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FORMATION OF INNOVATIVE ECONOMY: INVESTMENT PRINCIPLES OF EDUCATIONAL POTENTIAL DEVELOPMENT

Abstract. The purpose of this article is to investigate peculiarities of educational potential investment in the context of Ukraine's population. This paper focuses on the analysis of the growth rate of total education expenditure, the tendency of changes of total education expenditure indicators in Ukraine in 2007-2015. This paper aims at comparing the cost structure according to financing agents and sources. We also analyse the number and enrolment of students in higher educational establishments according to state financing. Moreover, this paper defines the basic problems of the current system of education financing in Ukraine and the ways of its elimination.

Słowa kluczowe: innovative economy, educational potential, labour potential, education expenditure, education funding, financing agents, providers, financing sources, endowments, donation

KSZTAŁTOWANIE INNOWACYJNEJ GOSPODARKI: ZASADY INWESTYCJI W EDUKACYJNY POTENCJAŁ ROZWOJU

Streszczenie. Celem niniejszego artykułu jest zbadanie cech edukacyjnego potencjału inwestycji w kontekście ludności Ukrainy. Artykuł poświęcony jest analizie tempa wzrostu całkowitych wydatków na edukację i tendencji zmiany zagregowanych wskaźników wydatków na edukację w Ukrainie w latach 2007-2015. Przedstawiono strukturę kosztów finansowania oraz przeanalizowano ilość studentów w uczelniach wyższych, zgodnie z państwowym finansowaniem. Określono podstawowe problemy istniejącego systemu finansowania edukacji w Ukrainie i sposoby ich rozwiązywania.

Keywords: nowatorska gospodarka, edukacyjny potencjał, potencjał pracowniczy, wydatki edukacyjne, finansowanie edukacyjne, finansowanie agentów, dostawcy, finansowanie źródeł, darowizny, datek

1. Introduction

The problem of innovative economy formation is not only and not so much in the technological contest, but more in the investment one. An innovative economy is characterized by the dominant influence on the efficiency of social factors that are caused by a significant proportion of breakthrough innovations in the structure of novelty, accelerated development of highly scientific sector of production as the result of decreasing of its material-, resource- and labour-consuming. This is achieved by generating distribution of innovators' creative ideas and transformation into innovative technologies/products that, in their turn, require a constant attraction of new knowledge. Therefore, investments in knowledge are growing faster than investment in fixed assets. So, the external manifestation of an innovative economy is the increase of public spending on savings of educational component of human capital.

The objectives of this article are to investigate peculiarities of educational potential investment in the context of Ukraine's population and determine the problem of the innovative economy formation.

2. Overview of the research literature

Leading domestic researchers of human capital, founders and leaders of neoclassical theory focus their attention on aspects of the formation and development of human assets. Together with it the attention of scientists to the educational component of social and labour potential, conditions, factors and trends of their formation is intensified in Ukraine.

For a long time the human ability to accumulate knowledge was considered to be a social factor and, therefore, investment in its formation – unproductive, costly. The theory of human capital has allowed not only to understand the crucial role of a man in the economy, but also the importance of the formation process of funding human resources qualities that increase labour productivity.

Becker (1993) identified four types of investment in human capital (formal education, professional development; use of informational sources outside studying and work; health and spiritual sphere) and Schultz (1961) included six elements (1 – health care, 2 – professional training, 3 – formal education, 4 - educational programs for adults, migration of people to get better jobs, 5 – information search about a company and career prospects, 6 – science). In the 20th century a list of investment elements in human capital significantly is expanded, adding

the improvement of population's living standards and life quality, intellectual activity, entrepreneurial ability, formation effective of elite, security of citizens, business and economic freedom, culture and art (Khomyakov, 2014).

This study is limited to the cost analysis of the education sector. In order to determine the total national expenditure on education, evaluation of various financing sources and use of funds received from various funding organizations for various functions, Ukraine implemented Education Support Account (ESA). The definition of expenditure on education is put into the basis of its concept. The cost analysis rather than the analysis of articles (such as state budgets) helps to evaluate more accurately the use of funds allocated for the cost estimate, which ultimately are not always used as intended (National Education Accounts of Ukraine in 2015, 2016). Today's current edition of ESA, dated 2017, contains analytical materials that are limited to 2007-2015.

