

ŠIAULIAI UNIVERSITY

Simona Potelienė

**ASSESSMENT OF THE PRIVATE RETURN
ON INVESTMENT IN HUMAN CAPITAL
AND THE IMPACT OF THE FACTORS
DETERMINING IT**

Summary of Doctoral Dissertation
Social Sciences, Economics (04 S)

Šiauliai, 2017

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ŠIAULIŲ UNIVERSITETAS

Simona Poteliene

**INVESTICIJŲ Į ŽMOGIŠKĄJĮ KAPITALĄ
PRIVAČIOS GRAŽOS IR JĄ LEMIANČIŲ
VEIKSNIŲ POVEIKIO VERTINIMAS**

Daktaro disertacijos santrauka
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INTRODUCTION

The relevance of the topic. Investment in human capital is one of the main factors determining technological development, production, and consequently the economic growth and the increase of competitiveness. In the current economic situation, when human capital and investment in it become inseparable from the growth of the state and the society, investments in human capital become of paramount importance, therefore, are constantly increasing. When the investment is increasing, the return on investment in human capital is becoming a particularly relevant problem. In many countries the indicators of the return on investment in human capital are calculated, on the basis of which the resource allocation for science, education and vocational training is regulated, the efficiency of investment is assessed in accordance with separate areas of study, the obtained degree, etc. Studies carried out in different countries and time periods have confirmed that more educated people receive higher salaries, face lower risk of unemployment, have more opportunities to be employed in a prestigious work, have a more attractive, more interesting and promising work, take a better position in the society, are more respected by other people, are able to adapt to the economic change better than people with lower levels of education. This positive correlation between earnings and investment in human capital is confirmed in many empirical studies. In addition, the latest sources of literature indicate some additional benefits, such as longer life expectancy or a higher degree of “happiness”.

The return on investment in human capital and its assessment are relevant for all investors, both for a private person, an enterprise / organization investing in its employee, and the state. How much to invest in human capital (education, as one of the major forms of investment in human capital) is one of the most important economic decisions faced by every individual. Information about the return on investment from an economic point of view can help individuals make a better decision on the further learning and the investment in himself / herself. The growth of private contribution in obtaining higher education is noticed in many countries recently, therefore, the importance of seeing the return on investment as a criterion of the private decision is increasing. Knowing what return can be secured by different study alternatives (even if higher education is financed from the state budget), it is possible to make scientifically significant insights, defining the priorities of how public funds should be distributed between different areas of education, the information obtained can also help explain the demand for different study fields.

Assessment of the return on investment in human capital, in order to make rational and efficient investment decisions, is a relevant topic of scientific discussion. Therefore, the chosen topics of the work confirm its relevance. Despite the fact that the concept of human capital has been intensively studied for more than 60 years, still there are discussions about the return on investment in human capital, its differences and assessment methods.

It should be noted that the studies of assessment of the return on investment in human capital do not distinguish a single most appropriate method of assessment. In many empirical studies the return on investment in human capital is calculated applying the Mincer earnings equation, assessing the factors that have an influence on a person's earnings, but the "return" on investment in human capital calculated using this method cannot be compared to the "real" return, as when calculating the return, the costs are not assessed, i.e. with the aid of the Mincer earnings function the pseudo-return is calculated and presented, ignoring the costs. Meanwhile, calculation and assessment of the return on investment should also include the costs incurred to achieve the expected benefits (wage increase).

Another method of assessment of the return often used in empirical studies is the internal rate of return, calculating which (assessing the return on investment in human capital) the costs are assessed, however, limited to the wage differences (of those who have acquired higher education and those who have not acquired it), without distinguishing and without regard to other factors, which may influence the differences in wages. Therefore, when assessing the return on investment in human capital and its differences, the latter can be underestimated, or on the contrary, overrated because other factors having an impact on the wage the person receives have not been estimated.

It should be noted that the assessment of the private financial return on investment in human capital and the factors determining it, the justification of the methodology of calculation of the return determine certain theoretical assumptions and practical solutions, which require theoretical clarification and empirical tests.

Despite the presently growing interest in human capital, the assessment of the return on investment in human capital and the factors determining it still remain a complex and further discussed object of scientific research. Thus, the relevance of the topic is reflected by the importance and the need of investment in human capital, the necessity to assess the future return before making an investment decision, and the scientific discussions reveal the problems of assessment of the return on investment in human capital.

The scientific problem and the level of its investigation. After more than half a century after the emergence of the theory of human capital, this topic is still widely analysed in many aspects in the works of many scientists. A variety of definitions of human capital, interpretations of assessment of the return on investment in human capital and the factors determining it of different scope and level of exploration, empirical research methods applied and their results can be found in the scientific debate. The importance of human capital and its influence on the economic growth and technological progress, productivity, wage growth and differentiation is discussed in the papers of many scientists: T. W. Schultz (1961, 1971), J. Mincer (1958, 1974), J. Mincer and S. Polachek (1974), E. F. Denison (1964), G. S. Becker (1964), R. Nelson and E. S. Phelps

(1966), M. P. Romer (1998), E. R. Lucas (1993), P. David (2001), L. Oxley, T. Le, J. Gibson (2003, 2005, 2006, 2008), B. A. Weisbrod (1961), H. Wei (2003), P. Wachtel (1997), H. L. Tao and T. F. Stinson (1997), R. Judson (2002), C. Dagum and D. Slottje (2000), D. L. Millimet, M. Nieswiadomy and D. Slottje (2010), M. Bullen, K. A. Eyler (2010), W. Guo, H. Xiao and X. Yang (2012), L. Romele, M. Purgailis (2013), D. Lazarov and G. Petreski (2016). There are a number of empirical studies carried out in order to verify the claims of the theory of human capital, which confirmed many of the postulates of this theory: *the relationship between education and productivity* (A. Maddison, 1986), *accumulated human capital and economic growth* (Benhabib and Spiegel, 1994, 2005; Seo, 2005; Paulsen and Fatima, 2007; Santos 2009; Chaudhry and Rahman, 2009; Siqueira, 2007; Mullin, 2010; Baldwin and Borrelli, 2008; Afzal, Malik, Begum, Sarwar and Fatima, 2012), *the impact of human capital on technological change and innovation* (Wang, Yen, Tsai and Lin, 2008; Davenport and Prusak, 1998), etc.

Scientists of the world give great attention to *research of the influence of human capital on growth and differentiation of wages* – J. Mincer (1958, 1974), J. Mincer and S. Polachek (1974), R. Tchernis (2010), H. H. Son (2010), P. Trostel, I. Walker, P. Woolley (2002), G. Psacharopoulos and H. A. Patrinos (2004, 2011), etc. G. S. Becker (1964, 1993), W. W. McMahon and A. Wagner (1982), J. G. Altonji (1998), O. Ashenfelter and A. Krueger (1994), K. Wilson (2001), D. Acemoglu (2002), L. Dearden (1998), R. J. Barro and J. W. Lee (2010), A. Leigh (2008), V. Kharbanda (2012) examined and assessed *the return on investment in human capital in the aspect of the individual* in their works, *the return on education, by comparing the wages of twins with different levels of education*, was analysed by O. Ashenfelter and A. Krueger (1994), C. E. Rouse (1999), J. R. Behrman and M. R. Rosenzweig (1999) et al. Considering that investments in human capital provide not only private, but also public/social benefit (Schultz, 1963; Fatima, 2009), the researches carried out (McMahon, 1991, 1998, 1999; Acemoglu and Angrist, 1999; Kara, 2009) showed that the *social rate of return on investment in human capital* is an important, significant return, and it is higher than the return on the funds invested in other assets.

