

## ECONOMIC COST ANALYSIS IN HIGHER EDUCATION IN LATVIA

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**Abstract.** The rising cost of higher education is a topic of large concern today. In this article, dynamics of the state and private expenses for education are analyzed. In this article, the ratio of the budgetary places is analyzed as well as paid places in higher education institutions of Latvia. Costs of receiving the higher education were also analyzed and the forecast of future income of the university graduate is made. This model can thus be readily interpreted in cost-benefit terms, and decisions as to how much and what sort of education to undertake can be analysed using the familiar economic techniques of cost-benefit analysis. In other words, to be defined in what degree the human potential which is saved up by the person when training in higher education institution can be transformed to the human capital, i.e. in set of professional knowledge, skills thanks to which the person has an opportunity to gain income and how concrete income will be over the expenses for education. This article is analyzing the financial costs of study in engineering and social programmes and the cost of education in regional and Riga universities.

**Keywords:** state-funded places, education costs, student loan.

### Introduction

The human capital theory [1; 2] has been the basis for a very large number of empirical studies on the wage structure and on the returns to education (see, for instance, the survey of Asplund and Pereira, for Europe) [3]. The empirical evidence related to the determinants of educational achievement often focuses on the link between the social origin and education [4]. Goux and Maurin [5], for instance, use for France a recursive model, in which individuals perfectly predict their future earnings. Kodde [6] uses the subjective expectations of high school graduates with respect to future income, foregone earnings and unemployment. The authors based their research on statistical data obtained as a result of the secondary analysis.

The aim of the research: to calculate economic effect of financial costs of receiving the higher education in Latvia.

A number of tasks had to be completed to implement the aim:

- to analyze the dynamics of public expenditure on higher education;
- to explore the relation of free places (state-funded places) and non-state-funded places at universities in Latvia;
- to determine the tuition fees in popular disciplines, as well as in socially significant disciplines;
- to review the effectiveness of financial capital costs in education based on a comparison of alternative educational strategies and discounting of future income.

### Research results and discussion

The authors use the term human potential to refer to the “stock” of knowledge and professional experience which has been accumulated by a person as a result of learning, self-education and socialization and which the person can use if involved in the process of capital turnover. In other words, human capital is a set of professional expertise, knowledge and skills, which make it possible for a person to receive rental income [3]. Based on the differences between human potential and human, the purpose of the research is to analyze the possibility of transformation of human potential in Latvia into human capital, i.e. the possibility to derive the rent from the obtained higher education degree and gained professional experience.

### Situation in the sphere of education

Over the last years, the share of state-funded places in Latvia’s universities has decreased.

Figure 1 shows the relation of state-funded and non-state-funded places in the academic year 2013/2014 at state universities, such as the University of Latvia (LU), Riga Technical University

(RTU), Latvia University of Agriculture (LUA), Daugavpils University (DU) and Riga Stradins University (RSU).

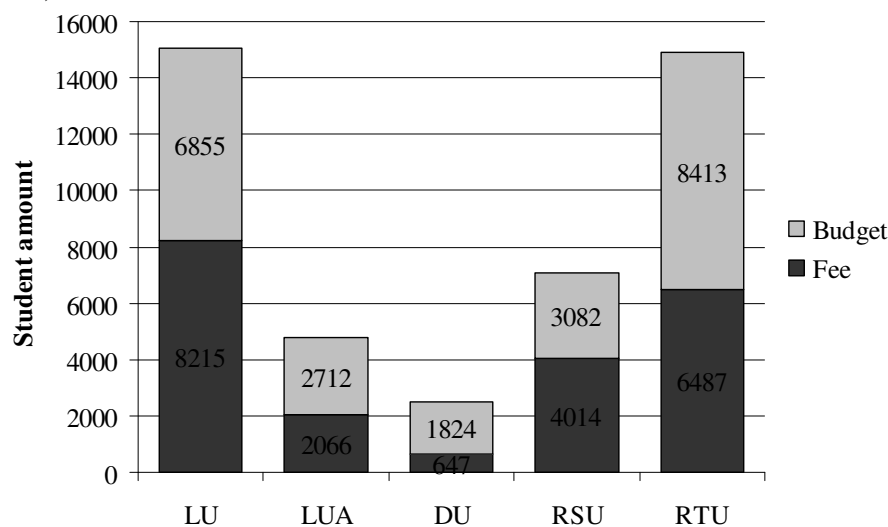


Fig. 1. Relation of state-funded and non-state-funded places at Latvia's universities in the academic year 2013/2014 (developed by the authors) [7]

