Economic Alternatives, 2018, Issue 4, pp. 517-526

Economic and Social Effects of Higher Education in the European Union

Nikolay Velichkov[*]
Kristina Stefanova[**]

Summary

This paper is a comparative study of the economic and social effects of higher education and their relevant determining factors in the European Union countries. The study results show that, as is the case with many other areas, Member States differ in terms of the impact of higher education. In less developed countries (mainly CEE countries), as well as countries with a share of the population with higher education lower than the EU average, the positive effects of higher education are more pronounced.

Key words: higher education, European Union, economic effects, social effects, returns to higher education

JEL classification: I21, I23, I26, O52

Introduction

At the current level of development of European economies, the role and importance of education is undeniable. Technological developments constantly change the job requirements and the necessary workforce skills. In order to develop successfully, each country needs highly skilled labor resources with accumulated human capital. In this respect, the efforts of the EU countries are aimed at improving the workforce quality as well as increasing the share of the population with higher education, which is also one of the aims of the Europe 2020 Strategy. There are studies that show that among all objectives of the Strategy, the level of higher education has the strongest positive impact on the economic performance and competitiveness of the countries (Radulescu et al., 2018).

Higher education is above all seen as an investment in human capital that induces many positive **economic and social effects** not only for people that earn it, but also for the national economy as a whole, representing a public good that generates positive external effects.

In terms of the benefits for the individual, higher education increases the productivity of the worker which in turn contributes to an increased remuneration. It is precisely the higher income that is the basis for estimating the returns to investment in higher education. According to a Eurostat Structure of earnings survey 2014[1], the average monthly earnings of a person with secondary education in the EU-28 was 2,216 euro, while for a person with higher education it was 3,049 euro.

In addition to higher incomes, another incentive for earning a higher education degree is also the better labor market integration. According to Eurostat data for 2016[2], the average EU-28 employment rate

[*] Chief Asst Prof, University of National and World Economy, Department of Economics

[**] Chief Asst Prof, University of National and World Economy, Department of Economics

[1] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=earn_ses14_23&lang=en

[2] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_ergaed&lang=en

(population aged 15-64) among the population with secondary education was 69.9%, while among the population with higher education it was 83.4%. In 2016, the average EU-28 unemployment rate[3] (population aged 15-64) among the population with secondary education was 6.9%, while among the population with higher education it was 5.1%. Earning a higher education degree is also of particular importance for the initial integration of young people into the labour market. Youth unemployment is a serious problem for all European economies and earning a higher education degree can improve the chances of a successful career start for young people. According to Eurostat data[4] for 2016, the average EU-28 youth unemployment rate among the population with secondary education was 22%, while among the population with higher education it was 17.3%.

In addition to the economic effects and the labour market integration, earning a higher education degree may limit the risk of poverty and social exclusion for the individual and increase his/her welfare. Earning a higher education degree has positive social effects, as the share of people with higher education at risk of poverty and social exclusion is lower (11.7% on average for the EU-28 for 2015[5]) compared to the respective share for people with secondary education (22.8 % on average for the EU-28 for 2015[6]).

The impact of higher education spans across a wide range of social and economic areas. This provides the rationale for studying the impact in the EU countries without limiting the analysis only to the positive effects on the income of individuals attaining higher education traditionally used in estimating the private returns to educational investment.

It is worth pointing out that it is possible to assess the differences in the effects of higher education both in terms of individual countries as well as in terms of the fields in which the degree was earned. This study abstains from the latter and focuses on the differences between the countries. For this purpose, general data will be used for individual indicators reflecting economic and social effects, without distinguishing between different fields, professions, and higher education institutions in which the degree was earned.

The aim of this analysis is to make an assessment of the economic and social effects of higher education in EU Member States and to determine the groups of countries in which earning a higher education degree has the greatest or respectively the smallest impact on achieving various economic and social effects for the individual. In this sense, our study complements the efforts of other researchers that have explored the private and social returns to higher education, applying a new methodology that looks at a wider range of effects. The study will also analyze the determining factors for the differences in the effects of higher education among EU Member States.

The paper is structured as follows: The next section presents the study methodology, while simultaneously comparing it with known published approaches. The third section presents the results of the original empirical study showing the economic and social effects of higher education in the EU Member States and identifying the possible determining factors for the resulting differences between the countries. The concluding section represents the main findings arrived at in this study.