It should be noted that in the scientific literature of the world there is a large number of researchers who analysed *the dependence of the rate of return on the degree of education obtained* (Becker, 1993; Grubb, 1995, 1996; Kane and Rouse, 1995; Leigh and Gill, 1997; Lewis, Hearn, Zilbert, 1993; McMahon and Wagner, 1982; Monk-Turner, 1994; Psacharopoulos, 1981, 1985, 1995, 2009, 2011; Said, 2016; Tzannatos, Diwan, Ahad, 2016; etc.), the results of whose research and opinions presented in the economic literature are controversial. For example, V. H. Herrera, M. Madrid-Aris (2000), A. A. Amin and W. J. Awung (2005), J. Gibson and O. K. Fatai (2006), Q. Zhang and H. Zou (2007), L. A. Amaghionyeodiwe, T. S. Osinubi (2007), T. Kifle (2007) et al. point out that the return on education increases with the increasing level of education, while according to the data presented by other researchers – K. Michaelowa

(2000), C. Sakellariou (2003), T. P. Schultz (1993), L. A. Riveros (1990), etc., the return on investment in education is the largest on the lower levels of education and is declining when the level of education increases. However, J. J. Heckman, L. J. Lochner and P. E. Todd (2008), P. Trostel (2005), O. Kara (2009) etc. who indicate that the return on education is not linear, i.e., it increases or decreases with the increasing level of education, should be distinguished among the participants of this debate.

The influence of the *area of study* chosen to study (Stark, 2007; Görlitz and Grave, 2012; Brunello, Comi, Lucifora, 2000; Yong, Heng, Thangavelu, Wong, 2007; etc.) and *the gender factor on the rate of return on investment in human capital* (Arai, 2001; Stark, 2007; Wahrenburg, Weldi, 2007; Mincer, Polachek, 1974; Brown, Monn, Zoloth, 1980; Groshen, 1991; Schumann, Ahlburg, Mahoney, 1994; Psacharopoulos, 1985; Sánchez-Pérez, 2012; etc.) is highlighted in researches of assessment of the return on investment in human capital, where the presented results are contradictory or not comparable due to different classification of the areas of study in different countries (for example, some researches highlight a high rate of return on the study areas of law, health sciences, information technology, engineering sciences, and other researches – on economic, technical, natural sciences, etc). However, as the analysis of empirical research carried out shows, it is usually limited to the assessment of the impact of the latter factors on the amount of the return. And although on the basis of the results of the empirical researches carried out the effect of other factors on the return distinguished by other researchers can also be found, for example, the type of the sector (the differences of the return on investment in human capital mentioned by the persons working in the public and private sectors) (Brunello, Comi, Lucifora, 2000; Lauer and Steiner, 2004; Okuwa, 2004; Budría, 2006; Chirwa and Matita, 2009; Javed and Arshad, 2013; et al.), it should be noted that basically the studies are often limited to the differentiation of wages when assessing how much and how individual factors influence the wage, without focussing on whether the same factors that affect the wage have an impact on the amount of the return. Therefore, the empirical studies lack the identification of the factors, what factors and how influence the return on investment in human capital and its rate.

The performed analysis of studies on the issues of the theory of human capital suggests that the Lithuanian scientists analyse human capital more on organizational level. It is possible to name only several authors, who calculated and assessed the return on investment in human capital in their works. They are A. Šileika and Z. Tamašauskienė (2003), Z. Tamašauskienė and V. Damašienė (2004), J. Palumickaitė, I. Kleivienė (2005), V. Gižienė (2011), V. Gižienė, Ž. Simanavičienė, O. Palekienė (2012), P. Grigas and B. Leiputė (2015).

The results of studies in Lithuania show that the return on investment in higher education for an individual varies from 6% to 25%, depending on the information used and methodology applied, however, the current studies do

not distinguish the factors that can significantly influence the benefits of and the return on investment in human capital (future income of those who have obtained higher education), i.e. gender, degree obtained and the area of study chosen. It is therefore appropriate to develop the model assessing the impact of these factors on the return on investment in human capital, taking into account the fact that the cost of study varies depending on areas of study and degrees.

It should be emphasized that despite a wide range of scientific researches, the number of studies, which dealt with the impact of factors on the return on investment in human capital is quite limited, the factors that have an influence on the return on investment in human capital are not analysed in detail, their impact is not explained, and the assessment of their impact is often limited to calculation of pseudo-return, applying the Mincer function (Alstadsæter, 2004; Pereira and Martins, 2004; Ciccone, 2004; Ulrick, 2007; Leigh, 2008; Ciccone, Cingano and Cipollone, 2006; Brenner and Rubinstein, 2011; Fiaschi and Gabbriellini, 2013; Alqattan, Al-Zayer, Stergioulas, 2013; Said, 2016; Tzannatos, Diwan and Ahad, 2016; etc.) that ignores the cost of acquiring education, as a result of which a higher return on investment in human capital is presented because of the costs that have not been estimated. Meanwhile, the research of assessment of the return on investment in human capital, evaluating the costs using the method of the internal rate of return (Collins and Davies, 2005; Boothby and Rowe, 2002; Constantatos and West, 1991; Dickson, Milne and Murrell, 1996; Wahrenburg and Weldi, 2007; Kara, 2009; Harberger and Guillermo-Peón, 2012; Heckman, Lochner, Todd, 2008; García-Suaza, Guataquí, Guerra, Maldonado, 2009; Giżienė, 2011; Lazarov and Petreski, 2016; etc.) are limited to the wage differences (of those with higher education and those who haven't obtained it), regardless of the other factors that could influence the wage differences. This can lead to inaccurate calculation of the return on investment in human capital: the return may be completely underestimated, or conversely, overestimated because of the impact of other factors determining the differences in wages. In addition, using the method of internal rate of return, it is assumed that the incoming flow of income is reinvested with the rate of return equal to the internal rate of return. However, in a real situation additional benefit received (wage increase) due to higher education acquired is not reinvested, it can therefore be stated that the reinvestment takes place partially, and this raises the issues concerning the suitability of the application of this method in assessing the return on investment in human capital, etc.

To sum up the level of investigation of the scientific problem, it can be stated that in the scientific literature attention is drawn to such important problems of assessment of the return on investment in human capital and the factors determining it as: how to assess the return on investment in human capital; how to measure the benefit provided by the investment in human capital; what the relationship between the obtained higher education and the return is; how to assess the impact of individual factors on the rate of return, etc. It should be noted that

the obtained results of the scientists' researches are often controversial because of different assessment methods chosen, or underestimated/ignored influence of other factors, costs not assessed, what results in inaccurate final results of a research received and/or questionable interpretations of the results presented. It should be noted that the assessment of the return on investment in human capital in the scientific aspect is analysed quite fragmentarily, dealing only with individual elements and approaches, scientific discussion lacks purposefulness and a systematic approach. Therefore, having noticed that the researches of the theory of human capital (especially in Lithuania) pay too little attention to the assessment of the return on investment in human capital and after evaluation of the relevance of this problem both from a theoretical and practical point of view, this dissertation work is intended for its solution.

In the view of the limitations of assessment of the private financial return on investment in human capital and the impact of the factors determining it presented above, **the scientific problem is formulated in the dissertation** – what factors affect the private return on investment in human capital and how to assess it identifying the impact of different factors?

Object of the research – the private return on investment in human capital.

The purpose of the research – to assess the private financial return on investment in human capital and the impact of the factors determining it, applying the developed model after conducting the theoretical analysis of assessment of the human capital and the private return on investment in it.

To achieve the purpose set, the following **tasks** are dealt with in the dissertation:

1. To examine and summarise the theoretical concepts of human capital, distinguishing the key components of the human capital.
2. After summarising scientific research to identify the factors determining the private benefit, costs and return on investment in human capital.
3. After the analysis of scientific research to present the possible methods of assessment of the private financial return on investment in human capital, distinguishing their advantages and limitations.
4. To develop the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it.
5. To prepare the methodology of research of assessment of the private financial return on investment in human capital and the impact of the factors determining it.
6. On the basis of the developed model of assessment of the private financial return on investment in human capital and the impact of the factors determining it, to assess the private financial return on investment in human capital in the case of Lithuania, identifying the impact of individual factors (differentiating it by the type of the sector (private and public sector), gender, qualification/research degree obtained and the area of study).

The structure and volume of the work. The dissertation consists of the

introduction, three parts, conclusions and a list of references. Twelve annexes are provided. The volume of work is 208 pages, it contains 17 tables and 35 figures, 539 sources of literature were used.

The logical structure of the dissertation is determined by the formulated scientific problem, the defined object of the dissertation and the tasks set for its implementation, the logical sequence of which is reflected in the three parts of the dissertation. The logical structure of the dissertation and tasks dealt with are shown in Figure 1.

