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Learning Innovation Policy in a Market-based Context: Process, Issues and Challenges for EU Candidate-countries

Introduction

Attention to innovation as a key driver of competitiveness has grown tremendously in the last decade. It is now well understood that perhaps the most significant division today from the view of long-term economic growth is the one between countries that are able to achieve technological innovation at a high rate and those that are not (McArthur and Sachs 2002). Empirical demonstrations of the strong link between innovativeness and competitiveness[1] (Porter and Stern 2002) have backed this consensus. From the policy point of view, the "National Innovation Systems" approach (Freeman 1995),[2] emphasising interactions between players and the role of framework conditions for innovation in firms, has progressively changed perspectives on the scope and instruments to be used by innovation policies (OECD 2002).

This paradigm change has profound implications for innovation policy governance. In particular, the role of government switches from that of "correcting market failures", notably by subsidising research and development (R&D) activities, towards that of "correcting systemic failures", facilitating flows of knowledge in the system and ensuring that the infrastructure works properly. Rather than merely focusing on endowments in the system and on flows between research and industry, new innovation policies have to pay more attention to the absorptive capacity of firms, their learning abilities, and to those non-technological factors that are crucial for successful innovation (Nauwelaers and Wintjes 2003).

Parallel to this changing "theoretical" framework, within the European Union (EU) innovation has moved increasingly up the agenda. Largely European Commission inspired, this policy development began in the mid-1990s with a Green Paper and an Action Plan on Innovation; with the most recent policy statement being the Communication on Innovation in a Knowledge-driven Economy in 2000 (European Commission 2000; 2001b; Cowan and van

de Pal 2000). As part of overall efforts to ensure improved policy co-ordination and "open learning" amongst EU member-states, the Commission also launched the Innovation Trend Chart project to map innovation performance and analyse innovation policies across the EU.[3] At the national level, over the last decade the majority of member-states and over a hundred European regions have developed their own policy frameworks and instruments to stimulate innovation capacities and performance.

In this context, in May 2002 the European Commission launched the first of two studies on innovation policy in the thirteen candidate-countries. The aim of these studies was to provide a first insight into the current state of development of both the "innovation policy community" and innovation policy measures as a priority of governments in the candidate-countries. The studies were carried out by a team of EU-level and national experts in each country and involved extensive consultation through interviews, workshops and surveys with the key stakeholders in each "national innovation system" (NIS).

The initial study on the top six countries (Reid *et al.* 2002)[4] leading in terms of economic transition and political and institutional reform concluded that policy-makers and other stakeholders in the innovation system face five main challenges:
— to promote a culture open to innovation and creativity;
— to place innovation at the heart of further reforms of the legal and regulatory environment;
— to increase the number of smaller innovative enterprises;
— to strengthen the diffusion of knowledge and technology in the economy; and
— to establish a policy-making process conducive to creating an innovation policy.

The first challenge reflects the serious lack of understanding of what innovation entails, not only in the general public, but also in policy circles and business. This applies even more in the second group of seven countries where economic and political transition is lagging even further behind (except Malta). A cultural change towards a willingness to reward risk-taking and creativity is a slow process, even in more advanced EU countries.

The fifth challenge reflects the weakness of policy design and consultation mechanisms in the six candidate-countries and, again broadly speaking, the six candidate-countries are ahead of the second seven. How to improve this situation is the core subject of this article and is clearly linked to the second challenge, where the study called for the greater reflection by governments in the countries as to the impact of policy change on innovation and a reduced focus on mechanistically fulfilling the *acquis communautaire* of the EU. The two other challenges closely relate to the enterprise, or demand, side of an innovation system. The need to create more innovative small enterprises is a challenge faced across the EU and candidate-countries, but even more intensely in the latter. Throughout both studies a clear message emerged that, while many larger, notably foreign-owned, businesses in candidate-countries were innovators, the real challenge was to upgrade the capacity of the mass of smaller firms, often involved in sub-contracting networks, to become more innovative. Raising low levels of productivity through the diffusion and adoption of new technologies was identified as a particular priority.

The article builds on the work done in the two policy studies referred to above, and attempts to explore in greater depth the scope and potential for "policy catching-up" in the candidate-countries in the area of innovation.

The first section briefly sketches out the current trends of innovation gover-

nance in the EU. This section draws on information and analysis gathered through the European Innovation Trend Chart project for EU countries. As there is only limited evidence allowing conclusions to be drawn on a direct link between innovation policy, on one hand, and national innovation performance, on the other, no attempt is made here to impose a "best practice" model. Instead, the diversity of approaches linked to underlying contextual elements in the national innovation systems of EU member-states is stressed.

In the following section, the current state of innovation policy in candidate-countries is evaluated, and the issue of whether there is a link between innovation performance and innovation policy maturity investigated. In other words, does a country need to reach a certain level of development (or transition towards a market-based economy) before developing an innovation policy, or can innovation policy be used as a tool of economic development even where NISs are weak due to systemic failures. A case study of the Estonian experience is used to illustrate how innovation can rapidly become part of the set of national policy objectives contributing to economic development. In the third section the question of the possibility and limits of trans-national policy learning in the area of innovation between EU member-states and candidate-countries is discussed. Finally, the concluding section outlines some options for future innovation policies and their governance in candidate-countries.

Innovation Governance: Trends in the European Union

This section does not seek to draw any definitive conclusions on the relative effectiveness (advantages and disadvantages) of the approach to governing innovation policy in the EU member-states.[5] Rather it seeks to underline that there is a relative diversity of approaches which can in part be considered as reflecting the NIS, including the level of economic development, social capital and institutional organisation, and R&D systems. This implies for the EU candidate-countries that, while all may aspire to have the level of innovation performance of the Nordic EU countries (see *e.g.* European Trend Chart on Innovation 2002a), simply adopting the policy framework and organisational system of policy delivery is unlikely to lead to an instant reward.

Given the changing theoretical perspectives on innovation outlined in the introduction, innovation policy is in large part seen as a horizontal co-ordination mechanism touching on organisations and policy schemes normally the prerogative of "sectoral" policies such as fiscal, research, enterprise, education and even agriculture, transport, and environment policies. The horizontal nature of innovation policy arises from the contemporary concept of the innovation process, which includes aspects ranging from industrial research, through finance to internal knowledge-management processes of firms, to product development and commercial exploitation of intellectual property rights. As a consequence, the definition and implementation of innovation policy often demands an inter-ministerial approach even if the measures specific to innovation policy (*e.g.* aid schemes for innovation networking amongst firms) are delivered by one agency.

