

THE KNOWLEDGE-BASED ECONOMY
IN TRANSITION COUNTRIES

selected issues

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Edited by

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2004

THE KNOWLEDGE-BASED ECONOMY IN TRANSITION
COUNTRIES: SELECTED ISSUES

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Introduction

Krzysztof Piech

The goal of this book is to present selected aspects of the knowledge-based economy (KBE) in European Union transition countries. The book concentrates on two broad issues: human capital and innovation, together with chapters on international comparisons: among transition countries, and the European Union. The following problem connected with recent European Union enlargement is becoming increasingly important: *will transition countries be a large burden to European communities, or will they facilitate the goal of the Union, established in 2000 in Lisbon – to become by 2010 the most competitive and dynamic knowledge-based economy in the world?* There is a threat that international discrepancies in technological development will enlarge and the so-called ‘digital divide’ will widen. Especially important for the European Union is competition with the United States, which receives large profits from the status of being one of the world’s most developed countries; developed, not in terms of industrial expansion, but in terms of post-industrial expansion stimulated by activities based on knowledge.

In describing the knowledge-based economy, first it is necessary to explain what knowledge is. Knowledge is recognised nowadays to be one of the most crucial factors for economic growth, possession of which secures other traditional factors, such as capital, labour force and land. Knowledge is sometimes mistakenly identified with information. However, knowledge is information which had been structuralised and interpreted, and the basic piece of information is data. Abilities to use, modify, and create new knowledge is wisdom.

Knowledge may be divided into two broad categories (Howitt, 1996):

1. codified knowledge – organised, systematised, written knowledge, which may be stored and transferred in different ways, like books,

- patents, reports etc. (so-called ‘paper knowledge’, however information gathered by Internet is also included here);
2. tacit knowledge, the nature of which is inherently intangible and results from talents, experience and abilities; which is difficult to measure.

Although we can quite easily measure the first type of knowledge, “we have today only very indirect and partial indicators of growth in the knowledge base itself. An unknown proportion of knowledge is implicit, uncoded and stored only in the minds of individuals” (OECD 1996).

Lundvall and Johnson (1994) introduced a widely quoted division of knowledge into four categories:

1. *know-what* – this type of knowledge relates to facts and is identified with information (thus information has a narrower meaning than knowledge),
2. *know-why* – relates to the knowledge on rules functioning in the nature, society etc.,
3. *know-how* – knowledge related to abilities of doing something; public access to this kind of knowledge is very limited and its transfer – very difficult; it is knowledge possessed by experts and gained by experience of companies,
4. *know-who* – relates to the combination of information and social relations, identifies those who possess knowledge and describes it.

While knowledge in the meaning of the two first categories is codified, the rest: “know-how” and “know-who” are more “tacit knowledge” and are especially difficult to codify, measure (Lundvall and Johnson, 1994) and disseminate by the use of formal ways.

Despite difficulties, measurement of knowledge and knowledge-based activities, has received increasingly more interest from economists, society and policy makers. However, there are still not many documents showing KBE development of certain countries. This is partly because of the lack of a generally accepted methodology of KBE measurement and description. Sometimes the KBE is regarded very narrowly, as related only to information and communication technologies’ development, which is rather a description of the ‘new economy’ than the knowledge-based one. KBE is a more complex phenomenon and is generally defined (by the World Bank) as consisting of four pillars: business and institutional environment, information and communication technologies, human capital and national innovation systems. OECD (1996) defined

knowledge-based economies as those, which “are directly based on the production, distribution and use of knowledge and information”.

Transition countries still struggle with the shift from inefficient, centralised economies to the more effective market ones. This process is still in progress however, and many years are required in order to catch up with the lagging members of the European Union. Kołodko (2001) argues that EU candidate countries should first overcome their ‘old problems’, i.e. finish the reforms of economic structure and inherited socialist economic inefficiency, and then take steps towards the knowledge-based economy. On the other hand, others state that the delay in starting the so-called ‘second transition’ may widen the ‘digital divide’ – the gap between countries in terms of their technological development, and they would have many more difficulties with EU catch-up.

