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EFFECTIVENESS OF GOVERNMENT EXPENDITURES ON EDUCATION: ASSESSMENT OF ECONOMIC CONDITIONS FOR GROWTH

The article is based on the World Bank statistics analysis and authors' methodology to test the correlation between the levels of government educational funding with macroeconomic dynamics of countries in the world, classified into 4 groups by their level of economic well-being. Major patterns of public expenditure on education cost-effectiveness are identified, overall principles of the national system of educational services' administration modernization are offered.

Keywords: *education; government spending; economic growth; economic structure; global economy.*
Peer-reviewed, approved and placed: *17.05.2016.*

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ЕКОНОМІЧНА ЕФЕКТИВНІСТЬ ДЕРЖАВНОГО ФІНАНСУВАННЯ ОСВІТИ: ОЦІНЮВАННЯ ЕКОНОМІЧНИХ УМОВ ЗРОСТАННЯ

У статті на основі аналізу статистики Світового банку та авторської методики протестовано кореляцію між рівнем державного фінансування освіти та макроекономічною динамікою країн світу, що класифіковані на чотири групи за рівнем їх добробуту. Виділено основні закономірності реалізації економічної ефективності державних видатків на освіту, надано висновки відносно принципів модернізації національної системи адміністрування освітніх послуг.

Ключові слова: *освіта; державні видатки; економічне зростання; економічна структура; світове господарство.*
Рис. 1. Табл. 4. Літ. 17.

Денис Ушаков, Алексей Архипов

ЭКОНОМИЧЕСКАЯ ЭФФЕКТИВНОСТЬ ГОСУДАРСТВЕННОГО ФИНАНСИРОВАНИЯ ОБРАЗОВАНИЯ: ОЦЕНКА ЭКОНОМИЧЕСКИХ УСЛОВИЙ РОСТА

В статье на основе анализа статистики Всемирного банка и авторской методики тестируется корреляция между уровнем государственного финсансирования образования и макроэкономической динамикой стран мира, классифицированных в четыре группы по уровню их благосостояния. Выделены основные закономерности в реализации экономической эффективности государственных расходов на образование, приведены выводы относительно принципов модернизации национальной системы администрирования образовательных услуг.

Ключевые слова: *образование; государственные расходы; экономический рост; экономическая структура; мировое хозяйство.*

Introduction. In the late XX century labor intellectualization has become a leading transformation of economic relations, the trend of economy globalization and post-industrialization dynamics. It defines the new role and the importance of education within the system of economic development maintenance. Determining labor cost-effectiveness, developing high-tech industries that are almost non-limited in terms of development prospects, repositioning country's role in the global labor divi-

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sion, national education today is an important factor of not only social, but also material prosperity of any country.

Meanwhile, we have to note that the enabling role of public education, of government expenditures on educational needs, has significantly changed during 2001–2014 as compared to the previous century.

The most obvious reasons for these transformations are:

- certain devaluation of education as a factor for further successful employment due to global spread of education, development of international labor market, more intensive migration;
- reduction of investment attractiveness of high-tech, Internet companies, service industries, financial firms;
- restructuring of almost all economies in favor of the industries producing food and hydrocarbons that are rising in price (up to 2014).

As a result, government expenditures on education were the leading factor for agriculture and industry growth (not financial and other service industries like in the XXth century). Steady relationships are observed between government spending on education and economic growth dynamics, country investment attractiveness, local population willingness to save and do business.

At the same time, it is obvious that certain correlations between government public spending and macroeconomic indicators are not homogeneous and are asynchronous in different countries or regions of the world, depending on the level of economic development of certain countries, the degree of their involvement in global education services and innovations development in particular.

The purpose of this study is to evaluate the correlation between the volume of government expenditures on education and macroeconomic indicators of today's countries, classified into groups by their economic characteristics.

The following objectives of the study are set forward:

- to evaluate the role of government expenditures on education for the formation of growth potential in the states classified by their economic characteristics;
- to analyze the correlation between government expenditures on education with key economic and social criteria of countries' development;
- to offer conclusions regarding structural and economic impact of public expenditure on education by groups of countries.

The main research **hypotheses:**

1. Public expenditure on education is an important factor for economic growth in any group of countries. However, only in relatively wealthy countries, having proper social and economic conditions for human development, domestic demand for high qualifications, experience and new knowledge, government spending on education will have high economic efficiency and will be able to promote growth.

2. The impact of government expenditures on education on the macroeconomic criteria of population material well-being and economic growth dynamics will be similar in all the countries of the world. At the same time the impact of public expenditure on education on economic system restructuring and national financial institutions development will vary considerably by the classification groups.

