FDI ATTRACTIVENESS POSITIONING AND ICT IMPACT ON PRODUCTIVITY GROWTH IN EUROPEAN TRANSITIONAL COUNTRIES¹

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Summary

In this paper our previous AHP analysis of FDI attractiveness is extended on all European transitional countries with recent data. The results show that former countries of USSR federation lags after other European transitional countries, except Latvia, Lithuania and Estonia which are among the most attractive in the group. It is obvious that there is not a great difference in the attractiveness level between the countries, and that process of institutional transition is close to finishing. The research evidence of ICT and institutional reforms impact on growth, from the relevant literature and the experiences of developed are summarized. The empirical research of the ICT contribution to productivity growth is conducted on the group of European developed and transitional countries. Important regression result is that positive and significant ICT growth effect on productivity is established in the entire sample of countries.

Key words: European transitional countries; Productivity; ICT; FDI..

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1. INTRODUCTION

The aim of this paper to analyze the position of European transitional economies (TE) on the possible incoming FDI inflows and to establish is there any evidence of positive and significant impact of ICT on productivity growth or we have the "productivity paradox". Economic integration process stimulated by information and communication technology provided technology adoption, coming from foreign developed countries, which is of great importance for economic growth and productivity improvement. This is the matter particularly important for all countries, especially for those lagging behind the most developed ones. The most part of empirical literature is concerned with how FDI affects labor productivity and economic growth in host economies and research have been mainly conducted at the micro-level using firm-level or industry data. Fewer studies have been conducted at the macro or international level. The research evidence on the growth contribution of ICT capital is related with the so-called 'productivity paradox'.

The paradox has been defined as the "discrepancy between measures of investment in information technology and measures of output at the national level." (Turban, et al., 2008). One of the possible explanations for the paradox is that data and analytical problems hide 'productivity-revenues' because it is sometimes difficult to measure, especially in the service sector. ICT producing countries, especially USA, in the last decade of century experienced unusually long period of expansion. Europe has not gained the same level of benefits from ICT achieved by the USA. Better understanding the sources of the aggregate growth differential between the EU and USA is very important from transitional economies point, because it could provide conclusions or suggestions how should proceed to catch up with the economy leaders. Next section summarizes the results of the relevant literature on this matter.

Section 3 of the paper contains the AHP model applied to define FDI attractiveness positioning of European transitional countries. The impact of ICT on productivity growth is investigated on the group of European developed and transitional countries in section 4. Section 5 summarizes the results.

2. IMPACT OF ICT AND INSTITUTIONAL REFORMS ON GROWTH

Multiple research studies have identified the impact of the level of investment in ICT as well as the amount and quality of the available human capital on growth and productivity and that have been the subject of intense investigation during the last decade. The new technologies of production and distribution in the late 1990's in US was mainly due to productivity improvements and innovations in the ICT sector, impacting all sectors of the economy and accelerating productivity and economic growth (Oliner and Sichel, 2000; Jorgenson and Stiroh, 2000; OECD, 2001; Economist Intelligence Unit, 2004; UNCTAD, 2006)). This growth paradigm, often called the "new economy", impacting all sectors of the economy with the contribution of globalization, accelerates productivity and economic growth. Spillover effects give communications networks (Stiroh 1999). Van Ark and Piatkowsky (2004) found out that during 1990s ICT capital in the CEE-10 has contributed

as much to labor productivity growth as in the EU-15 and that manufacturing industries that have invested heavily in ICT have been key to the restructuring process. Kraemer and Dedrick argued that developing countries have not been able profitably use ICT products because of the lack of complimentary investments in human capital, infrastructure, R&D. ICT skills are considered critical to a country's ability to absorb and efficiently use ICT.

Van Ark, Inklaar and McGuckin (2003) have identified by a detailed decomposition analysis that US productivity has grown faster than in the EU because of a larger employment share in the ICT producing sector and faster productivity growth in service industries that make intensive use of ICT. Three major service industries account for most of the US growth advantage, wholesale, retail trade and the financial securities industry.

