under no one's authority is exacerbating the problem. It

consists of the oceans, outer space and the Earth's bowels, beyond the reach of the traditional authority systems. As that unregulated biosphere becomes more accessible it allows rogue elements to locate in this no man's land and perform their activities fully sheltered from national laws.

Applied to science and technology the shrinking of the domain of national sovereignty means that scientific and technological activities (benevolent or malevolent) can thrive with impunity. The simplest example to consider is of course the Internet. The technology is global and therefore any attempts to regulate it must necessarily also be global or be completely futile. True, some countries may attempt to block Internet use but these attempts seem condemned to long-term failure as the technology progresses. Twenty five years ago, videotapes played in mosques destroyed the regime of the Shah of Iran. Tomorrow, the Internet may challenge the stability of any regime that bars its use.

Any level of control of the Internet, short of global (or to be more accurate biospherical) would be ineffective. It is interesting to note that servers are now being installed on deserted islands or on ships flying flags of convenience. These servers may dispense completely unregulated financial, consulting, pornographic or other services fully sheltered from national laws. In the absence of clearly enforceable international law, these "zero-sovereignty-havens" may well thrive and prosper.

In the field of medicine we are already witnessing some, so far benign examples, involving ships performing abortions or euthanasia outside the territorial waters of states whose laws forbid such activities. The next step, less benign, might involve the development of new forbidden technologies outside the Westphalian sovereignty system. The debate about human cloning and the commercial use of the human genome is raging

Science policy has to a large extent continued to be set at the national level, making it often unable to cope adequately with issues whose impacts are global in scope

It has become increasingly easy for activities to move from one jurisdiction to another, and so find a jurisdiction that suits them, or simply move to a safe haven offshore, out of the reach of national authorities

As environmental issues and developments in certain areas of biotechnology have already shown, simply controlling products or processes within a national jurisdiction is no guarantee that a country will not be affected by them

The Internet has the potential to allow more direct democracy, although the question remains as to whether our societies are ready for it. Indeed, there is the risk that the same technology could be perverted to the ends of "cybertotalitarianism" as society becomes more dependent on ICTs for all its information flows

within the sovereignty system itself and different countries are taking opposing points of view on the question. But what is to be noted is that even the countries who take positions against such experiments are by no means protected since the clones could be produced elsewhere and introduced in the reluctant country at a later date. In the same way that robots introduced in Sweden may have an effect on Asian industrial competitiveness, bioscientific experiments could have global effects, independently of whether individual countries approve or disapprove of such practices.

On a much smaller scale something similar is already happening with GMOs. Given the integration of world agricultural production and the increased trade in food components, it is extremely hard to make sure that genetically modified organisms are not being introduced in the food products we consume even if our particular country disapproves of their use. One of the defining features of globalization is the rise in interdependence in all fields. As one author put it, we are becoming one world whether we are ready or not. This is particularly true in the fields of science and technology.

The examples of course can be multiplied. The important element to note is that the policy capacity of individual countries in these fields is now severely curtailed by globalization. It would be misleading to claim otherwise. Governments who believe that the mere passage of an act of parliament forbidding a given technological activity will be effective are increasingly out of touch with the realities surrounding them.

A New Science of Governance?

Not only is the domain of science escaping the older forms of governance, the domain of governance is itself deeply affected by changes in

technology. A new science of governance is emerging. Once again the most obvious example is the relationship between the Internet and Governance. On the positive side, the advent of the information highway has introduced the pleasant possibility of cyberdemocracy. The direct democracy exalted by the Ancient Greeks could become a reality with every citizen being able to input his or her views in the political process, whether that process is local, regional, national or even global. With cyberdemocracy must come of course a heightened responsibility, which requires more effective mass education. One of the advantages of the more traditional representative democracy is that it creates a buffer between crowds acting as such, and the political decision process – something which would be lost with direct cyberdemocracy. The possibility of frequent and immediate referenda on any issue will have to be balanced with increased self-discipline to avoid abuse of the technology, but by and large the potential of the new technologies can be very positive in this regard.

On the less positive side is the realization that the same technology which makes cyberdemocracy possible could also lead to cybertotalitarianism. The Internet is today an open system accessible to all. In most cases, the entry cost is mainly limited to accepting constant bombardment with advertising, in some form or other. Information and Communication technologies have brought greater transparency and citizen involvement. But there is no guarantee that in the future the scientific direction of change may not lead us towards encrypted *intranets* rather than democratic and open *internets*. The exclusive and elitist *intranets* with limited rights of entry may usher in a new form of knowledge-power restricted to the very few. One may conjure up a scenario of closed information systems belonging to an elite. These opaque non-transparent *intranets* could confer immense power on those having access to them. Bolstered by impenetrable encryption technologies these

systems would make possible all sorts of hegemonic scenarios, dwarfing traditional totalitarian systems.

The technological debate on whether impenetrable intranets are possible is at present inconclusive – much as the debate between the efficacy of the sword and the shield has been in military technology. Sometimes the sword is ahead, sometimes the shield, sometimes technology favours the offensive at other times the defensive. Excessive bias towards the defensive has created centuries of stable feudalism where knights remained invulnerable in their stone fortresses. The invention of gunpowder changed all that and accelerated the demise of the feudal lords by robbing them of their invulnerability. A similar debate exists between offence and defence in the Internet Age. A perpetual race is on between intrusive hackers invading websites and e-mail boxes and encrypted intranets with significant informatic armour, fully protected against outsiders.

From the point of view of governance both “offence” and “defence” present problems as well as opportunities. If offence wins then unshielded internets become vulnerable to fraud, cybercrime, cyberterrorism etc. If defence wins then shielded intranets may be a prelude to a new totalitarianism with a new divide between the “knows and the know-nots” replacing the old divide of the “haves and the have-nots.” Since knowledge is the contemporary form of power, privileged access to knowledge may create hegemonic systems as stable (in the negative sense of the term) as feudalism was before gunpowder.

As far as cyberterrorism is concerned, it is quite clear that the productive and destructive capacity that these new forms of knowledge confer upon their users is enormous. Imagine terrorists using biological instead of traditional bombs, or cyberattacks sufficiently sophisticated to wreck the US banking system via a portable computer. These

possibilities may unfortunately be only a few years away and the international community needs to prepare sufficiently for them.

Implications for Science and Technology Policy

In the formulation of science and technology policy it is important that policy-makers realize that the rules of the game have fundamentally changed since the advent of globalization. In their attempts to democratize science policy at the national level, they are often forgetting that the battle is now global and biospheric and no longer only national. The passing of a law by a given parliament forbidding this or that scientific activity or regulating a specific technology may become meaningless as political borders disappear. To be effective science and technology policies must be not just international but also *supranational* i.e. to be effective they must not be limited by state frontiers. In other words science *policy* must gradually be globalized to match the already advanced state of globalization of science itself.

As a whole the field of science and technology, especially as it relates to governance, is like the mythical Pandora’s Box, full of both promises and threats. A neo-Luddite anti-technology strategy is clearly unwarranted because (a) technology brings with it considerable advantages to Humankind and (b) because to all intents and purposes, innovation cannot be stopped altogether anyway. On the other hand, a completely *laissez-faire* policy of non-regulation is extremely dangerous, given the immense power of the new technologies. In this connection, a feeble attempt at regulation, at the wrong level based on obsolete assumptions overestimating the power of national governments may end up as worse than *laissez-faire* since it will lull the public into a sense of false security. Only concerted international action is likely to be effective in those areas of science and technology which are becoming globalized.

Another possible scenario is that of tightly guarded Intranets available only to the knowledge elite, although experience shows that the advantage tends to alternate between such fortresses and the means to penetrate them

Policy needs to be globalized to match the scope of the activities it seeks to regulate. In this regard, as an experiment in supranationality, the EU is something of a pioneer

European experiments with supranationality are groundbreaking, but in order for them to be fully effective they will need to be endorsed at the global and not just continental level


About the author

Dr. Valaskakis is the former Canadian Ambassador to the OECD. He is currently professor of economics at the University of Montreal and senior fellow at FUTURIBLES Paris. He is also the president of the Club of Athens an initiative involving world leaders interested in improving the state of global governance. Previous to his appointment as ambassador to the OECD Valaskakis was president of the Gamma Institute a Canadian forecasting and planning research centre and chairman of ISOGROUP Consultants an international strategy firm. Dr. Valaskakis is the author of 8 books and over 150 articles.

In this context the European Union is a pioneer in this field but must avoid misleading itself into thinking that truly effective solutions can be found at regional level. It is a pioneer because it is the only region in the world openly experimenting with supranationality, which is a post-Westphalian concept. If the national sovereignty system was born in the European city of Westphalia the supranational sovereignty system was born and bred in other European cities such as Rome, Maastricht and Nice. European science and technology policy taking precedence over national regulations is a welcome event to be emulated elsewhere and the European experiment must be watched closely.

But the European Union may also end up inadvertently misleading itself and possibly others into believing that by transposing governance from the national to the continental level, the problem has been solved. In areas of true globalization

where all the world has become the stage, the continental level may be still too limited. To construct a European charter for the Internet or for the Biosciences may be a noble effort. But unless its provisions become global through endorsement by everyone, its limited geographical domain of applicability will greatly reduce its effectiveness.

