

Higher Education as a Means of Achieving Economic Growth and Development – A Comparative Analysis of Selected EU and Former Soviet Union Countries¹

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ABSTRACT

In the last twenty years, higher education policies have become increasingly important national priorities in both the developed and the developing countries. According to the endogenous growth theory, higher education and thereby accumulation of human capital is considered to be the main driver of economic competitiveness in the growing global economy founded on knowledge. Thus, as education is undoubtedly one of the main drivers of economic growth and development, an increase in the real expenditures for education is found in many countries. All this is especially evident in times of rapid technological changes. The interest of this paper is to show the relationship between GDP and public spending on education by applying the method of panel data analysis on the selected EU Member States and former Soviet Union Countries for the period 2000–2011. The results of the analysis showed that public expenditure for education, as well the size of the tertiary educated workforce and the number of researchers have a positive impact on GDP growth.

Key words: economic growth and development, expenditures for education, panel data analysis

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1 Introduction

The interrelation of education and economic growth is one of the central questions of economic analysis. Modern economists such as Krueger and

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Lindahl (2001), Bassanini & Scarpetta (2002) and Barro & Sala-i-Martin (1995) are trying to develop an empirical confirmation of the causation between education and economic growth, given the fact that education has great economic value and leads to the formation of human capital, which is one of the factors of economic growth. In addition, recently much attention has been paid to improving the quality of human life, and education represents one of the factors which contribute to its increase and which reduce income inequality. The contemporary studies such as Schultz (1963), Knight & Sabot (1983), Chenery & Syrquin (1975) on economic inequality and poverty increasingly emphasize that their key sources lie in the area of tax policy, labor market and employment policy, and in particular, achieved level of education. It is believed that the future trends concerning inequality and poverty i.e. the possibility of their decrease greatly depend on reducing the differences in the accessibility to education to all income categories of the population (Karaman Aksentijević, Denona Bogović, & Ježić, 2012, p. 144). Education is a process of learning in which one comes to know various facts, ideas and theories while on other hand knowledge is the application of these skills and is gained through experience and education. In contrast to capital and labor, education i.e. knowledge as its consequence is cumulative and as such suitable for explaining long-term economic growth and development. World industries that have high growth rates and expect this trend to continue are founded on knowledge and the human intellectual force. Some of these industries are: aerospace and pharmaceutical industries, communications services, financial services and business services, (including computer software development). Theoretically, they can be located in any country of the world if the country meets the most demanding requirement, that of possessing intellectual capital. Therefore, there is a subdivision of countries: those with an educated workforce and those with an uneducated workforce. Also, countries can be divided according to differences in the amount of wages received by workers with similar characteristics (same age, gender, level of education, the same years of working experience, etc.).

The aim of this paper is to explore empirically, using panel data analysis, the impact of public spending for education on GDP growth in EU-13 Member States and selected former Soviet Union Countries. Countries included in this analysis are listed in Table 1.

The economic literature which analyzes the impact of education on economic growth largely involves developed countries (OECD countries or EU Member states) and to a lesser extent only the Central and East European (CEE) countries (Bassanini et al., 2000; Bassanini & Scarpetta, 2001, 2002; Guellec & van Pottelsberghe de la Potterie, 2001; Vinod & Kaushik, 2007). Also, for former Soviet Union countries such research is lacking. Considering that, this paper aims to contribute to economic literature through the study of the impact of education on economic growth in a different group of countries (EU-13

Table 1: List of the countries included in the analysis

Armenia	Lithuania
Bulgaria	Latvia
Belarus	Moldova
Cyprus	Malta
Czech Republic	Poland
Estonia	Romania
Georgia	Russia
Croatia	Slovak Republic
Hungary	Slovenia
Kyrgyz Republic	Ukraine

Member States and selected former Soviet Union countries). The former socialist countries of CEE and the Soviet Union share some common characteristics such as the shared socialist past and significance of the political, economic, and social transformation since the collapse of socialism in 1989. Also, these countries share several educational characteristics, as reflected in a number of educational legacies inherited from the socialist regime and aspiration to embrace Western educational values. Among the positive socialist legacies are solid infrastructures for educational provision and administration, education without charge for all children, nearly universal general education enrolments, and high literacy rates.

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The purpose of this paper is to prove that public spending for education, as well as other variables included in the model (the number of tertiary educated in the total population and the number of researchers) have a positive impact on economic growth in the analyzed countries.

The rest of the paper is organized as follows. Section 2 reviews a theoretical background and literature review linking human capital, public expenditure and economic growth. Section 3 describes the data and methodology and presents the empirical results. Section 4 concludes.