The economic impact of ICT does not derive exclusively from its applications to other processes, products and services. Analyses of ICT impact using micro data showed that the use of ICT can help firms increase their market share, expand their product range, better adopt their products to demand, reduce inventories (OECD 2003). These firm level studies have identified that:

- among ICT, networking technologies have the highest positive impact on firm performance;
- ICT impacts emerge over time;
- effective ICT use is closely linked to innovation, skills and organizational
- change (UNCTAD, 2006:78).

Studies at the firm level (Brynjolfsson and Hitt, 2000, 2003) and industry level (mcKinsey Global Institute, 2001) find that investment in ICT goods leads to higher productivity, especially if the investment in capital goods is accompanied by complementary investments in organizational change, like reorganizing the supply chain and introducing new workplace methods.

The growth in the US has benefited not only from the production of ICT, but also from its adoption in ICT- using industries. The question is why ICT- using service industries would show much faster growth in the US than in European countries. The growth of ICT investments has been large in Europe as well, the market for ICT goods and software is essentially global and there are certainly opportunities to benefit from new technologies in Europe too.

Business organization and the opportunities to exploit technologies depend on the regulations, constraints and restrictions that firms face. McGuckin and Van Ark (2001: 41) argue that in many European industries regulations and structural impediments in product and labor markets limit the opportunities to invest in ICT Limits on shopping hours and transport regulations and restrictive hiring and firing rules as other restrictive labor regulations make it hard for producers to organize their organizations to reap the full benefits from ICT.

For transition economies there is opportunity for faster growth through technological absorption, imitation, productive utilization, and new organizational business

structures. The consequences of e-banking, e-commerce, mobile telephones appearance, increase productivity and rapid growth in consumption. Developments of institutional and economic infrastructure were the basis for the realization the potential of the ICT technology for faster economic growth and accelerated catching-up. This potential can be left unharnessed if there are no suitable institutional structures which would allow for adoption and profitable use of ICT technologies. Countries with insufficiently developed institutions, lack of regulations, the poor infrastructure, scarce capital and lack of educated labor force, are risking to be marginalized in a global economic community. They will not be able to apply the benefits of new technologies of production and distribution (ICT) which have a qualitative influence on way of doing business (Kolodko, 2001).

Transitional countries are faced with the establishment of institutions to support market economic behavior. There is a positive correlation between economic growth and institutional reforms (Sachs, 1996; Hildebrand, 2002; Lovrić, 2004)

Schreyer (2000) and Daveri (2002) examine the contribution of ICT on G7 and European countries, respectively, and show that there do not exist powerful signs for beneficial effects on productivity. Dewan and Kraemer (2000) analyzing period 1985-1993, come to the conclusion that the developed countries enjoyed substantial gains and achieved an increase in their output by the use of ICT. On the contrary, the developing countries do not benefit from essential returns because of the lack of additional infrastructure investments.

3. FDI ATTRACTIVENESS POSITIONING OF TRANSITIONAL COUNTRIES

Foreign direct investment is often mentioned as an important driver of productivity and economic growth. In transition economy it should be the productivity spillover. Foreign capital penetration brings positive effects to different sectors of economy in the sense of transfer technological knowledge. Attractiveness of European transitional countries for FI will be measured applying the AHP model which is developed in our last paper (Babić et all. (2007)). Now we have applied research on the extended sample of 19 TE, focusing on the recent data period of 2000 – 2007.

The AHP is developed by Thomas L: Saaty in 1980. This is a decision making tool for complex, multi-criteria problems which qualitative and quantitative factors and criteria are introduced in comparison. The mayor strength of the AHP is that it can be applied to a very complicated structure of decision making problem. The procedure is starting with breaking down a complex situation into its component parts arranging it into a hierarchic order of goal, criteria, sub criteria, alternatives. In pairwise comparisons, each criterion is compared one pair in a time in order to construct a matrix of these comparisons. A ratio of relative importance is assigned to each paired comparisons. A vector of priorities has to be calculated on criteria level and on alternatives level with regards to criteria. The AHP provides a mathematical process to input subjective and personal preferences of decision maker allowing inconsistency in judgments and provides a mean to improve consistency.

The model includes two criteria – the reached level of institutional reforms and the attained level of economic performances.