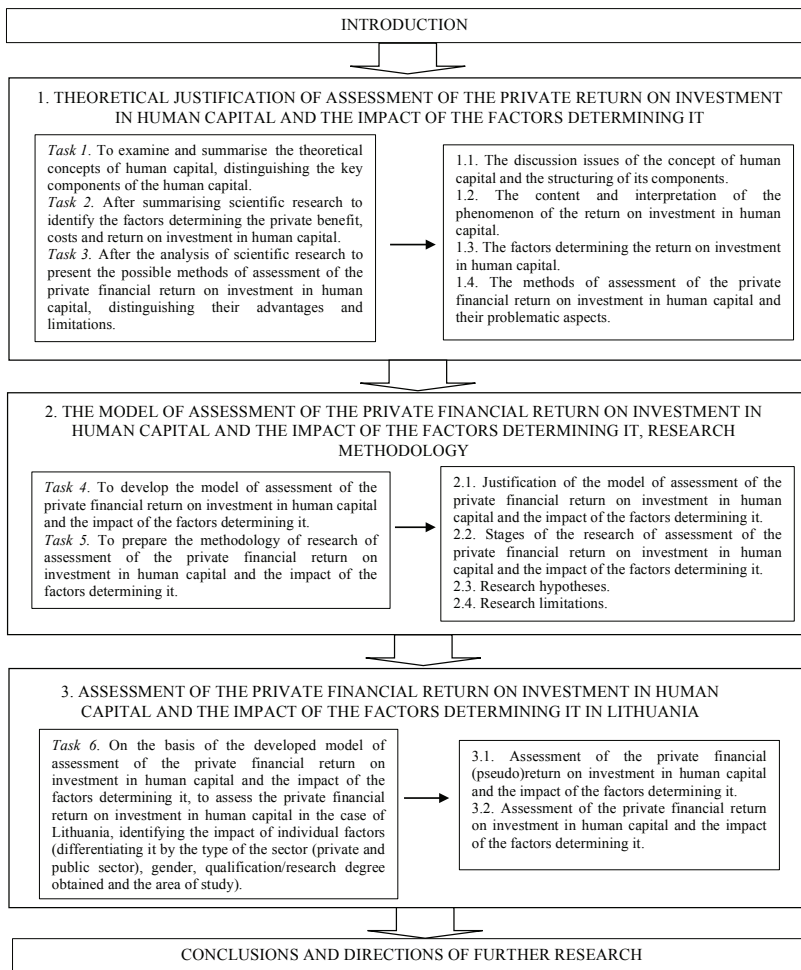


Figure 1. Logical structure of the dissertation

The first part of the dissertation deals with the first three tasks. In this part the

discussion issues of the concept of human capital are studied, key components of human capital are identified, forms of investment in human capital are presented, the benefit of investment in human capital from the viewpoint of the individual and the society is justified on the theoretical level, the costs of investment in human capital are discussed, the types of the return on investment in human capital are named and presented. Summarising the approaches to the concept of human capital presented in scientific literature sources and empirical researches, aiming at conceptual clarity when stressing the complexity of the concept, the explicated definition of human capital has been formulated. Generalisation of the results of theoretical and empirical researches of investment in human capital has been carried out, the factors that have an influence on the costs of investment in human capital, on the created benefit and private return have been identified. Possible methods of assessment of the private financial return on investment in human capital have been distinguished, noting their advantages and limitations, the range of problems of assessment of the return on investment in human capital has been revealed.

The second part deals with the fourth and fifth tasks of the dissertation. When forming the research methodology, the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it is developed, the stages of empirical research are discussed, the selection of the sample of the research is justified, the method applied is selected and justified, limitations of the research are indicated.

The third part of the dissertation deals with the last task of the scientific research. It presents the results of data of the quantitative research carried out, the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it is tested using the collected data, assessment of the private financial return on investment in human capital is carried out, differences in the return related to the obtained higher education degree, chosen area of study, taking into account the gender dimension, etc. are identified.

Methods of scientific research:

In order to achieve the aim of the dissertation and dealing with the set tasks, general scientific research methods have been applied. Researching the level of investigation of the scientific problem of the dissertation, analysing the aspects of assessment of human capital, the private return on investment in it and the impact of the factors determining it, revealing the limitations of assessment of the return on investment in human capital, the methods of analysis and comparison of scientific literature, grouping of the results of empirical studies carried out, generalisation, formulation of conclusions were applied. Methods of modelling and econometric analysis, integrating the quantitative methods of descriptive statistics and regression analysis were applied in the development of the model

of assessment of the private financial return on investment in human capital and the impact of the factors determining it, and in conducting the empirical verification of the model. In order to identify the factors affecting the wage rate and the private financial return on investment in human capital and to determine the strength of their impact, the questionnaire survey was carried out for data collection.

Information and data sources used in the scientific work:

- When researching and analysing theoretical aspects of human capital and assessment of the private return on investment in it, the impact of the factors determining it and the methods of research, when developing the model of assessment of the return on investment in human capital and the factors determining it, the author of the dissertation refers to the works and researches carried out by foreign and Lithuanian scientists.
- Given the shortage of primary data, the basis of empirical research is the data collected during the questionnaire survey.

Limitations of the research. To achieve the aim of the dissertation, the return on investment in human capital is assessed from the viewpoint of an individual, distancing from the public and social return, based on a broader assessment of both the benefits and the costs. The latter aspect is treated as the object of future research.

The designed model of assessment of the private financial return on investment in human capital and the impact of the factors determining it, which distinguishes internal and external factors determining the return, is one of possible options, thus, it cannot be stated that it includes all factors determining the return on investment in human capital.

In the dissertation research carried out, human capital is seen as education. This approach is based on the attitude that education is the main lever in the development of human capital, i.e. education ensures acquisition of the knowledge and skills which provide individuals an opportunity to increase the productivity and income. To implement the aim of the dissertation, the return on investment in higher education is assessed by conducting the research.

When carrying out the assessment of the return on investment in human capital and the impact of the factors determining it, it is dissociated from assessment of non-financial benefit.

The dissertation work complements the already existing scientific sources by new information. To the knowledge of the author of the dissertation, this is the first study carried out in Lithuania that calculates the private financial return on investment in human capital using the classical Mincer earnings function and assessing the return by the gender, obtained degree, and the chosen study area, and by the type of the sector in which they work, the nature of activities of the company, etc. Since the assessment of the return on investment in human capital takes into account the costs of studies, two methods, which are used to calculate

the private financial return received from higher education obtained, are related in the research. The designed econometric model, based on the Mincer earnings function, allowed to analyse and identify the factors that make an impact on the wage rate and the private financial (pseudo) return on investment in human capital and to calculate the private financial (pseudo) return. Another method, the discounted profitability index, has allowed assessment of the costs incurred during the period of studies and calculation of the average annual private financial rate of return.

The scientific novelty of the work is described by the following obtained results:

- Scientific literature in the sphere of assessment of the return on investment in human capital has been analysed, components of human capital have been distinguished, the revised definition of human capital has been formulated, highlighting the complexity of the concept and defining it from a narrow and broad viewpoints. The definition of the concept has been explicated to include the attitudes of the individual, creativity, entrepreneurship, motivation, innovativeness, orientation in the environment, being able to use one's knowledge and skills properly and timely, as well as other personal characteristics, enabling to increase the work productivity and the income of the individual in the form of salary.
- The methods of assessment of the private financial return on investment in human capital and their advantages and limitations, the problems of their application in empirical studies have been identified. The distinguished advantages of the methods became the basis for the preparation of the methodology of research of assessment of the private financial return on investment in human capital and the impact of the factors determining it, in order to eliminate the limitations of assessment methods applied.
- The performed analysis of theoretical and empirical researches of investment in human capital has allowed to identify and distinguish the factors determining the benefits, costs and return on investment in human capital, which can be grouped into two main groups: external factors, including the macro-economic environment, government policy, etc., and internal factors, depending more on the individual himself and covering his behaviour, psychological, educational, and other factors related to himself. On their basis, the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it has been prepared.
- After supplementing the Mincer function with individual factors and modifying it by including the education square to reflect the potential non-linear impact of education on wages, the model of econometric research, enabling to assess the financial benefit provided by the education (wage rise) – the private financial pseudo-return on investment in human capital

- and the impact on the factors determining it has been developed.
- The developed model of assessment of the private financial return on investment in human capital and the impact of the factors determining it and the prepared methodology of empirical research combine several methods of assessment and integrate identification and assessment of the benefits and costs of the investment, taking into account the time value of money.