The diagram shows that the share of students studying on a fee basis in the academic year 2013/2014 amounted to 57 % at RSU, 54 % at LU, 44 % at RTU, 43 % at LUA and 26 % at DU of the total number of students [7]. Simultaneously with the increase in the number of non-state-funded places, the cost of education has risen. For example, the tuition fees at LU have increased 1.5 times in just one year. While the minimum tuition fee at the mentioned university in 2007 was around 970 EUR and the maximum fee were around 1650 EUR, the minimum fee rose to 996 EUR and the maximum fee rose to 2560 EUR in 2014 [7].

At the same time, the upward trend of tuition fees is characteristic not only of the leading educational institutions in the country, but also of regional universities. For example, the tuition fees at the Daugavpils University ranged from 570 to 1000 EUR in 2007. In 2014, the cost of education at this university rose to 1252 EUR. Students and their parents have to pay significant tuition fees not only at the Faculty of Economics and Faculty of Law or for highly sought after degrees in Telecommunications, but also when studying for a degree in socially important disciplines, such as Education and Medicine. For example, the annual tuition fee at RSU amounted to 5208 EUR (Master programs 15000 EUR) in 2014 [7].

Reduction of state-funded places at Latvia's universities and growth of tuition fees take place against a background of overall state funding cuts regarding the social sphere. Beginning in 2004, the share of the state support of higher education in the total state budget expenditures declined from 2.13 % to 0.7 %, while the share of the state support of all levels of education decreased from 6.8 % in 2009 to 2.6 % in 2014. The dynamics of public expenditure on the social sphere is shown in Fig. 2.

The data presented in the chart indicate that along with budget cuts on education the state also decreased expenditure on health care and sports. For example, during the reporting period, the share of health expenditure in the total amount of the state budget expenditures declined from 3.85 % in 2009 to 3.01 % in 2014 [8]. The share of budget expenditures on sports over the same period decreased from 0.8 to 0.4 %. No wonder why Latvia ranks below 123<sup>th</sup> in the world for life expectancy [9].

Due to the reduction of state-funded places and the rising tuition fees, the number of students who pay for their studies from their own resources, increases. Therefore, to gain a better insight into the processes going on in the higher education system in Latvia, it is necessary to analyze the investment strategies of students and their parents.

The major stimuli that compel a person to spend time, effort and funds on higher education include the pleasure of mastering the chosen professional occupation, the opportunity for creative and professional fulfilment, comfortable working conditions, etc. An important factor influencing a

person’s decision to pursue higher education is also the expected stream of income in the form of salary after the education process is completed.

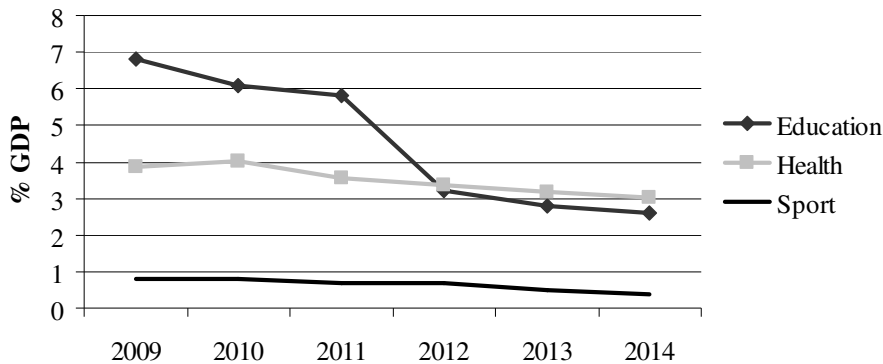


Fig. 2. Dynamics of public expenditure on the social needs (developed by the authors) [8]

Without belittling the importance of other factors, we will dwell on the analysis of expenditures on education and projected future stream of income of a Latvia’s university graduate. In other words, we will define the extent to which the human potential accumulated by a person during university studies can be transformed into human capital, *i.e.* a set of professional expertise, knowledge and skills, which make it possible for a person to receive income, and the extent by which the projected future stream of income will exceed the expenditures on education.