3. Spending on primary education more strongly determines the economic growth of rich and mid-rich states. At the same time, government expenditures on

secondary and tertiary education do not have a significant impact on countries' macroeconomic indicators in any of classification groups.

Literature review. Close relationship between education and economic development was revealed at the beginning of the industrial era. This relationship was noticed already by W. Petty (Hutchison, 1988), A. Smith (1976), J.S. Mill (1852) and other prominent economists. The study on the relationship between education and economic development has led to emergence in the mid-twentieth century of scientifically based theory of human capital by American economist and Nobel laureates Theodore Schultz and G. Becker. In his books "Human Resources (Human Capital: Policy Issues and Research Opportunities)" (1972) and "Investing in people" (1981) T. Schultz showed that education level of population determines its ability to use information and technologies for economic development. This scientist emphasized that making precise definitions of the value of land and equipment, almost none of economists did carry out an economic evaluation of labor. He considered quality of human factor to be a scarce resource, which has its economic value. Acquisition of this resource is surely related to some additional costs.

According to G. Becker (1985), major investments in students (future professionals) and workers training, their healthcare, social programs aimed at preservation, support and expanded staff reproduction are equivalent to major investments in acquisition of new machinery, equipment and technologies. In the future, these investments will turn into substantial profit, and this is comparable to investments in manufacturing modernization.

Later R. Easterlin (1981) identified the relationship between the spread of education in various countries and beginning of their economic growth. This scientist found that a noticeable growth of national economy begins usually in 25–30 years after the beginning of its educational reform.

We also have to mention here the research of Harvard University J. Mincer (1974) based on extensive empirical material to prove that being educated is financially advantageous initially for students themselves. According to his calculations, every extra year of education increases person's income by 7%. These findings were developed in complex of human resource managerial tools oriented on corporate staff development and promotion.

B. Blankeau et al. (2007) found that education expenditures since 1960 had been a significant factor that caused growth in per capita incomes for around 100 countries. J.C. De Meulmester and D. Rochet (1994) investigated the relationship between the higher education growth and economic progress in the developed world. Similar studies were carried out in developing societies too. For example, in Pakistan, M. Aqil et al. (2014) concluded that the impact of higher education on economic growth was significant. Some other researchers also derived the same results as H.-S. Jung and E. Thorbecke (2001) for Tanzania and K. Ogujiuba and A. Adeniyi (2005) for Zambia, Nigeria and A. Chandra (2010) for India. At the same time A. Nurudeen and A. Usman (2010) found that the impact of education expenditures on growth is negative.

This study will be based on the conceptual approaches of the human capital theory in an attempt to determine the economic value of education and its role in economic progress of the countries, classified into 4 groups by the level of their economic development and material welfare.

Methodology of the study. For this study we analyzed 61 countries. Their classification by geographical location and level of material well-being is given in Table 1.

Table 1. **Classification of the analyzed countries,** *authors'*

Geographical location		Number of analyzed countries		Number of analyzed countries
	North and Central Europe	12	East Europe	6
	South Europe	6	Middle East	6
	Former USSR	5	Asia Pacific	11
	America	8	Africa	7
Material well-being (in 2014)	Rich countries (GDP/per capita is higher than 40,000 USD)	21	Mid-poor countries (GDP/per capita is higher than 10,000 USD)	14
	Mid-rich countries (GDP/per capita is higher than 20,000 USD)	16	Poor countries (GDP/per capita is less than 10,000 USD)	10

The following indices of government expenditures on education in 2001–2014 the World Bank data were used in the research:

I1 – Expenditure on education as % of total government expenditure (%).

I2 – Expenditure on secondary education as % of government expenditure on education (%).

I3 – Government expenditure on education as % of GDP (%).

I4 – Government expenditure per primary student as % of GDP per capita (%).

I5 – Government expenditure per secondary student as % of GDP per capita (%).

I6 – Government expenditure per tertiary student as % of GDP per capita (%).

Correlation of the selected indices of government expenditures on education with the following national macroeconomic indicators (classified into 3 groups) for 2001–2014 was calculated (Table 2).

Table 2. **Analyzed indices, classified in 3 groups,** *authors'*

#	Group of indices	Indices
1	Indices reflecting the economic structure of the system	J1 – Agriculture, value added (% of GDP)
		J10 – Industry, value added (% of GDP)
		J11 – Services value added (% of GDP)
		J12 – Trade (% of GDP)
2	Indices reflecting general welfare and dynamics of economic growth in the country	J4 – GDP at market prices (current USD)
		J5 – GDP growth (annual %)
		J6 – GDP per capita (current USD)
		J7 – GDP per capita growth (annual %)
3	Indices determining the state of national financial market	J3 – Foreign direct investment, net inflows (% of GDP)
		J8 – Gross capital formation (% of GDP)
		J9 – Gross savings (% of GDP)

Methodology of correlation setting between governmental expenditures on education and macroeconomic indicators of the countries is explained in detail in our previous research (Ushakov, 2016).