Moreover, since innovation occurs in a system it is important that participants in this system have a "voice" in policy development in order to avoid a biased focus on just some parts of the system. The use of structures, such as policy advisory councils or other methods to involve stakeholders (notably business), in policy build-

ing is one way to respond to this challenge. Policy delivery needs to be adapted to the interactive view of innovation: responsiveness to firms' needs itself calls for more interactive and bottom-up types of policy intervention, often facilitated by proximity to target groups.

Recognising the need to improve co-ordination mechanisms for the design and implementation of innovation policy, EU governments have increasingly established units aimed at co-ordinating innovation policy yet this is by no means a majority trend. Other means used are task forces involving several departments of various line ministries in drawing up a White Paper or implementing legislation. In a number of member-states, an innovation agency has been established under the supervision of the executive branch with a view to delivering funding to enterprises or intermediary structures.

Regarding the management of innovation policy, the first aspect to consider is the general organisation of policy design and implementation. Two main approaches are identifiable within the EU. Firstly, in a number of countries there is no real separation between the government institutions which frame policy and those that implement measures arising from government decisions. This is clearly the case, for example, in Greece where a key characteristic of the system is that government policy-making departments are also implementing agencies (European Trend Chart on Innovation 2002b).

Most of the main schemes in terms of R&D, competitiveness of firms or the information society are managed either by the governmental body General Secretariat for Science and Technology or its sibling organisation the General Secretariat for Industry. The situation is similar in the United Kingdom where the Department of Trade and Industry is 'at the hub of the UK system of innovation governance' but also 'operates and/or funds a number of schemes for the promotion of innovation in companies' (European Trend Chart on Innovation 2001a:4).

Secondly, in a number of other member-states policy is framed by ministries of industry but delivered by public agencies distinct from the government structures. TEKES (the National Technology Agency of Finland),[6] in Finland, manages some 30 percent of government budget appropriations for R&D and is the principal source of funding for applied technological research and industrial R&D (European Trend Chart on Innovation 2001c).

Another agency, reporting directly to parliament rather than the government, is SITRA (Finnish National Fund for Research and Development),[7] which focuses on technology transfer, seed finance, financing of growth companies and investment in venture capital funds amongst other activities. Likewise, in Ireland there is a distinction between the policy mission of the government's Department of Enterprise, Trade and Employment, responsible for promoting and assisting overall industrial development as well as innovation and competitiveness in the economy, and the implementing agencies, most notably Enterprise Ireland which funds indigenous industrial and technological development through a range of programmes (European Trend Chart on Innovation 2001d). In Spain (European Trend Chart on Innovation 2001e), following the elections in 2000 innovation competencies were gathered within the Ministry of Science and Technology; although aspects such as fiscal incentives or small and medium enterprises (SMEs) policy fall within the remit of other ministries. This is a major change from the past since for the first time competencies concerning R&D are not included within the Ministry of Education. A specific government agency CDTI (The Centre for Technological De-

velopment and Innovation), which reports to the MICYT (Ministry of Science and Technology), manages R&D and innovation grants schemes to industrial firms.

The second aspect relates to the geographical level of responsibility for innovation policy. Again, two models emerge here. The classical model is that of definition and implementation through national bodies (government or agencies), as in Finland or Portugal (European Trend Chart on Innovation 2001c; 2001f). A variant of this national model exists in some countries — a typical case is France (European Trend Chart on Innovation 2001g) — where the main implementation agency ANVAR (Agence Nationale de Valorisation de la Recherche) is organised in regional delegations, the latter holding a relatively large degree of autonomy in allocating R&D and technology subsidies.[8]

The second model holds in member-states with a federal structure such as Austria, Belgium, Germany, and Spain. In these countries, the design and management of innovation policy is becoming increasingly complex with the strong interplay between federal and devolved administration being required. The German system (European Trend Chart on Innovation 2001h) gives a predominant role to the federal ministries (BMWi — Ministry of Economic Affairs) and BMBF (Ministry of Research), which provide both a strategic orientation to R&D and innovation policy and fund directly or through state banks innovation and industrial research in enterprises. Nevertheless, as with other federal states there is an increasing division of labour between the federal government and the *Länder* (Federal States) in launching policy initiatives and financing R&D and innovation policy. In Spain (European Trend Chart on Innovation 2001e), the role of the autonomous communities (regions) in supporting innovation has increased over the last few years. Belgium is an extreme case, with a completely decentralised system in which the regions have full autonomy for the design and implementation of almost all aspects of innovation policy (European Trend Chart on Innovation 2001i).[9] This results notably in the two main regions, Wallonia and Flanders, having followed different options as regards innovation-policy management: a ministry-led innovation policy for the former; and an autonomous agency for the latter.

The distinction between "centralised" and "decentralised" models is becoming increasingly blurred, as formally strongly centralised states such as the United Kingdom have devolved powers, including those for innovation, to the parliaments and governments of two of its constituent countries (Scotland and Wales) and to a lesser extent to the regional development agencies in England (European Trend Chart on Innovation 2001a).

The third aspect concerns the way in which governments in the EU take into account the needs to co-ordinate policy and to incorporate the broader viewpoints of business and society into its design. Ministerial co-ordination structures and independent advisory bodies are the main instruments in place to meet this challenge. Finland is a particular case where the Council of Science and Technology plays a key role in both policy co-ordination and the creation of an inclusive policy design process (European Trend Chart on Innovation 2001c). The remit of the former Science Council was extended to include Technology in 1987. The Council, chaired by the Prime Minister, is composed of seven ministers and ten representatives of interested organisations (TEKES, industry, employers and employees organisations). Its main function is to direct science and technology policy through triennial policy documents, which include statements on the allocation of funds. The latest is the 2000 review on the "Challenge of Know-

ledge and Know-how"; while as early as 1993 it issued a policy document on "Towards an innovative society — a development strategy for Finland".

In most other EU member-states, with Greece appearing to be an exception, similar structures exist but their actual influence on the policy-making process is seldom as important as in Finland. In Ireland (European Trend Chart on Innovation 2001d), for instance, an inter-departmental committee on science and technology annually reviews expenditure across departments and makes proposals to the Cabinet Committee on Science, Technology and Innovation. The Irish Council for Science, Technology and Innovation (ICSTI) has also been established to offer advice on the strategic direction of policy by inputting into the work of the inter-departmental committee.