2 Theoretical Background

A major part of economic literature (Fox & Smeets, 2011; Lazear, 2000; Ichniowski & Shaw, 2003) analyzing the importance of the human factor in production uses the terms *human resources* and *human capital* interchangeably. However, a distinction between these two terms should be made.

The term *human resources*, at company level, implies the overall psychophysical ability available to the company which can be used to achieve business goals (Karaman Aksentijević, Denona Bogović & Ježić, 2012, p. 8; according to Bahtijarević Šiber, 1999) while at national level, *human resources* can be defined as the total psychophysical energy possessed by the inhabitants of a country i. e. the energy a society can dispose of and use to achieve its development goals (Karaman Aksentijević, Denona Bogović & Ježić, 2012, p. 9). Human resources can also be defined as total knowledge, skills, abilities, creative capabilities, motivation and loyalty which are at the disposal to an organization. This is a total intellectual and psychic energy that organizations can engage in achieving the objectives and business development (Grbac, 2010). The term *human capital* implies the value of investment in the people through education and health care, but also, through all other activities that contribute to human development. This is the value that is invested in people (employees), primarily through education and health care, with the aim of creating knowledge, skills and professional capacities (according to Karaman Aksentijević, Denona Bogović, & Ježić, 2012, p. 7). In recent years, the Nobel Laureate, economist Theodore Schultz, has contributed to the measurement of human capital. His calculations were based on the accumulation of investment into quality components i.e. their improvement (through education, professional training and health care). However, he also entered into these calculations the lost earnings of people who pursued education, as well as other losses such as, those which occur due to death (Karaman Aksentijević, Denona Bogović, & Ježić, 2012, p. 7; according to Schultz, 1985).

Human capital is formed within a formal, non-formal and informal education system. The informal system includes family upbringing, self-education and self-learning, unintentional-convenient learning, learning from the media, and is achieved through increased accessibility to books, magazines, newspapers, films and the like. Non-formal education includes education for personal

development, language learning, computer courses for personal use, training for social roles - civil and political education – that which is often referred to as complementary education in terms of being complementary to the contents provided by formal and informal education. However, it is the formal education system that plays the most important role in the creation of human capital. It includes pre-school education, compulsory primary education, secondary education, higher education, lifelong learning programs and adult education i.e. education after which the participant receives a recognized degree of education (Babić, 2005, p. 31). Recently, the acquisition of knowledge and skills is growing beyond the traditional institutions of formal education and training. At the same time formal education and training are increasingly using approaches such as learning based on problem solving, mentoring, team work, workshops, case studies and other forms of learning, which are mainly based on learning through experience, both foreign and own (Tomažević, 2007, p. 76). Given all of the above, it can be concluded that human capital is a broader concept than mere education and is one of the driving forces in the creation of sustainable economic growth and development per capita.

There are many works that explore the role of human capital, education and public policy. The first works on this subject are that of Uzawa (1965) and Lucas (1988). In these models, the individual decides on how much of his/her time is intended for production and how much for creation of human capital. In his work on endogenous growth, Lucas (1988) argues that investment in education increases the level of human capital, which then increases the amount of resources within the economy, and thus the national product, and therefore, according to Lucas, the expenditure for education can be seen as a major source of long-term economic growth. Due to the imperfections on the credit market (Lazear, 1980; Jacoby & Skoufias, 1997), the fact that individuals are not certain that in the future they will benefit from additional education and the externalities of human capital, private agents have only limited incentives and do not have enough funds to finance their education. For this reason, education financed by the public sector can reduce or internalise externalities in the process of accumulating human capital. Any change in the provision of educational services by the government, driven by short-term changes in the fiscal policy, will change the process of accumulation of human capital, and thus long-term economic growth.

Earlier works on the influence of education on economic growth used the production function in their analysis in which education (together with technological progress), as a segment contributing to economic growth, was treated as a residual i.e. as an unexplained segment of the production function (Solow, 1957; Svenilsson, 1964; Denison, 1962). According to them, human capital, and especially education, accounts for a significant share in the residual i. e. something that is exogenously determined. However, in 1980, the endogenous growth theories began to evolve and stressed the role of human capital as an endogenous part of the production function. In his work, Rebelo

(1991) expanded the assumption on the impact of human capital on growth by introducing physical capital (e. g. buildings, production and commercial space, machinery and equipment) as an additional input into the process of creating human capital. However, none of these assumptions or models allow for the impact of public spending in the formation of human capital. The works that do take into account the fact that the public sector can stimulate the formation of human capital by investing public funds into education are Glomm & Ravikumar (1992); Ni & Wang (1994); Beauchemin (2001); Blankenau & Simpson (2004). In these works, the accumulation of human capital is the result of joint investments made by the private and public sectors (Glomm & Ravikumar, 1992; Blankenau & Simpson, 2004) or the result of the investment made solely by the public sector (Ni & Wang, 1994; Beauchemin; 2001). Also, as explained above, the accumulation of human capital may occur as a result of investment by the private sector or individuals in the form of non-formal and informal education. In their work, Krueger and Lindahl (2001) indicated that a change in education is positively correlated with economic growth and development. Furthermore, Levine and Renelt (1992) concluded that human capital, measured by the rate of involvement in secondary education, is a very important variable in the growth regression, and that the existence of endogenous growth models containing human capital as a driver of growth is justified.