Summary correlation between the indicators of public expenditures on education and macro-economic indicators of classification groups for 2001–2014 is shown in Table 3.

As it can be seen in Table 3, there is a strong correlation between the level of public expenditure on education and national GDP (both in absolute and in per capita terms) with its greater extent in poor and rich countries. The dependence of economic growth on government expenditures on education is much higher in poor countries.

Table 3. **Summary correlation between public expenditure on education and macroeconomic indicators by the group of countries, 2001–2014,** *authors'*

Macroeconomic indicators	Public expenditure on education by groups of countries			
	Rich	Mid-rich	Mid-poor	Poor
Agriculture, value added (% of GDP)	3,095238	2,375	2,285714	2,9
Exports of goods and services (% of GDP)	2,47619	3,125	2,571429	3,2
Foreign direct investment, net inflows (% of GDP)	0,904762	1,375	2,071429	2,8
GDP at market prices (current USD)	3,952381	3,375	3,857143	4,8
GDP growth (annual %)	1,47619	1,4375	0,928571	2,5
GDP per capita (current USD)	4,047619	3,25	3,5	3,8
GDP per capita growth (annual %)	1,428571	1,3125	1	2,7
Gross capital formation (% of GDP)	2,619048	2,5	2,714286	1,9
Gross savings (% of GDP)	3,333333	1,8125	2,785714	3,3
Industry, value added (% of GDP)	3,380952	2,3125	2,714286	3
Services value added (% of GDP)	3,047619	3,375	2,5	2,5
Trade (% of GDP)	3,142857	3,375	2	2,8
Trade in services (% of GDP)	3,095238	3,25	2	2,1

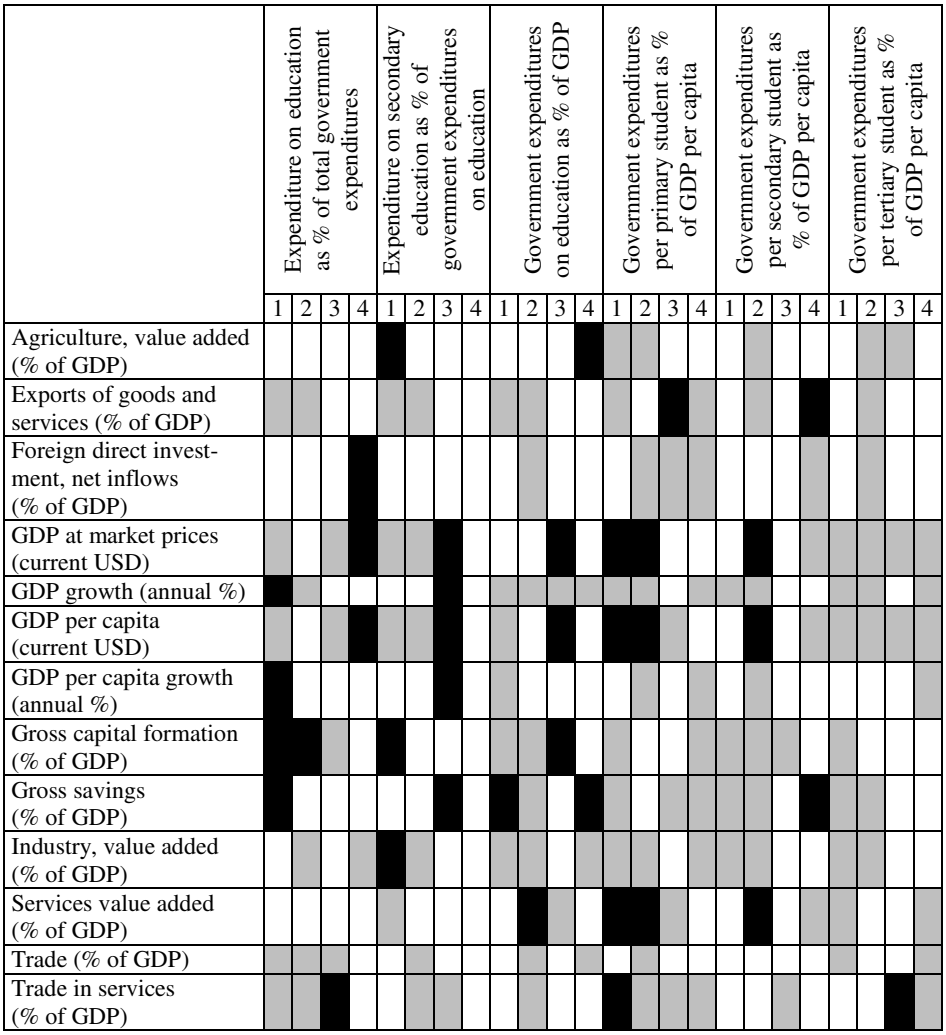
Rich and poor (!) countries' expenditures on education are associated with a changing role of agriculture and industries. In middle-income countries education funding affects, primarily, the development of service industries and trade (including exports). With the rising education spending the residents of rich and middle-income countries are more willing to save. However, the impact of education spending on business development in poor countries is minimal. Finally, it should be noted that together with the growth of country's prosperity an impact of government education expenditures on the overall investment attractiveness of a country is also increasing.