Methodology

The methodology employed in this article is original and offers an alternative way of

[1] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_urgaed&lang=en

[2] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=yth_empl_090&lang=en

[3] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_peps04&lang=en

[4] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_peps04&lang=en

drawing conclusions regarding a broader range of higher education effects compared to the traditional approaches in studying private and social returns to higher education. In this respect, the study does not aim at estimating the returns to higher education as it only takes into account the outcomes of attaining higher education. The private returns to higher education studies (Brunello, Coni and Lucifora, 2000; Blundell el al, 2004; Strawinski, 2007; Psacharopoulos, 1993; Psacharopoulos and Patrinos, 2002, etc.) are based largely on the Mincerian wage equation (Mincer, 1974) or its modifications[7], which generally includes the use of the smallest squares method through a natural logarithm of income as a dependent variable and years of education, years of labour market experience and their squares as independent variables. What is specific about these groups of studies is that taking into account income as an independent variable, they only look at the positive effect of increased remuneration that higher education can provide for the individual. In this respect, it is important to point out that the present study also differs from traditional ones by covering a wider range of indicators that reflect the effects of earning higher education, apart from focusing solely on the higher incomes of individuals.

There is another set of studies that measure the social returns to education (Strawinski, 2009; Venniker, 2001; Moretti, 2004, Dziechciarz, 2015, etc.). They take into account the positive external effects of higher education that extend beyond the benefits to the individuals attaining higher education. An example of such an effect is the fact that the higher incomes of people with higher education can increase tax revenues in the government budget due to the broader taxation base, which provides additional resources for government spending. There are also a number of other areas which can be influenced by the positive external effects of higher education. Higher-educated employees in a company can also spread their knowledge and skills to those with a lower level of education, thus increasing the overall productivity of the enterprise. According to the Human capital theory, earning a higher education degree by a larger share of the population has a beneficial effect on the long-term economic development and contributes to the development of a knowledge-based economy as it is considered an investment in human capital. However, there are significant methodological problems in these studies, because despite the fact that higher education is a quasi-public good that generates positive external effects, it is very difficult to identify and measure them unambiguously.

In the field of studying the effects of higher education, there are also a number of studies on the efficiency of higher education spending (Afonso and Aubyn, 2005, Herrera and Pang, 2005, Aristovnik, 2013, Yotova and Stefanova, 2017, etc.). These studies carry out a comparative analysis of the efficiency of higher education spending in different countries by comparing inputs to outcomes (measured by various positive effects of higher education).

This paper takes into account the outcomes (effects) of earning a higher education degree and looks not only at the higher incomes, but also at two additional directions of impact. The effects are measured by the amplitude in percent[8] in the positive effects manifestation

[7] Two methods for calculating private return can be employed (Psacharopoulos, 1993, pp. 1-3): elaborate method and earnings function, while most empirical studies use the Mincerian earnings function (Mincerian wage equation).

[8] The amplitude is calculated in the following way: First, for the employment rate and average monthly earnings indicators: the indicator regarding the population with secondary education is calculated as percentage of the indicator regarding the population with higher education. For the people at risk of poverty and social exclusion indicator: the indicator regarding the population with higher education is calculated as percentage of the indicator regarding the population with secondary education. Second, the percentage per country for each of the three indicators is subtracted from 100%.

between an individual with a higher education (tertiary education) and an individual with a secondary education using data for the following indicators:

- Average monthly earnings
- Employment rate
- People at risk of poverty and social exclusion

The first two indicators reflect the economic effects associated with labour market integration. The third indicator reflects the social effects, which are also expected to be significant. The data for the used indicators was obtained from Eurostat as the standardized statistical framework of the EU. The information on average monthly earnings per individual with a secondary and higher education in Eurostat are available in Structure of earnings survey only for 2006, 2010, and 2014. For that reason, the analysis is based on the 2014 data for the three indicators. The International Standard Classification of Education (ISCED 2011), developed by UNESCO, was used to distinguish between the population with secondary and the population with higher education. For secondary education, levels 3 and 4 were used, while for higher (tertiary) education, levels 5 through 8 inclusive were used.