In the United Kingdom, the system is more diffuse as the government seeks and receives policy advice from a diverse array of committees and advisory groups (European Trend Chart on Innovation 2001a). These are located at various levels of the governmental system, from cabinet level, through parliament and departmental levels, down to the various *ad hoc* and standing committees (official and unofficial). This advice is further supplemented by a number of non-governmental bodies and interest groups, for example, the Confederation of British Industry.

In the federal countries Germany, Spain and Belgium, in addition to national advisory councils, there are regional committees and committees bringing together the federal authorities and the regional governments (the *Bund-Länder Konferenz* in Germany, the General Council on Science and Technology in Spain and the Inter-Ministerial Conference on Science Policy in Belgium). The role of such bodies is to co-ordinate the research and innovation policies of the different levels of government.

Behind similarity in titles, Science-Technology and Innovation Councils, have in practice a very different emphasis on innovation, and very different memberships. In extreme cases, only science policy is in focus and therefore the influence on innovation is likely to be minor. The composition and mission definition of those Councils are therefore important determinants of their actual influence on innovation policy-making.

Apart from the establishment of Councils, several member-states have also set up co-ordination structures to cope with the transversal dimension of innovation, in the form of *ad hoc* or permanent working groups. In France (European Trend Chart on Innovation 2001g), for example the widespread exercise of *Assises de l'Innovation* at the end of the 1990s was an occasion to develop lateral communication not only between ministries, but also between the main actors of the national innovation system. Thus, another distinction can be made between those countries that have established co-ordination and consultation structures on a permanent basis, and those that have developed them in the framework of specific operations, limited in time.

This brief overview of various aspects of innovation policy governance shows the diversity of models at work in Europe. On the basis of EU experience, there is no one-fits-all "system of innovation governance". Good practice (European Commission 2001b) in this area will always be context-dependent, notably with regard to the institutional structure of the country, the conception prevailing about state intervention in the economy, collaboration practices and culture in public organisations and in wider society, the tradition of social dialogue. Nevertheless, from the perspective of the central question of this article as to how candidate-countries can draw on the experience of EU partners and

catch-up in policy terms, some common features are worth highlighting:

— There does seem to be a preference for providing a clear remit and mission to a lead ministry or government department for industrial, technology and innovation policy objectives. Such a feature would indeed ease the need for lateral thinking in innovation policy. However, this is only effective if the lead ministry effectively covers the whole range of areas falling under innovation policy, or develops operational links with other ministries in charge of them so that the innovation policy exploits maximum synergies.

— There is a general separation of competencies between the bodies responsible for innovation/industrial research policy and those for education and fundamental research. At the same time, a major part of recent policy debates in the EU is about building or strengthening bridges between scientific research and the exploitation of such research in the enterprise sector.

— The regional or local level is increasingly important in the design and implementation of innovation policies in the EU. This reflects both a general trend to decentralisation in many countries but also a recognition that proximity matters in delivering effective policies to, in particular, smaller enterprises.

— The existence of inter-ministerial co-ordination mechanisms and consultative instruments play a key role in policy development, co-ordination and strategic evaluation of policies in most EU member-states.

State-of-play of Innovation Policy in Candidate-countries

This section seeks to summarise the level of development of innovation policy in the thirteen candidate-countries. In order to avoid a purely descriptive approach, and with a view to trying to provide a response to the question of the link between the level of economic development and the capacity to implement an innovation policy, a summary index has been conceived. Table 1 summarises the state of play in the candidate-countries regarding innovation policy developments using three indexes:

— The first provides an indication of the level of innovation performance, using the score attributed to each candidate-country by the Index of Innovative Capacity proposed in the latest Global Competitiveness Report (Porter and Stern 2002).[10] This index is the sum of four sub-indexes reflecting various aspects of a country's innovative potential.[11]

— The second column attributes a score to each country in terms of its level of policy development, what could be called the "explicit policy framework". The criteria used here are the stage of development of the policy framework (from no-recognition of innovation through to a government-approved policy document, annual programmes), stability of the framework (are there competing policy documents from science and innovation perspectives, or frequent changes to the policy framework); and longevity (initial date when innovation policy was placed on the agenda).

— The third column provides a score in terms of actual policy delivery: schemes or programmes in favour of innovation. This score can be taken to represent what could be termed the "implicit policy framework". Put simply, the existence of a policy document does not necessarily guarantee that funds will be made available for implementation; equally, programmes or initiatives can be delivered without a "law" or government policy framework.

The two policy-related indexes are clearly subjective: scoring is based on a cross-country analysis of the European Commission studies mentioned above, as well as

the on-going policy benchmarking work undertaken through the Innovation Trend Chart project of the European Commission.

The remaining columns are of a more descriptive nature and attempt to summarise the "governance system" as discussed above in the case of the EU. Three aspects in particular are examined:

— The dominant players in policy development at the executive level: is there a "bi-polar" system common to some EU member-states where both the ministries of science and the economy have responsibilities in innovation policy or does one of these two types of ministries dominate?[12]

— The existence of one or more implementing agencies and their main mission (enterprise or small business policy, technology/innovation, science funding) can be a guide to the capacity of a country to effectively deliver policy (particularly with a view to the future use of EU Structural Funds in support of innovation; where a management agency is required that can produce audited accounts).

— The existence and nature of co-ordination mechanisms for innovation policy.

The first three columns in Table 1 suggest there is a positive relationship between the innovation performance indicators and the two policy performance indicators. Two out of three (Estonia and Hungary) of the leading countries in terms of performance also fare best in terms of policy (European Trend Chart on Innovation 2001l; 2001m). Thus, progress in the development of policy seems to be related to the degree of innovativeness in the economy. In itself, this is not a particularly useful conclusion since it does not tell anything about the direction of causality. An exception is Turkey's good performance in terms of policy development and delivery compared with its worse score in innovation performance (European Commission 2002b). This result can be explained by other factors not captured by the indicators, such as political and macroeconomic instability leading to an unfavourable environment for enterprises. A group of Central and Eastern European economies come in second place, performing relatively well in terms of innovation performance but lagging somewhat in terms of innovation policy, namely: the Czech Republic, Slovenia, Slovakia and Poland (European Trend Chart on Innovation 2001o; 2001p; 2001r; 2001s). The other candidate-countries are all further behind, although Cyprus and Malta show an average degree of policy maturity (European Trend Chart on Innovation 2001t; European Commission 2002b).