Table 4 shows that economies of poor countries are most dependent on public expenditures on education. In rich countries, education spending is an important factor for economic restructuring.

Table 4. **Interdependence between groups of macroeconomic indicators and the level of government expenditure on education in 4 groups of countries, 2001–2014,** *authors'*

Macroeconomic indicators	Public expenditure on education by groups of countries			
	Rich	Mid-rich	Mid-poor	Poor
Overall	36	32,875	30,92857	38,3
Structure of economy	12,66667	11,4375	9,5	11,2
Wealth, economic growth	10,90476	9,375	9,285714	13,8
Financial markets, investments	9,333333	8,8125	10,14286	11,2

Findings. The indicators of economic well-being of all groups of countries (GDP, GDP per capita) are maximum dependent on government funding of education. At the same time a positive impact of education spending on GDP was observed in rich countries only. At the same time, government education funding affects (in all groups of countries) on the role of agriculture in the structure of national economic system, on the direct investment inflow, on the growth of GDP per capita.



1 – Rich countries; 2 – Mid-rich countries; 3 – Mid-poor countries; 4 – Poor countries.
Black square – strong positive correlation; Grey square – strong negative correlation; White square – absence of any correlation.

Figure 1. **Correlations between government expenditures on education and macroeconomic indices of classified countries of the world, 2001–2014,** *authors'* World Bank data applied

Maximum homogenous (among all groups) negative impact of government expenditures on education for observed in national exports, GDP formation in indus-

tries, commerce and trade in services. Maximum homogeneous positive impact of education funding is typical only for the growth of national GDP.

Most multidirectional (depending on a country belonging to a certain group) impact of government expenditures on education affects the development of national services, households' propensity to save, investment in fixed assets.

Government expenditures on primary education have the maximum determining influence on all the analyzed indicators in all the groups of countries. At the same time, they have positive impact only on certain indicators (GDP, growth of services) in mid-rich and rich countries.

Separately it can be noted, that if positive impact of government expenditure on primary education is observed almost in due third of all cases (mainly in rich and mid-rich countries), positive impact of public expenditure on higher education is much less observable (20% of all cases, mostly rich countries). State funding of post-higher education only worsens the macroeconomic indicators in all the countries.

The positive impact of all categories of government spending on education is concentrated on the macroeconomic boundaries of rich countries. We can also observe that state educational costs have positive effect on the dynamics of agriculture in rich and poor countries; on the development of industry and services in mid-rich and rich countries, and finally, on financial institutions – in rich and poor countries.

Conclusions and limitations. Having tested the relationships between the dynamics of public spending and the behavior of macroeconomic indicators in 4 groups of countries we can conclude that in the XXI century the stimulating role of public education is rather exaggerated; public spending on education often have no economic viability in the short term.

Apparent relationships between government expenditures on education growth and development of services sector are noteworthy only for mid-income countries, while rich countries actively use the advantages of agriculture and industry innovative modernization.

The imbalance of domestic innovations' market (lack of domestic demand for innovation) leads to higher devaluation of postcollegiate education in poor and mid-income countries. However, even in rich countries the stimulating economic role of higher and postcollegiate education is obviously very modest, due to government and corporate opportunities to effectively import high skilled workers.

As the limitations of the proposed model and authors' findings we can identify that this work was carried out on the correlation of simultaneous macroeconomic indicators and the indicators of public spending (2001–2014). While according to R. Easterlin (1981), A. Maddison (1991) economic effects from government spending on education can reveal itself in 25–30 years.

Therefore, to assess the economic role of public expenditure on education it is advisable to extend the time frames of such research and to use data on government expenditures on education for the period 1980–1995 years and also the macroeconomic indices of countries' development during 2000–2015.

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