Practical significance of the dissertation results:

- The model of assessment of the private financial return on investment in human capital and the impact of the factors determining it presented in the dissertation and the prepared methodology of empirical research expand the area of already existing models of return on investment in human capital and the impact of the factors determining it and can be applied and used to research the cases of other countries.
- The prepared questionnaire can be adapted and used in the assessment of the impact of factors on wages in the case of any country of the world.
- Although other studies revealed that a much higher return can be expected on higher education than on alternative investments, during the research carried out in the dissertation it was found that different rates of return are created depending on the chosen area of study and the degree obtained (some areas of study are not as attractive, evaluating from the economic point of view) therefore, the decision of what to study (and what educational institution to choose) can have a significant influence on the person's future income.
- On the basis of the designed model of assessment of the private financial return on investment in human capital and the impact of the factors determining it, the results of the research carried out may be useful for scientists, researching the issues of assessment of the return on investment in human capital and work payment, for school leavers and other persons, choosing an area of study, making the decision on selection of the study cycle, etc., as well as for the country's human capital management policy makers.
- The obtained results of the research can be used in the study and continuing education process, and for conducting further scientific research.

REVIEW OF THE CONTENT OF THE DISSERTATION

1. THEORETICAL JUSTIFICATION OF ASSESSMENT OF THE RETURN ON INVESTMENT IN HUMAN CAPITAL AND THE IMPACT OF THE FACTORS DETERMINING IT

In the first part of the dissertation, in order to justify the object of the research and dealing with the first three tasks of the research, the discussion issues of the concept of human capital are studied, the key components of human capital are identified, forms of investment in human capital are presented, the main differences of investments in human and other capital are noted, the benefit of investment in human capital from the viewpoint of the individual and the society is justified on the theoretical level, the costs of investment in human capital are discussed, the types of the return on investment in human capital are named and presented.

Summarising and presenting the results of theoretical and empirical researches of investment in human capital, the factors determining the private and public benefit of investment in human capital, the costs and the return on investment have been identified and justified, thus, substantiating the object of the research and forming the conception of development of the model.

To generalise various empirical studies carried out, where the benefits, costs and the return provided by investment in human capital are assessed in different countries, at various periods of time, the systematised factors that influence the return on investment in human capital are distinguished and presented in Figure 2, taking into account the variables used in the models of assessment of the return chosen by researchers. Also it should be noted that the factors determining the private and public benefits and costs of investment in human capital at the same time influence the return provided by the investments, i.e., the same factors that foster investment in human capital influence not only benefits, but also costs, and at the same time the return received. The relationship between the factors is depicted in the figure presented below.

As the analysis of the conducted theoretical and empirical studies shows, scientists focussing on and assessing the return on investment in human capital investigate not only the different factors, but also use different methods of assessment of the return. Therefore, in the last section of the first part the methods of assessment of the return on investment in human capital are highlighted, marking their advantages and problematic aspects.

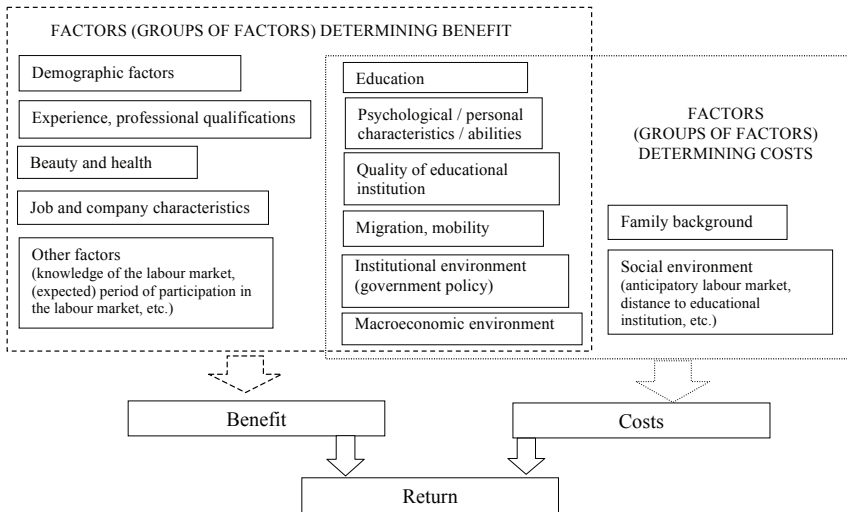


Figure 2. Summary of theoretical and empirical studies, which assess the factors influencing the benefit, costs and return of investment in human capital

To summarise the methods used by various authors to assess the return on investment in human capital, they can be grouped into two types: traditional (classic) and specific methods.

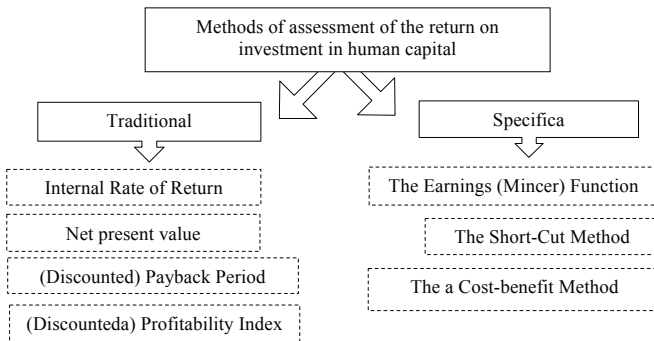


Figure 3. Methods of assessment of the return on investment in human capital

The performed analysis of theoretical and empirical studies of assessment of the return on investment in human capital allows to state that different methods can be applied to one of the most important indicators of assessment of human capital, the assessment of the return on investment in human capital (education) and the impact of the factors determining it. All of them are characterized by

distinctive calculation methodology. When applying some of them, the average values (average costs or benefit) are enough, and when using them, simple calculations are performed. Other methods (Mincer earnings function) require information about the wages of every person with different education and work experience. However, it should be noted that each of them has both its advantages and disadvantages. Therefore, the problem is raised – how to assess the return on investment in human capital, identifying the impact of different factors?

Based on theoretical approaches analysed in the first part of the dissertation, the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it is designed and research methodology is prepared, following which the empirical research is conducted in the next part of the dissertation.

2. THE MODEL OF ASSESSMENT OF THE RETURN ON INVESTMENT IN HUMAN CAPITAL AND THE IMPACT OF THE FACTORS DETERMINING IT, RESEARCH METHODOLOGY

In the second part of the dissertation, on purpose to implement the aim of the dissertation, the research methodology is developed: the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it (based on the insights of generalisation of theoretical concepts in the first part of the dissertation and the results of critical assessment of empirical studies conducted by other authors), the stages of empirical research are discussed, the sample of the research is selected, the econometric model of the research is developed, suitability of the methods applied in it is justified, hypotheses of the research are formulated, limitations of the conducted research are identified (assumptions and limitations of the model of assessment determining interpretation of the research results are formed).

In Figure 4, after summarising the results of the analysed theoretical and empirical researches, the conceptual model illustrating the author's approach to the factors affecting the return on investment in human capital is designed. As it is shown in the illustration, the benefit received, costs incurred and financial return on investment are influenced by various economic and non-economic factors, including the economic situation of the country, taxation (and governmental in general) policies, cultural and social environment and security, level of unemployment and employment in the country, as well as the individual's gender, age, education, family status, number of children, health and physical state, religion, political views, personal beliefs and attitudes, etc. The latter factors interacting with each other have an impact on the individual's

wages (benefit), costs, and determine the financial return on investment in human capital.