Corporations have become global. Communications have become global. Organized crime has become global. It is high time that science and technology policies aspired to attain the same goal. A post-Westphalian, truly international and truly democratic science policy must become the long-term objective. The medium-term objective is for pioneers like the European Union to show the way by experimenting with supranationality and demonstrating to the world its strengths and weaknesses, its potential and its drawbacks. The stakes are high and the time is short. 

Keywords

globalization, national sovereignty, science policy, supranational coordination

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Connectivity in Rural Regions: Bottlenecks and Policy Options

Mario Zappacosta, *IPTS*

Issue: The low levels of connectivity in rural areas of less developed regions are frequently the result of a number of socio-economic barriers: a weak local energy and telecommunications infrastructure, the lack of technical skills and the limited relevance of the information content available.

Relevance: The existence of these barriers needs to be acknowledged by decision-makers in order for them to be able to design development and technology policy measures appropriately and avoid both a waste of financial resources and the risk of negative side effects.

Data are converted into useful information and knowledge only if three crucial stages are successfully completed (Wilson and Heeks, 2000): data first need to be accessed, then assessed, and finally applied to local conditions. People living in rural areas in developing countries, and also in some regions of transition economies, usually experience serious problems in all three of these stages. Discussing usage and usefulness of information and communications technologies (ICTs) for rural development is meaningless unless the "connectivity" question is addressed¹. Access to information potentially available over ICTs needs many tangible resources such as telecommunications infrastructure, electricity, skills for maintenance and use, and the financial resources necessary to buy hardware or to access networks. Moreover, adequate levels of literacy are also necessary in order to be able to use technologies properly and also to assess, adapt and

apply the information obtained. Finally, it is important to address the question of information content quality and its relevance for people living in rural areas.

A problem of infrastructure

In most developing countries basic communication infrastructure is very weak given the low priority it received on past development agendas. Using "teledensity" (number of main telephone lines per 1,000 inhabitants) as an indicator, the 1996-98 average value for low-income countries is less than 40, whereas it is 569 in high-income countries (see Table 1). Moreover, telecommunications infrastructure in developing countries is concentrated in urban areas and, in many cases, it is non-existent in rural areas. It is estimated that in rural areas of developing countries, on average nearly 1,500 inhabitants have to share a single

Data only become information when it can be acted upon, and this is a process fraught with difficulties for many people living in rural societies

In most developing countries communications infrastructure is weak, and this problem is often compounded by a lack of electrical power needed to run computers and communications equipment

The cost of new PCs in developing countries is high both in relative and absolute terms, as the limited market prevents economies of scale. However, the extra running costs of using cheaper second-hand equipment can make it a false economy

**Table 1. Access to information flows (years 1996-98)
(units per 1000 persons)**

World economic regions	Main telephone lines	Public telephones	Mobile telephones	Television sets	Internet hosts
High income	569	5.1	266	674	48.18
Medium income	143	2.1	39	258	1.09
Low income	36	1.0	8	145	0.02
World total	142	1.9	54	253	7.42

Source: UNDP, 2000.

phone line (Hudson, 1998; European Commission, 1997). Finally, for want of financial resources, communication infrastructures are often poorly maintained and are subject to vandalism and theft (especially of copper cables).

Electricity is a prerequisite for access to global communications networks. However, nearly two billion people in rural areas still have no access to electricity, and with current demographic trends and the slowness of rural electrification programmes, the situation looks set to worsen in the coming decades (Barnes *et al.*, 1997).

The price of hardware, software and peripherals is another important barrier to the diffusion of new ICTs in rural areas. In developing countries the cost of a basic personal computer and a modem, about 2,000 US dollars, is simply out of reach to people who on average earn only 1,250 US dollars a year (UNDP, 2000). The cost of a PC is also higher than in industrialized countries as local markets are still at an early stage of development where sales are insufficient to bring the economies of scale that would allow for price reductions. This is often compounded by the application of high import duties.

In addition, rural areas frequently lack affordable and accessible local financing mechanisms and when they are available people often lack the collateral needed to access credit. A frequent suggestion is to use cheaper second-hand or second-generation products instead of state-of-the-art technology, but this would bring with it the drawback of reduced speed and power. In many cases, what would be saved in the initial outlay on equipment would be later be spent on increased telecommunications costs and charges for connection time.

Many recent technological innovations seem to offer possible solutions for extending access in rural regions, bypassing the problem of weak communications infrastructures and reducing connection costs. New technologies, such as satellite and wireless telecommunication systems will provide developing countries with an "instant infrastructure", without the need to build expensive terrestrial fixed networks (Mansell and Wehn, 1998). Cellular radio communication systems, small satellite earth stations (very small aperture terminals or VSATs) and low earth orbit satellites (LEOS) are expected to play a key role in extending worldwide the reach of the global information infrastructure and make telecom services more

reliable and cheaper to provide. The diffusion of solar power systems in rural areas will also contribute to reducing their isolation from national electricity grids.

The implementation of regulatory reforms in the telecommunications sector is expected to magnify the positive effects of technological progress in the aforementioned areas. Since the end of the 1980s an increasing number of developing countries have been opening up their markets to competition and transferring their state-owned monopolies into various forms of private ownership. This policy shift toward liberalization and privatization is often the result of the conditions imposed by international development institutions, such as the World Bank and USAID, as part of the implementation of structural adjustment programmes.

The rationale behind these reforms is that national telecom monopolies are inefficient and, in view of their mounting debt and worsening terms of trade, they cannot afford the investments needed to expand, upgrade and maintain infrastructure. Competition and privatization are therefore looked upon as prerequisites for modernizing the sector, leading to improvements in quality of service and a reduction in costs to users. However, it should not be forgotten that a frequent reason for privatizing, especially in poorer countries, is to raise cash with which to solve fiscal crises rather than to maximize the prospects for improved efficiency (Hamelink, 1999, Van Audenhove *et al.*, 1999).

The impact of these reforms on rural areas is not always clear cut, and privatization often fails to live up to expectations that it will encourage greater competition. The telecommunications market is in fact showing a clear trend toward concentration, making it look more like an oligopoly than an openly competitive market. Moreover, once they become profit-making enterprises, former public service providers may have even less incentive to

supply services to rural areas where there are few customers and their purchasing power is marginal. They may prefer, at least in the short and medium term, to develop communication infrastructure for urban areas where installation costs are lower and the demand for services is higher.

A shortage of skills

Illiteracy is an enormous barrier to accessing ICTs (Mansell and Wehn, 1998; Munyua, 2000; Burkett, 2000; Uimonen, 1997). Despite the development of user-friendly interfaces based mainly on presenting information in pictographic and audio-visual form, the productive use of ICT services requires at least the attainment of basic literacy levels. Unfortunately, in developing countries adult illiteracy rates are still very high, amounting in 1995 to 870 million people, i.e. almost 30% of local population, two thirds of illiterates being women and the majority living in urban slums and rural areas (UNESCO, 1999).

In addition, apart from the telephone, the majority of information exchanged via ICTs, whether in text format or broadcast orally, takes place in the languages of developed countries. At present 90% of the information stored on the Internet is in English (Burkett, 2000), a language spoken by about 700 million people (including both native speakers and those for whom it is a second language) (English-Speaking Union, 2001), thus representing less than 12% of the world population.

Human resource development is also a decisive factor in guaranteeing local user support. Training local technicians to manage and maintain ICTs is essential in order to break the existing dependence on outside help. The growing complexity of ICTs systems resulting from the full digitization of the network makes communications infrastructure management extremely difficult and therefore calls for special skills.

Although many developing countries have privatized their telecommunications operations in order to stimulate competition, this process has not always lived up to expectations

As well as a lack of infrastructure, a shortage of the necessary technical and language skills can be a barrier to accessing and using the information available on the Internet

Efforts to build up ICT skills in rural areas may be undermined by migration of skilled technicians to the cities where market demand for their know-how is strongest

Information obtained from remote sources via ICTs may prove hard to assimilate by rural communities for social as well as technical reasons given that traditional information flows tend to place more emphasis on direct face-to-face contact

The form of information available on the Internet may also be inappropriate, geared as it tends to be to professionals working in research centres and development institutions

The effort of developing countries in local training and skills building, often with financial support from international development aid organizations, may be completely undermined by the difficulty of retaining skilled technicians in rural areas. In effect, thanks to the training itself, these professionals become more competitive in the job market and may decide to migrate to urban areas in search of better employment opportunities in the ICT sector.

Relevance of information content

Without any doubt, a massive and continuously growing amount of data is accessible via ICTs. However, little of the information available may in fact be relevant to the socio-economic context of developing countries. The cultural distance between information producers and users, a lack of trust in remote sources of information, the difficulty of adapting technical content, and the need for additional means to translate information into useful decisions are the main factors in reducing the relevance of information available via ICTs.