It is my opinion, that these processes should run parallel: while finishing the first transition: from socialism to market economy, the new European Union member states should adopt the EU goals and, based on its best practices (as well as of the United States), enter the second transition: towards the knowledge-based economy.

The building and development of knowledge-based economies in Europe is crucial to further socio-economic development of EU. In order to achieve this, proper economic policies should be conducted, especially in the new EU member states. To enhance the knowledge-based growth in transition economies Orłowski (2000, p. 96) recommends the following solutions:

- correct macroeconomic and structural policies (lowering the level of corporate taxes, more relaxed amortisation of costs, increase the openness of the economy; effective privatisation, restructuring and demonopolisation should be strengthened and accelerated),
- creation of competitive R&D market and increasing the efficiency of use of the research funds;
- education policy and a reform of the education system (aimed at increasing the number of students, the quality of education and orienting the system to the market needs).

The answer for the central question of this book, given by the authors, indicating the short- and medium-term prospect for development of European Union transition countries is rather pessimistic: *continuation of present development trends will worsen prospects for building the knowledge-based economies in EU new member states and in the EU, as a whole*. Although, it is possible to follow the successful example of

Estonia (or Slovenia), the following general changes in economic (esp. in innovation) policies are necessary:

- governments should concentrate more on education (e.g. by stimulation of creation of ‘learning regions’ through promotion of creation of local universities – which may provide social cohesion, the importance of which was underlined e.g. in the Lisbon Strategy – and paying greater attention to access to knowledge) and more effective use of financial resources,
- they should also pay more attention to harmonisation of cooperation of foreign companies with national innovation systems;
- governments should also balance financing the stimulation of domestic activities and stimulation of the absorption of technologies and knowledge from abroad.¹

This book consists of three parts, following an introductory chapter written by K. Piech on methodologies of measurement of knowledge-based economies, with special reference to transition countries that recently joined the EU.

The first part of the book begins with chapters on the knowledge-based economy in selected transition countries: their development, strategies and research programmes. The second part deals with innovations and technology transfer in Central and East European Countries and Russia, and the final part with education and human resources in candidate countries, especially in Poland, with comparison to the EU member states. The largest new EU member state is Poland thus the majority of the authors are Poles, which influenced the contents of the book, relatively biased towards Polish matters.

The first chapter was co-written by A. Kukliński, one of the famous authors in the field of the knowledge-based economy in transition economies, especially Poland. Together with W. Burzyński they aim at opening the discussion on the future of the knowledge-based economy in EU accession countries. They propose preparation of a grand research project, which should include four institutions: OECD, European Commission, the World Bank and United Nations; four EU members: Germany, the Netherlands, Sweden and the United Kingdom; and four

¹ Such a strategy was undertaken in Hungary, where most of R&D units were radically transformed during the transition, however foreign companies did not integrate their R&D units with domestic ones. Later, it even threatened the economic development of Hungary, because FDIs did not integrate with national innovation systems, and could withdraw relatively easily from the country.

accession countries: the Czech Republic, Hungary, Poland and Slovakia, as well as 22 regions to be selected from the above countries. The chapter criticises the past initiative of Visegrad countries of 2001 to promote the development of KBE, and calls it a 'classical paper tiger', with no real follow-up. Then authors outline the World Bank Institute's Knowledge Assessment Methodology (KAM), which thereafter they modify to adjust to the needs of the research they propose. The modified set of data has been compared with the records for the United States, and presented on radar charts. The chapter refers also to the Expert Meeting held in June 2001, in Konstancin, Poland, proposing the organisation of the next such meeting (*Konstancin II*) in the future, aimed at preparing the Grand European Research Programme on the development of the knowledge-based society and economy in Europe.