3. Research of educational expenditure in the context of the innovative economy formation in Ukraine

Data given in Table 1 show that the direction of the total amount of educational expenditure and the level of expenditure per pupil/student have:

- the same tendency;
- different speed of changes.

The first indicator during 2007-2015 grew by 11.4% annually and for the analysed period has increased in 2.3 times. The second indicator was growing faster – on average by 15.4% annually (totally over the analysed period in 3.1 times). Such tendency indicates an annual decrease in the number of educational services consumers by 3.4%.

Reducing the number of people enrolled in Ukrainian formal education is explained by a number of reasons:

- annual reduction in population;
- tendency towards an aging population;
- desire of students to study abroad;
- falling demand for paid educational services of institutions.

Table 1

The growth rate of total education expenditure in Ukraine in 2007-2015 (2007 = 100 %)

Indicators	2008	2009	2010	2011	2012	2013	2014	2015
Total expenditure	31,6	44,8	70,3	82,5	107,9	116,9	104,8	137,7
Total expenditure per pupil / student	35,2	53,5	85,7	102,0	133,2	147,0	168,4	214,8

Source: Own calculation based on National Education Accounts of Ukraine in 2015 (2017).

The progressive development of the total expenditure on education in p.p. of GDP is not observed (Table 2). Even among falling levels of public spending on education in Ukraine in p.p. of GDP, this rate according to world standards remains quite high. Thus, due to VoxUkraine (Repko, 2017) the level of public expenditure on education in p.p. of GDP is higher than in the new member-states by 0.8%. Exceeding this indicator is caused mainly by spending on pre-school education (0.9% Ukraine vs. 0.5% new member-states of EU) and higher education (1.6% vs. 1.1% respectively). The volume of spending per pupil/student in Ukraine is much lower than the following indicators in developed countries.

Table 2

Indicators of total education expenditure in 2007-2015

Indicators	2007	2008	2009	2010	2011	2012	2013	2014	2015
Participation between total education expenditure and GDP, %	7,42	7,42	8,48	8,41	7,50	7,88	7,60	6,90	6,39
Participation between public education expenditure and GDP, %	5,59	5,89	6,78	6,63	5,94	6,44	6,42	5,87	5,34
Total expenditure per pupil / student, USD Thousand	1,15	1,49	1,14	1,36	1,47	1,69	1,79	1,31	0,84
Average expenditure per student, UAH Thousand	8,1	10,8	12,8	15,5	17,6	19,9	21,6	24,4	29,8
The share of public sector in education funding, %	75,4	79,3	80,0	81,5	82,1	84,6	84,3	85,1	83,5
The proportion of household education expenditure in total expenditure, %	1,3	1,3	1,3	1,3	1,3	1,3	1,2	1,1	1,1

Source: Own calculation based on National Education Accounts of Ukraine in 2015 (2017) and Total household spending structure (1999-2015) (2016).

Most of the funding of education in Ukraine is provided by a public sector. The share of public institutions among educational establishments generally shows an upward trend. In 2015 in comparison with 2007 this indicator increased by 9.1%. The contribution of businesses to funding of the population's educational potential for the same period dropped from 1.1% to 0.7%, and households – from 23.5% to 15.8%.

The analysis of financing structure by the level of education in Ukraine shows that during 2007-2015 the flow of funds aimed at training professionals in higher educational establishments range from 36,8 to 41,6%; in secondary education from 24,5 to 28,0%; in primary education from 22,9 to 31,7% shares of funding for vocational and postgraduate education varied accordingly from 5,8 to 6,3% and from 1,5 to 1,7%.

The smallest share of the private sector is consumed by primary and secondary educational institutions. The proportion of the central government in providing these types of financial institutions is also low (about 1%). They are funded mainly from regional budgets/local government, from funds that are allocated according to the state regulations on one pupil established for a certain territory. Since such educational establishments the largest include part of the population, their public funding in social context is justified and necessary.

Among all types of educational institutions the funding universities is the smallest. Due to the reduction of higher education and decreasing the number of students the funding of this sector in Ukraine during the period 2007-2015 has increased in 2.1 times (from UAH 22.2 UAH Billion to 46.8 UAH Billion). As a result, the growth rate of the cost of training spent on one student is even higher – 3.7 times (from 8135 UAH to 29,817 UAH).