First criteria - institutional reforms

This research is specific in a way of including institutional reform measuring, especially because of measuring the various complexity of each reform area. Progress in institutional reforms is measured by transition indicators of European Bank for the Reconstruction and Development (EBRD). The indicators reflect cumulative progress in the movement from the centrally planned to the market economy and provide assessments of progress in three main areas, which play an important role in a market economy: markets and trade (including the categories price liberalization (PL), trade and foreign exchange system(T), competition policy(CP)), enterprises (including the categories large(LP) and small-scale privatization(SP), governance and enterprise restructuring(GR)), and financial institutions (including the categories banking reform, interest rate liberalization (BL) and progress in the field of securities markets and non-bank financial institutions (SFI)).

Table 1: Institutional reforms country ratings 2000 – 2007

				INSTITUTIO	NAL REFOR	MS				
	LP	SP	GR	PL	T	CP	BL	SFI		
Weights	0.078	0.026	0.116	0.053	0.036	0.260	0.172	0.260	10	otal
Countries		J ()	Tra	nsition indi	cators* (TI)		19_m		TI	96
Armenia	3,4	3,8	2,2	4,3	4,2	2,0	2,5	2,0	2,47	57,
Belarus	1,0	2,2	1,0	2,6	2,2	2,0	1,5	2,0	1,78	41,
Georgia	3,5	4,0	2,1	4,3	4,3	2,0	2,5	1,7	2,39	55,
Kazah	3,0	4,0	2,0	4,0	3,5	2,0	2,8	2,4	2,54	59,
Kirgizstan	3,3	4,0	2,0	4,3	4,3	2,0	2,2	2,0	2,40	55,8
Moldova	3,0	3,7	1,9	3,8	4,3	2,0	2,5	2,0	2,40	55,7
Ukraine	3,0	3,8	2,0	4,0	3,4	2,3	2,5	2,2	2,50	58,
Albania	3,0	4,0	2,1	4,3	4,3	1,8	2,5	1,7	2,30	53,6
Bulgaria	3,8	3,8	2,5	4,3	4,3	2,5	3,4	2,3	2,91	67,6
Croatia	3,2	4,3	2,8	4,0	4,3	2,4	3,8	2,7	3,01	70,1
Czech	4,0	4,3	3,3	4,3	4,3	2,9	3,8	3,3	3,46	80,4
Estonia	4,0	4,3	3,4	4,3	4,3	3,2	3,8	3,3	3,57	82,9
Hungary	4,0	4,3	3,5	4,3	4,3	3,2	4,0	3,8	3,71	86,2
Latvia	3,5	4,3	2,9	4,3	4,3	2,7	3,6	2,8	3,15	73,2
Lithuania	3,7	4,3	2,9	4,2	4,3	3,1	3,3	3,0	3,28	76,3
Poland	3,3	4,3	3,4	4,3	4,3	3,1	3,5	3,7	3,50	81,5
Romania	3,5	3,7	2,2	4,3	4,3	2,4	2,9	2,2	2,71	63,1
Slovak	4,0	4,3	3,4	4,2	4,3	3,2	3,5	2,6	3,30	76,7
Slovenia	3,0	4,3	2,9	4,0	4,3	2,7	3,3	2,7	3,01	70,1

Source: EBRD (2008), Transition Report.

The existing EBRD transition indicator measures the progress in transition areas against the standards of industrialised countries and given values from 1 to 4. It doesn't measure neither distinguish the various complexity of each reform area. Each of area or category has different duration, intensity and complexity over time. Progress in the areas, measured by EBRD transition indicator, is a good, simple, quantitative indicator when it is used to show the score of reforms inside one area or category of reform. To make comparisons between categories or areas we have give them various weights to be able to compare them, and have use AHP to determine the weights as a measure of realization complexity of each category.

Utility function (Lovrić, 2004) of transition preferences to determine the position of each country is a weighted sum of transition indicators:

$$UTILITY = w_1 TI_1 + w_2 TI_2 + \dots + w_n TI_n$$
 (1)

TI_i = transition indicator of each country of the ith category,

 w_i = weight of the i^{th} category (result from pairwise comparison).

Using utility function, weights and average transition indicators for the period 2000 – 2007 for eight transition categories, we obtain total values and also the percent of realized reforms in European transition countries (Table 1).