Besides the shortage of material in local languages, information channelled via ICTs, mainly through television and the Internet, has embedded in it the characteristics of the culture of developed countries and symbolizes a specific way of communicating (Burkett, 2000; Uimonen, 1997). "Data is created within a particular context [...and ...] it contains what its creators do know and do feel is important and misses out what they do not know or do not feel is important" (Wilson and Heeks, 2000, p.416). The pervasiveness of ICTs and their capacity to spread rapidly, supported by commercial interests, are dramatically accelerating a process of cultural homogenization, where a uniform consumer lifestyle is being marketed across the globe. This process is altering and standardizing consumer preferences about goods such as food, clothing, music and television, but also "it has important

consequences for economic development patterns and may create serious obstacles to self-reliant strategies" (Hamelink, 1997, p.24).

People in rural societies usually get their most valuable information via informal sources such as personal contacts. Although this information may often be inaccurate and incomplete, they seem to prefer this type of source because the physical and cultural proximity generates a feeling of trust which finally determines the acceptance of the data. Traditional information flows, based on known and trusted sources such as elders or the collective memory, are often preferred to the emerging digital systems based on virtual and virtually anonymous sources. It seems difficult to move from a logic of perceiving the world based on an oral tradition and experience, physically close to objects, places and persons, to a logic of texts, files and windows (O'Farrell *et al.*, 1999).

Information available through global ICT networks is not always technically relevant for people living in rural areas, either because its content is too generic and abstract or because local people lack the necessary skills to interpret and adapt it. Technical data about rural development mainly deals with best practices and lessons learned in specific projects. This information is essentially delivered by international development agencies that place the results of their projects on the Internet and it is usually oriented toward meeting the needs of an audience made up of professionals working in research centres and local development institutions. Without a proper mechanism for filtering, interpreting and disseminating this information it will be unable to reach people at business and farm level effectively.

Non-scientific forms of knowledge - such as local, indigenous and tacit knowledge - are only minimally represented on ICT networks. This happens for two basic reasons: firstly, scientific know-

ledge can be codified, universalized and decontextualized, and then easily transformed into digital information; secondly, most of the institutions that have access to ICT networks and use them to deliver information mainly own and manage just this kind of knowledge. The result is the danger of creating a new hierarchy of knowledge where only the information that is available worldwide on information networks is considered to be valid, or even to exist. The Internet in particular is often seen as the new source of truth: "it is on the Web, therefore it exists" seems to take the place of Descartes' philosophical dictum "*cogito, ergo sum*". This may mean that a vast amount of knowledge, comprising everything that is too difficult to be codified or too valuable and sensitive for its owner to allow it to be shared, may ultimately be lost (Deane, 1998).

Finally, information has no value if it does not lead to decision-making and action (Wilson and Heeks, 2000). To get daily prices for agricultural produce may be of no use if farmers cannot reach the marketplace to sell their produce because they lack the means of transport or because of the poor state of the roads. Similarly, to be informed about the recent development of new agricultural techniques makes no difference to farmers if they lack the financial resources to buy the equipment or materials they would need. Or, finding out about new export subsidies will not change the agricultural production strategy of a rural family whose production is barely sufficient to cover its basic food needs. Therefore, action is frequently constrained by lack of resource endowments other than ICTs or the information itself. Factors such as financial credit, skills, production technology, demand for output, also play a very important role.

Concluding remarks: universal access

It is not easy to overcome the barriers described in this article, and its aim is far from that of looking

for blueprints. Appropriate policy measures depend upon the characteristics of local situations and the social groups involved and need to be backed by accurate analyses. Nevertheless, some key issues of broader relevance seem to emerge and they may be useful in order to define the general framework for policy development.

Firstly, in rural areas, given the weakness of the infrastructure and the lack of financial and human resources, people can generally not afford new ICTs for their own individual use. A possible solution, already in place in some developing countries, is to promote community access. In fact several ICT applications have clear public service characteristics (market information, education, healthcare, weather forecasts, etc...) and they do not need individual home access. Concentrating ICT services in this way has concrete advantages such as providing user support and basic maintenance, ensuring the security of both the service and the equipment, supplying the power needed, and collecting charges for the service on the spot.

The size of community-access facilities depends on local needs and may change over time. A simple "public telephone office", with just a phone and maybe a fax, may gradually evolve in a "multi-purpose community telecentre", providing office support, data processing, access to databases, training courses, healthcare services, audio and video-conferencing. Such centres may also become social and cultural meeting places, offering entertainment and broadcasting local radio and video programmes. These facilities should use an appropriate mix of traditional and new ICTs depending on the preferences and abilities of the users. For example, the information obtained online may be disseminated within the community using traditional communication channels, such as newsletters, meetings or radio announcements, or just posting it at social gathering points; such as cooperatives, local stores or bus stations.

As the Internet comes to play an increasingly central role as a repository of knowledge, traditional forms of knowledge that are difficult to codify may be further marginalized

Information about current market prices or new agricultural techniques may be useless to rural producers if they are unable to reach those markets or if they cannot access the finance necessary to implement the techniques

The lack of infrastructure and the skills to use it can to some extent be overcome by pooling resources through community access

Developing intermediation mechanisms is potentially a way both of overcoming the skills and cultural barriers to accessing the available information and of enhancing understanding of people's needs and expectations

Policies to develop ICTs in rural areas of developing countries should take care they do not siphon investment away from other more pressing needs

Secondly, if community access to ICTs is a feasible solution for improving connectivity, then it is essential to develop an intermediation mechanism that is able to build a bridge between information sources and the end user. This mechanism should be based on institutions in charge of gathering information from the global information infrastructure, adapting it to local needs and context and disseminating it through the network of community access facilities. At the same time, these institutions may be used as a platform for open discussion to enhance understanding of people's needs and expectations regarding their information system.


Depending on specific cases, the identity of these intermediary institutions may vary considerably, ranging from government agencies to non-governmental organizations. Nevertheless, in order to work properly and guarantee quality of service, they have to fulfil the following main requirements:

- *Skills*: they need to be able to make links with the global information infrastructure, to have critical capacity to screen, interpret and adapt information as well as to compile and develop new content-relevant information autonomously;
- *Trust*: the information they provide should be perceived by final users as relevant, reliable and valuable;
- *Representativeness*: only if these intermediaries are fully legitimized by rural communities would end users feel they have some degree of control over the definition of their information needs and problems;
- *Proximity*: they need to be physically and culturally close to the end users in order to receive useful feedback from the grassroots level and to gain a better knowledge of their users' needs and social context.

Thirdly, ICT policy needs to be part of a broader approach to development. On the one hand, information and its related technologies do not exist in a vacuum. They are part of a larger system that

includes social, economic and political institutions as well as cultural values. On the other hand, ICT policy is a crosscutting domain, affecting several policy areas such as technology, research, industry, telecommunications, education and health. Without properly considering these elements during the process of policy formulation, ICT diffusion would not match local needs and circumstances and its impact in terms of rural development could be limited or even negative.

Lastly, it is crucial that developing countries set their development priorities in a clear and independent way and examine carefully the relative priority of ICTs. The decision to invest in ICT needs to be carefully balanced with the investment needs of other types of infrastructure such as roads, railways, schools, hospitals or electricity grids. And when investing in ICT, they should consider whether it is more appropriate to promote traditional ICTs, such as radio and TV, or new ICTs, such as the Internet.

In conclusion, although the possibility of reducing distances and connecting remote areas to production and decision-making centres is evidently appealing, it is important to not overestimate its impact. The attractive idea of leapfrogging stages of development and catching up with developed countries has to be considered carefully. It should not be forgotten that technology is just a facilitator of change, neither the sole determinant of change nor an end in itself. The impact and uptake of new technologies is always driven by the socio-political context within which they are introduced and implemented. The bitter lessons learned from the experience of the Green Revolution should serve as a reminder that solutions based solely on technological fixes may have negative side effects. Moreover, the outcome of such measures may even be quite contrary to the original expectations if they are not accompanied by political will and the active participation of the stakeholders. 

Keywords

ICTs, less developed countries, rural and remote regions, connectivity

Note

1. The Information and Communication Technologies (ICTs) discussed here include broadcasting (radio and TV) and transmission of speech, data and images (telephones, faxes, email and the Internet) through fixed, wireless and satellite networks.

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Continued economic growth in pre-accession countries will in future depend less on institutional reform than on the capacity to create local growth

Sources of Value-Creation in the Enlargement Countries

Alexander Tübke, *IPTS*

Issue: Economic restructuring in many Pre-Accession Countries (PACs) is losing the momentum it needs to establish favourable conditions for future growth and competitiveness.

Relevance: A number of PACs have begun to tap their sources of value creation with promising results in some sectors. Others, however, face the risk of falling further behind if they neglect the important task of developing their own future sources of growth, a process in which technology can play a role.

Introduction

During the last decade numerous reforms have been undertaken in the Pre-Accession Countries (PACs). Some of these countries have been able to put in place an institutional framework supporting their economic growth¹. Although the pace of the reform process has slowed down in some countries, the ratification of important chapters of the *acquis communautaire* and the approach of EU accession will foster the enforcement of market rules and lead to an advanced institutional and legal framework in the future.

