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INSTITUTIONS, EDUCATION AND INNOVATION AND THEIR IMPACT ON ECONOMIC GROWTH

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ABSTRACT

The aim of this article is to provide a closer look of the institutions, their development, education and innovation and their impact on economic growth. The postulates of the neo-classical economic growth theories consider the accumulation of human capital and the technological development as factors that promote economic growth. Thus, investing in education, R&D and innovation is essential for a country's prospects for economic growth. However, the main idea is to present this topic from institutional point of view. By using literature and statistical analysis, the article investigates whether the degree of institutional development in country's educational system is sufficient enough to create prospects for economic growth. We compare four different countries: Macedonia and Serbia as non EU countries and Bulgaria and Slovenia as EU member countries. We perform two analysis – the first one is comparison of selected statistical data, and the second one is comparison of the Human Development Index for the four countries of interest. The research findings indicate to the fact that institutionalized society with higher degree of institutional development in this case in the educational system is more likely to boost the economic growth. The results also indicate to the fact that societies in which the degree of institutional development is higher, as it is in our case in Slovenia and Bulgaria, are more likely to produce well qualified and skilled labour force which will further impact the economic growth.

KEY WORDS

institutions, education, R&D, innovation, economic growth

CLASSIFICATION

JEL: I25, I28, O43

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INTRODUCTION

In recent years, especially after the latest recession, the issue of economic growth and factors encouraging it became very popular. In the period after WWII, the establishment of the neoclassical economic theory of growth elaborated on the fact that physical and financial capital, labor and technical progress could explain most differences in the rate of economic growth and development between countries[1]. Later, in the 1980's, the development of endogenous growth theory introduced the role of innovation[2] and education[3] as significant factors in promoting economic growth and development.

Human capital is the stock of knowledge that people have learned and maintained. The more human capital one economy has the more creative its labor force can be, thus the more prospects for productivity the economy will have. Accordingly, it could be stated that education gives people skills that enable them to be more productive and creative. However, this article tries to identify the factors affecting economic growth from another perspective, a deeper one, which is the impact of institutions and their degree of development. Before proceeding any further it has to be stated that under the term institutional development in this article we use the definition postulated by the Nobel Laureate Douglas North (1991) [1], who defines institutions as clearly defined rules, regulations, norms within the society, or simply as 'rules of the game'. Moreover, this article is based on the assumption that accumulation of human capital can only influence the economic growth, if there is a constant creation of new job vacancies, either through FDIs or investments in R&D and innovation. In order to depict a closer look at the impact of institutional development on economic growth, we try to identify the impact of institutional development on education system in four different countries: Macedonia, Slovenia, Serbia and Bulgaria. The goal of this article is to try to identify the role of institutional development in educational system on economic growth by comparing four different countries. After the introductory part, the article further proceeds with presenting the literature review which has an attempt to present the basic rational behind the topic. After presenting the literature review in which the institutional development of the four countries of interest is presented, the article explains the basic methodology, thus further proceeds with the presentation of the results followed by brief discussion and finally it finishes with the concluding remarks.

The main background supporting agrument in this article is the following one: "the factors we have listed (innovation, economies of scale, education, capital accumulation, etc.) are not causes of growth; they are growth" [2; p.2].

Figure 1. Sequence of causes.

In the previous quote some of the proximate factors, such as innovation, education, capital accumulation are listed which generally corresponds to the factors of production incorporated in the aggregate production function. It has to be pointed out the fact that it is commonly known that the developed countries, and in here we assume as well institutionally developed, experience higher levels of total factor productivity (TFP), more educated workers (human capital) and more machines, tools and factories (physical capital), whilst other countries do not. Thus, the interesting intellectual question, arising from the above view point is why it is that some countries are so much more innovative than others, why they invest much more resources into the educational system, and why people save and invest to accumulate physical capital.

Thus, it is vital to provide a link between the institutions, their development and how its impact through education and innovation promote economic growth.

It could be stated that in almost all countries, governments play a fundamental role in education, health, infrastructure and technology, and policies and expenditures regarding each of these areas. Also, it plays a key role in the balance of spending among these areas, and in that way creates the economy. Briefly speaking, all governments really do have an industrial policy. However, the only difference is among those who construct their industrial policy deliberately, and those who let it be formed by others, usually by particular interests, who view with each other for concealed and open subsidies, for rules and regulations that favor them, usually at the expense of others [3].