P. Judak has made an attempt to describe a few elements of Hungarian transition with regard to the knowledge-based society. It concentrates mainly on two out of four KBE pillars: human resources as well as science, technology and innovation. The author shows the development of these aspects during transition, against the background of overall changes of the structure of the economy. He concludes with what is an important lesson for other developing and transition countries, that although multinational companies transferred many new technologies to Hungary and they contributed considerably to the establishment of KBE there, it would not have caused stable development without investment in education and research, especially without the cooperation of universities' research centres with companies. Thus, the integration of foreign companies into national innovation systems and more emphasis on training and education policy are required.

The European Union has introduced the strategic programme *eEurope*. Central and East European countries (CEECs) wanted to implement their own plan, i.e. *eEurope+*, which is a modification of *eEurope*, adjusted to the needs and requirements of EU candidate countries. The next chapter describes both programmes. R. Żelazny compares the performance of CEECs, with the EU, stressing the situation in Poland, as well as its programme *ePoland*. The detailed analysis follows the pattern of *eEurope+* contents: speeding up allocation of basic construction elements of information society (so-called "target 0", added to include CEECs specifics), cheaper, faster and more secure Internet, investing in people and qualifications, and stimulating the use of Internet.

Although human capital development as well as innovation systems are, and were, very important for economic development, the next

'civilisation revolution' all over the developed world was brought about by new technologies, especially the Internet. It is becoming an increasingly more important element of socio-economic life. It also influences politics. There are some attempts to implement e-government concepts.

The next chapter however touches a broader and complex issue: the influence of Internet on the political culture, democracy and more ways of governing the country. There is a lack of studies in this field, thus the authors set out their chapter as a proposal for a new research agenda. While the first chapter in this part was aimed at taking steps towards studying the development of the KBE in European regions, this one focuses on analysing Internet presence in politics; on questions that have not been posed or answered by political scientists. Oxford social scientist: S. Coleman, L. Frazer and H. Hardman did pilot research involving seven transition countries: Belarussia, Estonia, Georgia, Kazakhstan, Poland, Russia and Ukraine. This was based on web sites of parliaments (governments), political parties, non-governmental organisations, newspapers and broadcasters and evaluated them in four dimensions: informativeness, accessibility, web design and participation. The authors at this stage of research address many questions to be included in the agenda for future research. Some initial findings by the authors may be surprising, which might partly be caused by the set of institutions analysed, thus raising more questions to be answered.

The second part of the book is devoted mainly to innovation and technology transfer in Central and East European countries, especially in Estonia and Russia. The first chapter of this part was aimed at conducting the analyses of competitiveness of CEECs with respect to innovations and technology transfer. R. Ciborowski and J. Grabowiecki began their analysis from recalling Schumpeter's phases of technological innovations evolution and presentation of spatial differences in innovative capabilities of these countries. Then, they focused on European Union transition countries, trying to measure their innovation capacity before comparing science and technology systems. Thereafter, the authors try to measure the efficiency of innovation processes and present international trade by technology intensity. The authors conclude that the worsening of innovation quality, spending on research and development with its low efficiency did not allow for maintaining a scientific base and the creation of technology. Thus, the structure of financing the innovations should be changed and new solutions for technology transfer created.

Innovation systems are very problematic issues for CEECs. The non-existence or high fragmentarisation of these complex phenomena in CEECs is still a heritage from the socialist period. As S. Radosevic writes, there is also no regional innovation systems in candidate countries, and only a fairly small importance is given to regions and regional policy in most of the CEECs, with the exception of Poland. The author argues that after EU accession, *it will be more difficult for EU new member states to build the knowledge-based economies*. According to him, the gaps in knowledge and innovation-related activities will widen, partly because of their weak technological capability. Moreover, their long-term growth will not be possible based on low value-added activities, which dominate now. Thus, there is a need to introduce changes in innovation policies. One such proposal is to absorb more knowledge from abroad, instead of only generating it domestically.