Based on the studies related to the impact of education on economic growth, in this paper we will expose the model evaluating the impact of public expenditure for education, the number of highly educated workforce in the total population and the number of researchers on the GDP per capita growth.

3 Education as a Determinant of Economic Growth and Development

After opening their markets to global competition many developing countries began building the necessary educational infrastructure, thus raising the question on how much should be invested into human capital. In their works aimed at proving the significance of human capital, Bassanini et al. (2000) and Bassanini & Scarpetta (2001; 2002) used data from OECD member countries. Mamuneas et al. (2006) also found a positive impact of human capital on economic growth in a group of high, medium and low income countries. The results reached by Vinod & Kaushik (2007) in their work analyzing South American, Asian and African countries are consistent with the trends towards increased expenditure for education as recommended by the World Bank, international agencies and the developing countries. In the observed countries, which are also OECD members, the share of highly educated in the overall population is at least 10 %. Moreover, according to the Vinod & Kaushik (2007), in most countries, an increase of 1 % in the literacy rate increases growth by 1,2 % to 4,7 %.

Most of the literature confirms, theoretically and empirically, that education has an important impact on economic growth and development. Education can have a positive impact on the growth rate by means of a variety of mechanisms, including also increase in productivity, literacy (Schultz, 1963), spillover effects from the average level of education in the community (Lucas, 1988) or managers (Chatterji, 1998), by learning how to learn (Phelps, 1995), facilitating the use of new technologies (Nelson & Phelps, 1966), creating new technologies and spillover effects of new knowledge (Nelson & Phelps, 1966; Romer, 1986, 1990), reducing fertility rates (Barro, 1991) and reducing income inequality (Barro, 2000). The synthesis of all these studies is highlighted in the report prepared by the OECD. According to this report, higher education contributes to the social and economic development through four main segments (OECD, 2008):

- creation of human capital by learning,
- development of a knowledge base by researching and developing knowledge,
- dissemination and use of knowledge by interacting with knowledge customers and
- maintenance of knowledge by intergenerational storage and transferring of knowledge.

With such far-reaching mechanisms, it seems unlikely that this knowledge has been acquired within the same levels of education. While primary education may be sufficient for the basic production of goods and services, secondary may be sufficient for applying the technology at one's workplace, higher education is necessary in order for new technologies to be developed. Each level of education raises labor productivity, however, the higher the level the higher the need for resources (Schultz, 1963, p. 43).

In accordance with the findings that various levels of education are causing a different level of productivity, and hence various levels of economic growth, in this paper will be proved that higher education (represented by the number of highly educated workforce in the total population and the number of researchers who are particularly significant in the development of new sophisticated technology, research and development as well as in process of developing patents) has a positive impact on economic growth.

3.1 Expenditures for Education in Selected EU – 13 Member States and Former Soviet Union Countries

According to Sošić (2003) the increasingly rapid technological development has led to an increase in premiums for education in developed economies, while, developing countries demonstrate a convergence of the payment structure towards those in developed economies. This means that in the less developed countries, the structure of wages, during the period of

transition from a planned to a market economy, has adapted to wage structures existing in developed economies regardless that there were many factors that impede that adjustment. Some of the factors are inherited structure of collective negotiation, wages in the public sector or a lower valuation of highly educated workers (Šošić, 2003). The need for increased investments in human capital is particularly important for the developing countries since such investments speed up the restructuring of the economy, increase employment, reduce poverty and solve problems of social exclusion (Sošić, 2003, p. 439). As a result, more and more experts (Possen, 1975; Barro, 1989; Barro, 1991; Devarajan et al., 1996; Kneller et al., 1999) direct their attention to investment in human capital, particularly to the financial significance of investments into education (the share of public and private expenditure for education in GDP). The increased interest of experts results from the fact that in the last two decades, investment into human capital (i. e. education) has imposed itself as one of the priorities of the economic policy as evidenced by a number of strategies and guidelines that have been adopted including the Lisbon Strategy for Growth and Jobs (European Commission, 2005) the European Employment Strategy (European Commission, 2003), the Jobs Strategy (OECD, 1996).