It is important to note that from the current analysis point of view, the positive effects of higher education on individuals are indirect and cannot be fully attributed to earning a higher education degree. Higher education may lead to higher labor productivity and respectively higher income. At the same time, however, income growth may also be due to other factors that are not necessarily related to an individual's educational level, such as personal qualities, IQ, talent, dexterity, etc. However, academic environments in higher education institutions may, for example, create greater responsibility, employability, adaptability, etc. and still influence personal development and formation of the necessary qualities for successful labor market integration and career development. When considering education, the Human capital theory concentrates mainly on its productive function, while neglecting its so called 'signaling function', which assumes that better educated people are more adaptive. (Mysikova and Vecernik, 2015, p. 867). For that reason, the conclusions drawn regarding the effects of higher education measured by the amplitude in indicators for the population with secondary vs. higher education cannot be absolutized.

In addition to assessing the effects of higher education and outlining the differences between EU Member States, this study also highlights the possible determining factors that induce such differences. In this way, a more detailed identification of the groups of countries characterized by varying strengths of higher education impact can be achieved.

Results and Discussion

Table 1 presents the results for the calculated amplitude for the three indicators (average monthly earnings, employment rate, people at risk of poverty and social exclusion) for the population with secondary education vs. the population with higher education in 28 Member States of the European Union for 2014. The EU-28 average value of the three effects and coefficients of variation indicating the difference between the countries in terms of effects manifestation were also calculated.

Table 1: *Amplitude (%) between indicators for the population with secondary education vs. the population with higher education*

Country	Employment rate	Country	Average monthly earnings	Country	People at risk of poverty and social exclusion
Sweden	8.13	Italy	-1.06	Denmark	26.46
Denmark	9.82	Estonia	11.84	Austria	27.16
Czech Republic	10.46	Denmark	16.13	Sweden	31.68
Germany	11.40	Sweden	17.39	Italy	34.47
Austria	11.40	Finland	17.50	Luxembourg	38.69
Slovakia	11.51	Slovakia	17.56	Estonia	39.64
Netherlands	12.44	Spain	18.91	Netherlands	41.18
United Kingdom	13.76	Austria	19.63	Germany	42.92
Estonia	14.66	Netherlands	19.89	France	43.02
Finland	15.25	France	20.92	Spain	44.57
Portugal	17.00	Belgium	21.09	Portugal	45.18
Italy	17.09	Malta	23.56	United Kingdom	45.29
Hungary	17.45	Czech Republic	24.56	Belgium	48.19
Latvia	18.82	United Kingdom	25.44	Cyprus	51.19
France	18.99	Germany	25.56	Latvia	51.86
Cyprus	19.15	Ireland	27.61	Ireland	51.91
Malta	19.49	Greece	27.82	Bulgaria	52.99
Bulgaria	20.20	Luxembourg	29.05	Greece	53.02
Luxembourg	20.60	Lithuania	31.19	Slovakia	55.56
Slovenia	20.85	Croatia	31.54	Croatia	55.60
Romania	21.21	Poland	33.48	Malta	59.54
Ireland	21.82	Slovenia	33.56	Slovenia	62.62
Belgium	22.10	Cyprus	34.33	Hungary	65.85
Poland	25.03	Bulgaria	35.81	Lithuania	67.53
Spain	25.63	Latvia	36.70	Czech Republic	68.42
Lithuania	26.92	Hungary	41.37	Poland	68.92
Croatia	27.30	Portugal	44.12	Finland	69.34
Greece	30.47	Romania	51.00	Romania	71.01
Average	18.18	Average	26.30	Average	50.49
Coefficient of variation (%)	32.02	Coefficient of variation (%)	40.65	Coefficient of variation (%)	25.70

Source: Own calculations based on data from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_ergaed&lang=en http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=earn_ses14_23&lang=en http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_peps04&lang=en

The calculated coefficients of variation show that there are differences between Member States in terms of the data amplitude for the three indicators between the population with secondary education and the population with higher education. The biggest differences between Member States have been established in terms of the amplitude in the average monthly earnings of the population with different levels of education. This implies that in some countries the impact of higher education is weak (it is even negative for Italy for 2014), while in other countries it is significantly stronger. The weak impact of higher education in Italy is consistent with the results of private returns to education studies which have also shown weak impact (Banerjee and Duflo, 2005, p. 12).

The dispersion is lowest in terms of people at risk of poverty and social exclusion, which shows the smallest differences between countries compared to the other two effects.

At the same time, however, by applying this indicator the strongest effect was measured. The average amplitude between the population with higher vs. secondary education for the EU-28 is 50.49%. In that sense, the positive social effect of higher education is stronger than the effects related to labour market integration. In the EU-28, the economic effects associated with higher earnings of the population with higher education are on average greater than the positive effect on employment. Higher earnings resulting from increased labour productivity has a major positive impact of higher education and it is precisely the basis for calculating private returns to higher education.