Despite problems with the creation of national innovation systems in post-socialist countries, some of them were able to make substantial progress in this field. The next chapter is aimed at checking if there is any new style of innovation in CEECs. This was done following the example of the Estonian telecommunications sector. First, the theoretical basis of innovation systems and innovation styles is discussed, with a historical background of CEECs. Although there is some ‘convergence’ of socialist systems with capitalist ones, P. Högselius claims that in some sectors and countries, new styles of innovation may emerge. He states that instead of speaking about national innovation systems, cross-border sectoral systems should be studied, without limiting them to the purely domestic perspective. The author analyses Estonian telecommunications, which is regarded as the most successful ICT country among CEECs and has the potential to compete worldwide. He explains this phenomenon through the influence of the Nordic countries: Sweden and Finland, the world leaders in telecommunication, and by basing innovation on totally new segments of the telecommunications sector (mobile telephones and Internet) – a new ‘window of opportunity’ for CEECs, used by Estonia. Institutional changes also played some role. The chapter concludes that in the case of Estonia, at least it is possible for CEECs to catch up along trajectories that do not necessarily lead them towards “Western styles of innovation”, but towards their own way, which, as the author claims, can be labelled as having a *creative* nature.

The next chapter concentrates on foreign direct investments (FDI) as a main factor for technology transfer. The Russian situation is similar to the CEECs in terms of scientific and technological capability; it also has a

well-educated labour force, however the level of FDI inflow is still relatively lower. The latter factor mostly explains regional differences of FDI inflow. Other microeconomic evidence shows, that FDI in automotive industry did not revolutionise productivity, as it did in Hungary, because of the prevailing mentality inherited from the lengthy socialist period and troubles with Russian suppliers. Thus, foreign companies built supply networks. Post-socialist countries were generally obsolescent from a technological point of view, however. There were some industries in Russia, which were exceptions (mainly the military-related sectors). D. Dyker discusses also how EU enlargement is likely to affect the future of CEECs and Russia. Although the investment risk in countries that join the EU and EMU will be lower, there is no clear evidence, that it will 'crowd out' investment in the transition countries that did not join the EU in 2004, including Russia.

One of the important pillars of the knowledge-based economy is human capital. This may be enhanced by education, which nowadays is an important element of socio-economic life and a key factor for success. The last part of the book is devoted to these issues, concentrating mostly on Poland. G. Wronowska presents selected educational issues uprising and human capital in EU candidate countries and compares them with respective data for the EU. She found that candidate countries spend approximately 4.5 times less money for education per capita than the EU members. Moreover, if the pace of GDP growth remained the same as the average of the last five years, it will take Hungary – 35 years, Poland – 52 and the Czech Republic 108 years to catch up with the level of spending on education – US\$1,000 per capita (slightly above the EU level). The author also compares gross enrolment ratio and unemployment by levels of education completed.

Wronowska tried to show the importance of education in the creation of human capital; however, we still do not have measurements for the latter. D. Dobija tried to fill this methodological gap in the next chapter. She shows many theoretical aspects of human capital measurement based on human resources accounting. Then, the approach towards the value added to a company is presented with its distribution among employees. Thereafter the author proposes a method of measurement of intellectual capital of a company and moreover, exemplifies it. This topic is increasingly important nowadays, when there are substantial numbers of companies where the largest values are not physical assets, but intellectual ones. Thus it is not surprising, that the knowledge

management in companies became such an important and popular research stream of modern management theory. These companies are not only consulting companies, lawyers etc. but also more traditional ‘firms’, e.g. universities.

Such a way of treating universities – as a source of income and employment – is not surprising in the United States or in the United Kingdom, however, transition countries have not learnt it. Universities are still not the main regional centres of development, through the linkage with industry, supplying it with innovation, technologies or more broadly – knowledge. Since the announcement of the Lisbon Strategy in 2000, the European Commission promotes the role of universities as a critical element of the regional knowledge-based economy.

Thus, we can say, that the next chapter partly relates to the first chapter of the book. G.Blazyca reviews the experience of the UK universities, putting much emphasis on the regional distinction of English, Welsh and Scottish institutions and education policy adopted there. Thereafter, the author shows the transition of the Polish tertiary education system, together with its spatial disproportions: 44% of national R&D spending goes to the Warsaw area (similar to the UK’s ‘golden triangle’ of research activity – London, Oxford and Cambridge), where around one third of private higher education institutions are located in Poland. Humboldt’s idea of education: the transfer of knowledge from research to the teaching process is questioned nowadays in the UK and there is a distinction between both research and teaching universities and universities that only teach. While this also exists in Poland, most of the activity of private, teaching-only institutions, is paralleled in state-owned research and teaching universities. In the UK, regional/local universities are shaping regional development strategies, while in Poland similar movements appear to be underdeveloped.