Second criteria - financial factors

The second criteria of the model we consider are Economic - financial factors⁵:

- GDP growth rate, to give evidence about the economic forces of the country;
- GDP p/c, to monitor the present richness of the country;
- Inflation rate is an indicator of stability in managing exchange rate and of potential
- future development;
- Current account over GDP, is an indicator of a country's proneness to invest;
- Risk of direct investment, is a way to monitor the credit worthiness of a country.

Table 2: Relation between intensities and the rating grades of statistical data

Sub criteria	High	Medium-High	Medium	Medium-Low	Low
Inflation (%)	< 2	2 < < 4	4 < < 7	7 < < 10	10 <
GDPgrowth (%)	>5	5>>4	4>>3	3>>2	2>
GDP pc (000\$)	>9	9>>7	7>>5	5>>3	3>
Curr.acc/GDP (%)	<-1	-1<<-3	-3 < < -4	-4 < < - 6	-6 <
Risk of dir.invest.	>80	80>>70	70 > > 60	60>>50	50 >

Source: Authors' estimation

Saaty & Vargas 2001, for the group of developing countries from 6 geographical regions.

Applying AHP we have defined and assigned the factor weights to measure the reached rank in economic-financial development of TE. Each economic-financial factor includes five intensities: high, medium high, medium, medium low and low. The procedure continues with the specification of:

- relation between intensities and the rating grades of statistical data for each factor;
- pairwise comparison matrix components of the financial economic factors;
- pairwise comparison matrix for the rating grades for each of the five financial economic factors.

Relation between intensities and the rating grades of statistical data for each factor are defined in Table 2. Less preferred characteristics have lower rank, like significant inflation or investment risk.

For each of the factor the intensity of priority is quantified and the pairwise comparison matrix is made. Then, the vector of priorities is evaluated for financial economic factors and their rating grades (Table 3).

Table 3: Priority vectors results - relative scores for factors and grades

	Risk of dir.inv.	Cur.acc/GDP	Inflation rate	GDP p/c	GDP Growth rate
weights	0.353	0.058	0.118	0.118	0.353
Grades:					
Н	0.409	0.460	0.409	0.460	0.460
MH	0.295	0.299	0.324	0.299	0.299
М	0.117	0.144	0.159	0.144	0.144
ML	0.09	0.065	0.076	0.065	0.065
L	0.029	0.032	0.033	0.032	0.032

Source: Saaty & Vargas (2001) Models, Methods, Concepts & Applications of the AHP, p.142-145

The results of country ratings are shown in Table 4.

Table 4: Financial economic factors country ratings 2000 - 2007

		FINANCI	AL ECONOMIC FAC	rors		
	Risk of dir.inv	Cur.acc/GDP	Inflation rate	GDP p/c	GDP Growth rate	Total
Weights	0.353	0.058	0.118	0.118	0.353	10101
Countries			Grades			%
Armenia	ML	L	Н	L	Н	56,9
Belarus	M	М	- L	ML	Н	51,3
Georgia	ML	L	M	U	Н	50,1
Kazah	ML	MH	ML	ML	Н	52,3
Kirgizstan	ML	Н	M	L	MH	42,8
Moldova	М	L	Ł	L	Н	48,9
Ukraine	М	Н	L	L	Н	54,6
Albania	MH	L	MH	L	Н	71,2
Bulgaria	MH		М	ML	Н	67,6
Croatia	MH	L	МН	МН	MH	65,4
2.30		FINANCI	AL ECONOMIC FAC	TORS		
Czech	МН	ML	МН	Н	MH	70,2
Estonia	MH	L	L	MH	Н	70,5
Hungary	MH	L	М	MH	Н	60,9
Latvia	MH	L	М	Н	H	78,3
Lithuania	МН		Н	MH	н	80,7
Poland	MH	М	MH	MH	MH	66,9
Romania	MH	L	L	ML	II	64,2
Slovak	MH	Ĺ	M	MH	Н	74,0
Slovenia	MH	MH	M	Н	MH	68,8

Source: Authors' estimation

Based on the rating data of the countries, investment attractiveness map is developed in two dimensions – institutional reforms realization and financial economic factors levels (Figure 1). It represents the priority distribution of the countries for 1999-2004 time period. The CEE countries have better results in institutional reforms realization (71% in average) than in financial economic factors intensity (48% in average). According to these average indicators, the map can be divided in four sub quadrants. The most attractive countries are in the highest sub quadrant and besides Ireland, Spain, Greece and Portugal, here are also transitional countries: Slovenia, Hungary and very close are the Czech Republic and Estonia.