The three leading countries (Estonia, Hungary and Turkey) which have adopted a relatively well-defined policy framework and begun to implement adequately-funded multi-annual programmes have each taken a different path to attaining a degree of policy sophistication. Hungary has long been considered a precursor amongst Central and Eastern European countries in terms of developing and implementing an innovation policy (European Trend Chart on Innovation 2001m). Until the end of 1999, the National Committee for Technological Development (OMFB) interacted strongly with EU agencies such as NUTEK (Swedish Business Development Agency)[13] and created a broad range of programmes targeted at research, technology development and innovation. However, as Havas argues in this volume, while the absorption of the OMFB into the Ministry of Education does not, so far, seem to have altered the number of policy initiatives, funding levels are dropping and only a couple of the existing schemes are focused specifically on supporting systemic improvements. Moreover, Havas is broadly critical of the loss of the co-ordination function played

Table 1: State of Play of Innovation-policy Developments in Candidate-countries

Country	Innovative Capacity Index	Policy maturity	Policy delivery	Executive level	Delivery system	(type of agency) Co-ordination mechanisms
Czech Republic	21.3	2	3-	Bipolar	Ministry	Council — Science
Estonia	21.2	3+	3+	Bipolar	Agency (Technology)	Council — Innovation
Hungary	21.1	3	4-	Dominant — Min. Science	Ministry	Council — Science
Slovenia	20.4	2	3	Dominant — Min. Eco	Ministry / Agency (SME)	Council - Science
Slovakia	20.0	1	3-	Bipolar	Agency (Science, SME)	Council — Science
Poland	19.6	3	3-	Bipolar	Agencies (Science, Enterprise)	Inter-ministerial approach
Lithuania	19.2	2+	3	Bipolar	Agency (SME)	Council — Business
Latvia	18.5	3	2+	Bipolar	Agency (SME)	Council — Science
Turkey	17.8	4	4	Variant — Science	Agencies (Science, technology, SME)	Council — Science
Bulgaria	16.8	2	1+	Bipolar	Agency (SME)	None
Romania	16.3	2	3	Dominant — Min. Science	Ministry	Inter-ministerial approach
Malta	n.a.	1	1	Dominant — Min. Science	Agency (SME)	Council — Science
Cyprus	n.a.	2	2	Dominant — Min. Eco	Agency (Technology)	Inter-ministerial approach

Notes to Table 1: Innovative Capacity Index: This index was developed in (Porter and Stern 2000). It measures national innovative capacities in developed and emerging economies on a progressive scale ranging from a score of 11 (lowest innovative capacity) to 30 (highest innovative capacity). Policy maturity score: 1 = Absent (innovation not recognised as a policy issue); 2 = Infancy (development of policy documents); 3 = Unstable (competing policies, regular changes to policy); and 4 = Mature (Policy framework in place for at least 2 years). Policy delivery score: 1 = No implementation; 2 = Projects or infrastructural initiatives; 3 = *Ad hoc* implementation of support schemes (budgetary problems); and 4 = Multi-annual programmes operating (2 years or more). Pluses and minuses for the two policy indexes are an indication of recent trends. For example, 3+ for Estonian policy delivery indicates that this country is moving from *ad hoc* schemes towards multi-annual programmes but that these have not yet reached the 2 years of operation required by the next category. N.a. indicates that information is not available.

Sources: Reid et al. (2002) and European Commission (2002b).

previously by the OMFB, which has been transformed from a high-ranking inter-ministerial body to a department of a single ministry.

Turkey is a case apart having a long history of science and technology policy and agencies in place to deliver policy for several decades (Reid *et al.* 2002). A greater focus on "strengthening national innovation systems" has however come through as a key message in the context of the most recent planning period.

At the other end of the spectrum, perhaps not surprisingly, can be found countries such as Bulgaria, Romania and the two other Baltic states. Bulgaria (European Trend Chart on Innovation 2001v), in particular, is at a stage of policy development in 2002 that can be most kindly considered as being five years behind other candidate-countries. Romanian policy remains dominated by the reorganisation of public research and "infrastructure" type developments although a number of more innovation-oriented programmes have been launched (European Trend Chart on Innovation 2001y). The two Mediterranean islands are both faced by scale issues in developing a research base and by serious problems in terms of the competitiveness of their local industries. Policy responses are at best partial and focussed on "miracle cures" (high-tech incubators in Cyprus, ICT — information and communication technologies — in Malta) while broadly ignoring innovation in existing manufacturing companies (Musyck and Reid 2000).

The Czech and Slovak Republics appear to share a common historical path on which the dominance of science and research lobbies leaves little room for initiative in the field of business (applied or industrial R&D) innovation.

Latvia and Lithuania are both in broadly similar positions: the 2000-2002 period saw the development of innovation policy documents, in both cases with the objectives closely matching EU-level policy declarations on innovation (European Trend Chart on Innovation 2001x; 2001z). It is thus likely that they will follow the path of their Baltic neighbour Estonia in beginning to implement a number of more important programmes. However, at the current time the funding available for business R&D or innovation is minimal and most initiatives are infrastructure-related (tech parks, centres).

The following picture emerges from the last three columns of Table 1, dealing with the modes of innovation governance in candidate-countries. The bipolar model (role for both the ministries of science and the economy) tends to be the majority model of decision-making, as is the case in EU countries. As long as the remit of each ministry is relatively clear and the intervention logic for programmes or initiatives well thought out, this may favour a system of checks and balances where both sides of the science-innovation scales receive equal weight. However, in the candidate-countries the division of responsibilities is often not as clear-cut and the views and opinions of ministries of education, supported by the still powerful "Academy of Science" lobby, often holds sway. Co-ordination failures are apparent with competing policies being developed by different government ministries or agencies ("science *vs.* industry"); and even when the government adopts policy documents they too often depend on the unlikely scenario of several line ministries allocating financial resources to a policy of another ministry.

In four (Hungary, Malta, Romania and Turkey) out of thirteen countries, a ministry of science effectively has responsibility to frame policy in the field of science, technology and innovation, but with the emphasis on the former. Only in Cyprus and Slovenia does a ministry of the economy (industry) clearly play a lead-

ing role in framing technology and innovation policy.