The results presented in Table 1 show that there are two groups of countries which show amplitudes respectively above and below the EU-28 average with regard to **all three indicators**. The countries with amplitudes below the EU average are **Sweden, Denmark, Austria, the Netherlands, United Kingdom, Estonia, and Italy.** It can be noted that Sweden, Denmark, Austria and the Netherlands are grouped together in a common social model (Esping-Andersen, 1990) and are traditionally characterized by a developed social system and a high degree of economic development. In countries with a highly developed social risk coverage system, the risk of poverty and social exclusion is significantly lower regardless of the educational level. That is the reason these countries show some of the lowest amplitudes with respect to this indicator. The same trend is observed in terms of average monthly earnings and employment rate. The stronger impact of a wider social system on certain aspects of socio-economic development in the EU countries has been subjected to analysis in a number of studies (Velichkov, 2015). The countries with amplitudes above the EU average are **Latvia, Bulgaria, Romania, Poland, Lithuania, Croatia, Cyprus, Ireland and Greece**. This group mainly includes Central and Eastern European countries. The similarities of CEE countries are hardly surprising, as separating them into a common developmental model is a traditional approach that has been suggested by a number of empirical studies (Petrova, 2014, Fenger, 2007, Draxler and van Vliet, 2010, etc.). These two groups of countries represent **typical examples** of weak and strong effects of higher education.

After evaluating the effects and outlining two groups of countries characterized by strong and weak effects, it is necessary to look at the determining factors that contribute to the described differences while making a more detailed characterization of the distinct groups of countries.

The relevant literature researching the returns to higher education has demonstrated a relationship between economic development level and the share of population with higher education with respect to the results measuring the returns. For this reason, the study is complemented by an analysis of the per capita GDP and the share of population with higher education in the EU Member States, in an attempt to verify the findings of researchers in the field of private returns to higher education. In addition, the Gini coefficient is analyzed.

Studies of private returns to higher education (Psacharopoulos, 1993, Psacharopoulos and Patrinos, 2002, Banerjee and Duflo, 2005) have concluded that the return to education is lower in countries with high per capita GDP that measures the achieved level of economic development. Although the present study does not assess the returns to higher education but only takes into account its outcomes in different EU countries, the data presented in Table 2 confirms this relationship. In the group of countries characterized by weaker effects of higher education (lower than the average amplitudes of the studied indicators), there is a higher level of economic development as measured by the per capita GDP indicator. In all countries in this group with the exception

of Estonia, the per capita GDP for 2014 is above the EU-28 average (Table 2). On the other hand, for 2014 all countries (except Ireland) with amplitudes higher than the EU-28 average with regard to all indicators and, respectively, stronger effects from earning a higher education degree, show per capita GDP levels below the EU-28 average, which reflects their lower level of economic development. This group mainly includes Central and Eastern European countries whose economic development is the weakest in the EU.

Table 2. *GDP per capita, Share of the population with higher education, and Gini coefficient in EU countries (2014)*

Country	GDP per capita (euro)	Share of the population (age 30-34) with higher education (%)	Gini coefficient (%)
Belgium	35900	43.8	25.9
Bulgaria	5900	30.9	35.4
Czech Republic	14900	28.2	25.1
Denmark	47000	44.9	27.7
Germany	36100	31.4	30.7
Estonia	15000	43.2	35.6
Ireland	42200	52.2	31.1
Greece	16300	37.2	34.5
Spain	22300	42.3	34.7
France	32400	43.7	29.2
Croatia	10100	32.2	30.2
Italy	26700	23.9	32.4
Cyprus	20600	52.5	34.8
Latvia	11800	39.9	35.5
Lithuania	12500	53.3	35.0
Luxembourg	89500	52.7	28.7
Hungary	10600	34.1	28.6
Malta	19800	26.5	27.7
Netherlands	39300	44.8	26.2
Austria	38700	40	27.6
Poland	10700	42.1	30.8
Portugal	16600	31.3	34.5
Romania	7600	25	35.0
Slovenia	18100	41	25.0
Slovakia	14000	26.9	26.1
Finland	37600	45.3	25.6
Sweden	44600	49.9	25.4
United Kingdom	35000	47.7	31.6
Average	26,136	39.5	30.4

Source: Own calculations based on data from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en
http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_41&plugin=1
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di12&lang=en

Results in Table 2 lead to the conclusion that the amplitudes reflecting strength of the economic and social effects of higher education can be influenced by the level of economic development in individual countries. This is consistent with the results of empirical studies evaluating private return and showing that returns are lower in countries with a

higher degree of economic development and lower in those with higher GDP per capita (Psacharopoulos, 1993; Psacharopoulos and Patrinos, 2002, Banerjee and Duflo, 2005). According to Psacharopoulos, this is another reflection of the law of diminishing returns to the formation of human capital at the margin (Psacharopoulos, 1993, p. 9).