In most countries around the world, the public sector plays a prominent role in the financing of education, especially in primary and secondary education (Sopek, 2011). While the economic theory assigns the key role in growth to expenditures for education, the empirical support in terms of this relation is different. In almost every model in which growth is driven by expenditures for education, different relationships between spending and growth may occur. For example, expenditures for education can increase growth, while imposition of taxes to finance those expenditures may reduce it, leaving the net effect unclear. Therefore, according to the endogenous economic theory in order for the effects of the expenditures for education on economic growth to be clear, the effects of the introduction of taxes should also be considered, which has not often been the case in empirical research.

Besides the mentioned variables, economic growth can be influenced by other variables such as trade openness, accumulation of physical capital, expenditures for research and development, rate of inflation or public expenditures. Given that the main goal of this paper is to analyze the impact of public expenditure for education to economic growth, the model presented in this paper includes only variables that are closely related to education (public spending on education, number of tertiary graduates and number of researchers). Blankenau, Simpson and Tomljanovich (2007) placed the relationship between expenditures for education, taxes and economic growth in the focus of their analysis. In their analysis, they assess the equation deriving from theoretical models in which expenditure for education is an essential factor in economic growth. The key novelty in their regression is that they took into account the taxes paid to support education. They used the panel data for 23 developed

countries from 1960 to 2000 and found a positive correlation between expenditures for education and long-term growth only in cases when rules of budgetary constraints were followed. The studies which do not take the mode of financing as a control variable, underestimate the role of expenditures for education (Mendoza et al., 1997). In addition to studies that find positive correlation among these variables, there are some which indicate the presence of reverse causality between investment in human capital and economic growth (Nelson & Phelps, 1966; Benhabib & Spiegel, 1994). Therefore, the developing countries need to increase the share of human capital by funding it through various sources such as their own savings, different types of support received from bilateral and multilateral sources of financing such as European Community Action Scheme for the Mobility of University Students (ERASMUS AND ERASMUS+), Horizon 2020, Central European Exchange Program for University Studies (CEEPUS) as well as from private sources.

In the early 1990s i. e. the beginning of transition in these countries, political control over wages was abolished and the wage structure rapidly converged to the structures present in the markets of the developed countries (Rutkowski, 1996). Most underdeveloped countries invest noticeably more funds into higher education in relation to primary and secondary, while this ratio is lower in developed countries (Rutkowski, 1996). Generally, insufficient resources for primary and secondary education affect all individuals within the society, as well as the decrease in production and the increase in inequality, where, on the other hand, excessive resources result in excessive tax burden which reduces the well-being of all individuals in society (Welsch, 2009).

Data used in this paper are annual data covering the period from 2000 to 2011 for 20 countries (EU-13 Member States and seven selected former Soviet Union countries (Armenia, Belarus, Georgia, Kyrgyz Republic, Republic of Moldova, Russia and Ukraine). The reason why in the analysis all former Soviet Union countries are not included is the lack of data. Considering that the analyzed countries, as previously mentioned in this paper, share some common characteristics, the panel data analysis was performed on all twenty countries together. Of course, there is the possibility that the analysis would be done separately (EU-13 Member States as one group and the former Soviet Union countries as other group). However, given that the data for the former Soviet Union countries is available only for seven countries, the panel data analysis only for this group of countries is not possible.

Variables included in the model are Gross Domestic Product (GDP) per capita, public spending on education as a percentage of GDP, share of tertiary graduates in total population and number of researchers. The data was extracted from the World Bank (World Development Indicators) and from UNESCO Institute for Statistics (Education and Science, Technology and Innovation Statistics).

The most widely used method of panel regression analysis when it comes to utilization of short panels with high probability of correlated time-invariant component of the error term is fixed panel regression.

The general form of the panel regression model used in this paper is as follows:

$$y_{it} = x_{it}\beta + a_i + u_{it}; \text{ for } t = 1, \dots, T \text{ and } i = 1, \dots, N$$

Where y_{it} denotes dependent variable, x_{it} regressors, a_i individual-specific effects and u_{it} is an idiosyncratic error.

The results of the empirical estimation are presented at the Table 2.

The full model results show the positive effect on economic growth of public spending on education, percentage of tertiary graduates and number of researchers. Percentage of tertiary graduates in total population has the greatest impact on economic growth in the analyzed countries, while the public expenditure on education has the smallest impact. A more educated workforce is more mobile and adaptable, can use a wider range of technologies and sophisticated equipment (including newly emerging ones), can learn new tasks and new skills more easily and is more creative. This is particularly evident and is associated with a number of researchers, scientists and engineers whose number also shows a positive impact on economic growth. All of these attributes make a more educated workforce more productive (compared to a less educated one) and enable employers to organize their work places differently and adjust better to changes necessitated by competition and technical advances or by changes in consumer demand. It can be concluded that countries that increase the level of education of their workforce obtain greater productivity and through the impact on income, employment and poverty levels faster economic growth.