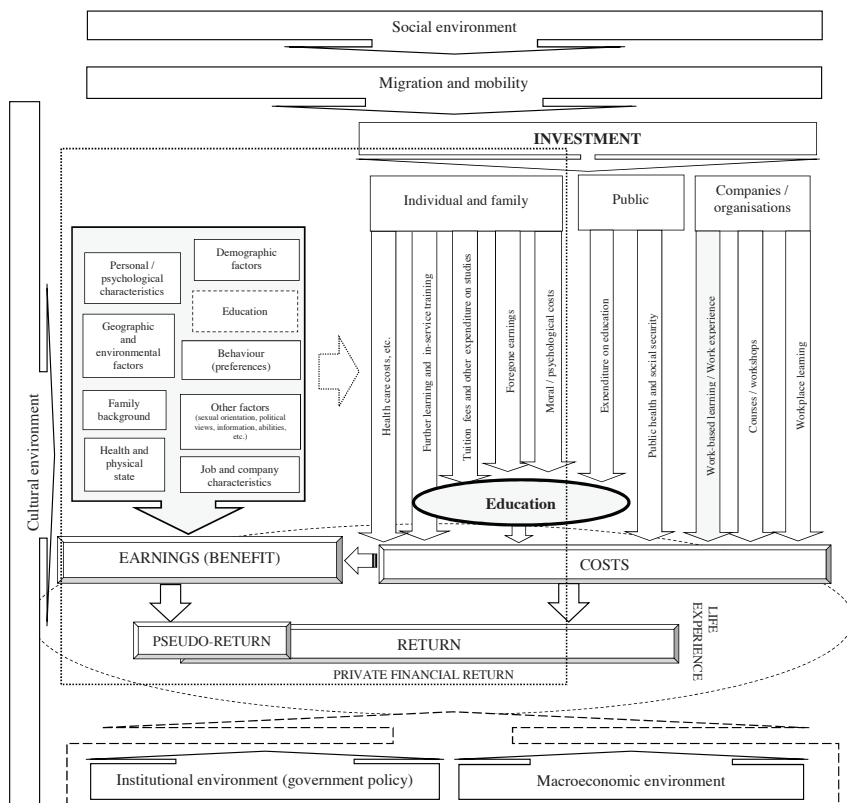


Figure 4. The model of assessment of the financial return on investment in human capital and the impact of the factors determining it

The aim of the prepared model is to test what factors influencing wages (benefit) and costs can explain the differences in individuals' private financial return on investment in human capital. The factors affecting the financial return on investment in human capital can be divided into two main groups: external and internal.

External factors include macroeconomic environment, government policy, social and cultural environment, migration and mobility opportunities. The financial return on investment in human capital is influenced by the

macroeconomic environment, for example, a youth unemployment rate can both foster and reduce the incentives for individuals to continue their studies after obtaining compulsory education, as given a high youth unemployment rate, alternative costs of obtaining a higher level of education will decrease, as a result of that the financial return on investment in human capital (education acquired) will increase. Institutional environment, including taxation policy, minimum wage determination, the influence of trade unions, the financial support of the state for the acquisition of education (free or only partially paid studies), the duration of the period of study, the determined retirement age (the expected period of participation in the labour force), etc. can also both foster and reduce investment in human capital, the benefit obtained, and at the same time the financial return. Cultural (informal institutional) environment, which is often described as a way of life of the society, its norms, traditions and values, passed down from generation to generation and shaped under the influence of the phenomena that take place, also has an influence on the behaviour of individuals and the decisions they make, which in turn can influence the financial return on investment in human capital.

Meanwhile, *internal factors* are more dependent on the individual himself and include his behaviour, psychological, educational, and other factors related to himself. Considering the fact that the macroeconomic environment, which is described by the country's economic condition, the effectiveness of social and other policies, migration and mobility opportunities, cultural environment, affects all individuals (and their behaviour), separate attention is not given to examination of the latter factors and their influence in the dissertation (the impact of external factors at the same period is the same for all individuals (or groups of individuals analysed)).

It should be noted that the return on investment in human capital (as well as the costs or benefits separately) can be evaluated from the point of view of the society and the individual. The assessment of the impact of the factors on wages (as a value expression of benefit of investment in human capital) and the private financial return carried out in the dissertation is focussed on assessment of the costs and benefits of investment in human capital from the individual's point of view. In the light of this, Figure 5 presents the designed elaborated conceptual model of assessment of the private financial return on investment in human capital of the model of assessment of financial return on investment in human capital and the impact of the factors determining it presented in Figure 4. The former model depicts the approach of the author of the dissertation to the assessment of the private financial (pseudo) return on investment in human capital (higher education) and the impact of the factors determining it.

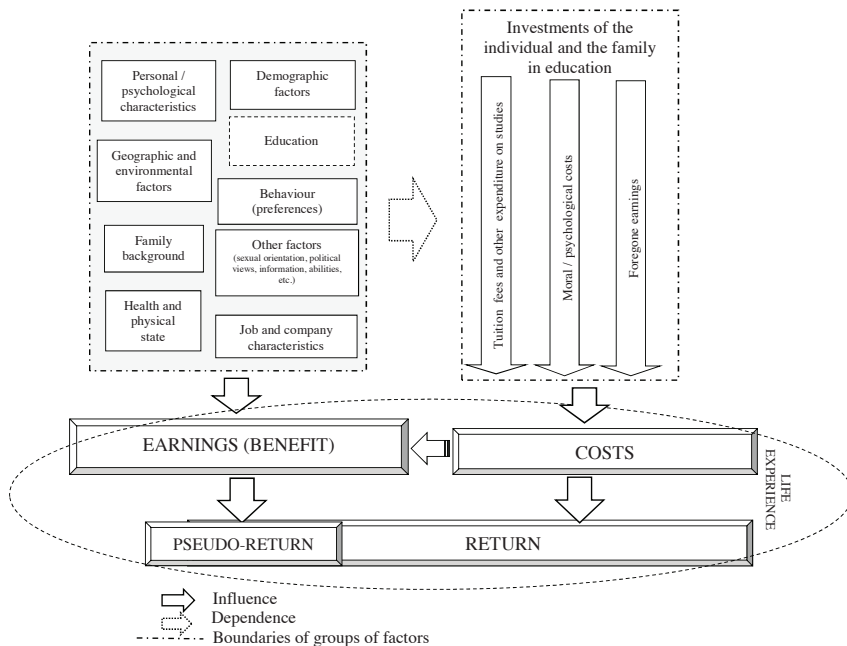


Figure 5. The model of assessment of the private financial return on investment in human capital and the impact of the factors determining it

This model reflects the aspects related to the assessment of the factors affecting the benefit (expressed as value) – wages, and at the same time the generated private financial return, provided by investment in human capital that have been analysed in the theoretical part of the work. Two parts – benefits and costs, determining the return, after assessment of which the private financial return on investment in human capital is calculated, are highlighted in the theoretical model.

In order to determine which factors and how influence the wages of individuals and after elimination of the impact of other factors (controlling it) and distinguishing the impact of education, to implement the aim of the dissertation, the application of the developed model of the dissertation research covers three main stages, which are presented in Figure 6.

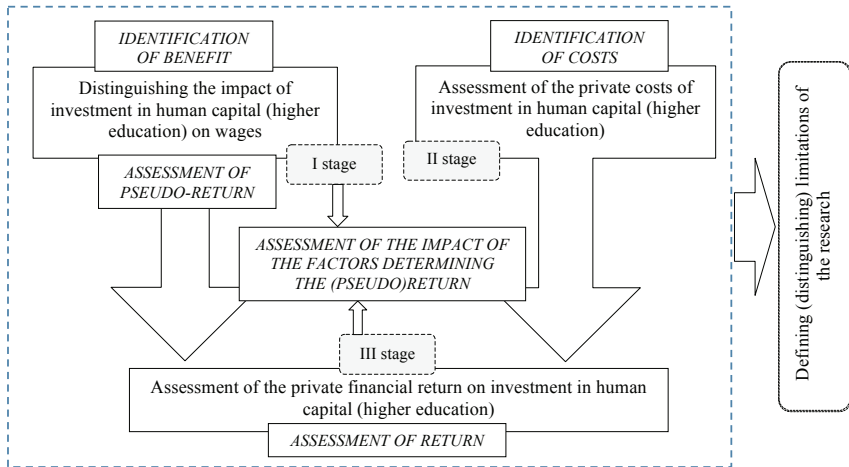


Figure 6. Stages of the empirical research

Primarily, in order to determine the benefit of investment in human capital (education) to a person, which is expressed as a wage rise, the econometric model for assessment of the impact of the factors on the wage (benefit of investment in human capital) and finding out which factors and how determine wages is formed. After assessment of the extent of the impact of factors and distinguishing the impact of investment in human capital on wages, the private financial (pseudo)return on investment in human capital is found and the impact of the factors on the private financial (pseudo)return is assessed. Further, *at the second stage*, assessment of the private costs of investment in human capital (higher education) is carried out. *At the third stage*, the private financial return on investment in human capital (considering the costs incurred) and factors affecting it are assessed.