**Methodology for evaluating the effectiveness of investments in higher education**

The following methodology has been used to evaluate the effectiveness of investing in higher education:

1. It is assumed that the undergraduate applicant may receive a higher education degree in one of four professions: engineer, economist, physician and teacher.
2. Depending on the place of residence, the undergraduate applicant may select a university in his/her hometown or move to another city where the preferred university is located, including the capital.
3. Depending on his/her abilities, the undergraduate applicant can study for a higher education degree at the expense of the state budget or on a fee basis.
4. Tuition for studies on a fee basis is funded at the expense of the parents or through a bank loan. It is assumed that the student does not have an opportunity to have a side job due to a heavy academic load.
5. The student loan is provided on preferential terms by one of Latvia’s banks (the state student loan).
6. If the studies are funded through the state budget, the student will receive a scholarship.
7. Depending on his/her financial situation, the student can either rent a room or live in a dorm. In this case, the cost of meals and lodging should not be lower than the minimum consumer budget.
8. It is assumed that after graduation, the graduate may start his/her professional career in any city in Latvia, including the capital. If the graduate moves from his/her hometown, he/she will have to rent an apartment.

The factors influencing the parents’ educational strategy and the effectiveness of financial costs in education are presented in Figure 3. Different combinations of factors have enabled us to analyze various educational strategies for each professional occupation.

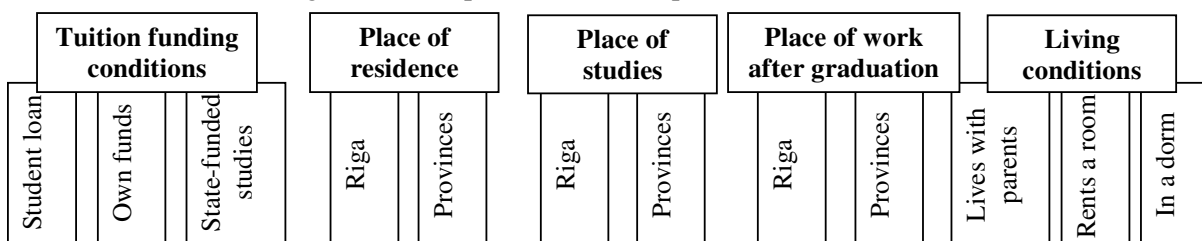


Fig. 3. Factors influencing the educational strategy for professional occupation

In the presence of five major factors having impact on educational strategy and three criteria of tuition funding conditions, we can analyze, at least, 15 possible educational strategies for any of the named professions.

The net present value of the future stream of income (the sum of the discounted net cash flows) has been used as a criterion for the effectiveness of costs in higher education [10]. The general formula of the calculation is shown below.

$$NVP = \sum_{t=0}^n \frac{B_t - C_t}{(1+i)^t} \quad (1)$$

where  $NVP$  – net present value of the future stream of income;  
 $B_t$  – benefits from education in period  $t$ ;  
 $C_t$  – costs of education in period  $t$ ;  
 $n$  – number of time period, which is equal to the number of years of work activities;  
 $i$  – discount rate.

Benefits from education  $B_t$ , which are calculated for the certain time period  $t$ , represent the difference between incomes received by a person with higher education and a person without higher education.  $B_t$  can be calculated using the following formula:

$$B_t = I_{et} - I_{wet} \quad (2)$$

where  $I_{et}$  – the remaining available income received by a person with higher education in period  $t$ . It is the difference between the total income and expenditure on food and essential items included in the minimum consumer budget.  
 $I_{wet}$  – the remaining available income received by a person without higher education in period  $t$ . It also equals the difference between the total income and expenditure on food and essential items included in the minimum consumer budget.