Rating results from the Table 1 and Table 4 are represented in Figure 1 as a map of the countries investment attractiveness based on the average data for 2000- 2007 time period. The average level of factors and reforms realized are presented as vertical and horizontal line, and the map is divided in four sub quadrants. The most attractive countries are in the highest sub quadrant. The results show that former countries of USSR federation lags in both indicators after European transitional countries, except Latvia, Lithuania and Estonia which are among the most attractive in the group. It is clear that there is not significant difference in the attractiveness level between them, and that process of institutional transition is close to finishing.

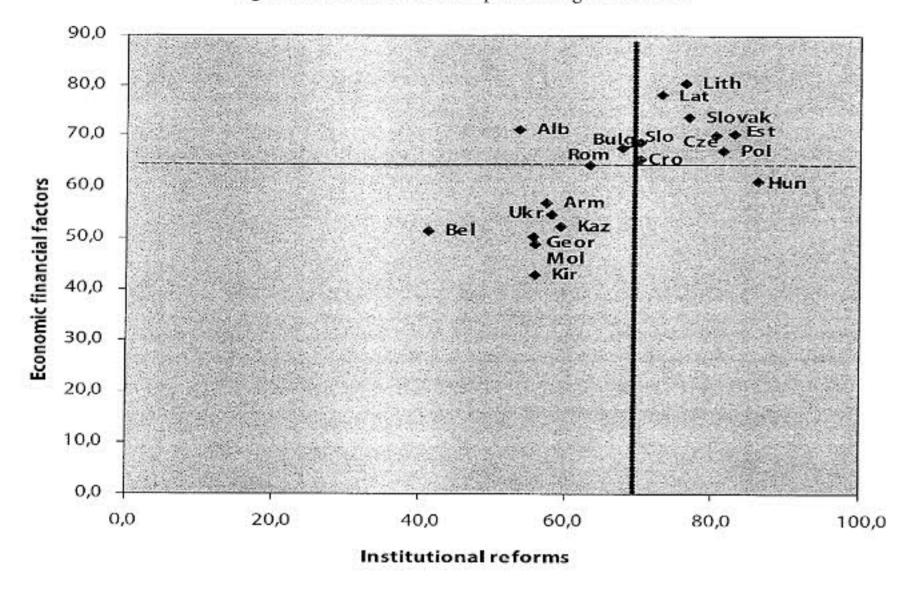


Figure 1: FDI attractiveness positioning of countries

Source: According to the results in Table 1 and 4.

Despite the results, the most attractive countries are mainly members of EU, and the less attractive ones have a big potential and are interesting for entrepreneurs.

4. EMPIRICAL EVIDENCE ON THE ICT CONTRIBUTION TO PRODUCTIVITY GROWTH

To assess the contribution of ICT on production, Hall and Mairesse (1995) specified an aggregate Cobb-Douglas production function, which incorporates four inputs, domestic capital (K), labor (L), foreign capital (F) and ICT capital. Yet, the translog production function is more flexible than Cobb-Douglas function in the sense that it allows testing for the presence of the interactions between the variables. Complementarities of investments have been empirically investigated and validate in the literature. Barro (1991) has found for a crossection of 98 countries the importance of human capital on economic growth. These are main guidelines we take in model specification to avoid the problems of hide "productivity-revenues".

Our productivity model specification follows the aggregate Cobb-Douglas function and the assumption of constant return to scale. The problem of enclosing all ICT implications on productivity is well resolved applying an indicator of ICT country's progress, and that is ICT-OI index. It includes the progress in capital and labor skills and their interactions.