Most transition countries have put an attempt in terms of resource constraints and knowledge deficiencies. Their development depends significantly on numerous factors, including the quality of the institutional and regulatory framework and its implementation, the physical infrastructure, the sophistication and depth of financial markets, the quality of educational institutions and labour skills, and the protection of intellectual capital. Greenwald and Stiglitz [3] also state that learning requires resources, including access to capital, which in downturns of the economy is rationed thus investments in R&D are often surrendered. This has an utmost implication for policy: policies which *expose* countries to a high level of instability, or which increase the economy's instability have an unfavorable effect on knowledge. Examples include financial and capital market liberalization and deregulation [4-6], and tarrification [7]. Research shows that societies that have advanced educational systems, in this context it implies institutionalized societies do the best at developing and integrating new technologies into their economies partly because educated workers are more able to think for themselves and solve problems creatively. Government can also play a crucial role in the process of development of technology by providing research and development funds to universities and researchers.

Although, there is not much literature on this specific topic, it has to be stated that [8], claimed that the educational system in Bosnia and Herzegovina lacks a higher degree of institutional development, thus the corporate and business sector are not in a position to invest in R&D and innovation thus, be able to compete in the global and rapidly changing business environment.

EU MEMBER COUNTRIES REPRESENTATIVES

SLOVENIA

Comparing Slovenia to the other transition countries, it has to be claimed that unlike the other transition countries, Slovenia adopted a gradualist approach to privatization from the start. In the period of EU accession the Slovenian policy changed to a larger accent on horizontal industrial policies, and the exclusion of subsidies and state aids for industry in keeping up with the EU release [9]. In the process of synchronizing with the horizontal approach to industrial policy, Slovenia implemented a program for developing industrial clusters connecting companies and research institutes beginning with a pilot program in 2000-2003 [10]. By doing that, it intended to promote knowledge transfer from research institutes to the companies in the cluster. The Slovenian industrial policy focused on support for small firm clusters and networks, throughout a decentralized system of support for innovation using technology parks and university-sponsored by-products [11]. Thus, one might say that the main policy approach was to maintain the old established industrial base though establishing a core of high growth small businesses which would be capable of creating high quality jobs (in terms of value added per worker).

BULGARIA

Bulgaria had a long lived tradition of investing in high tech industries dating back from the communist era when it specialized in computer industries. Even though the large number of

big corporations generally collapsed in the 1990s, a considerable number of high tech SMEs developed with a support from the state [12]. Regarding the final standard annual report in 2005 Bulgaria's industrial strategy generally fulfilled the principles of European industrial policy. In that manner it could be stated that the privatization and reformation process had moved forward and Bulgaria had enhanced the business environment, strengthened the banking sector and attracted foreign investments. Nevertheless, with the intention of completing its preparations for EU accession, Bulgaria was demanded to continue to develop an industrial policy involving promotion of R&D and innovation and reinforce economic competitiveness, complete its privatization strategy as well as the reformation of the steel industry. The EU industrial policy, to which Bulgaria was asked to match, was limited to attracting the competitiveness of enterprises in general, promoting an environment conducive to inventiveness and to the creation of SMEs, and to exploiting the industrial potential of innovation, research and technological development. By 2011, Bulgarian industrial policy was entirely in line with the EU industrial policy reform. This was neatly summarized in the National Reform Programme document for 2010-1013 adopted in April 2011 cited by [13] according to which the government policy in Bulgaria supported R&D and innovations by businesses, increase of the rate of knowledge transfer towards them throughout the development of high-technology parks and technological incubators, centers for transfer of technologies, etc.

NON EU MEMBER COUNTRIES REPRESENTATIVES

MACEDONIA

The current trend of adopting Industrial policy in Macedonia was developed in an attempt to follow the EU horizontal approach, clearly influenced by the EU pre-accession process. The industrial policy of Macedonia according to [14] aims to attract FDI, promote R&D and innovation, promote SME development and entrepreneurship, and develops clusters and associations. The implemented measures are intended to support applied research, development and innovation in industry, encourage knowledge transfer between universities and industry, support industry in employing researchers, motivate transfer of technology, create technological industrial zones, protect intellectual property rights, and develop an integrated innovation policy. The vision of the policy is to encourage the production of higher value-added products and services based on knowledge, innovation and collaboration.