As far as the delivery of innovation policy is concerned, the situation is similar to that in the EU: the governments of candidate-countries are divided as to whether an innovation or technology agency autonomous from a ministerial structure is a necessary instrument. In terms of agencies for implementing policy, only in Cyprus, Estonia (to be discussed separately later in the article) and Turkey do agencies or foundations exist which have a dedicated mission to provide financial support to industry in the fields of technology and innovation. In Hungary, an existing agency was re-absorbed into the executive branch as the R&D division of the Ministry of Education. Plans for an innovation agency in Slovenia were not implemented due to a lack of funding. In the other countries, the main support to enterprises is provided by the development of SME agencies none of which has a specific remit for providing funding or support related to innovation matters.

Finally, advisory and consultative mechanisms in the field of innovation are few and far between, with policy debates in most of candidate-countries failing to include a broad enough set of stakeholders, particularly from business. Co-ordination and consultative mechanisms, particularly those involving business interests, are weak or non-existent in all but four of thirteen candidate-countries. Estonia, Lithuania, Malta and Turkey are the exceptions where institutions exist in which business interests are represented in debates on science, technology and innovation. From this type of qualitative analysis, the conclusion might be that to develop a strong innovation policy a country needs to be more innovative; a clear variant on the chicken-or-egg type question! In the next section, the issue of whether policy "catching up" is possible will be examined in more detail. First, however, a short case study of one of the leading candidate-countries, Estonia, in terms of innovation performance and policy, is sketched out in order to underline some of the difficulties in drawing hard and fast conclusions in terms of policy learning.

Estonia — A Case Study in Developing Innovation Policy

Estonia is one of the smallest candidate-countries in population terms. It started out slightly later than the Central and Eastern European candidate-countries on the road to transition since it only gained its independence in 1992. For a large part of the 1990s it adopted an almost pure "free-market" approach to economic development with little state intervention in the economy. However, by 1999, it became apparent that this approach was unable to overcome some of the broader systemic weaknesses of the economic system. Although growth of both gross domestic product (GDP) and productivity has been strong, this has been driven essentially by foreign direct investment (Estonia holds the highest percent of FDI stock to GDP of candidate-countries) and productivity gains have been realised through restructuring by capital investment rather than organisational and technological changes. Although there has been some inter-sectoral shift in the structure of the economy (away from primary and manufacturing sectors towards services), the result of this capital deepening (increase in the capital-labour ratio) in terms of employment has been a worsening unemployment rate.

Innovation policy in Estonia only really began to develop after the significant economic shock provoked by the financial crisis in Russia in the second half of the nineties (European Trend Chart on Innovation 2001l). The shock particularly affected more traditional and domestical-

ly-oriented industries notably the foodstuffs industry (fish-processing, milk products), while construction and other domestically-oriented economic sectors also declined. Other industries, more oriented to the West, suffered less. The result in many cases was either bankruptcy or a takeover by foreign investment. This has resulted in an economy split between relatively competitive larger foreign-owned firms, in both manufacturing and services (*e.g.* banking), *vs.* smaller domestically-focussed firms and sub-contractors.

The first Community Innovation Survey carried out in Estonia in 2001 (covering the 1998-2000 period) underlines the challenges facing Estonia to achieve real catching up with the EU average. While some 36 percent of firms (see Table 2) indicated that they were innovators, the survey tends to confirm the standard finding at EU level that the larger the number of employees or net turnover, the higher is the probability that the enterprise is innovative. However, the number of innovative smaller enterprises (those with less than 20-49 employees) is particularly small (some 13 percent below the EU average). Similarly, the fact of whether a company belongs to a group (or concern) is a significant factor in influencing innovation performance in Estonia — just 29.6 percent of firms not belonging to a concern declaring themselves innovators, while over 51.4 percent of firms belonging to a concern are innovators.

Foreign equity investments in Estonian firms also appear to be a key factor in influencing innovative performance — firms with foreign equity being 1.5 times more innovative than those without foreign equity — and the effect on innovation appears to be correlated to the degree of ownership (rising to 51.3 percent for 100 percent foreign-owned companies). The orientation of firms between national versus export markets also clearly makes a difference, although the main distinction is between those firms which export and/or serve the entire national market (both groups reporting about 39 percent of innovators) *vs.* firms serving only part of the national market or limited parts of neighbouring countries (within a 50 km radius). The latter are clearly less innovative.

The "Russian crisis" provoked a recognition that economic growth was unsustainable based as it was on low-cost subcontracting exports, and that Estonia needed to create a more innovative, technology-rich and research-intensive economy

Table 2: Preliminary Results of the CIS3 Survey in Estonia (2002)

Type of company	Share of innovators in percent, 1998-2000
Innovators	35.7
Real innovators (est. before 1998)	33.2
With innovation expenditure in 2000	28.5
No. of employees	
10-19	27.6
20-49	36.2
50-99	45.2
100-249	54.5
250+	75.4
Not belonging to a concern	29.6
With foreign equity	46.7

Source: Estonian Statistical Office (unpublished report).

if high productivity and growth rates were to be achieved over the medium term. As of 1999-2000, policy-makers began to adopt the term innovation and highlight role models to follow (for instance, the President of the Republic talked about the need to find an "Estonian Nokia"). This led to several strategic reforms, notably influenced by an evaluation of the innovation system (Hernseniemi 2000), in policy-making structures, especially:

— the reorganisation of the R&D Council (an advisory body to government) with the creation of an Innovation Policy Committee (to advise on the programmes and policies of the Ministry of Economic Affairs) and dominated by business;

— the dissolution of the Estonian Innovation Foundation (which had provided grants and loans to innovators during most of the 1990s but which remained sub-critical in terms of funding and somewhat non-transparent in its operations) and its replacement by the Estonian Technology Agency (which is a functional division of the large Enterprise Estonia Foundation regrouping all business support, inward investment *etc.* services), reflecting a broad view on innovation; and

— the continued development of capacity within the Ministry of Economic Affairs with a four-person innovation and technology unit which has received policy advice support through EU Phare[14] funding and whose members participate actively in EU policy-benchmarking events such as Trend Chart.

A noteworthy aspect of this reorganisation is the intelligent use of expertise from neighbouring Nordic countries, in particular Finland. The director of strategy of TEKES acted as a permanent advisor to the Ministry of Economic Affairs and the new ESTAG (Estonian Technology Agency)[15] management during the first six months of its life, participating actively in strategy development and advising on the design of initial funding schemes for applied research and product development, including their operational aspects (application forms, procedures for selection) which were transposed from the TEKES experience.