The annual increase in the cost of university training as a result of unbalanced labour market leads to the higher depreciation of funds invested in the formation of educational potential, which are not capitalized because of unemployment of graduates. It can be illustrated by the fact that "only 30% of graduates of Ukrainian universities have got a job within a year after their graduation. About 7% of them immediately after graduation look for a job in employment services (Zubchuk, 2014). Moreover, we should not lose sight of another problem – the low employment rate for graduates with a degree. In this context, we can distinguish three aspects of loss. First, the obtained knowledge – the core of human capital – is eventually lost. The process of its loss, as well as depreciation of equipment is found in biophysical displacement of unused information from the person's active memory and the moral out-of-date knowledge under the influence of the latest achievements in science and technology. Second, the discrepancy of specialists' training needs to the labour market makes national employers spend more than 1 UAH Billion annually for their retraining. Third, the society does not get the return of investment made in training, but it is forced to increase the number of social spending.

In Ukraine the amounts of funding preschool and secondary education does not correspond to the innovation and innovative in society type. Most of the funds are spent on salaries and infrastructure payment. The rapid increase in energy prices decreases the possibility of free spending manoeuvring by the educational establishment. According to its structure we cannot say about effective financial support and insufficient amounts of financial resources, which further exacerbates the problem. The funds that are get from parents payment in the form of special classes, books, food and other materials cannot solve the problem of school budgets deficit.

The situation is not better with the financial support of vocational education. The level of state funding is little lower than in pre-schools and schools, but the share of central government (ministries and departments) is much bigger. Tenth of the cost of vocational education is covered by the households, unlike employers – five times less. From the current cost of the public sector in vocational education two-thirds is spent on utilities and salaries.

The chronic shortage of financial resources cannot but affect the effectiveness of education. Obviously, the national professional and technical education does not produce enough human capital. For example, in countries of Northern Europe the number of graduates of vocational schools exceeds by 25% the number of graduates. In Ukraine, this proportion is diametrically opposed, with more than a double dominance indicator.

The results of the analysis of financial support for institutions of I-IV accreditation levels give grounds to claim about the mitigation of market institutions in the financing of higher education. This testifies to the fact that, first, reducing of the private sector share in students' training and, secondly, reducing of the proportion of the students number studied at the expense of individuals (Table 3).

Table 3

The number and enrollment of students in higher educational establishments according to state financing

Indicators	School years					
	2008/09	2010/11	2012/13	2013/14	2014/15	2015/16
Total number of students, Thousand	2763,9	2418,1	2170,1	1992,9	1689,2	1605,3
Who studied at the expense of						
– state budget	35,3	38,3	41,2	43,1	44,5	45,4
– local budgets	3,4	3,8	4,4	4,4	4,9	4,9
– public authorities, legal agents	0,5	0,4	0,3	0,4	0,6	0,6
– individuals	60,6	57,5	54,1	52,1	50,0	48,9
Total accepted, Thousand	540,0	506,5	441,1	428,4	361,1	323,0
Who studied at the expense of						
– state budget	42,6	42,0	47,0	46,2	47,7	48,6
– local budgets	5,3	5,3	6,2	5,5	5,9	6,4
– public authorities, legal agents	0,3	0,2	0,2	0,2	0,2	0,2
– individuals	51,8	52,5	46,6	48,1	46,2	44,8

Source: Own calculation based on Key indicators of activities of higher educational establishments in Ukraine at the beginning of the school year 2015/16 (2017)

There is also a clear imbalance between the scale of operations and cash flows in high school. Substantial funding (over 25%) is involved in higher education from non-budget funds, primarily through partial tuition fees. For comparison, we would like to give a quotation by Zubchuk (2014): "Only 3% falls on extra-budget sources in EU countries". This scientist positions financial security flaws as the main cause of a lack of good knowledge in Ukraine. Despite the presence of a number of advanced scientific schools and laboratories in universities, in which 80% of candidates and 90% of doctors available in the country are involved in terms of funding for scientific and technological activities higher education is significantly inferior to other institutions, namely academic and business sectors.