In addition to the level of economic development, a determining factor for the stronger impact of higher education may also be the number of people with higher education in a given country. According to Becker (1975), returns decrease as the number of people with higher education increases. Psacharopoulos (1989) demonstrated that for a group of developed and developing countries, the increase in the educational level of the population is usually followed by a decrease in the return on education. In particular, Moffitt (2007), assessing the return to higher education in the UK, demonstrated that it decreases when the share of the population with higher education increases. Another study (Mysikova and Vecernik, 2015) also exposed the negative impact of the share of population with higher education on returns to education in Europe. Although the negative relationship between the returns to education and the share of educated population refers to the changes in the two variables in a country over time, it can also be applied in a comparative analysis of different countries over a given period of time. Looking at the social returns on education in Europe, Strawinsky (2009) showed that returns are higher in smaller economies in which the number of highly educated people is lower.

The data in Table 2 shows that most of the countries with a lower level of economic development (in which a stronger effect of higher education for 2014 is observed) are characterized by a lower than the EU-28 average share of the population with higher education. This applies to Bulgaria, Romania, Latvia, Poland, Croatia, and Greece. On the other hand, countries with a higher level of economic development (and weaker effects of higher education for 2014) show a share of the population with higher education above the EU-28 average (except for Italy). This is consistent with the assertion that in countries where the share of population with higher education is lower the effects of earning a higher education degree are stronger.

With respect to the Gini coefficient values, it can be noted that there is a positive relationship with the effects of higher education. The results presented in Table 2 show that in almost all countries (except Croatia) from the group with stronger effects, the Gini coefficients have higher average value than the EU-28 average. At the same time, the income inequality in Sweden, Denmark, the Netherlands, and Austria, belonging to the group of countries with weaker effects of higher education, as measured by the Gini coefficient, is among the lowest in the EU and below the EU average for 2014 (Table 2). This positive relationship applies not only to the amplitudes measured on the basis of monthly income, but also to those based on the other two indicators.

Conclusion

This empirical analysis shows that besides the traditionally studied effects related to labour market integration, there is also a strong social effect of higher education, measured by the amplitude in the share of population at risk of poverty and social exclusion indicator for the population with secondary vs. the population with higher education. At the same time, according to the data for the EU-28 average, it can be concluded that the social effects of higher education in the EU as a whole are stronger than the economic effects.

The results also show that there are differences in the EU Member States as to the extent of the positive effects of earning a higher education degree. According to the coefficient of variation data, the differences

between countries are greater in terms of the economic than in terms of the social effects.

The results give grounds to identify two groups of countries characterized by respectively stronger and weaker effects of higher education. The Member States with weaker positive effects are Sweden, Denmark, Austria, the Netherlands, the United Kingdom, Estonia, and Italy. The first four are traditionally grouped into a common social model characterized by high quality of the provided public services, including education. The second group of countries with stronger effects (Latvia, Bulgaria, Romania, Poland, Lithuania, Croatia, Cyprus, Ireland and Greece) includes mainly CEE countries.

The identified country groups show differences in terms of socio-economic systems, level of education of the population, and degree of economic development that can be considered determining factors for the varying strength of the higher education impact. In this respect, the results of the study are consistent with the established negative relationship between the strength of the positive effects of higher education on the one hand and the share of the population with higher education and GDP per capita on the other. The study results also demonstrate a positive relationship between the Gini coefficient values and the strength of the effects of higher education (not only the income effect).

References

Afonso, A., Aubyn, St., 2005, Non-parametric Approaches to Education and Health Efficiency in OECD Countries. Journal of Applied Economics, Vol. 8, № 2, pp. 227-246.

Aristovnik, Al., 2013, Relative Efficiency of Education Expenditures in Eastern Europe: A Non-Parametric Approach, *Journal of Knowledge Management, Economics and Information Technology*, Vol. III, Issue 3, pp 1-13.