In the space of three to four years, by Summer 2002 innovation policy development in Estonia had progressed rapidly (European Trend Chart on Innovation 2002c). A scheme in favour of professional research-industry interface structures and research commercialisation services was launched in early 2002, a Competence Centre scheme was expected to be operational by the Autumn of 2002 aimed at creating strategic research consortiums involving industry and science; and plans for an innovation awareness and a management programme to be launched in 2003 are advancing.

Moreover, for the first time EU Phare funding is going into investment projects in the field of research and innovation, notably a biotechnology development and incubator centre in the university town of Tartu and for the preliminary development phase of the Tallinn Technology Park. The prospect of receiving Structural Fund support as of 2004 has encouraged the Ministry of Economic Affairs to undertake an appraisal of its current policy during the second half of 2002 with the assistance of international experts whose mission covers the full spectrum of classic business support measures and R&D and innovation schemes.

The Estonian example suggests that, where a sufficient consensus exists at political level that R&D and innovation are crucial for the future development of a country, rapid changes can be made to long-standing policy positions and institutional "sea-changes" can occur. However, even in this positive case, while the clear government objective is to increase the overall intensity of business expenditure

on R&D and innovation activity in firms, innovation policy remains largely focused on supporting "high-tech" developments, creating new technology-based firms and increasing the potential of universities and research institutes to commercialise research and collaborate with industry. A funding system modelled on "best practice" in the EU has been created but the client base remained restricted to less than 50 companies in its first 18 months of operation. The gap in the innovation system does not relate to the design of policy measures but to the skills, competence and awareness within existing manufacturing companies to begin to take the first vital steps up the staircase of "innovation competence". This is compounded by a dearth of "innovation intermediaries" from either the public or private sector and the mistrust of "public agencies" within the private sector.

Is "Policy Catching-up" Possible for Candidate-countries?

The main message in the preceding section was that innovation policies in the latter countries are still in their infancy, although the recognition of innovation as a valid policy target is growing. After the collapse of the centrally-planned economies at the end of the 1980s, urgent needs and a heavy agenda have mobilised all policy resources towards setting up the main conditions for functioning market economies: the privatisation of public enterprises and creation of a private banking sector; economic and monetary policies for stabilising the main macroeconomic indicators; setting up a transparent and favourable fiscal framework *etc.* When this has been achieved to a sufficient degree, the possibility has opened for considering other policy areas, such as innovation, as policy targets.

In the candidate-countries, at the beginning of the new century elements of an innovation policy exist in one or both of the two forms below:

— policy declarations and broad economic development programmes encompassing, more or less explicitly, the notion of innovation as a driver of economic growth (the "explicit" part of innovation policy, as referred to above); and/or

— series of policy instruments that can play a role in innovation promotion, such as technology centres, business support agencies, mobility schemes, supply-chain promotion measures *etc.* (the "implicit" part).

What is missing, however, is the link between the two so that policy instruments, taken together, would play a clear role in addressing the weak nodes of national innovation systems. Broad policy goals need to be transformed into operational policy approaches and instruments and, conversely, publicly-funded structures or programmes need to be calibrated so that, seen together, they contribute to the fulfilment of general policy goals. This challenge is not specific to candidate-countries but is a more recent one compared to EU member-states since many innovation-related policy declarations and instruments were adopted in recent years or are still in preparation in the former. One element that seems to be specific to a number of candidate-countries is the distance between policy intentions, as expressed in broad governmental programmes, and actual policy-making, notably because of a lack of funding.

The question therefore arises if and how the candidate-countries, as latecomers in the innovation policy field, can learn from the greater experience gained by EU member-states in developing and implementing their innovation policies. The

response to this question can be positive provided that a great deal of policy intelligence is put at the service of this endeavour. The analysis of EU innovation policies can inform the development of such policies in candidate-countries because a lot of experience has accumulated, but there is no such a thing as an *acquis communautaire* in innovation policy simply since there are no uniform practices in the matter that can serve as an univocal reference to be transposed in any national context.

Two sets of reasons help to explain this problem. First, the role of innovation policy is to compensate for market and systemic failures in national innovation systems, and these take various shapes, and are characterised by different strengths and weaknesses: to take extreme cases, goals and instruments to promote innovation cannot be the same in a technology-advanced country like Finland or in a catching-up one like Portugal. The argument is also valid for less extreme cases if account is taken of the importance of human capital assets, availability of finance, strength of entrepreneurial spirit, academic-industry collaboration traditions *etc.* Each country will show a unique combination of these crucial factors for innovation, which call for an appropriate and unique policy mix for innovation policy.

Second, there is as yet little indication in the EU as to whether the policies actually at work are efficient: innovation performance can be measured or, at least, proxies of this performance are computed, a limited number of individual policy instruments (*e.g.* R&D tax credits) are evaluated, but there is no reliable assessment of the efficiency of innovation policies taken as a whole. Thus, learning from experience accumulated in the EU could be an excellent thing to do for candidate-countries willing to leapfrog stages of development of their own innovation policies, but it might be dangerous if it leads to a sort of neo-colonialism, whereby EU countries would offer "role models" that are copied by candidate-countries wishing to catch-up in this area. For the two reasons mentioned above, there is no "best practice" available and therefore the task needs to be more subtle.

The very popular concept of "benchmarking" can help us in discussing how candidate-countries can learn from innovation policies in EU countries. A mechanistic approach to benchmarking innovation policies would involve comparing one specific innovation policy to a "best practice", examining the features of the latter and transposing them to the former case. The main problem with this approach is that, as mentioned above, any innovation policy is context-dependent and therefore there is no fit-for-all best practice policy. Even identifying context-dependent good practices is fraught with difficulties because of the multiplicity of variables that need to be taken into account to ascertain the "good practice" character of an innovation policy: framework conditions, economic development drivers, institutional settings, social capital *etc.* This is why scholars from the EU involved in innovation policy benchmarking have developed a softer notion of benchmarking, based on "learning-by-interacting" processes rather than on a "borrowing from best practice" notion (Lundvall and Tomlinson 2000; Tomlinson and Lundvall 2001). In this approach, an exchange of experiences takes place between policy-makers, who are then pushed to analyse and investigate their own policy practices in the light of the "mirror" offered by practices deployed elsewhere. No best practices are found, but lessons from successful foreign policy approaches are incorporated in the policy thinking of the country undertaking the benchmarking exercise. This kind of process is currently tested under the Innovation Trend

Chart project of the European Commission, a project aiming at gathering better insights and supporting more adapted policy approaches to foster innovation in Europe. Until the beginning of 2002, this project had mainly involved EU countries in the benchmarking exercises, but the candidate-countries are also being progressively integrated.