Unlike in the past, future growth in the PACs will depend less on institutional and regulatory reform and more on their capacity to create the local growth they need to ensure longer-term economic development and stability². Literature on this subject is sparse and heterogeneous. This

article investigates trends in seven key sectors where past changes have had an effect and where they have transformed into sources of growth³. Sectoral trends overlap country developments and, due to the increasing exposure of the formerly protected economies to international competition, increasingly impact on country developments. Based on a qualitative perspective of the developments in the seven key sectors across the different countries, this article identifies a number of early sources of value-creation.

Sectoral Trends

Seven key sectors have been identified based on the advancement of the reforms, the presence of competitive markets, their importance for the national economies, and their possible impact on future developments. The sectors looked at are manufacturing (with consumer-goods manufacturing as a sub-sector), retailing, utilities, media and

entertainment, telecommunications, financial services and e-commerce. Developments in the manufacturing industry are investigated in more detail because of the special significance of this sector for most PAC economies.

Literature on sectoral trends is sparse and heterogeneous, and few studies have been conducted enabling a comparison of sectoral trends between countries⁴.

Manufacturing in the PACs has been forced to undergo a painful restructuring over the last ten years, in which more than five million jobs have been lost⁵. However, manufacturing still plays a very important role in terms of value creation in these countries, accounting for between 13% (Estonia) and 27% (Czech Republic) of employment. FDI patterns vary considerably between sub-sectors and depend on the relative cost position of each country together with its expected national market potential⁶. In the Czech Republic, Poland, Slovakia and Slovenia, industrial structures have come fairly close to the EU-15 average. Bulgaria, Romania and the three Baltic candidate countries

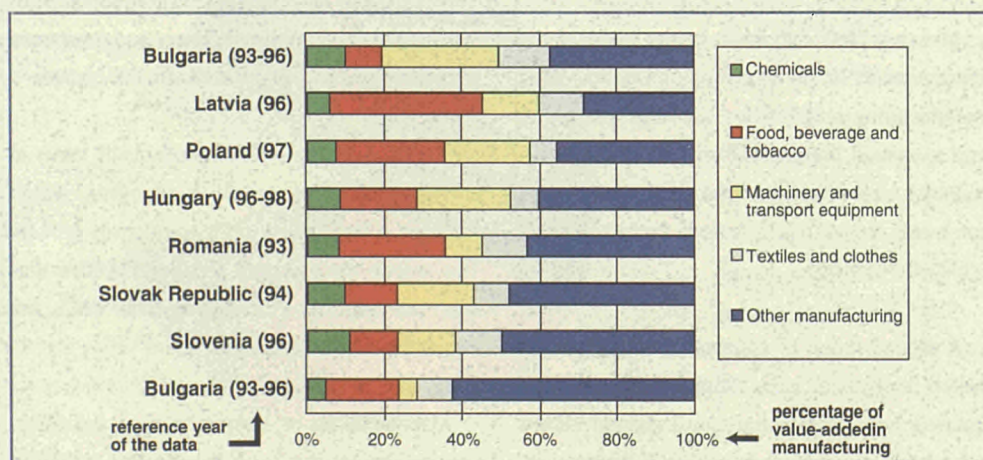
have a rather different industrial structure with a stronger focus on labour-intensive sectors. Figure 1 shows the composition of value-added in manufacturing in selected PACs compared with Italy, an EU-15 country with well-established and competitive industrial structures.

Except in the case of Slovakia and Slovenia, the food, beverage and tobacco sector plays a very important role in the PAC economies. Compared to Italy, most of the PACs have little activity in the machinery and equipment sector. In Latvia and Bulgaria the chemical industry is under-developed as a source of value-added. For the industrial structures to approach those of the EU-15 countries, most PACs will have to move further away from the low value-added labour-intensive production to higher value-added sectors⁷.

Accordingly, it has been observed that the strongest productivity improvements generally accrue to the technologically intensive machinery and equipment sectors. This has led to a characteristic pattern of labour productivity gains in the more advanced countries.

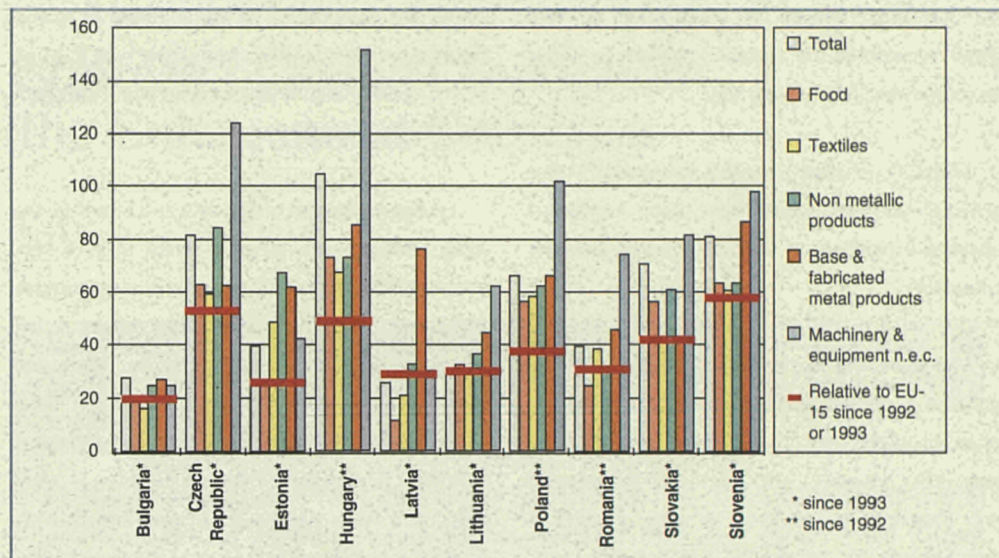
Despite very severe restructuring over the last ten years, manufacturing still plays an important role in value creation in the PAC economies

Figure 1. Composition of value added in manufacturing in selected PACs and Italy



Source: Compiled from World Bank (2000).

Figure 2. Labour productivity in manufacturing in some PACs from 1992(3) to 1999



Source: Compiled from IMF (2001), p.16 and OECD (2001).

Industrial structures in most PACs still depend on low value-added labour-intensive production to a much greater extent than the EU-15 countries

The picture for economic growth in the PACs is mixed, with some countries lagging considerably behind the more advanced countries

Manufacturing of electric, optical and transport equipment has been the clearest source of productivity growth in almost all the PACs during the last 8 years

Figure 2 shows manufacturing labour productivity compared to the EU-15 in 1992 or 1993 (horizontal bar) and the labour productivity advances in different manufacturing sectors of these countries since then (vertical bars). The horizontal bars thus show the base level the country started from in the manufacturing sector as a whole, while the vertical bars reveal the relative productivity improvements in the sub sectors.

In Latvia and Lithuania labour productivity improvements in the technically more advanced manufacturing sectors were not large enough to lead to overall productivity growth. In these two countries, restructuring in the food, textiles and non-metal products sectors have perhaps not yet achieved this target.

A second group of countries presents modest overall productivity gains. Romania, Slovakia and Slovenia were able to translate industrial reform into a factor for productivity growth. Bulgaria, starting out from the lowest manufacturing productivity

level, has not yet been able to produce significant productivity gains in the machinery and equipment sector. This might reflect a considerable lag in technological development and loss of competitive advantage.

The Czech Republic and Estonia show medium overall productivity growth. Estonia relies on its gains in the textiles, plastics and metal products sectors. The Czech Republic benefits from strong productivity advances in the machinery and equipment sector, a traditionally strong sector in this country.

The only country without productivity losses in any manufacturing sector is Hungary, which managed a very high overall productivity growth. This reflects the country's good competitive situation not only in comparison to other PACs, but also at the international level.

Manufacturing of electric, optical and transport equipment has been the clearest source of productivity growth in almost all the PACs during

the last 8 years⁸. In countries like the Czech Republic, Hungary, Poland and Slovenia the engagement of Western car manufacturers has played an important role⁹. Their investments were motivated by low relative labour costs and the growth potential of the local markets. In the Baltic States and the Czech Republic the rubber and plastics, non-metal mineral products and the basic and fabricated metals sectors also showed high productivity growth. It is a characteristic of these sectors that productivity growth has been quicker than labour cost growth, indicating that companies were able to increase cost advantages over time and gain a favourable competitive position in the longer-run¹⁰.

Where competitive advantages have been achieved, the sectors concerned have often shifted from being low value-added labour-intensive producers to high value-added knowledge or technology-intensive producers. Successful competition generates exports that produce an inflow of foreign exchange, allowing for a virtuous cycle of

further technology investment and rejuvenating industrial structures, which in turn further enhance companies' competitive performance. As shown in the figure 3, high value-added goods already form an important share of exports in some countries.