Since the goal is to estimate the growth, the average seven years (2000-2006) growth rate data for 28 European developed and developing countries are taken for variables and the ICT effects on cross country productivity will be empirically analyzed with the following model:

 $\ln GW_i = \beta_0 + \beta_1 \ln GTW_i + \beta_2 \ln IR_i + u_i$

where the variables are:

lnGW = logarithm of average annual % growth of GDP per worker;

lnGTW = logarithm of average annual % growth of gross fixed capital formation
per worker;

lnIR = logarithm of average annual % growth of ICT-OI index

The ICT opportunity index (ICT-OI) is developed by International Telecommunication Union. It is a statistical tool of the information society measurement, based on the linkage of ICT to economic development through the country's productive capacity (infodensity) and use of ICT (info-use).

Infodensity represents the productive capacity of the economy in terms of ICT capital and ICT labor stocks. ICT capital and ICT labor stocks are the input factors of growth and development. The network infrastructure development (penetration rates of fixed telephone lines, mobile cellular subscribers and international internet bandwidth) is used for ICT capital indicator. ICT labor is the total stock of ICT skills of labor force, which are closely linked to overall skills, and the proxies are literacy rates, primary, secondary and tertiary gross enrolment rates.

Info-use refers to the consumption of ICT and comprises ICT uptake and ICT intensity of use. ICT uptake (usage and consumption of ICT goods and services) is represented with three indicators: internet users and computers per 100 inhabitants and the proportion of households with a TV. Two indicators are included to measure ICT intensity: total broadband internet subscribers per 100 inhabitants and international outgoing telephone traffic (minutes) per capita.

The data were obtained from the EBRD Transition Report, World Development Indicators database web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS), which is the World Bank's (web.worldbank.org) comprehensive database on development data, and the Yearbook of Statistics (2008; www. itu.int/ITU-D/ict/publications), which is published yearly by International Telecommunication Union (ITU; www. itu.int), UNECE Statistical Division Database, http://w3.unece.org

With TEs that are included in the study, we tried to select a group of countries that started the transition process at approximately the same time. The number of countries included was determined by the statistical data. Because of negative or zero average annual growth rates data in Austria, Georgia, Germany, Italy, Moldova, Portugal, and Spain, we have to reduce the sample. Thus, we decided on 10 developed countries and 15 transitional countries: Albania, Armenia, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Kazakhstan, Latvia, Lithuania, Norway, Poland, Slovakia, Slovenia, Sweden, UK and Ukraine. In terms of the

period we were restricted with the provided data of ICT-OI index. The fact is that effects of ICT diffusion in transition economies earlier of disposed period do not exist, or they are week.

In Table 5 are presented OLS estimations results for four regression functions. Beside three main explanatory variables we have included two dummies. C1 is dummy for the group of countries with high ICT-OI growth rate (between 366.71 and 60.8) band , C2 is a group for upper growth rate (between 60.79 and 47.77) band, and the remaining are medium and low. The classification is reported in original data source for ICT-OI. All estimated parameters are significant on the 0.05 level. The t-statistics are reported in parenthesis. The explanatory power of the models is high. The Park test and Farrar-Glauber test confirmed that there is no significant heteroscedasticy of error terms and multicolinearity between explanatory variables. As it is evident from Table 5, the elasticity of ICT –OI average growth rate is highly significant. A Chow test for the equality of coefficient estimates between the developing and developed countries was rejected. It is rather a small group of countries, so we have not run separate regressions for transition and developed countries, yet we have included dummy variables (regression number 2) and theirs interaction with ICT growth effect (regression number 3).

Table 5: Impact of ICT on productivity growth

1.1	Dependent variable InGW				
Independent variables	(1)	(3)	(4)		
Const	-2.4878	-0.0727	-0.0818		
	(-2.30)	(-0.37)	(-0.42)		
InGTW	0.6435	0.5566	0.5635		
	(6.53)	(4.58)	(4.67)		
InIR	0.6514		Y		
	(2.28)				
C1		0.4039			
		(2.25)			
(2		0.6388			
		(2.36)			
C1*InIR			0.1010		
			(2.26)		
C2*InIR			0.1427		
			(2.33)		
Obs	25	25	25		
Remand		1 1 2			
\mathbb{R}^2	0.755	0.759	0.759		
Fstat	38.03	26.19	26.15		

Notes: t statistics in parenthesis, all estimates significant at 5%level; GW, GTW, IR variables: average growth rates for the period 2000-2006.C1 group: Latvia, Lithuania, Estonia, Belarus, Armenia, UK; C2 group: Hungary, Slovenia, Ireland, Poland, Ukraine, Albania, Slovakia, Kazakhstan, Norway, Iceland, Czech Republic, Croatia.