Costs of education  $C_t$  include the costs of studies on a fee basis funded through own resources or credit resources.

Since investments in education and income received after graduation are stretched in time, there is a need to equate the value of future income to its present value, i.e. to perform discounting. To calculate the discount factor, we have used the refinance rate of the Bank of Latvia, which is equal to 3.5 %.

The RSU tuition fee to become a physician was 9000 EUR. The fees for pursuing a degree in Economics amounted to 4200 EUR at LUA and 5120 EUR at LU, while the fees for studying Engineering were 5400 EUR at RTU and 6600 EUR at LUA. The tuition fees to become a teacher amounted to 4000 EUR at DU and 3150 EUR at LU [7].

Table 1 shows the cost of accommodation and meals of a student and subsequently an employed graduate [11; 12]. The cost of accommodation and meals is based on a minimum consumer budget (MCB) on the day of calculation. For those living in the capital city, a multiplying factor of living expenses, which is equal to 1.5, is implemented.

Table 1

**Cost of accommodation and meals, EUR (2013)**

Expenditure item	Period	
	per month	per year
The cost of accommodation and meals of a student pursuing higher education in the provinces (1 MCB)	250	2500
The cost of accommodation and meals of a student pursuing higher education in Riga (1.5 MCB)	375	3750
The cost of accommodation, meals and tuition of a student in Riga if the student is from outside of Riga	412	4120

Salary of a person with higher education, depending on his/her duration of employment and chosen professional occupation is presented in Table 2. Data of the Ministry of Welfare of Latvia and the Central Statistical Bureau have been used for the calculation of salaries [11; 13].

Table 2

**Monthly salary depending on the duration of employment, EUR (2013)**

Professional occupation	Place of work	Period of employment				
		Year 1-5	Year 5-10	Year 10-15	Year 15-20	Over 20 years
Engineer	Riga	820	870	950	1100	1400
	Provincial centre	650	680	750	860	1100
Physician	Riga	750	780	850	980	1200
	Provincial centre	600	650	700	800	1000
Teacher	Riga	520	545	600	690	860
	Provincial centre	400	420	460	540	670
Economist	Riga	550	580	640	740	920
	Provincial centre	500	525	580	670	830

Table 3 provides additional data on the size of the scholarship and the salary level of an employee without higher education [11].

Table 3

**Size of scholarship and salary level of an employee without higher education (2013)**

Name of the index	Value
Scholarship per month, EUR :	170
Employee's salary per month, EUR :	
• Riga	550
• The provinces	380

To compare the level of salaries, we have chosen the salary of a locksmith, as locksmithing is the most sought-after trade. The average locksmith's salary was 550 EUR per month in November 2013. The average salary in other trades that do not require higher education was as follows: a welder's salary was 615 EUR, a construction worker's salary was 700 EUR and a driver's salary was 580 EUR [14]. Thus, the salary of a worker without higher education is comparable to the salary of a doctor and a teacher in the first and second year of employment.

The second important conclusion is that the salaries of workers without higher education remain high not only in the capital city, but also in the provinces, while the salaries for the professions of an economist, a physician and a teacher are differentiated depending on the geographical location of the place of work.

### Calculation of the cumulative net present value

Figure 4 shows the results of the calculation of the cumulative net present value of investments in education for people who were born in the capital city, where they have received higher education and where they are working.

The comparison of incomes of a person with higher education and of a person without higher education demonstrates that the return on financial costs in education in Latvia is low. In other words, benefits from education, i.e. the difference between the incomes received by a person with higher education, taking into account costs in higher education, and the income received by a person without higher education is negligible.

Calculations show that even in the capital city the only professional occupation which guarantees a positive cumulative net present value of higher education at the end of working career is the profession of an engineer. The cumulative net present value of education is 9900 EUR for state-funded studies, 4200 EUR for studies funded through own resources and 3750 for studies funded through credit resources. Engineering profession is not very popular in Latvia, there is no such thing as industry. People who have studied engineering are also in demand to fill other occupations.