Bagby (2011) proved a cause and effect relationship between a child's cognitive abilities and her family's investment in education. The scientist showed that the main cause of youth

unemployment lies in the asymmetry of financial provision of a child's educational potential. Creative inclinations of young people are laid since their birth, but they have considerable potential for their development due to the deliberate influence of individuals that create a favourable environment for them. Therefore, those who are at the age prior to able-to-work period have not received formal training, have high chances of long-term prospects for social deprivation, poor economic conditions out of continuous lifelong learning. In Ukraine, only 30.8% of adults can provide their children or grandchildren with education of high quality (Are you able to give a good education to your children or grandchildren? A survey. Razumkov Center, 2016). Mostly large families, single-parent families and those who have non-working adults capital suffer from limited resources for financing of human capital.

During 2007-2015 a share of education expenditure in the structure of total household expenditure ranged at the level of 1.1-1.3% (Table 2). Instead, more than 50% of spending was used for food. The dominant factor in the total spending of households for surviving serves as an indicator of the population's poverty, its low payment capacity. Obviously, for the irrational structure of households' consumption expenditure we cannot speak about their quality investment support of educational potential.

4. Conclusion

The analysis of national practices of education funding allows us to come to the following conclusions:

- an annual population decline and its aging, together with reducing of the number of pupils and students, the spending on education is moving ahead as well as the tendency of gradual slowdown of the development speed;
- dominant part of education funding is provided by the public sector and the private businesses investment is hardly invisible;
- households feel a lack of funds for the education;
- the high cost on education in Ukraine by the world standards, only leads to a higher percentage of people with higher education, but did not lead to a significant innovation breakthrough;
- the Ukrainian universities are in weak competitive position in the global educational space.

The increased flow of public funds in the innovative development is possible due to the creation of knowledge – based job positions and build a strong middle class.

The real working mechanism of social partnership will contribute to the solution to the problems of educational potential funding. The state's role in this mechanism is reduced to the formation of strategic decisions that would ensure the appropriate conditions for activating of

business investments, working population, other stakeholders and would facilitate the implementation of long-term policy on the basis of efficiency and social justice. The state should focus on creating a favourable climate for capitalization of labour potential by encouraging of labour market towards creating knowledge-based job well-paid positions and for the development of the productive population assets.

An essential determinant of improving of human capital funding is stimulating a business segment of the market infrastructure that is able to accumulate a priori and to use a significant amount of money rationally. This refers to financial institutions, private pension, savings, investment, venture funds, insurance business agents. These institutions can provide unloading of the state budget on the basis of formation of new investment instruments with the aim of accumulating sufficient amount of money to develop their own innovative capital potential in a competitive environment among providers of educational services.

Among the recommendations to improve the financial security of public assets we would like to focus our attention on proposals for the endowment creation in Ukraine – funds of target capital formed through donations and income from funds investing used for financing non-profit organizations. Unlike the usual charity organization, the endowment is characterized by its target and profitable activities. The most common this financial instrument is in countries where the society tends to patronage (USA, UK, Japan, Australia etc.). Here endowments provide funding for applied research in high schools, financially motivate the university community to creativity, can adjust its membership.

In Ukraine, it is quite difficult to determine the amount of funding allocated in the form of donations accurately. Publicity of national tax reporting, unlike the European countries and the United States is not a requirement, therefore, the information about the amount charity funds is often confidential. By promulgated in 2015 by the British organization of the World Charities Aid Foundation, the World Giving Index Ukraine occupied 89 place among 145 countries, including the volume of donations – 47 place; volunteer work – 103 place; direct aid – 122 place. The following situation is due to a number of reasons. Firstly, the rating was based on data collected in 2014, when efforts to raise funds for the victims were activated as a result of the military conflict. Secondly, the donating culture is fairly new to the post-Soviet countries, their people have not get any rooted understanding of its importance and value of philanthropy for the social development. Thirdly, a lack of transparency, non-accountability and privacy of the charity sector and the use of funds for political purposes gave a rise to distrust of the Ukrainians to charitable organizations. Fourthly, the volume of financial resources of many households only cover the necessary needs of their living, which slows down the involvement of the general public to charity.

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