Blazyca mentioned a few times in his chapter the potential of Lower Silesia (Poland) to build the knowledge-based region. The next chapter concentrates on the Upper Silesia region. Robert Geisler uses a sociological approach in the analysis of the KBE. He compares the Upper Silesian region with others in Poland in terms of GDP per capita, and expenditure on R&D. The author focuses on human capital and on changes in the educational system during transition, which were huge. Because this region was based on heavy industry, to which the structure of the education system was adjusted, all of this should have changed. Together with the massive outflow of employees from mining (partly ‘to unemployment’), pupils and students faced a need to learn other jobs.

This evolution in education patterns should continue towards the transition from the coal- to the knowledge-based economy and society (see Kukliński, 2001).

Frequently at the end of an introduction authors or editors express their gratitude to people and institutions; I will not make an exception. However, the inspiration and motivation for the book should be mentioned first. At the end of April 2003 the Annual Anglo-Polish Colloquium entitled “The Knowledge-Based Economy in Central and East European Countries: Exploring the New Policy and Research Agenda” was conducted (www.ssees.ac.uk/knowledge/). It gathered about 50 specialists of KBE-related areas from 11 countries. Despite the tough qualification process, we received many papers – enough for two books. This is one of them. The organiser of the conference was the School of Slavonic and East European Studies, University College London. The conference was co-funded by: the MB Grabowski Fund (London), the Embassy of the Republic of Poland in the UK, the Foundation for Polish Science (Warsaw), and the Foreign and Commonwealth Office (London). I would like to express my gratitude to all of them.

As a coordinator of that conference, I am also indebted to those who expressed their support for the conference and helped me with advice: George Kolankiewicz (Director of SSEES-UCL) and the chairman of the conference’s Organising Committee, which included also Philippe Aghion (UCL and Harvard University, EBRD), David Dyker (University of Sussex), Hanna Gronkiewicz-Waltz (Vice-President of EBRD), Tomasz Mickiewicz (SSEES-UCL), Danny Quah (London School of Economics and Political Science, MERIT, CEPR), and Slavo Radosevic (SSEES-UCL), who substantially contributed to the success of the conference and gave me much advice during my stay in London and later. I would like to thank Christine Fernandes, who patiently proof read the book and supervised the publishing process.

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the responsibility of the editor, who apologises for any inconvenience connected with it.

References

1. Howitt, P. (1996), 'On Some Problems in Measuring Knowledge Based Growth', in: P. Howitt (ed.), *The Implications of Knowledge Based Growth for Micro-Economic Policies*, University of Calgary Press, Calgary.
2. Kołodko, G. (2001), 'The 'New Economy' and Old Problems. Prospects for Fast Growth in Postsocialist Countries', "TIGER Working Paper Series", No. 9, Warsaw, June (www.tiger.edu.pl).
3. Kukliński, A. (2001), 'From CBE to KBE. From the coal-based economy to the knowledge-based economy', in: Kukliński, A. (ed.), *Knowledge-Based Economy: The Challenge for Poland of the 21st Century*, State Committee for Scientific Research of the Republic of Poland, Warsaw (in Polish).
4. Lundvall B. and B. Johnson (1994), "The Learning Economy", *Journal of Industry Studies*, Vol. 1, No. 2.
5. OECD (1996), *The Knowledge-Based Economy*, Paris.
6. Orłowski, W. (2000), 'Knowledge Economy and Knowledge-Based Growth: Some Issues in a Transition Economy', in: Kukliński, A. (ed.), *The Knowledge-Based Economy: The European Challenges of the 21st Century*, State Committee for Scientific Research of the Republic of Poland, Warsaw, pp. 89-96.