The prestigious profession of an economist ensures a positive cumulative net present value of higher education only provided that the studies have been funded through the state budget. The economist's cumulative net present value of education is 4800 EUR (state-funded studies), 2360 EUR (studies funded through credit resources) and 3000 EUR (funded through own credit resources).

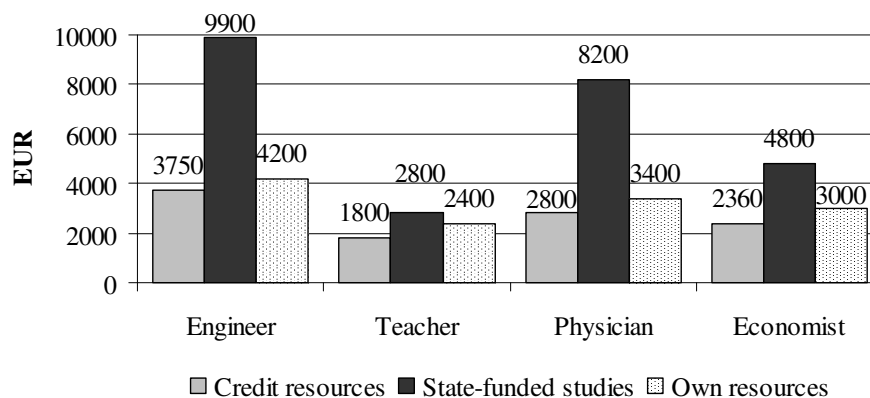


Fig. 4. **The cumulative net present value for students who were born in the capital city, where they have received higher education and where they are working (developed by the authors)**

The professions of a physician and a teacher in term of the stream of the cumulative net present value of higher education do not justify the costs of financial resources and time. Whatever the educational strategy, a metropolitan resident with the profession of a physician or a teacher, will have a negative cumulative net present value of higher education at the end of his/her working career. In other words, the total income of a person without higher education, after taking into account the discounting, is higher than the income of physicians and teachers. The cumulative net present value of these professions ranges from 700 EUR to 1900 EUR.

## Conclusions

The present analysis of the data allows us to draw the following conclusions. Firstly, the socially significant professions such as a physician and a teacher cannot provide respective specialists with a higher income compared with trades that do not require any education, for example, a road worker or a salesperson. Consequently, the labour market witnesses an imbalance regarding the salaries of individual categories of workers.

The income of highly skilled workers is equal to the income of employees performing work that does not require high skills and education.

Secondly, the calculations show that the investments of human and financial capital of the parents in the children's human capital have become ineffective due to the "abandonment" of the social sphere by the state. The costs of education to pursue a degree in the socially important disciplines, such as Medicine and Education, as compared to alternative investments of financial resources, do not pay off either in the short or long term as a result of rising tuition fees and low salaries. In other words, due to lower public expenditure on education, parents and their children, after mobilizing all available resources of the family with the help of the social capital, cannot get a positive net present value of investments in the future.

Moreover, the existing bank loan conditions do not contribute to improvement of the situation. Because of the short duration of the loan and the high cost of using the credit resources, a young professional with a higher education degree is unable to make the current loan payments on his/her own in view of the level of salaries.

Thirdly, considering the inefficiency of costs in higher education in Latvia, a part of the most active undergraduate applicants, depending on their financial capacity, prefer to pursue higher education either in the Commonwealth of Independent States or Western Europe. In the future, these students studying abroad are unlikely to return to their home country.

Fourthly, the low salary of the general population challenges not only the reproduction of qualified specialists, but also the mere reproduction of population in Latvia. This situation is well

correlated with the long-term UNDP forecasts regarding the total population in Latvia, which is expected to decline significantly.

All of the above suggests that the state and business merely declare a transition to innovative development. If the need for innovation really existed, the work of scientists and specialists would be remunerated much better, while the demand for places in PhD programmes and research institutions would be very high.

Comparing the obtained data with the distribution of population by income, we can say that if the situation with the cost of the non-state-funded education and loan conditions does not change, no more than 10-15 % of the population will be able to afford studies on a fee basis in the future, even if funded through credit resources.

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