The research is conducted in accordance with the logical scheme of the research presented in Figure 7, in which the actions carried out at each stage of the research are distinguished, consistently going from one stage to another, by means of the methods specified.

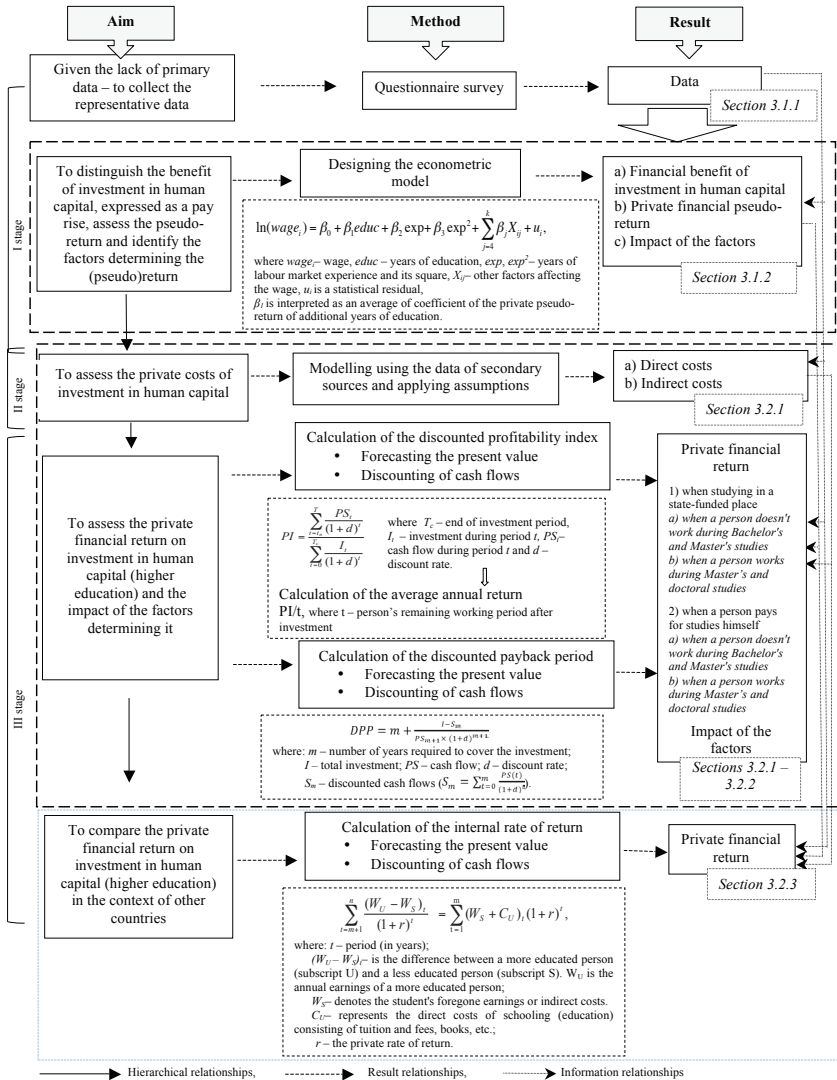


Figure 7. Logical scheme of the research and methods used

Collection of data. In order to implement the aim of the dissertation, taking into account the fact that the amount of statistical data presented in the secondary sources of information is limited and insufficient (there is no database containing the necessary amount of data according to various characteristics), on purpose to assess the private financial return on investment in human capital

and the impact of the factors determining it, given the lack of data, the data had to be collected first.

Quite a fast and convenient way of collecting research data, a quantitative research by survey, was chosen as the way of research data collection. The survey research method was selected for the following reasons:

- the method of the survey allows to implement the tasks of the empirical research;
- the method of the survey allows to achieve a large sample of respondents;
- the method of the survey is recognised as appropriate for scientific researches (Kardelis, 2007).

In order to carry out the survey, the aim of which is firstly to identify the factors affecting wages and private financial pseudo-return and to determine their strength, the survey instrument, questionnaire, was developed.

The questionnaire was prepared based on I. Luobikienė (2000), K. Kardelis (2007), R. Tidikis (2003), E. Babbie (2004), V. Dikčius (2011), A. Valackienė, S. Mikėnė (2010) et al. recommendations. The questions of the questionnaire are prepared so that they would best reflect the analysed problem and are based on the analysed theoretical literature, on the previous studies and scientific articles that deal with the issues of assessment of the return on investment in human capital. Both closed, dichotomous, questions and semi-closed questions, depending on the researched factor, were used in the questionnaire to obtain necessary information.

The questionnaire consists of nine groups of questions, including factors (potentially) influencing the wages, 101 questions in total.

Table 1

Diagnostic blocks of the research instrument

No.	Diagnostic block	Diagnostic block criteria	Number of indicators
1	Definition of the respondent	Sociodemographic characteristics (gender, age, nationality, place of residence, family status, etc.)	15
2	Qualification	Education, area, field of acquired education, educational institution; study cycle, training, etc.	13
3	Job and company characteristics, experience	Work activities: general characteristics, nature of work, location, company characteristics, distance, work conditions etc., length of service	36
4	Family characteristics (background)	Mother's/father's (foster-mother's/foster-father's) education, number of siblings, which child in the family, family income	4
5	Household information	Partner's (husband's/wife's) education	2
6	Preferences	Preferences for work conditions, family and career	11

Continued Table 1

No.	Diagnostic block	Diagnostic block criteria	Number of indicators
7	Health and appearance	Health state, height, weight, appearance, bad habits, etc.	7
8	Personal characteristics	Communicative, dutiful, open for innovations, reserved, etc.	10
9	Other	Sexual orientation, religion, political views	3
Total:			101

Considering the aim of the research, the target group of the survey is people of 25–65 years of age. In this work, to carry out the empirical research, the respondents are selected by multistage stratified random sampling method, which ensures data representativeness, i.e., each respondent has equal opportunities to be surveyed and the sample according to purposive criteria corresponds to the general population. Stratified sampling allows achieving a greater representativity and reduces the likelihood of error. Making the sample of the survey of the people of 25–65 years of age, the location criterion was followed first, using the method of stratified sampling procedure based on area sampling, otherwise called geographical cluster (unit) sample. Scientific studies have proved that the location criteria ensures representativity of sampling in the aspects of age, education, ethnic, socio-economic status.

At the first stage ten strata (groups) have been distinguished, taking into account the fact that the whole territory of the country is divided into 10 counties (third territorial level according to NUTS) of Alytus, Kaunas, Klaipėda, Panevėžys, Šiauliai, Marijampolė, Tauragė, Telšiai, Utena, Vilnius. In this way, the respondents represent different geographical regions. *At the second stage*, two groups were distinguished in accordance with the level of education acquired by individuals: higher education not acquired and higher education acquired. *At the third stage*, two groups have been distinguished in accordance with the sector of companies: public and private. Non-proportional stratified sample is selected, where the number of items selected from each group is not necessarily proportional to the number of items in it.

Formation of econometric model. The classical Mincer function based on multiple regression analysis and recognized as a standard method used for the calculation of the return on investment in human capital (Asaoka, 2006; Heckman, Lochner and Todd, 2003; Patrinos and Psacharopoulos, 2010; Psacharopoulos, 1981; etc.) is applied for basic determination of the private financial pseudo-return on investment in human capital and for assessment of the impact of the factors affecting an individual's earnings and the private financial (pseudo)return on investment in human capital. The latter function allows to find and assess the individual's pseudo-return, and the factors determining it and the wage, thus identifying the impact of education on wages (benefit):

$$\ln(\text{wage}) = \beta_0 + \beta_1 \text{educ} + \beta_2 \text{exp} + \beta_3 \text{exp}^2 + u \quad (2.1)$$

where *wage* is the individual's wage, *educ* – number of years of education and *exp* – work experience (in years), and *exp*² – square of work experience, *u* – random error (statistical residual).