Important regression result is that positive and significant ICT growth effect measured by country's productive capacity (infodensity) and use (info-use) and it is something that has long been disputed in the empirical literature. The results indicate a rising importance of ICT-OI on productivity, contrary to the level of average growth rate bands. The evidence is that lower average growth rate of GDP per worker is in the countries with high ICT-OI average growth rate (C1) relative to the group of countries of upper average growth rate (C2). Regarding the interaction effect of C1 and C2 dummies with average annual growth of ICT-OI index on productivity, we find again that the countries with high ICT-OI average growth rate band have lower elasticity of productivity growth.

A possible weakness of this study is relatively low number of countries in the sample under examination, but the aims of investigation are European countries. The further research could include a panel data.

5. Conclusion

In this paper we have revisited the FDI attractiveness of transitional countries. We have provided updates and applied research for period of 2000- 2007 on the extended sample of 19 European transitional economies. The country attractiveness level is measured by economic performances factors and institutional reforms indicator. The evidence is that there is not a great difference in the attractiveness level between the countries, and that process of institutional transition is close to finishing with the exception of former countries of USSR federation which lags after other European transitional countries, except Latvia, Lithuania and Estonia.

The impact of ICT on productivity is investigated through average annual growth rates through the period of 2000 –2006 on the sample of 25 European countries which includes 15 transitional countries. The problem of enclosing all ICT implications on productivity is well resolved applying an indicator of ICT country's progress, and that is ICT-OI index. It includes the progress in capital and labor and their interactions. A positive and significant ICT growth effect on productivity is established in the entire sample of countries. The results indicate that lower average growth rate of GDP per worker is in the countries with high ICT-OI average growth rates, relative to the group of countries of upper ICT-OI average growth rate and that the countries with high ICT-OI average growth rate band have lower elasticity of productivity growth.

REFERENCES:

- Ark, B., Van, Inklaar, R., McGuckin, R.H. (2003), ICT and Productivity in Europe and the United States. Where Do the Differences Come From? CESifo Economic Studies, Vol.49, 3/2003, 295-318.
- Ark, B., Van and Piatkowski, M.(2004), Productivity, Innovation and ICT in Old and New Europe, International Economics and Economic Policy, (1), 215-246.
- Barro, R., (1991), Economic growth in a cross section of countries, Quarterly Journal of Economics 106 (2), 407-433.
- Brynjolfsson, E. and Hitt, L.(2000), Beyond Computation: Information Technology, Organizational Transformation and Business Performance, Journal of Economic Perspective 14(4), 23-48.
- Brynjolfsson, E. and Hitt, L.(2003), Computing Productivity: Firm Level Evidence, MIT Sloan Working Paper No 4210-01, June.
- Daveri, F., (2002), The new economy in Europe: 1992-2001, Oxford Review of Economic Policy 18 (3), 345-362.
- Dewan, S., Kraemer, K., (2000), Information technology and productivity: Evidence from country-level data, Management Science 46 (4), 548-562.
- 8. EBRD, (2008), Transition Report.
- Economist Intelligence Unit (2004), Reaping the Benefits of ICT, Europe's Productivity Challenge, The Economist.
- Hall, B.H., Mairesse, J. (1995), Exploring the relationship between R&D and productivity in French manufacturing firms, Journal of Econometrics 65 (1), 263-293.
- Hldebrand, A. (2002), Central and Eastern Europe in Transition, Dissertation, Humboldt-Universit\u00e4t zu Berlin.
- 12. ILO (2003), Labor Statistics, Available at: http://www.ilo.org.
- Jorgenson, D.W. and Stiroh, K.J. (2000), Raising the Speed Limit: U.S. Economic Growth in the Information Age, Brookings Papers on Economic Activity, (1), 125-211.
- 14. Kolodko, G.W. (2001), The 'New Economy' and the Old Problems, Prospects for Fast Growth in Post-Socialist Countries, Zagreb, International Review of Economic and Business, Vol 4, No.2, 71-90.
- Kraemer, K.L. and Dedrick, J.(2001), Information Technology and Economic Development: Results and Policy Implications of Cross-Country Studies, in M. Pohjola (ed), Information Technology, Productivity and Economic Growth, Oxford University Press, 262-263.
- 16. Lovrić, Lj. (2004), Measuring the Institutional Reform in Transition, in Readings Book of the International Conference – Global Business and Technology Association, Cape Town, June, ISBN:1-932917-00-4, p.439-447.