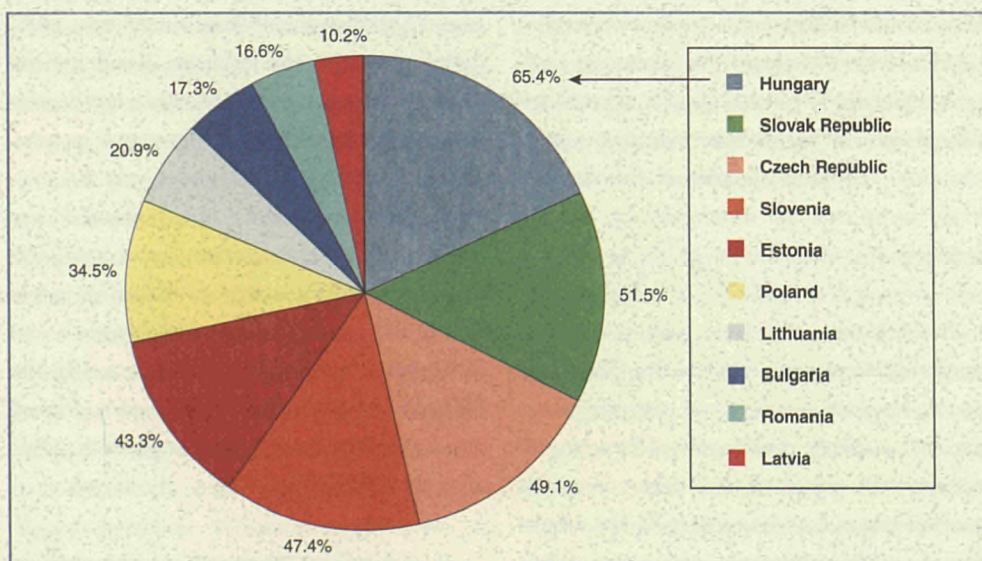
Hungary, Slovakia, the Czech Republic, Slovenia, Estonia and, to a lesser extent Poland, have already entered such virtuous cycles. However, the high degree of specialization in certain products makes the economies of the PACs vulnerable to economic shocks. Furthermore, the PACs might miss important future growth opportunities due to their overall weakness in advanced manufacturing sectors.

In total, manufacturing has become a source of growth in those countries that combine a high relative labour productivity (as compared with the EU-15) with significant productivity gains in high value-added sectors. This has created competitive advantages and virtuous cycles of value creation primarily in the Czech Republic, Hungary, Slovakia

Where competitive advantages have been achieved, the sectors concerned have often shifted from being low value-added labour intensive producers to high value-added knowledge or technology-intensive producers

Foreign companies have established leading market positions in a range of consumer goods, such as tobacco, detergents and consumer electronics

Figure 3. High value-added goods as a proportion of exports (in %)



Source: ERT (2001), p.28 (based on Smith (2000)).

The retail sector has grown rapidly in recent years, but regulatory control has failed to keep pace leading to weaknesses in both consumer and IPR protection

Enlargement is likely to have an especially powerful impact on the utilities sector, which is still characterized by regulatory control and inefficient pricing

Local media and entertainment businesses have thrived in some PACs, but language, culture and their adaptation to local budgets limit their possibilities on the international stage

and Slovenia, but also in Estonia and Poland. Despite significant productivity improvements in Lithuania and Romania, further efforts need to be made to improve overall labour productivity in relation to the EU-15. Latvia and Romania are particularly dependent on labour intensive manufacturing, and a source of concern in Latvia, Lithuania, Romania and Bulgaria is the dependence on labour-intensive production. In Bulgaria the weakness of the sector compared to the EU-15 suggests that the manufacturing sector still faces serious obstacles.

Developments in the **consumer goods manufacturing** sector are characterized by narrow profit margins and strong competition. The low wages and the outlook for growth in future local demand have attracted a considerable amount of FDI, especially in tobacco, detergents and consumer electronics¹¹. Foreign companies have been able to establish leading market positions in these areas. In many other product categories, local companies could enhance their production capacity and market positions significantly given the fact that their products are well suited to low local incomes and local consumer patterns. For both international companies and the bigger local ones, rising wages in the more developed PACs are starting to pose a problem. Some companies have started to examine relocating to areas with even lower manufacturing costs. However, access to national markets and expected income growth are factors militating against relocation. The future structure of the consumer goods sector will be determined by location decisions.

The last ten years have seen a complete transformation of the **retail sector** and rapid growth. However, the regulatory environment has not kept up with the development of the sector, for instance with regard to food safety or against counterfeiting of branded products¹². The relative maturity of the sector now means that further potential is limited. Profit margins in the retail

sector are expected to shrink as the market players have to take a stronger consumer perspective. This is likely to lead to further consolidation. Local businesses might have to seek alliances with other partners or regional expansion to cope with the increasing capital intensity of the sector.

In the **utility sector** rising energy prices and technological progress have forced governments to seek cooperation with western companies and attract foreign investment¹³. Indirect subsidies and prices set below cost by regulatory control still remain the biggest obstacles to the reform of the sector in most PACs. Artificially low energy costs lead to wasteful use of energy, which affects the whole economy. The EU enlargement process will have significant impacts on the utilities sector, fostering further reforms, encouraging greater emphasis on environmental considerations and forcing more efficient energy use through energy prices that reflect more closely costs. However, given the high government stakes in the sector and the strategic importance some governments assign to it, the reform process might meet obstacles.

The **media and entertainment** sector in the Czech Republic, Hungary and Poland has experienced high growth rates from a small base, partly taking advantage of lax regulation. Significant local businesses have emerged but have not become international players due to low local incomes. Poland has attracted foreign investment due to its large population, and the Czech Republic and Hungary thanks to the expectation of rapid economic growth¹⁴. However, the PACs are not seen as critical markets on the international media scene, where North American and European giants fight for dominance in key media. For the local businesses, development is linked to income growth within their cultural and linguistic area of coverage.

By making large investments in high technology infrastructure, international companies have taken

important stakes in the national **telecommunication** operators. Mobile phone penetration has increased significantly in recent years, but is still lower than in the EU-15 because of the high tariff-income ratio. Despite the marked rate of improvements, the shortcomings in both the "soft" and "hard" telecommunications infrastructure still limits growth opportunities. By how far the telecommunications operators will be able to exploit productivity and competitiveness improvements will be determined by the development of economic activities based on the use of telecommunications. On their way they will struggle for control of the mobile phone and the Internet access markets. In addition, companies will have to prepare for competition in the enlarged EU market, which will likely lead to further consolidation.

Foreign banks entered the **financial services** sector early and made Central and Eastern Europe one of the most intensively banked markets in the world. The more dynamic the banking reform policies and the more a country opened towards the participation of foreign banks, the more the financial sector has since contributed to the development of other sectors of the economy¹⁵. However, this has led to a predominance of foreign banks in the Czech Republic, Hungary and Poland. Further consolidation in the financial services sector due to service-related competition and the need for cost-reduction is expected. Reform of the pensions system and the broadening of the customer base will open up new opportunities in retail banking. In corporate banking, banks will have to focus increasingly on the SME segment, given the fact that the large corporate segment is already well developed. A decision on when some of the PACs could join European Monetary Union (EMU) would speed-up the development of the financial services sector. Banks are expected to further restructure through greater use of information technologies, to prepare for further consolidation and to find new ways to address local customers.

The **electronic business** sector has not been able to develop very far as yet. The limited use of PCs, in particular in firms, the low telephone and internet penetration, the high internet access costs at the local level, the absence of local language Internet content, the lack of a supportive soft infrastructure, and the limited use of electronic payment methods are hampering the expansion of the sector. Obstacles like the need for a more developed and better-valued customer service, comprehensive legal customer protection for electronic business transactions, and the development of the distribution infrastructure will have to be overcome¹⁶. For local companies it will be important not to miss the opportunities created by electronic commerce. Even the more advanced companies will be forced to revamp their internal structures and develop the technological and organizational expertise they need to enable them to compete over the Internet.

Policy Challenges

The sectoral developments described above are the results of the opening up of the former centrally controlled economies to market conditions. In this environment, governments are increasingly being forced to take a pro-active approach instead of restrictive measures which imply the risk of making a country miss growth opportunities and fall behind other PACs. This has been recognized for example in Hungary, which has reaped the benefits of its business-orientated legislative activity¹⁷.

Such an attitude is particularly necessary for the manufacturing sector, which is exposed to international competitive pressures while still facing structural problems. The reshaping of the manufacturing sector is far from over. Although countries like the Czech Republic, Hungary, Slovakia, Slovenia, Estonia and also Poland show promising signs of growth and competitiveness in high value-added sectors, these sectors still need policy support in order to stimulate the formation of

Limited telecommunications infrastructure continues to put a brake on the sector's growth

The entry of foreign banks has led to a thriving financial sector in the region, and dynamic banking reform has contributed to the development of other sectors of the economy

The limited penetration of ICTs, the lack of a customer-focused approach, and inadequate legal and regulatory frameworks have limited the uptake of e-commerce in PACs

Although countries like the Czech Republic, Hungary, Slovakia, Slovenia, Estonia and also Poland show promising signs of growth and competitiveness in high value-added sectors, these sectors still need policy support in order to stimulate the formation of vibrant industrial clusters and technological spin-offs

There is a risk that countries which are not able to create a friendly business environment and competitive structures in a large number of sectors will not only squander past efforts, but also scare off their own capital stock, their entrepreneurs and foreign investors

vibrant industrial clusters and technological spin-offs. Only with pro-active policymaking, in particular at the regional level, will these countries be able to induce competitiveness in a wider range of sectors, reducing their vulnerability to sectoral downturns and create a wider industrial base.