Necessary Conditions for the Relevance and Usefulness of Innovation Policy Benchmarking

Several general conditions are needed for such a "learning-by-interacting" benchmarking exercise to bear fruit in the candidate-countries. First and foremost, the whole exercise should start from a deep understanding of the state-of-play of innovation in the country to be benchmarked. Properly assessing the features of the innovation system and their trends is needed if one wants to know the questions for which answers are to be searched. To this end, innovation surveys can play a role but these should be complemented by more systemic analyses of the environment for innovation, drawing, *e.g.* on the experiences gained in the RITTS (Regional Innovation and Technology Transfer Strategies) and RIS (Regional Innovation Strategies) exercises to identify overlaps and gaps in innovation-support systems. The other articles in this issue quite clearly show that this varies country by country. Besides this diversity, a number of common challenges are specific to the candidate-countries in transition because of the legacy of the past system. These have been alludet to in the preceding section of this article, namely: the lack of entrepreneurial culture, the unfamiliarity of company managers with modern management techniques, the lack of risk capital, the crucial role played by foreign investors in bringing in new knowledge and openness to global changes. Any comparison with EU innovation policies should bear in mind that the above factors are likely to be more central in the innovation challenge than in the EU countries.

A second condition for such an exercise to bear fruit is the existence of a political commitment to it. For this to happen there must be a commonly agreed definition of innovation, differing from that of R&D or technological development: this is not yet the case in the majority of countries. Then, innovation must be accepted as a valid policy target: again, this is generally not the case because of the dominance of a free market ideology after the collapse of the socialist regime. And policy-makers should recognise that the content and shape of policies are not straightforward and cannot be decided upon by resting solely on internal views or domestic experience. Learning-by-comparing will only make sense if those who take decisions on policy options are themselves involved in the game. Leaving it to experts will reduce the chance to see the conclusions translated in real policies: findings need to be moulded with the reality of policy-making conditions and this can only be done by policy-makers themselves. Many elements beyond the scope of experts' knowledge intervene here: the natural inertia of policy systems, the broad trade-offs that need to be made at the political level among various society choices, the budgetary funds available *etc.* It should also be mentioned here that benchmarking own policies has a cost which needs to be met by public authorities.

A third condition is that of co-ordination of policy efforts. As discussed above, innovation is a multi-facet activity. Thus, innovation policy should reflect this through the involvement of the various ministries concerned. The key challenge of conducting a regulatory reform conducive to innovation is a good example of the need for such a co-ordinated approach.

A fourth essential condition for the relevance and success of policy-benchmarking exercises is that sufficient analytical capabilities and creative thinking are present in the ministries and agencies involved in the game (on both sides — EU and candidate-countries). The bureaucratic traditions in many candidate-countries and the associated poverty of creative skills in public administration can indeed constitute important barriers to fruitful benchmarking exercises. Even if bright people are hired in ministries, they also must have been given the "right to think" rather than only the duty to carry out missions decided above them. As an example, one of the factors in Estonia's policy development has been the rejection of the generation over 40 leading to a seismic shift in age structures of ministerial, and indeed business, hierarchies, with young and fresh thinkers having "real" power to take decisions. In fact, international benchmarking can be very helpful to push for more policy intelligence in decision circles because it legitimates the efforts paid to compare and draw lessons from other experiences. Benchmarking makes sense if it is embedded in continuous efforts to compare, evaluate, experiment and bring back lessons from experimentation into policy-making.

A fifth condition is that of involving stakeholders of innovation in the exercise. The aim is to create an innovation constituency, and not to be trapped into vested interest groups. This is perhaps the best way to investigate the various facets of national innovation systems and bring the complementary knowledge of various actors into the policy-design process.

The last condition is a key one: benchmarking without proper evaluations, from both EU and candidate-countries' policies, is close to meaningless. It would amount to comparing policy approaches and instruments without knowing their effects. On the candidate-countries' side, because innovation policies are new many instruments are experimental but the leading candidate-countries (Estonia, Hungary and Turkey) are all characterised by a recent development in evaluation practice that is absent in the other 10 candidates. It is quite clear that being willing to call into question the system and to appraise what has been done is a vital part of policy learning and indeed increases the "policy competitiveness" of leading countries.

Coming back to the previous discussion, it is obvious that adequate governance structures at both executive and implementation levels are of striking importance for the successful conduct of international innovation-policy benchmarking. In fact, it is no coincidence that the three most "policy advanced" candidate-countries have started to embark on such a process, as mentioned already for Estonia; Hungary has been maintaining links with Austria and Sweden for a long time, and Turkey with the World Bank, as well as with British or German experiences.

Options for Innovation Policies in Candidate-countries

The inherent uncertainty of innovation precludes a "picking-the-winner" strategy. Many Western governments indeed slowly moved away from such policies during the nineties and instead concentrate on building favourable conditions for innovation (OECD 2001). But pure *laissez-faire* does not exist, even in the most liberal countries. As Landabaso (2000) showed, contrary to popular perceptions the number and size of publicly-funded technology and innovation programmes in the United States is impressive. The candidate-countries, after a first period of policies targeting liberalisation

and macroeconomic stability, have come to realise that market forces alone are insufficient to bring about renewal in industrial structure and competitiveness. The case of Estonia illustrates this evolution quite well. This opens the door to more pro-active innovation policies, justified by the need to correct system failures.

The biggest challenge for candidate-countries is thus to find the right middle way between tempting "picking the winner" strategies (such as the already mentioned "finding their own Nokia in Estonia") and pure *laissez-faire* choices, which leave a number of critical barriers in their innovation systems unanswered. In between these two extremes, policy options can be identified that target the weak links in the innovation systems of these countries.

As repeatedly argued, innovation policy should be context-dependent and based on a deep understanding of specific features of the national innovation system. However, this is not to say that nothing can be stated about the general shape to be taken by those policies. The introduction of this article noted that research results from the analysis of national innovation systems and policies delivered the following messages: STI (science, technology and innovation) policies need to shift emphasis from support to knowledge creation (in public research institutions or in R&D performing firms) and knowledge diffusion (by developing bridging policies between science and industry, through the development of intermediaries *etc.*) towards more attention to the development of learning capacities in firms.