SERBIA

Same as in the case of Macedonia, Serbia is also trying to follow a horizontal industrial policy according to the EU accession requirements. Thus, the industrial policy is focused on creating sustainable industrial growth and development, developing of institutions, improving the investment climate, as well as strengthening the regional and global competitiveness, festering development of entrepreneurship, increasing and restructuring export, reforms of the educational system in line with needs of the economy, active and dynamic cooperation between science and industry, stimulating the process of innovation, developing of the regional industrial centers and regional business infrastructure.

The industrial policy adopted in Serbia from 2000-2010 inverted the policy of the previous government which had given large subsidies to enterprises in order to maintain employment. It also involved the privatization and restructuring of the economy, attraction of FDI, creation of a competitive business environment, and the escalation of the entrepreneurial sector.

METHODOLOGY

The methodology employed in this article is based on empirically gathered data from the site of World Bank Data Base. We analyze several indicators from the period 2000-2013. We

take the GDP growth as percentage in order to see whether the economy is experiencing growth or decline. Also, we consider as an important factor the population growth, since it can predict the future trends in school enrolment. The primary and tertiary school enrolment rates are found to be crucial for this topic. Also, we consider the FDIs and investments in R&D to see to which degree the countries are institutionalized and whether they follow the EU regulatory postulates. The unemployment rate is also important in this case, especially the unemployment rate of graduate students.

Besides analyzing the aforementioned data, we considered as important factor to compare the Human Development Index (HDI) for these countries and check whether it applies with the results obtained from the above explained variables. The data is obtained from the United Nations Development Programme data set. The HDI is a statistical composition incorporating three statistical measures: life expectancy, education and income per capita.

RESULTS

In the aforementioned reports it was stated that EU representative countries and non EU countries are both following EU directives in terms of boosting the economy to grow. However, the statistics say the opposite. In Macedonia, the data presented in the below Table 1a even though the GDP is in upwards trend, still the investments in FDIs and R&D is still positive but declining. Having the population growth declining, it is reasonable to have a decline in the primary school enrolment. However, it is obvious that there is an increase in the tertiary school enrolment ratio. But, with a declining trend of the population growth and a decline in the primary school enrolment, this number will decline through years. Also, it is vital to state that even though the percentage of FDIs is positive still the country has high unemployment rate, of around 30 % for the analyzed period.

For Slovenia, it is the opposite case, Table 2. The investments in R&D are increasing over time, as well as the enrolment in the tertiary school. Unlike in the case of Macedonia, in which there is no available data for unemployment rate of graduate students, in Slovenia the percentage is high.

In the case of Serbia it is obvious that there is a negative population growth percentage, Table 3. However, the school enrolment in both primary and tertiary has increased over time. The investments in R&D are also increasing over time. There is no availability of data for the unemployment rate of the graduate students enrolled in the tertiary schools.

On the other side, the case of Bulgaria is very similar to Slovenia, Table 4. Both countries as EU member countries, as following the regulative postulates that the countries have to have institutional developments, in our case, have to have investments in the R&D sector, and tend to invest in education.

In Table 5, statistical representation of Human Development Index (HDI) for the four countries of interest is presented. Besides that, information is given of the proxy level of how high or low the Human Development is for one country.

Except for Slovenia which according to the data in the above table is considered as to have very high human development, the other three countries Bulgaria, Serbia and Macedonia are considered as to have high human development. The most development through time has Bulgaria, since the 1980s, when the country has medium human development, in the 1990s it reached a point in which now it is considered as to have high development. However, for Slovenia, Serbia and Macedonia the data from the 1980s is missing.

Considering what was stated in the introductory part, given the fact that the HDI is composed of life expectancy, education and income per capita, it can also be connected to the level of institutional development. Thus, the same conclusion can be drawn as from the previous analysis, Slovenia shows the highest level of institutional development given the data analyzed.

Table 1. Macedonia. Source: World Bank Database.

Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Variable														
GDP growth (annual %)	4.54914	-3.0672	1.494	2.2222	4.6744	4.7234	5.137	6.473	5.472	-0.3586	3.3588	2.34	-0.4562	2.666
Population growth (annual %)	0.86341	0.62999	0.4514	0.3092	0.2334	0.2067	0.1796	0.135	0.102	0.0852	0.0789	0.08	0.0801	0.075
Foreign direct investment, net inflows (% of GDP)	5.70011	12.0532	2.6273	2.3808	5.6844	2.3221	6.2299	8.798	6.173	2.7605	3.2044	4.84	3.4128	3.84
School enrollment, primary (% gross)	95.6998	93.4475	92.643	91.289	91.898	93.416	93.542	93.9	90.13	90.202	90.091	/	89.254	/
School enrollment, tertiary (% gross)	22.6325	24.5213	26.994	27.444	28.024	29.63	28.986	34.79	39.11	38.983	37.075	/	38.458	/
Unemployment, total (% of total labor force) (national estimate)	32.2	30.5	31.9	36.7	37.2	37.3	36.025	34.93	33.76	32.179	32.02	31.38	31.016	29
Unemployment with tertiary education (% of total unemployment)	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Employment in industry (% of total employment)	/	/	33.3	33.9	32.8	32.3	32.6	31.3	31.3	/	/	30	29.9	/
Research and development expenditure (% of GDP)	0.44059	0.31635	0.2593	0.2191	0.2395	0.2386	0.2027	0.175	0.225	0.1987	0.2179	/	/	/

Table 2. Slovenia. Source: World Bank Database.

Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Variable														
GDP growth (annual %)	4.15549	2.94951	3.83613	2.84241	4.3517	4.003	5.6561	6.9415	3.3	-7.797	1.2218	0.613	-2.64	-0.998
Population growth (annual %)	0.29607	0.1575	0.12392	0.0603	0.0641	0.1732	0.3191	0.5592	0.158	0.9039	0.4361	0.208	0.21	0.1357
Foreign direct investment, net inflows (% of GDP)	0.66758	2.41145	7.04264	1.01524	2.4119	2.6709	1.7611	3.8836	1.987	-0.7	0.635	1.728	0.0778	0.1771
School enrollment, primary (% gross)	96.7904	100.43	104.109	109.204	120.4	98.784	100.06	96.781	97.31	97.912	98.218	98.45	98.93	98.784
School enrollment, tertiary (% gross)	55.1109	60.3339	66.3009	69.1475	72.681	79.708	83.14	84.905	85.55	86.119	88.468	85.09	86.025	84.41
Unemployment, total (% of total labor force) (national estimate)	6.9	5.7	6.3	6.7	6.3	6.5	6	4.8	4.4	5.9	7.2	8.2	8.8	10.1
Unemployment with tertiary education (% of total unemployment)	4.3	5.2	3.5	6.3	8.2	8.6	11.5	14.6	16.3	/	/	/	/	/
Employment in industry (% of total employment)	37.4	38.1	38.6	36.9	35.9	37.2	35	34.2	35	33	32.5	31.5	30.8	/
Research and development expenditure (% of GDP)	1.38087	1.49473	1.46527	1.26862	1.3936	1.4371	1.5581	1.4481	1.655	1.8603	2.1062	2.474	2.7995	/

Table 3. Serbia. Source: World Bank Database.

Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Variable														
GDP growth (annual %)	6.0383	3.7989	4.4802	5.357	6.5597	5.9553	6.4704	6.9074	5.7547	-5.012	0.6553	1.982	0.4922	1.0659
Population growth (annual %)	-0.4939	-1.852	-1.911	-0.572	-0.543	-0.532	-0.53		-0.7019	-0.644	-0.658	-0.641	-0.579	-0.56
Foreign direct investment, net inflows (% of GDP)	7.4999	5.6834	5.5354	9.937	10.271	13.987	23.401	31.797	19.312	7.7683	3.8353	3.8093	3.0011	3.4649
School enrollment, primary (% gross)	104.32	105.8	104.98	105.9	105.12	101.21	98.656	100.42	101.53	102.74	103.2	100.93	99.528	99.245
School enrollment, tertiary (% gross)	44.491	43.018	40.864	41.52	41.938	44.272	45.82	49.535	51.351	54.1	57.993	59.625	62.696	66.495
Unemployment, total (% of total labor force) (national estimate)	16.218	19.921	18.11	13.73	12.037	10.083	8.9507	6.8777	5.6095	6.8166	10.234	11.26	12.27	12.941
Unemployment with tertiary education (% of total unemployment)	8.4	10.3	10.3	11.9	11.4	10.3	10.7	8.6	10.1					
Employment in industry (% of total employment)	32.7	32.7	32.6	32.1	32.9	34.2	34.5	35.5	36.4	35.2	33.3	31.5	31.3	
Research and development expenditure (% of GDP)	0.5083	0.4572	0.4771	0.483	0.4872	0.4576	0.4577	0.4537	0.4702	0.5285	0.5979	0.5704	0.6392	

Table 4. Bulgaria. Source: World Bank Database.

Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Variable														
GDP growth (annual %)	7,7592	4,99271	7,1158	4,4154	9,0465	5,54	4,9043	5,8888	5,3667	-3,116	0,5845	1,401	-1,015	2,5717
Population growth (annual %)	-0,3195	-0,1719	-0,0453	-0,2595	-0,233	-0,3	-0,393	-0,4055	-0,4257	-0,401	-0,402	-0,789	-0,485	-0,4866
Foreign direct investment, net inflows (% of GDP)	0,7933	1,44682	3,5201	6,6354	4,1352	7,812	16,231	8,5181	6,0829	4,5419	3,3963	5,812	2,9104	4,3373
School enrollment, primary (% gross)	103,59	102,521	102,12	101,07	101,55	102,7	101,84	101,06	100,63	97,686	95,896	94,88	92,962	100,9
School enrollment, tertiary (% gross)	/	37,7619	35,664	39,613	40,934	44,21	46,82	47,993	48,665	49,85	49,083	50,37	52,377	56,381
Unemployment, total (% of total labor force) (national estimate)	/	/	/	/	18,5	20,8	20,8	18,1	13,6	16,6	19,2	23	23,9	22,12
Unemployment with tertiary education (% of total unemployment)	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Employment in industry (% of total employment)	/	/	/	/	26,9	27,6	29,3	29,5	26,2	25,1	26	26,8	26,5	/
Research and development expenditure (% of GDP)	0,9656	0,34591	0,7252	0,5651	0,32	0,434	0,4889	0,3624	0,3848	0,9171	0,7921	0,777	0,9868	/

Table 5. Human Development Index. Source: United Nations Development Programme.

HDI Rank	Country	1980	1985	1990	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
..	Very high human development	0.757	0.775	0.798	0.849	0.870	0.874	0.877	0.879	0.880	0.885	0.887	0.889	0.890
..	High human development	0.534	0.552	0.593	0.643	0.682	0.691	0.701	0.710	0.715	0.723	0.729	0.733	0.735
..	Medium human development	0.420	0.448	0.474	0.528	0.565	0.573	0.580	0.587	0.593	0.601	0.609	0.612	0.614
..	Low human development	0.345	0.365	0.367	0.403	0.444	0.456	0.465	0.471	0.478	0.479	0.486	0.490	0.493
25	Slovenia	..	..	0.769	0.821	0.855	0.861	0.865	0.871	0.875	0.873	0.874	0.874	0.874
58	Bulgaria	0.658	0.679	0.696	0.714	0.749	0.753	0.759	0.766	0.767	0.773	0.774	0.776	0.777
77	Serbia	..	..	0.726	0.713	0.732	0.735	0.739	0.743	0.742	0.743	0.744	0.743	0.745
84	Macedonia	..	..	..	..	0.699	0.705	0.708	0.724	0.725	0.728	0.730	0.730	0.732

DISCUSSION

From the results of this study we can state that the higher the institutional development higher the prospects for economic growth. The countries that are EU members are more institutionalized, have lower unemployment rate, higher investments in the R&D but lower FDIs. They seem to manage to follow their created industrial policies, unlike the case of non EU countries, Macedonia and Serbia. The study has several limitations. First, for the case of Macedonia and Serbia we have missing data, from the separate analyzes. In the analyzes of the Human Development Index, most data is provided for Bulgaria, so the level of development could be observed in a more clear way. Moreover, the study should be based on analyzing more factors, not the selected ones, in order to depict the total degree of institutional development. The selected countries are not very transparent in their data.

CONCLUSION

Having clearly defined rules and regulations, meaning having institutionalized societies, the country can experience prospects for future economic growth. The human capital can have an impact on economic growth only if there is a creation of new job vacancies and higher absorbtion power for employment. If that is not the case, the country could experience tendentions towards Brain-gain and Brain-drain. Considering the last statement, it could be concluded that by having high enrolment rate in the graduate schools, and having high investments in the R&D and higher degree of attraction of FDIs, the country can experience high economic growth, if the institutions are developed, ceteris paribus. The prospects for further research might include the issue of Brain gain or Brain drain, since it is the usual occurrence in the developing countries. In the case of Macedonia and Serbia as non EU members countries, it could be easily measured the mobility of citizens that emigrated in order to gain better education and experience in the Western countries.

REMARKS

[1]We refer to the Solow model developed in 1953.
[2]We refer to the model developed by Arrow and Romer 1986.
[3]We refer to the model developed by Lucas 1988 – the first three quotations are not in the reference list.

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