However, there are several econometric issues that require caution when interpreting the results. The first one is that there is an autoregressive effect of GDP on public spending on education. Growth of GDP in current year raises education spending in the following year. This leads to overestimation of regressors effect on economic growth. Secondly, the regressors in the model are actually connected through the structural relationship. More specifically, increase of public spending on education increases the number of tertiary graduates in total population. In addition, the more tertiary graduates in total population, the more researchers per million of inhabitants are there. Finally, more researchers cause a rise of GDP per capita through the well known process of rising productivity. This structural relation is presented by regressing variable tertiary graduates in total population with public spending on education (second column) and researchers per million of inhabitants with the percentage of tertiary graduates in total population (third column). In both cases independent variables exert positive and significant effects on dependent variables.

Table 2: Panel fixed effects estimation results for model

Dependent variable	GDP per capita	Tertiary graduates in total population (%)	Researchers per million of inhabitants
Constant	2,089493 (1,56)	0,26*** (2,37)	7,356451*** (228,84)
Public spending on education (% of GDP)	0,12*** (3,11)	0,12*** (5,10)	
Tertiary graduates in total population (%)	1,61*** (12,89)		0,3680668*** (9,86)
Researchers per million of inhabitants	0,59*** (3,30)		
R2	0,72	0,13	0,35
F-test	136,92***	25,98***	97,14***

Source: Authors calculation

3.2 The impact of the highly educated population on economic growth and development

In addition to the role of public expenditures for education in economic growth and development, some empirical studies explain a positive impact of public expenditures on economic growth by technological progress or by the growth of total factor productivity. Total factor productivity is the measure of the efficiency of all inputs to a production process. Increases in total factor productivity result usually from technological innovations or improvements. According to Jorgenson & Stiroh (2000), Abdih & Joutz (2005), Guellec & van Pottelsberghe de la Potterie (2001) and Ulku (2004) the total factor productivity is a function of human capital quality or level of education. The quality of human capital or a higher level of education of the workforce, especially in the field of science and technology, leads to greater innovation capacity, accelerated acquiring of knowledge needed to implement new and sophisticated technologies, and attraction of investment into physical capital, all of which have a positive impact on economic growth and development but to varying degrees, depending on the structure of the highly educated in each country. Differences in management “account” for around 40 per cent of the difference in productivity between branches within the same line of business service (Griffith et al., 2006, in Conrad, 2013). There is a clear correlation between employee engagement and high organisational productivity (Rayton et al., 2012 in Conrad, 2013). Value-based (rather than volume-based) fees for service seem to improve productivity for both service operations and strategy (Conrad, 2013).

The microeconomic evidence speaks in favor of educational accomplishments (expressed as the number of years of education). In his work, Mincer (1974) assessed the log-linear relation between the years of education and annual income. Recent studies show that an additional year of education increases

income at individual level by about 6,5 % in the EU and this relation gets stronger in times of rapid technological progress. This is founded on the report prepared by de la Fuente & Ciccone (2003).

A similar situation exists also in the EU-13 Member States as well as in the former the Soviet Union countries. For instance, in Slovakia workers with only a primary education earn 450 EUR per month on average, while the workers with tertiary education earn more than 1200 EUR per month. In the Czech Republic the tertiary educated people have on average 60 % higher wages as primary educated people (Kahanec, 2012).

Studies, including those of Mankiw, Romer & Weil (1992) and Barro & Sala-i-Martin (1995) found a significant positive correlation between countries that varied in the early stages of education and subsequent rates of economic growth. Numerous empirical studies on the impact of human capital on economic growth and development take human capital as an independent variable presented by the average number of completed years of secondary, associate and higher education. Such an approach exists in the work of Barro (2001) where research was conducted based on data for 100 countries that had different levels of economic growth for three decades: 1965–1975, 1975–1985 and 1985–1995. The growth rate of real GDP per capita was taken as the dependent variable, and human capital was defined as the percentage of the male working population above 25 years of age who had completed secondary and tertiary education. The research results showed that an additional year of schooling increases the rate of economic growth by about 0.44 % per year. Moreover, the research by Bebczuk (2002) showed that countries with a higher share of highly educated (tertiary education) have a tendency to have more scientists and engineers which requires a greater level of investment in R&D. Consequently, *ceteris paribus*, these countries should achieve higher GDP growth rates.