In the case of candidate-countries, the other articles in this issue show that innovation weakness is not so much caused by a lack of resources but by a lack of capabilities to access existing resources and organise them properly: R&D capacities and human resources are generally fairly developed when compared to countries with a similar development level, but the difficulty to exploit those resources for globally competitive activities is the main deficiency. As argued elsewhere, 'such capabilities are path-dependent ... but not predetermined, they can be learned, thus widening the range of feasible innovation opportunities affecting economic progress' (Cooke 1998:8). Therefore, innovation policies in candidate-countries should first and foremost be policies that help firms learn how to become more innovative.

What can these "learning-oriented" policies consist of? The building of such policy should take into account the fact that most innovative companies in candidate-countries are involved in "innovation without R&D" practices, that their main difficulty is the lack of understanding and experience with innovation, a legacy from the previous regime with sheltered markets and low competitive pressures, and that most innovative activity is concentrated in foreign-owned firms rather than in domestic ones. Thus, a "demand-oriented" policy portfolio could significantly give priority to the following types of measures and programmes:

— promotion of entrepreneurship;
— restructuring of education systems to promote "learning to learn" capacities;
— reduction of administrative and regulatory burdens on SMEs;
— raising finance for SMEs and risky undertakings;
— promotion of lateral relationships between firms through the use of business services, co-operative practices, clustering; and
— use of FDI as an engine for cluster formation; promoting horizontal and vertical linkages around foreign-owned subsidiaries.

In all these areas, many experiences have been gained in EU member-states which, if assessed, could be exploited in candidate-countries.

The above accent on demand stimulation does not mean that supply-oriented measures and technology diffusion programmes have no relevance, but that priorities should shift from the latter to the former. As this point is valid for EU countries too, the difficulty to benchmark policies becomes evident: as this challenge of developing more "demand-led" policies is not fully met in EU countries, candidate-countries do not have good models to copy in this respect. Therefore, the benchmarking exercise appears to be multilateral rather than one-directional: as there is no overall best practices, everyone can learn from everyone (although in varying degrees).

Conclusion

Candidate-countries may leapfrog stages of development in their innovation policies if they are able to integrate, from the start, the "modern" vision of innovation into their policies. However, this cannot be done properly without the proper innovation governance system, for which some indications have been put forward earlier in the article. If carefully carried out and if proper conditions are present, policy benchmarking can benefit candidate-countries in building up their innovation policies not so much because of the availability of good practice experiences to be copied, but because of more subtle effects:

— the rise in learning and creative capacities that is needed as a pre-condition from decision-makers involved in benchmarking exercises;

— the strain put on the availability of appropriate governance modes to conduct benchmarking exercises;

— the legitimacy benchmarking could bring to change things and combat natural inertia caused by technological specialisation along trajectories from the past, as well as institutional stickiness; and

— the "mirror" effect occurring during benchmarking, which helps identify strengths and weakness of innovation systems as well as innovation policy systems.

On the contrary, copying instruments popular in the EU countries or elsewhere, without a good understanding of innovation challenges, can generate a harmful loss of public money that could be better exploited elsewhere. Examples of "cathedrals in the desert" are not rare in EU member-states, and candidate-countries have probably even fewer financial resources to commit to such purposes. Such policy benchmarking oriented towards the development of innovation policies in candidate-countries can also point out problems and needs in the EU, since evaluations and systemic understanding of innovation policies are in their infancy in the EU. The EU can offer support for such improvements by offering platforms (and funding) for various modes of "learning" exchange between policy-makers (workshops, studies, visits, people mobility programme, virtual networks). Better linkages with OECD (Organisation for Economic Co-operation and Development) work on the same issues would reinforce the potential. Therefore, the main argument is that candidate-countries can catch up with innovation policy, not in a mechanistic sense, but by improving their policy-learning capacities, which in turn demands appropriate innovation-policy governance.

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1 The definition of competitiveness adopted here is that adopted by the European Commission "Communication on Productivity: the Key to Competitiveness of European Economies and Enterprises" (2002:4, note 2) namely a 'a sustained increase in real incomes and in the standard of living with jobs available for all those who wish to find employment.'

2 Key elements of this approach are: the recognition of innovation as something different from R&D and technology transfer; the acknowledgement that firms do not innovate in isolation and the consequent importance of networking and clustering as new organisational modes; the key role played by organisations (such as training and R&D organisations, intermediaries, service companies) in the innovation processes in firms; the search for a balance between knowledge creation, diffusion and absorption capacities of the system.

3 Available at http://trendchart.cordis.lu/ (November 2002).

4 Cyprus, Czech Republic, Estonia, Hungary, Poland and Slovenia. The second study, due to be completed in 2003, covers Bulgaria, Latvia, Lithuania, Malta, Romania, Slovakia and Turkey.

5 References to country-specific trends, agencies or policy documents, can be found in the country reports of the Innovation Trend Chart project (available at http://trendchart.cordis.lu, October 2002). This is also valid for descriptions in the next section, *i.e.* for candidate countries.

6 See http://www.tekes.fi (October 2002).

7 See http://www.sitra.fi (October 2002).

8 See http://www.anvar.fr (October 2002).

9 See also http://www.belspo.be (October 2002).

10 The rankings obtained with this index are very similar to those obtained in the draft version of the Innovation Scoreboard produced under the Innovation Trend Chart Commission project (still not official at the time of writing this paper, but *cf.* European Commission 2001a).

11 The proportion of scientists and engineers in the workforce, innovation public policy environment (effectiveness of IPR — intellectual property rights — protection, ability to retain scientists and engineers, size and availability of R&D tax credits for the private sector), cluster innovation environment (sophistication and pressure to innovate from domestic buyers, presence of suppliers of specialised research and training, prevalence and depth of clusters) and linkages (overall quality of research institutions and availability of venture capital for risky projects).

12 The generic terms Science and Economy are used here but often the science ministry includes the (higher) education portfolio; while the economic affairs ministries are usually responsible for industrial policy and trade (macroeconomic policy including fiscal policy usually being under the control of the ministry of finance).

13 See http://www.nutek.se (October 2002).

14 The Phare programme is one of three pre-accession instruments financed by the EU to assist the 10 candidate-countries of Central and Eastern Europe (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) in their preparations to join the EU. See: http://europa.eu.int/comm/enlargement/pas/phare/ (September 2002). The three other candidate-countries (Cyprus, Malta and Turkey) benefit from separate pre-accession funding.

15 See http://www.estag.ee (October 2002).

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