Latvia, Lithuania and Romania are countries where high value-added sectors have not yet started to develop sufficiently. Their dependence on labour-intensive production makes them vulnerable to low-wage competition and exchange rate fluctuations. In addition, if these countries are not able to attract FDI or finance the necessary investments for modernization, they risk falling further behind the first group of countries. This applies especially to Bulgaria, where productivity improvements in manufacturing have been so slow that the sector is lagging ever further behind.

Whilst the manufacturing sectors already show a high degree of exposure to international competition, regulation and policy obstacles still hamper the development of others. In the retail sector, PAC governments will have to foster a social environment in which customers have positive expectations about their future. Areas of food safety, the removal of trade barriers, and anti-counterfeiting legislation also need to be addressed.

For utilities, PAC governments face the challenge of reducing the dependence of the sector on regulation, making it more competitive and transparent, and accelerating the implementation of international standards for energy generation, security, and waste disposal. The energy companies themselves will have to foster links with international utility companies in order to access know-how and capital, become more customer focused, and ensure compliance with EU regulations as they come into force.

With respect to the media and entertainment sector, PAC governments will have to address the

protection of Intellectual Property Rights (IPRs), improve the regulatory coverage, and further support the sector's development towards international competitiveness.

In telecommunications, policy-makers will have to continue developing telecommunications regulations in order to match the rapid technological developments, harmonize regulation at the international level and establish independent regulators.

In the area of financial services, challenges for the governments lie in the continuing reform of the banking sector, the enforcement of shareholder rights and banking regulation, the necessary reform of the pension system and the preparation for possible EMU entry.

In order to support electronic business, the legal framework has to be further developed in most PACs, especially in terms of privacy, consumer protection, the validity of e-contracts and the recognition of e-signatures.

The differences between the more advanced countries and the laggards are set to increase further if some sectors are left out of the reforms. The risk is that if countries are not able to create a friendly business environment and competitive structures in a large number of sectors they may not only squander past efforts, but also scare off their own capital stock, their entrepreneurs and foreign investors¹⁸.

The timing of accession is another factor that puts pressure on the economic development of the PACs. The countries that enter at an early stage will be the more advanced ones. Accession will further improve their economies, while those that join at a later stage will have to make considerable efforts to avoid falling further behind, especially those that are facing a widening gap with respect to the other PACs¹⁹. Clear entry requirements and indications

of timing would help bolster reforms in all the PACs and accelerate the process through improved economic confidence. Policy-makers in the PACs have to be aware of what is at stake during the pre-accession period.

Conclusions

In spite of the increasing importance of local growth creation for future development in the PACs, promising developments have only been identified in some manufacturing sub-sectors. The problem of creating sources of growth on a wider base still remains. As observed in the manu-

facturing sector, countries can either follow the cost competition route towards low value-added products or strive for quality competition in high value-added products. In many sectors PACs still compete on the basis of low wages. However, sectoral developments show that it is possible to progress from there to a stage where higher value-added products predominate and so attain the "virtuous cycle" described earlier, which fosters development and competitiveness. As the PACs are due to join – and hence compete directly with – a group of economically strong countries, it is essential for them to recognise this essential step and prepare for it.

Keywords

EU enlargement, sources of value creation, enterprise policy, innovation policy

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Notes

1. See EBRD (2000), pp.13.
2. See also Radosevic (2001), p.1.
3. The agricultural sector is not included in this analysis because it is shaped by agricultural policies which are currently under discussion.
4. ERT (2001), Havlik (2001), Ambler et al. (2000) and ERT (1999).
5. In absolute terms, job losses were the biggest in Romania with 1.76 million layoffs. Relative losses ranged from 25% (Poland) over 50% (Romania) to 60% (Bulgaria) of the whole manufacturing sector (see Havlik (2001), p.5).
6. FDI ranges from the acquisition of local manufacturers (e.g. Renault's major stake in Revoz Ltd., which produces the Renault Clio) through Joint Ventures (e.g. Krupp-Bilstein's Joint Venture with the Romanian automotive parts manufacturer Compa S.A. in order to produce shock absorbers for the Romanian and European market) to greenfield investments (e.g. Saint-Gobain's 90 million Euro investment into a state-of-the-art flat glass plant in Poland) (see ERT (1999), pp.37).
7. See ERT (2001), p.27.
8. See Havlik (2001), p.12.
9. See ERT (1999), pp. 38.
10. See Havlik (2001), p.26.
11. Some examples include the acquisition of the Hungarian cigarette firm Pecs by BAT, Philips' engagement in Hungary, where it now employs over 8000 people, the Profilo group share in the Lithuanian colour picture tube company Ekranas, or Unilever's acquisition of the Romanian detergent manufacturer DERO (see ERT (1999), pp.32).
12. See Ambler et al. (2000).

13. For large Western companies, the opening up of the PACs has started to provide opportunities for international growth away from their mature home markets. Their entry creates a rapid transfer of environmental know-how and technologies and the possibility of large-scale infrastructure investments. The Suez Lyonnaise des Eaux group's has established Joint Ventures and long-term cooperation agreements with municipalities and companies in the Czech Republic and Hungary. Veba's cooperation with Latvia's Latvenergo has led to the construction of wind energy converters (see ERT(1999), pp.44).
14. One example is Bertelsmann's investment in these three countries, where it started book club businesses in 1991 (the Czech Republic and Hungary) and in 1993 (Poland). These investments were on a relatively small scale, but have become profitable quickly. They are seen as an experience that builds a potential for expanding into other group activities in the future (see ERT (1999), p.35).
15. See Ambler *et al.* (2000).
16. This includes the postal code system and lower postal fees.
17. See IMD (2000).
18. Venture Capital, for example, is highly volatile towards the general framework conditions and the availability of investment opportunities. In the Czech Republic, Hungary, Poland and Slovakia, twice the amount of Venture Capital has been raised than the amount that was being invested in 1999 (US\$ 424 million raised vs. US\$ 227 million invested (Ritchie and Arundale (2000), p.10)). This outflow has considerable negative effects on relative national competitiveness in the longer term.
19. See also ERT (2001), p.26.

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Urban Safety Management: Basic Principles and Concepts

George Georgiou, *Aristotle University of Thessaloniki* and
Panayotis Christidis, *IPTS*

Issue: Urban Safety Management (USM) is a comprehensive methodology which combines the use of a range of policies, cooperation between the various authorities concerned, and implementation of a variety of measures to improve the level of safety in urban areas.

Relevance: An integrated approach needs to be taken to the issue of transport safety in urban areas, combining all the major issues of urban planning and management, such as enforcement, education, management, as well as accident prevention.

Introduction

Urban transport as a whole is a complex and dynamic system, with various factors interacting in an almost “chaotic” way. Traffic safety is part of this system and its level is significantly influenced by the other elements of the urban system. It is evident that the traffic safety problem – especially in urban areas – is becoming so severe that individual remedial measures are no longer sufficient. Several studies suggest that the key solution to the problem is the implementation of integrated safety policies, such as the Urban Safety Management (USM) methodology.

USM is an area-wide approach that combines all the major issues affecting urban planning and management, including enforcement, education and management, as well as safety. A wide range of transport policy issues are involved – not only

those directly related to safety – in the design and implementation of the most suitable safety scheme for every case. An example of a USM framework focusing on high-risk sites and vulnerable road users (VRU, e.g. pedestrians, cyclists) is presented in Figure 1. The role of education and training, as well as that of enforcement is apparent and it should form part of any safety policy. But it is also important to identify clear objectives, both as regards safety and other transport related policies, and to take into account the impact of other policies that may influence the development of the transport system at the urban level.

Designing a national safety policy

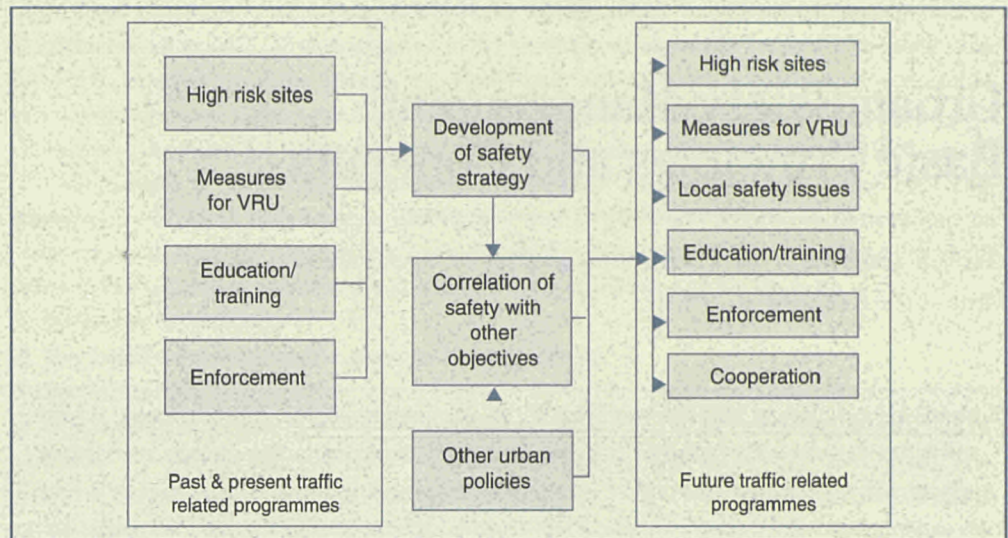
Urban traffic safety is not a solely local problem. Many of its aspects are influenced by policies at a higher –often national or international– level.