Gaining and dissemination of knowledge is very characteristic for both the former Soviet Union countries and for EU-13 countries. The key lessons drawn from theoretical and empirical contribution of this paper is that there is a structural relationship of higher education spending on economic growth. The increased spending on education leads to higher share of highly educated population and consequently more researchers which raise the production possibility frontier of particular society. Economic, socio-cultural and political environments in the analyzed countries, neoliberal reforms brought in by the West and globalization have shaped the path each country chose or had to follow in the last twenty years. The transformations in educational systems in many ways were similar: reforms of admissions to higher educational institutions, introduction of Bologna process, establishment of private higher education institutions and shrinking of the free higher education. The countries also faced cuts in public funding and massification (i. e. the move from a system where only elite could enter higher education system to one that every member of society might enter) of higher education participation.

In most of the countries, establishment of the private sector of higher education contributed to quantitative growth of higher educational institutions. New educational institutions, whose number has doubled in the last twenty years, have contributed to increasing the quality of the education system as well as the growing number of highly educated people.

Regardless of the already mentioned implemented reforms in the education system, the analyzed countries show weaker economic performance in relation to the old EU member (EU-15)² or OECD countries. Removing the corruption, which is a major problem in the education system, particularly in the former Soviet Union countries, harmonization between the educational system and the actual requirements of the labor market and increasing the quality and number of academic professors in order to continue with the establishment of private universities are necessary prerequisites for education to have an even greater positive impact on economic growth.

4 Conclusion

Economic growth and development require an increase in worker productivity over time. This is achieved through the innovation of the manufacturing techniques and products, increase in the capacities to apply the existing and new technology and as such contribute to the increase in the total factor productivity. Changes in production technologies as well as in the structure of the economy represent the challenges and opportunities that require higher levels of knowledge and skills of the workforce. Higher education plays a key role in this process, especially in the creation and application of new knowledge and techniques resulting in the increase in productivity. Even in developed economies, increased productivity implies the implementation of better and new methods of production by means of innovation, acquisition or imitation of existing technologies. For this reason, low-income countries must constantly strive to keep up and align with the technologically advanced countries or trying to improve the application of foreign technologies. That is crucial for low – income countries because they already have exploited the comparative advantages of low wages, but not the benefits of improved skills and knowledge. The workforce in these countries must obtain the necessary level of education that will provide them with the ability to follow up on and to adopt the existing technologies or innovations in order to become competitive in world markets, and thus keep up with the development in the developed countries reducing the income gap. Therefore, in both the developed and developing countries, there is a need for increasing the financial resources allocated to education and the role of the public sector. The common motivation lies in the fact that public expenditures for education are vital for sustainable economic growth.

² Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Also, in recent years, there are an increasing number of private universities in all countries. Like public universities, private universities are playing a vital role in the educational system of the country and such institutions revitalized the higher education system due to the importance attached to the quality of graduates and programme offerings. Also, private universities provide good avenues to complement the public tertiary institutions to absorb the huge number of pre-tertiary students as well as adult learners who are unable to gain access to the public schools. One of the problems that occur in private universities is the price of education, which in most cases is very high. It prevents the access to higher education to poorer individuals. Because of this, education should still largely be made public and available to everyone.

The results in this paper show the positive effect on economic growth (GDP per capita) of public spending on education, percentage of tertiary graduates and number of researchers.

However, when interpreting the results, we should take into account several econometric limitations such as autoregressive effect of GDP on public spending on education and structural relationship of the regressors. Structural relation is presented by regressing variable tertiary graduates in total population with public spending on education and researchers per million of inhabitants with the percentage of tertiary graduates in total population. In both cases independent variables exert positive and significant effect on dependent variables.

In this paper, we have made a progress on identifying the effect of public expenditures for education, number of tertiary graduates in total population and researchers per million of inhabitants on GDP growth for 20 countries (EU-13 Member States and selected former Soviet Union countries). Results of the study indicate that in future studies, in order to evaluate the impact of variables associated with education on economic growth, should take into account the number of individuals involved in primary and secondary education, the structure of the working age population and the number of private universities.

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POVZETEK

1.02 Pregledni znanstveni članek

Visokošolsko izobraževanje kot sredstvo za doseganje gospodarske rasti in razvoja – Primerjalna analiza izbranih držav Evropske Unije in držav nekdanje Sovjetske zveze

Ključne besede: gospodarska rast in razvoj, izdatki za izobraževanje, analiza panelnih podatkov

V zadnjih dvajsetih letih so politike visokošolskega izobraževanja postajale vedno bolj pomembne v nacionalnih prednostnih nalogah tako razvitih držav, kot tudi držav v razvoju. V skladu z endogeno teorijo rasti se visokošolsko izobraževanje in z njim akumulirani človeški kapital šteje za glavno gonilo gospodarske konkurenčnosti v rastočem svetovnem gospodarstvu, osnovanem na znanju. Ker je torej izobrazba nedvomno eden od glavnih spodbujevalcev gospodarske rasti in razvoja, je povečevanje dejanskih izdatkov za izobraževanje mogoče zaslediti v mnogih državah.