- 17. Babić, J., Kandžija, V., Lovrić, Lj., (2007), Attractiveness of central European transitional countries for foreign investment, International Conference "Economic Integrations, Competition and Cooperation" Opatija, 2007., University of Rijeka, University of Ljubljana, University of Trieste, University of Antwerpen, Europacentrum Jean Monnet, CD ROM full papers.
- McGuckin, R.H. and Ark, B. Van (2001), Making the Most of the Information Age: Productivity and Structural Reform in the New Economy, Perspectives on a Global Economy, Report 1301-01-RR, October.
- McKinsky Global Institute (2001), U.S. Productivity Growth 1995-2000. Understanding the Contribution of Information Technology Relative to Other Factors, October.
- OECD (2001), The New Economy: Beyond the Hype, Organization for Economic Cooperation and Development, Paris.
- OECD (2003), ICT and Economic Growth. Evidence from OECD countries, Industries and Firms.
- 22. Oliner, S.D. and Sichel, D.e. (2000), The Resurgence of Growth in the Late 1990s: Is Information Technology the Story, Journal of Economic Perspectives 14(4), 3-22.
- 23. Saaty, T.L. and Vargas, L.G.(2001), Models, Methods, Concepts & Applications of the Analytic Hierarchy Process, Kluwer Academic Publishers.
- Sachs, J.D. (1996), "Transition at Mid Decade", American Economic Review Papers and Proceedings, 86.
- 25. Schreyer, P., (2000), The contribution of information and communication technology to output growth: A study of the G7 countries OECD, Paris.
- 26. Stiroh, K. (1999), Is There a New Economy?, Challenge, July/August, 82-101.
- 27. Turban, E. et al.(2008), Information Technology for Management: Transforming Organizations in the Digital Economy, John Wiley & Sons, 6th edition.
- 28. UNCTAD (2006), Information Economy Report, The Development Perspective, UN.
- 29. UNECE Statistical Division Database, http://w3.unece.org.
- 30. World bank, (2003), World Development Indicators, Available at: www.worldbank.org.
- 31. World Information Society Report (2007), Available at: www. itu.int

ANALIZA PRIVLAČNOSTI ZA FDI I UTJECAJ ICT-a NA RAST PRODUKTIVNOSTI U EUROPSKIM TRANZICIJSKIM ZEMLJAMA

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Sažetak

U ovom članku se prije napravljena AHP analiza privlačnosti za strane direktne investicije (FDI) proširuje na sve europske tranzicijske zemlje. Rezultati pokazuju kako zemlje bivšeg SSSR-a zaostaju za drugim europskim tranzicijskim zemljama, osim Latvije, Litve i Estonije koje su najatraktivnije u ovoj skupini. Ne postoji velika razlika u stupnju atraktivnosti među zemljama, a očigledno je i kako je proces institucionalne tranzicije pri kraju. Na temelju istraživanja i iskustava razvijenih zemalja, članak se osvrće na utjecaj reformi ICT sektora te institucionalnih reformi na rast. Empirijsko istraživanje utjecaja ICT-a na rast produktivnosti je predstavljeno na primjeru europskih razvijenih zemalja te europskih tranzicijskih zemalja. Važan je rezultat da se na čitavom uzorku zemalja dokazuje značajan utjecaj ICT-a na rast produktivnosti.

Ključne riječi: europske tranzicijske zemlje, produktivnost, ICT, FDI.

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