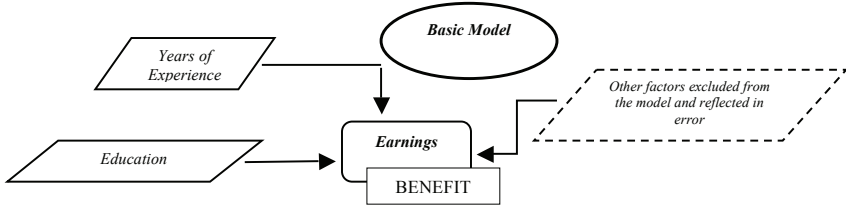


Figure 8. Basic Mincer function model

In order to assess the private financial pseudo-return on investment in human capital more accurately, the standard Mincer earnings function is extended by supplementing it and introducing additional variables in the equation, supplementing by indicators that a researcher is interested in and aiming to address such issues as discrimination, effectiveness of curricula (areas), the influence of the educational institution, etc.:

$$\ln(\text{wage}_i) = \beta_0 + \beta_1 \text{educ} + \beta_2 \text{exp} + \beta_3 \text{exp}^2 + \sum_{j=4}^k \beta_j X_{ij} + u_i, \quad (2.2)$$

where *wage_i* – wage, *X_{ij}* – other factors affecting the wage, *u_i* – random error (statistical residual).

Assessment of investment in human capital (higher education) – private costs. The conceptual framework of how the research of assessment of the private financial return on investment in human capital, taking into account the costs, was carried out (assessing direct and indirect costs and the benefit of acquiring higher education) is presented in Table 2.

Table 2

The periods during which the costs are incurred and benefit is received

INDIVIDUALS									
With secondary education				With higher education					
Age	Period when costs are incurred	Period when benefit is received	Years of working experience	Age	Period when costs are incurred	Period when benefit is received	Years of working experience		
7	Personal costs / costs incurred by parents	X	X	7	Personal costs / costs incurred by parents	X	X		
8				8					
9				9					
.....				...					
16				16					
17				17					
18	18								
19	X	Predicted Benefit	1	19	Personal costs / costs incurred by parents	Foregone Earnings *	Period of studies	0	0
20			20	0				0	
21			21	0				0	
22			22	0	0				
23			23	Personal costs / costs incurred by parents	Foregone earnings**	Period of studies	0	1	
24			24				0	2	
25			25	Personal costs / costs incurred by parents	Period of studies	1	3		
26			26			4	4		
27			27			5	5		
28			28			6	6		
29			29			X	Predicted Benefit	5	7
30			30					6	8
31			31	7	9				
32			32	8	10				
33			33	9	11				
...						
59			59	35	37				
60			60	36	38				
61			61	37	39				
62			62	38	40				
63			63	39	41				
64			64	40	42				
65			65	41	43				
<i>Retirement</i>			<i>Total Cost</i>	<i>Predicted Total Benefit</i>		<i>Retirement</i>	<i>Total Cost</i>	<i>Predicted Total Benefit</i>	

Note: * – foregone earnings without higher education.

** – foregone earnings after completing the 1st cycle of higher education studies.

Selection and justification of methods of assessment of the private financial return on investment in human capital. Although in order to calculate the rate of return on investment in human capital two main methods

are usually used in the empirical literature, i.e. *Full discounting* method, which is used to determine whether the investment in human capital is cost-effective, and *the Mincer earnings function* method, the essence of which is to show the influence of an individual's additional one year of studies/learning on earnings and to distinguish the pseudo-return, taking into account the highlighted methodological aspects and limitations of the methods of assessment of the return on investment in human capital and the impact of the factors determining it (Table 3), the assessment of the private financial return on investment in human capital and the impact of the factors determining it in the dissertation is carried out using the advantages provided by different research methods, combining several methods of assessment. I.e., after distinguishing (controlling the influence of other factors) the impact of investment in human capital (higher education) on wages and having calculated the private financial pseudo-return with the help of the modified Mincer function, the benefit-cost ratio / discounted profitability index, which after comparing the benefits with the costs shows whether the costs incurred are recovered by the benefit is used for assessment of the private financial return on investment in human capital (higher education).

Table 3

Methods of assessment of the return on investment in human capital

Method	Brief description	Main advantages / disadvantages	Empirical researches	Notes
Full Discounting / Elaborate Method Internal rate of return	Shows the maximum limit of the cost of borrowing at which the investments remain profitable	+ shows the annual rate of the return on investment taking into account the time costs of capital; - correctly shows the effectiveness of investment only if the incoming flow of income is reinvested with the rate of return equal to the internal rate of return. As in a real situation the received benefit of higher education acquired is not reinvested, partial reinvestment takes place.	M. Wahrenburg, M. Weldi (2007), O. Kara (2009), A. C. Harberger, S. Guillermo-Peón (2012), A. F. García-Suaza, J. C. Guataquí, J. A. Guerra, D. Maldonado (2009), V. Giżienė (2011), D. Lazarov, G. Petreski (2016) etc.	Used to compare the obtained results of the research in the context of other countries
The Net Present Value	This is the difference between the discounted cash flows of expenditure and revenue, representing the present value of the future cash flows	+ shows how much of the total inflows of the project exceed the total outflows; - does not show the profitability of investment (the result is the absolute rate, which is more a measure of cash flows).	L. Zaplatinskaja (2009), OECD (2010, 2011, 2012, 2013, 2014, 2015, 2016), V. Giżienė (2011)	Not used

Continued Table 3

Method	Brief description	Main advantages / disadvantages	Empirical researches	Notes
Net Present Value Ratio / Discounted Profitability Index	The ratio of net present value and the present value of investment costs	+ allows to compare profitability of investments; + the calculated benefit/cost ratio shows the earnings on a euro spent; - time of receiving profit is not taken into account.		Used as the main method to assess the private financial return on investment in human capital
Discounted Payback Period	Shows the moment at which the sum of received (discounted) cash revenue equals to the value of the initial investment	The method allows the assessment of time, but not the value of the decision. In addition, the cash flows after covering the investments are not evaluated. Therefore, in practice, although the payback period is simple and easy to apply both in the calculation and the interpretation of the results obtained, this method is usually used as an additional criterion.	V. Gižienė (2011)	Used as an additional criterion in the assessment of the rate of the private financial return on investment
Mincer earnings function (The Earnings Function Method)	Shows what the influence of one additional year studies/ learning on the individual's (wage) is	+ it is possible to distinguish the impact of investment in human capital (higher education) on wages, controlling other factors that affect a person's wage; + allows to assess the impact of the factors on (pseudo) return; - requires comprehensive data; - it is necessary to have a sufficient number of observations according to the selected age – cycle of education, earnings of persons with different education and work experience; -the costs are not assessed.	A. Alstadsæter (2004), P. T. Pereira, P. S. Martins (2004), A. Ciccone (2004), Sh. W. Ulrick (2007), A. Leigh (2008), A. Ciccone, F. Cingano, P. Cipollone (2006), D. Brenner, Y. Rubinstein (2011), D. Fiaschi, C. Gabbriellini (2013), H. A. Alqattan, J. Al-Zayer, L. Stergioulas, (2013), R. Said (2016), Z. Tzannatos, I. Diwan, J. A. Ahad (2016), etc.	Used as the main method to distinguish (controlling the influence of other factors) the impact of investment in human capital (higher education) on wages and to assess the private financial pseudo-return on investment in human capital, and the impact of the factors determining the (pseudo) return

Continued Table 3

Method	Brief description	Main advantages / disadvantages	Empirical researches	Notes
The Short-Cut Method	Shows the approximate return (excluding costs)	+ does not require to perform complex operations, it is easy to use, as it is necessary to know only a few components for calculation of this indicator; - assesses only the differences in wages and duration of studies.	M. E. Menon (2008), J. R. Anchor ir J. Fišerová (2010), J. R. Anchor, J. Fišerová, K. Maršíková, V. Urbánek (2011), A. Athanassiadis (2011) etc.	Not used
The Reverse Cost-benefit Method	Shows what should an annual benefit of investment in human capital be, taking into account the cost of the investment, and aiming to get a return on the selected size	+ simple calculation; + simple interpretation of the results obtained.		Not used

Hypotheses of the research. In order to achieve the aim of the dissertation to deal with the raised tasks before conducting the research, taking into account the factors that influence the benefit, costs and return of investment in human capital (higher education) analysed and distinguished in the first part of the dissertation, the following hypotheses of the research have been formulated in the empirical research on the basis of the analysis of scientific literature and assumptions of the researches carried out.