Izobraževanje ima veliko gospodarsko vrednost in vodi do oblikovanja človeškega kapitala, ki je eden od glavnih dejavnikov gospodarske rasti. V nasprotju s kapitalom in delom, je izobrazba, tj. znanje kot njena posledica (izobraževanje je proces učenja, kjer človek spozna določena dejstva, ideje in teorije, medtem ko po drugi strani znanje, pridobljeno skozi izkušnje in izobraževanje, pomeni uporabo teh veščin v praksi), kumulativna in kot takšna primerna za razlaganje dolgoročne gospodarske rasti in razvoja. Poleg tega se v zadnjem času veliko pozornosti namenja predvsem izboljšanju kakovosti življenja ljudi, pri čemer izobrazba pomeni enega izmed dejavnikov, ki prispevajo k boljši kakovosti življenja in zmanjšanju dohodkovne neenakosti.

Izobraževanje, ki se financira iz javnega sektorja, lahko zmanjšuje ali prevzema zunanje dejavnike v procesu akumulacije človeškega kapitala. Vsak ukrep vlade glede zagotavljanja izobraževalnih storitev, ki je posledica kratkoročnih sprememb v fiskalni državni politiki, zato spreminja proces akumulacije človeškega kapitala in s tem vpliva tudi na dolgoročno gospodarsko rast. Kakovost človeškega kapitala ali visoka stopnja izobrazbe delovne sile, še zlasti na področju znanosti in tehnologije, vodi k večji zmogljivosti za inovacije, pospešenem pridobivanju znanja, potrebnega za pripravlanje nove in napredne tehnologije, in privlači naložbe v fizični kapital, kar vse pozitivno vpliva na gospodarsko rast in razvoj, vendar v različnih obsegih, odvisno od strukture visoko izobraženih ljudi v državi.

Cilj članka je s pomočjo analize panelnih podatkov empirično raziskati učinek javne porabe za izobraževanje na rast bruto domačega proizvoda v državah

Evropske Unije – v 13 državah članicah in izbranih državah nekdanje Sovjetske zveze. Podatki, uporabljeni v tem članku, vključujejo letne podatke, ki zajemajo obdobje od leta 2000 do 2011 za 20 posameznih držav (13 držav članic Evropske Unije (EU-13)) in sedem izbranih držav nekdanje Sovjetske zveze (Armenija, Belorusija, Gruzija, Kirgiška Republika, Republika Moldavija, Rusija in Ukrajina). V model so vključene naslednje spremenljivke: bruto domači proizvod (BDP) na prebivalca, javna poraba za izobraževanje kot odstotek BDP, delež diplomantov terciarnega izobraževanja v celotnem prebivalstvu in število raziskovalcev.

Potem ko so odprle svoj trg globalni konkurenci, so mnoge države v razvoju pričele graditi potrebno izobraževalno infrastrukturo in se tako srečale z vprašanjem, koliko bi morale vlagati v človeški kapital. Različne stopnje izobrazbe povzročajo različno stopnjo produktivnosti in posledično tudi različne stopnje gospodarske rasti. Glede na slednje ta članek potrjuje, da ima visokošolska izobrazba (predstavljena s številom visoko izobražene delovne sile v celotnem prebivalstvu in številom raziskovalcev, ki so še posebej pomembni pri razvoju nove napredne tehnologije, raziskav in razvoja, kot tudi v procesu razvoja patentov) pozitiven učinek na gospodarsko rast.