Traffic safety is part of a complex system and is influenced by an almost chaotic interaction of factors

Urban Safety Management (USM) is an area-wide approach that combines all the major issues affecting urban planning and management

Although urban and transport planning fall into the area of responsibility of local authorities, an alignment with national and international policies is often necessary in order to improve the overall traffic safety situation

Figure 1. Interrelation of USM with other traffic related issues



Source: DUMAS Project (1999).

National policies drive regulations and infrastructure development while policies at an international level are becoming increasingly relevant, especially in the EU, mainly as regards standards. Although urban and transport planning fall into the area of responsibility of local authorities, an alignment with national and international policies is often necessary in order to improve the overall traffic safety situation.

It is clear that each city or country has unique characteristics that influence the type, scale and timing of the implementation of safety policies. Transferring successful policies from one city to another is not always feasible, as differences in legal frameworks and cultures make the adoption of a universally accepted safety policy a difficult task. However, a common methodology for the formation of an urban safety policy, with a number of main safety principles that can be adopted by most countries, could be agreed upon (figures 2 and 3).

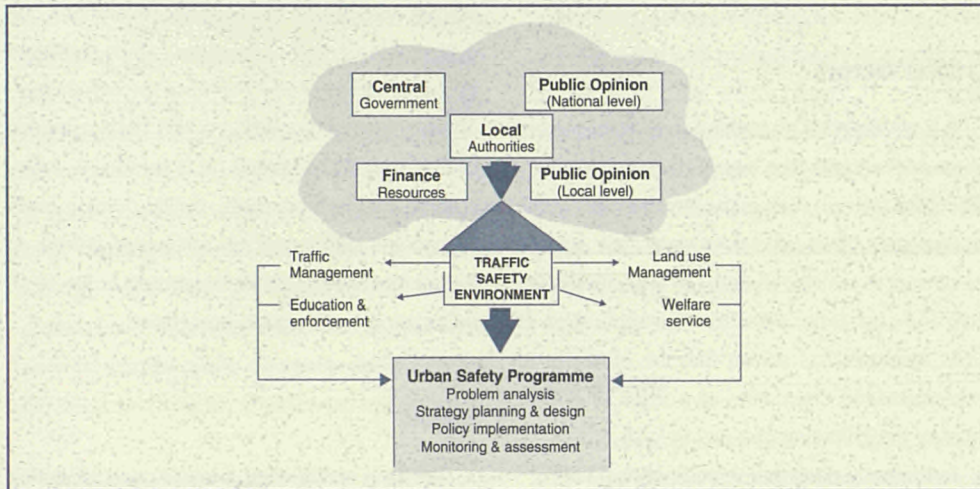
Experience from some EU member states can offer useful examples of national urban traffic safety strategies. For instance, in the UK, ten principles

are applied in order to reduce deaths, injuries and damage in accidents on urban roads, as well as people's apprehensions about traffic risk:

- Consideration of all kinds of road users, especially the most vulnerable.
- Consideration of the functions and use of different types of roads.
- Formulation of a safety strategy for each urban area as a whole.
- Integration of existing accident reduction efforts into the safety strategy.
- Correlation of safety objectives to other objectives for the urban area.
- Encouragement of all professional groups to help achieve safety objectives.
- Avoidance of adverse effects of other programmes upon safety.
- Use of the scarce expertise of road safety specialists effectively.
- Translation of strategy and objectives into local area safety schemes.

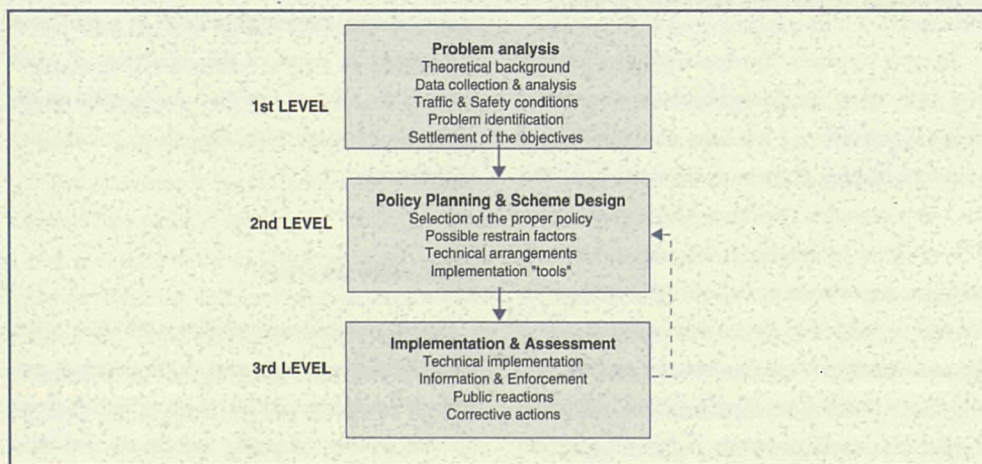
Since 1997 Sweden has been applying the "Vision zero" safety policy that aims at achieving zero deaths or serious injuries in the transport network,

Figure 2. Generalized methodology for the formation of an urban safety policy



Source: DUMAS Project (2000).

Figure 3. The three-implementation levels of a USM programme



Although every city or country has its own specific characteristics that influence safety policies appropriate for it, experience from other EU member states can offer useful examples of traffic safety strategies

with emphasis being put on the ethical dimension of road accidents. The goal is to raise awareness among politicians, authorities, manufacturers, companies and drivers, and have everyone strive towards the goal of increasing road safety. The actions within this strategy include guidelines for infrastructure design and construction, speed limits, vehicle technical characteristics, segregation of vulnerable road users' traffic, dual carriage-ways, etc.

In the Netherlands, the policy framework is summarized as "Sustainable Road Safety". Quantitative goals have been also set (750 or fewer fatalities and 14,000 or fewer hospitalized victims by 2010) and multifaceted measures are being applied. The priorities include the improvement of traffic law enforcement and road infrastructure, the introduction of initiatives to reduce drinking and driving, speeding and other forms of

Obstacles to implementation of urban safety measures often arise as a result of a lack of political will, public awareness or funding, or of a clash with other policy priorities

In most countries a number of different authorities are responsible for road and traffic safety, making it difficult to introduce innovative ideas

Public awareness is a key factor as legislation alone is not always sufficient to change users' behaviour

dangerous behaviour, and the enhancement of cyclist and heavy vehicle safety.

Critical factors

It is obvious that an Urban Safety Management framework should take into account other policy objectives as well, such as the improvement of the environment. It is also important that such a framework is realistic in terms of implementation time and cost. Experience from the application of USM measures has shown that the obstacles to implementation often arise as a result of one or more of the following four factors:

- Institutional cooperation and political will
- Public awareness
- Funding
- Other policy priorities.

Institutional cooperation and political will

In most countries, the responsibilities for road and traffic safety are divided between a number of different authorities. It has been observed that the larger the number of agencies involved in a USM, the more complex the procedure and the more difficult it is to introduce innovative ideas. In addition, experience has shown that getting the support of politicians for a safety policy is one of the most important requirements for success. The notion of a "leader" accepted by all the authorities involved is usually necessary in order for support for the programme to be maintained. Measures initiated and coordinated by central government agencies have demonstrated higher success rates than those begun at local level.

Public awareness

Public awareness and acceptance is also a key factor. It is important that the public adopts the principles of a new USM framework, since legislation is not always sufficient on its own to change

users' behaviour. It is also unlikely that political support can be achieved without first ensuring the interest and support of the public. In addition, the design of the remedial measures can be facilitated by consultation of the public at an initial stage. The reaction of the public is not always positive during the design phase of a proposed safety scheme but, in most cases, public opinion tends to become more positive when the process is transparent and the public is granted access to all information and decision procedures.

Funding

The lack of sufficient funds is often a limiting factor for the implementation of a safety policy. Sources of funding usually include central government and local authorities, but other sources such as local companies could be also utilized. Although the total direct cost of USM measures may be felt to be high in some cases, the benefit in terms of the reduction of social costs in the form of fatalities and injuries should normally be more than enough to justify such investments.

Other policy priorities

Safety policies may conflict with other policy priorities in the urban area. Such priorities may address economic and social issues, urban development policies (planning regulations and other transport policies), energy consumption considerations, accessibility requirements, pollution, noise, congestion, etc. It is often difficult for policy-makers to identify a hierarchy of policy priorities, especially if the various parts of the local community have differing preferences. Improving traffic safety has its trade-offs, usually in the form of increased direct transport user costs, but the policy-maker should be able to judge the extent to which sacrifices in other areas should be made in order to improve safety.