Banerjee, Abh., D. Esther, 2005. "Growth Theory through the Lens of Development Economics" in: Handbook of Economic Growth, edition 1, volume 1, chapter 7, Elsevier, pp. 473-552.

Becker, 1975, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, Second Edition, NBER, ISBN: 0-226-04109-3.

Blundell R., Dearden L., Sianesi B., 2004, Evaluating the impact of education on earnings in the UK: Models, methods and results from the NCDS. THE INSTITUTE FOR FISCAL STUDIES WP03/20, pp. 1-52.

Brunello G., Coni S., Lucifora C., 2000, The Returns to Education in Italy: A New Look at the Evidence. IZA Working Paper 2000, No 130, pp. 1-47.

Draxler, J., O. van Vliet, 2010, European Social Model: No Convergence from the East, *Journal of European Integration*, Vol. 32, No. 1, pp. 115-135.

Dziechciarz, J., 2015, Measurement of Rate of Return in Education. Research Directions, Proceedings of FIKUSZ '15 Symposium for Young Researchers, Obuda University Keleti Faculty of Business and Management, 2015, pp. 39-56.

Esping-Andersen, G., 1990, Three Worlds of Welfare Capitalism, Princeton University Press, pp. 1-34.

Fenger, H.J.M., 2007, Welfare regimes in Central and Eastern Europe: Incorporating post-communist countries in a welfare regime typology, Contemporary Issues and Ideas in Social Sciences, pp. 1-30.

Herrera, S., Pang, G., 2005, Efficiency of Public Spending in Developing Countries: An Efficiency Frontier Approach, World Bank Policy Research Working Paper 3645, pp. 1-67.

Hughes, A., 2002, Guide to the Measurement of Government Productivity, International Productivity Monitor, № 5, pp. 64-77.

Mincer. J. 1974, Schooling. Experience and Earnings, Columbia University Press, New York.

Moffitt. R., 2007, Estimating marginal returns to higher education in the UK, NBER Working

paper series, Working Paper 13534, National bureau of economic research.

Moretti, E., 2004, Estimating the social return to higher education: evidence from longitudinal and repeated cross-sectional data, *Journal of Econometrics*, vol. 121. pp. 175-212.

Mysikova, M., J. Vecernik, 2015, Returns to education in transition and advanced European countries: The role of an expansion of higher education, In Marta Rahona López & Jennifer Graves (ed.), 2015. "Investigaciones de Economía de la Educación," E-books Investigaciones de Economía de la Educación, Asociación de Economía de la Educación, edition 1, volume 10, number 10, September, pp. 865-885.

Petrova, K., 2014, Significance of public expenditure for the formation of separate models of socio-economic development in the European Union, *Economic and Social Alternatives*, Issue 1, pp. 58-71 (in Bulgarian).

Psacharopoulos, G., 1987., Time Trends of the Returns to Education: Cross-National Evidence, The World Bank Discussion Papers, Report No. EDT94.

Psacharopoulos, G., 1993, Returns to Investment in Education: A Global Update, Policy Research WORKING PAPERS Education and Employment, WPS 1067, pp. 1-68.

Psacharopoulos, G., Patrinos, H., 2002, Returns to investment in education: A further update, World Bank Policy Research Working Paper 2881, September 2002, pp. 1-36.

Radulescu, M., Al. Fedajev, Cr. Il. Sinisi, C. Popescu, S. El. Iacob, 2018, Europe 2020 Implementation as Driver of Economic Performance and Competitiveness. Panel Analysis of CEE Countries, Sustainability, MDPI, *Open Access Journal*, vol. 10 (2), pp.1-20.

Strawinski, P., 2007, Changes in return to higher education in Poland 1998-2004, MPRA Paper No. 5185, posted 7. October 2007.

Strawinski, P., 2009, External Return to Education in Europe, IRISS Working Papers, 2009-09, pp. 1-34.

Velichkov, N., 2015, Fiscal Rules Versus Fiscal Discretions, *Economic Alternatives*, UNWE Publishing Complex, Issue 3, pp. 39-45.

Venniker, R. 2001, Social Returns to Education: A Survey of Recent Literature on Human Capital Externalities, CPB (Netherlands Bureau for Economic Policy Analysis) Report 00/1, pp. 47-50.

Yotova, L., K. Stefanova, 2017, Efficiency of Tertiary Education Expenditure in CEE Countries: Data Envelopment Analysis, *Economic Alternatives*, Issue 3, pp. 352-364.

http://ec.europa.eu/eurostat