Rezultati modela kažejo, da imajo javna poraba za izobraževanje, odstotek diplomantov terciarnega izobraževanja in število raziskovalcev pozitivne učinke na gospodarsko rast. V analiziranih državah ima največji vpliv na gospodarsko rast odstotek diplomantov terciarnega izobraževanja v celotnem prebivalstvu, medtem ko imajo javni izdatki za izobraževanje najmanjšega. Bolj izobražena delovna sila je namreč bolj mobilna in prilagodljiva, lahko uporablja več različnih tehnologij in sodobno opremo (vključno z novo, nastajajočo opremo), se lažje nauči novih nalog in veščin in je tudi bolj ustvarjalna. To je še zlasti očitno in je tesno povezano s številom raziskovalcev, znanstvenikov in inženirjev, katerih število pozitivno vpliva na gospodarsko rast. Zaradi svojih lastnosti je bolj izobražena delovna sila tudi bolj produktivna v primerjavi z manj izobraženo delovno silo in omogoča, da delodajalci organizirajo delovna mesta drugače ter jih bolje prilagodijo spremembam, ki jih narekujejo konkurenca in tehnični napredek, oziroma spremembam v povpraševanju potrošnikov. Prav tako je mogoče sklepati, da države, ki povečujejo stopnjo izobrazbe delovne sile, dosegajo z večjo produktivnostjo in učinki na dohodek, zaposlenost in stopnjo revščine, tudi hitrejšo gospodarsko rast.

Kljub temu pa je več ekonometričnih vprašanj, ki zahtevajo previdnost pri razlagi rezultatov. Prvo vprašanje je vprašanje avtoregresivnega učinka bruto domačega proizvoda na javno porabo za izobraževanje. Rast bruto domačega proizvoda v tekočem letu namreč poveča porabo za namen izobraževanja v naslednjem letu, kar vodi do precenjenosti vpliva regresorjev na gospodarsko rast. Drugič, med regresorji v modelu dejansko obstaja strukturno razmerje. Natančneje to pomeni, da povečanje javne porabe za izobraževanje poveča število diplomantov terciarnega izobraževanja v celotnem prebivalstvu. Prav tako velja tudi dejstvo, da več kot je diplomantov terciarnega izobraževanja v

celotnem prebivalstvu, večje je tudi število raziskovalcev na milijon prebivalcev. In končno, več raziskovalcev z dobro znanim procesom povečanja produktivnosti povzroči dvig bruto domačega proizvoda na prebivalca. To strukturno razmerje je predstavljeno z regresijo spremenljivke diplomantov terciarnega izobraževanja v celotnem prebivalstvu z javno porabo za izobraževanje ter z raziskovalci na milijon prebivalcev z odstotkom diplomantov terciarnega izobraževanja v celotnem prebivalstvu. V obeh primerih neodvisne spremenljivke izražajo pozitivne in pomembne učinke na odvisne spremenljivke.

Pridobivanje in razširjanje znanja je zelo značilno tako za države nekdanje Sovjetske zveze, kot tudi za države članice EU-13. Ključno spoznanje, ki izhaja iz teoretičnega in empiričnega prispevka tega članka, je, da obstaja strukturno razmerje med porabo za visokošolsko izobraževanje in gospodarsko rastjo. Povečana poraba za izobraževanje vodi do večjega deleža visoko izobraženega prebivalstva in posledično večjega števila raziskovalcev, ki razširjajo proizvodne zmožnosti neke družbe. Ekonomska, družbeno-kulturna in politična okolja v analiziranih državah, neoliberalne reforme, ki jih je prinesel Zahod, in globalizacija, so oblikovale pot, kateri je želela slediti vsaka država oziroma ji je bila primorana slediti v zadnjih dvajsetih letih. Spremembe izobraževalnih sistemov so bile v mnogih pogledih zelo podobne: spreminjanje sprejema na visokošolske izobraževalne ustanove, uvedba bolonjskega procesa, ustanovitev zasebnih visokošolskih izobraževalnih ustanov in krčenje brezplačnega visokošolskega izobraževanja. Države so se spopadale tudi z zmanjšanjem javnega financiranja in s prehodom iz sistema, kjer je v visokošolski izobraževalni sistem lahko vstopala le elita, v sistem, v katerega je lahko vstopil prav vsak član družbe. V večini držav je vzpostavitev zasebnega sektorja za visokošolsko izobraževanje povečevala število visokošolskih izobraževalnih ustanov. Nove izobraževalne ustanove, katerih število se je v zadnjih dvajsetih letih podvojilo, so prispevale k večji kakovosti izobraževalnega sistema, kot tudi k večjemu številu visoko izobraženih ljudi.

Ne glede na omenjene izvedene reforme v izobraževalnem sistemu analizirane države v primerjavi s starimi članicami EU (EU-15) ali državami OECD kažejo manjšo gospodarsko uspešnost. Odstranitev korupcije, ki se kaže kot glavni problem v izobraževalnem sistemu, še zlasti v državah nekdanje Sovjetske zveze, usklajevanje med izobraževalnim sistemom in dejanskimi potrebami trga dela ter povečanje kakovosti in števila akademskih profesorjev, ki pripomorejo k nadaljnjemu ustanavljanju zasebnih univerz, so nujno potrebni osnovni pogoji, da bi imela izobrazba še večji pozitivni učinek na gospodarsko rast.