Implications for policy at the EU level

Transport policy, and road safety in particular, is clearly an area where the subsidiarity principle should be applied. In this context, policy intervention is appropriate only at the level where the desired effect of the actions can be best achieved. Although the planning and implementation of USM or similar measures is primarily a responsibility of local authorities, policy intervention at national and EU levels is a crucial ingredient for an integrated policy. The areas where the EU can intervene are mainly public awareness, legislation and technical standards for vehicles and infrastructure.

Public awareness needs to be the cornerstone of any policy on road safety if it is to be successful since many of the causes of road accidents can be traced back to driving behaviour or to choices that planners, manufacturers and authorities make. It is therefore important to inform the public about the importance of the issues involved, the ethical dimension of the actions of each individual, company or authority, and the measures that can be taken in order to improve the situation. More particularly, as regards the EU level, dissemination of best practices can be very useful. The frequency of road accidents in the EU member states with the highest risk is four times as high as in those with the lowest risk. It is evident that there is scope for improvement by adapting measures that have proven successful throughout the EU.

Legislative interventions require close cooperation between the EU and member states. Legislation at EU level could provide an enabling legal framework that assists individual member states in achieving their own goals for safety, particularly in relation to procedures, tests and standards with cross-border implications.

Technical standards are perhaps the area where EU level intervention could be most useful. Standards for vehicles (e.g. car fronts to protect

vulnerable road users), road characteristics (e.g. road-side crash barriers), on-board equipment (safety belts, airbags, helmets), etc., can be defined and negotiated with manufacturers more effectively at this level. The development of a European assessment programme for new car models (Euro-NCAP) that is underway can certainly help in this direction. The development of EU-wide road design standards could potentially increase the safety levels of European roads.

Conclusions

The safety problem and its possible solutions differ from country to country. Simply setting quantitative targets for the EU as a whole is not sufficient, since the specific local characteristics often require different strategies that have to be decided at the local level. Nevertheless, some common conclusions have been derived from the implementation of USM programmes over the years in European countries.

- The implementation of area-wide traffic safety schemes is a cost-effective way to substantially reduce fatalities and injuries, and improve the overall traffic safety level.
- The cooperation of different organizations, from the local to the international level, is required and should to be facilitated.
- Reliable data is essential for a detailed analysis and understanding of the safety problem, in order to raise public awareness and the political will to cope with it.
- Concepts such as those of "sustainable road safety" and "vision-zero" approaches should be taken into account when a USM programme is carried out and traffic safety schemes are proposed.
- The EU can promote safety considerations in areas related to best-practice dissemination, EU-level enabling legislation and definition of technical standards for vehicles and infrastructure.

Transport policy, and road safety in particular, is clearly an area where the subsidiarity principle should be applied. The areas where the EU can intervene are mainly public awareness, legislation and technical standards

Public awareness is the cornerstone of any policy concerning road safety since many of the causes of road accidents can be traced back to driving behaviour or to choices made by planners, manufacturers and the authorities

Standards for vehicles, road construction, equipment, etc. can be defined and negotiated more efficiently at European level

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Keywords

transport safety, urban planning, traffic engineering

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Technology and Competitiveness in the Knowledge Society

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Issue: The competitive success of many companies in Japanese, American and Western European markets has been associated with integrated strategies which link innovation and design and a market focus that is oriented towards differentiated customer needs and problems.

Relevance: Central to the EU's openness to technological development and innovation is the extent to which policy-makers are committed to possible technology responses as an important means of resolving the socio-economic problems faced by groups within it.

Introduction

In the context of today's modern business structures many of the old definitions have become obsolete. Mass production and low prices as a means of attracting consumers have given way to emphasis on quality, speed and total consumer satisfaction. These elements are being achieved by a change in the management role of executives and particularly by new management attitudes and the exploitation of knowledge in the emerging knowledge society.

In a sense we are in the midst of another economic revolution, which some would go as far as to call the most important yet, and which is something that goes beyond the revolution in microprocessors, computers, and other information technologies, to make the concept of a "network economy" perhaps more accurate and useful than the term "new economy".

As concern about the challenge from flexible, well-managed companies has grown and as awareness of the types of factors behind this challenge has progressed, so some leading companies in Europe and America have moved towards more coordinated and strategic approaches to technological and other aspects of their business. This shift has partly focused on process innovation within organizations. This is evident, for instance, in the radical changes involved in moves towards flexible production, lean production methods and continuous improvement policies. Some firms have also placed more emphasis on **process innovation across organizational boundaries** – focusing on the total production flow along the "supply chain" - from raw materials through to end product delivery, and thus have supported a move which, in some case, links service and manufacturing companies. Collaboration has also developed between organizations on the basis of compatible interests in such areas as core

Mass production and price competition are being replaced by emphasis on quality, speed and consumer satisfaction in today's market place

Companies around the world are taking a more strategic approach to technology in an attempt to tackle the challenges created by the need for greater agility

Against this backdrop, there is clearly a need to identify the relevant groups of factors in the EU environment which have an impact on flexible enterprises

There are a number of factors which help shape effective policy and the course of implementation of new technologies in society and the economy

Policy-making must be focused on developing skills and the capacity to research, recognize and identify social and economic needs and trends in the EU

Strengthening business performance and adaptability through emphasis on education and learning –particularly from best practice– is today more necessary than ever

technologies, product ranges, marketing and sales support - for instance, through joint ventures.

The emphasis on increasing output and direct control of all stages of production by vertically integrated bureaucratic organizational structures has been partly replaced –especially in the way modern technology is organized– by emphasis on innovation, flexibility and the constant striving for creativity. One of the key areas for the future of business in the international globalized environment are technologies such as XML (Extensible Mark-up Language), which enables data interchange between B2B (Business to Business) platforms, facilitating electronic commerce solutions between organizations.

Against this backdrop, pointing at the importance of technology-facilitated flexibility for enterprise competitiveness, there is clearly a need to identify the relevant groups of factors in the EU environment which have an impact on flexible enterprises. Some of these may seem to be remote from the implementation process of new technologies in many socio-economic sectors and activities but it is clear that, in practice, making connections between changes in the business environment and the various phases of implementation of new technologies is important given that technological change is ultimately guided by the process of adapting to the external environment or accommodating regulatory and other changes.

The character of policies and practices is not solely related to external stimuli but reflects the general patterns of activities or ways of doing things that develop from day to day and year to year. In seeking to develop a framework of strategies and in endeavouring to understand and anticipate the types of problems that may be encountered, it is important to be sure that practices are understood in relation to their context. In effect, new technologies interposed between different socio-

economic sectors may potentially disturb many established - often well established - ways of doing things. These reflect a variety of socio-economic factors, such as:

- The nature of strategic and other general policies
- The size of the socio-economic groups, and their financial and other resources
- The extent of centralization and decentralization and of functional differentiation
- The level of skill and experience within the socio-economic groups as a whole
- The existing systems of education and training.

Factors like these will help shape both the form of an effective policy (the nature of change and the extent to which that change can be successfully assimilated) and the course which implementation of new technologies takes in society and the economy. However, the various socio-economic groups that we may come across in Europe have divergent, often contrasting, sets of values, attitudes and expectations about important socio-economic issues (unemployment, welfare, what constitutes a satisfactory life-style, buying power etc.)

The need thus emerges for multi-dimensional policies to meet the needs of new economic activities. This means that policy-making must be focused on developing skills and the capacity to research, recognize and identify social and economic needs and trends in the EU. Such a direction makes us focus not only on adaptation skills but also on other core variables, e.g. full adoption, implementation and enhancement of information and knowledge flows in all EU decision-making units. In this context, one of the key challenges is therefore promoting knowledge flows in all socio-economic sectors. This points to the need to address the problems of communication between society and science including the way that educational institutions and organizations work.

Indeed, the strengthening of business performance and adaptability through emphasis on education and learning –particularly from best practice– is today more necessary than ever. The difficulties that are faced by the small and medium-sized organizations in an environment characterized by rapidly changing technology are enormous. The creation of banks of (qualitative) information on best practices, the connection with sources on a local, national and international level, is an area which can usefully be facilitated by policy. Business innovation should be rewarded in the market place and policies can enable the innovators' to reap the fruits of their work and enhancing the competitiveness of their firms and by extension, the society of which they form a part.

Societies need to create the conditions in which competitive economic actors can thrive. In short, societies must nurture economic agents large and small, from larger firms down to individual entrepreneurs. A key prerequisite to competing successfully on world markets is the ability to learn, assimilate, produce, enhance and exploit knowledge

flows. Human capital is a key ingredient as well as a beneficiary of this process of enhancing and exploiting knowledge flows.

Competing on the basis of low wages in increasingly commoditized industries is not an option in countries that have become accustomed to high living standards. But remaining competitive in a context of constant technological change means workers' skills need to be continually updated, right across the spectrum. Moreover, efforts to build human capital through investments in education and training will be futile if, in an increasingly mobile world, that human capital is not given the incentives and encouragements to stay.

To conclude, policy-makers need to keep in mind the interplays at work in the emergence of the knowledge society and their impact on way firms run their business. High in importance are adaptability, encouraging continuous learning at all levels, and creating, retaining and attracting the human capital upon which competitiveness increasingly rests.

Competitiveness is a feature of societies that nurture economic agents large and small, from larger firms down to individual entrepreneurs

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A B O U T T H E I P T S

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