H1: The higher the level of education acquired, the higher the private financial pseudo-return expressed as a wage premium is.

H2: The largest private financial pseudo-return is provided by investment in Social sciences.

H3: University, where education is acquired, has an impact on the private financial pseudo-return on investment in human capital.

H4: Male and female private financial pseudo-return on investment in human capital is equal.

H5: When working in the private sector a greater private financial return on investment in human capital is created.

H6: The size of a company/organization has an impact on the return on investment in human capital: when working in a larger company a higher private financial return on investment in human capital is received.

H7: The nature of activities of the company, where a person works, has an impact on the private financial return on investment in human capital.

The first hypothesis is the main hypothesis of the whole work. It is raised on the basis of the systematic analysis of scientific literature, examining the return on investment in human capital (education), in order to find out whether the private financial return provided by investment in human capital increases with the increasing level of education. Controversial opinions and research results are provided in the economic literature examining the issues of the private financial return on investment in human capital. Some authors (V. H. Herrera, M. Madrid-Aris, 2000; Q. Zhang and H. Zou, 2007; L. A. Amaghionyeodiwe; T. S. Osinubi, 2007; J. Gibson and O. K. Fatai, 2006), argue that the private financial return on investment in human capital increases with increasing level of education, others note that the largest private financial return on investment in human capital (education) is on lower levels of education and it is declining with the growing level of education (K. Michaelowa, 2000; C. Sakellariou, 2003; T. P. Schultz, 1993; L. A. Riveros, 1990). However, among the participants of this discussion there can be found some, who indicate that the private financial return on investment in human capital is not linear, i.e. it goes up or down with the increasing level of education: after acquiring secondary education the return increases when compared to the return provided by primary education, and decreases after acquiring higher education (J. J. Heckman, L. J. Lochner and P. E. Todd, 2008; P. Trostel, 2005; O. Kara, 2009).

The second and third hypotheses are related. The second hypothesis, based on empirical researches carried out (A. Stark, 2007; K. Görlitz, B. S. Grave, 2012; G. Brunello, S. Comi, C. Lucifora, 2000; Y. K. Yong, T. M. Heng, Sh. M. Thangavelu, J. Wong, 2007 etc.) and analysis of scientific literature, enables to state that there are differences in the private financial return on investment in human capital between the different areas of study. Considering the areas of study researches indicate most often as the ones generating the greatest private financial return on investment in human capital, the second hypothesis examines whether the investments in Social sciences generate the largest private financial pseudo-return compared to other study alternatives. When testing the third hypothesis, the qualitative aspect of an educational institution is assessed relatively.

The remaining hypotheses, raised on the basis of the performed systematic analysis of scientific literature, dealing with the return on investment in human capital (education), examine the potential impact of discrimination and other factors on the private financial return on investment in human capital in order to find out whether the latter factors, dealt with in empirical researches by assessing their impact on wages, have an influence on the private financial return on investment in human capital. I.e., after elimination of the impact of the factors

affecting the wages, it is aimed to check and determine whether there are any differences in the private financial return on investment in human capital when working in companies of a different size, different nature of activities, etc. For example, as it is known, the mechanisms of determining the wages are different in the public and private sectors. It is therefore expected that given the different wage structure, the private financial return on investment in human capital can also vary. Thus, on the basis of the results of the empirical researches (Lauer and Steiner, 2004; Chirwa and Matita, 2009; Okuwa, 2004; Brunello, Comi and Lucifora, 2000; etc.) that revealed that the private financial return on investment in human capital of the persons employed in the public sector is lower in some countries and higher in others, the H5 hypothesis is raised and tested in the case of Lithuania.

Also taking into account the existing differences in male and female earnings, the hypothesis whether after the assessment of possible differences in male and female wages the private financial pseudo-return on investment in human capital is the same (as without assessment of gender wage differentiation, according to the data of empirical studies, the values of the indicators of the rate of return for male are usually higher than for female) is verified.

The hypotheses are tested by conducting the research of the wages of Lithuanian population aged 24 to 65 intended to assess what factors influence the private financial return on investment in human capital, what their impact is and what the private financial return on investment in human capital is. The formulated hypotheses are tested taking into account the significance and impact of the factors and the indicators reflecting them. Assessment of the impact strength allows determining whether the analysed factor (acquired education, university a person has graduated from, chosen area of study, gender, etc.) has an impact on the private financial return on investment in human capital.

Hypotheses testing procedure. The formulated hypotheses are tested by preparing the model of empirical assessment of the private financial return on investment in human capital and the impact of the factors determining it in accordance with the standardized model coefficients. The formulated hypothesis is confirmed if the estimator of the empirical coefficient next to the independent variable included in the regression equation that represents the hypothesis is statistically significant (as well as the determined impact) and its sign (indicating the direction of the impact) corresponds to the sign provided for in accordance with the raised hypothesis. The hypothesis is rejected if the coefficient is statistically insignificant (as well as the assessed impact itself) or coefficient sign (at the same time the direction of the impact) does not match the one that is predicted in accordance with the raised hypothesis.

3. ASSESSMENT OF THE PRIVATE FINANCIAL RETURN ON INVESTMENT IN HUMAN CAPITAL AND THE IMPACT OF THE FACTORS DETERMINING IT IN LITHUANIA

Considering the aim of the dissertation and the hypothesis raised, the third part of the dissertation deals with the last task of the scientific research. Firstly, the results of the data of the conducted quantitative survey are presented. Using the collected data the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it is tested, the impact of education on income (wages) is assessed, the assessment of the private financial return on investment in human capital and the impact of the factors determining it is carried out.

Analysis and assessment of the return on investment in human capital (higher education) in the conducted research is limited to the private financial return, focussing on two types of financing of higher education: the system where higher education is fully funded from the state budget, and the system when higher education costs are covered by the investors themselves, which means a greater personal contribution.

In order to assess the private financial return on investment in human capital and the impact of the factors determining it, first, it was necessary to identify the factors affecting an individual's wage. To obtain this information, the questionnaire survey was carried out. It provided an opportunity to make large sample measurements quickly, ensuring the confidentiality of participants in the survey, analyse the data objectively and clearly present the results of the research. Representative sample of the survey from the individuals of the age of 25–65 with 5 per cent margin of error, confidence probability of 0,95 was 384 respondents. The research involved 904 respondents.

Taking into account the fact that the aim of the empirical part of the dissertation is not a systematic assessment of factors that have an influence on wages, when analysing the data collected during the questionnaire survey carried out and designing the econometric multiple regression model on its basis, the attention is given to the determination of the impact of investment in human capital (higher education) on wages in order to assess the private financial (pseudo) return on investment in human capital and the impact of the factors determining it.

Invoking the basic Mincer function, using instrumental variables, which have indicated in the research the need to supplement the Mincer function by other factors determining wages, control of which would allow to find a more precise private financial return on investment in human capital (education), also taking into account its potential non-linear correlation with wages, the Mincer function has been modified by adding a variable *educ*² (years of education

square) reflecting the non-linear interaction between education and wages, as well as the factor of gender inequality in the labour market *female* (denoting a person's gender (female)) and variables, reflecting the level of the position *dir*, *vir* and *spec* (showing a person's position at work – a director (top level manager), department manager and specialist respectively).

After the inclusion of these variables, the equation given below was made. The model is illustrated in Figure 9.

$$\ln(\text{wage}) = \beta_0 + \beta_1 \text{educ} + \beta_2 \text{educ}^2 + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u \quad (3.1)$$

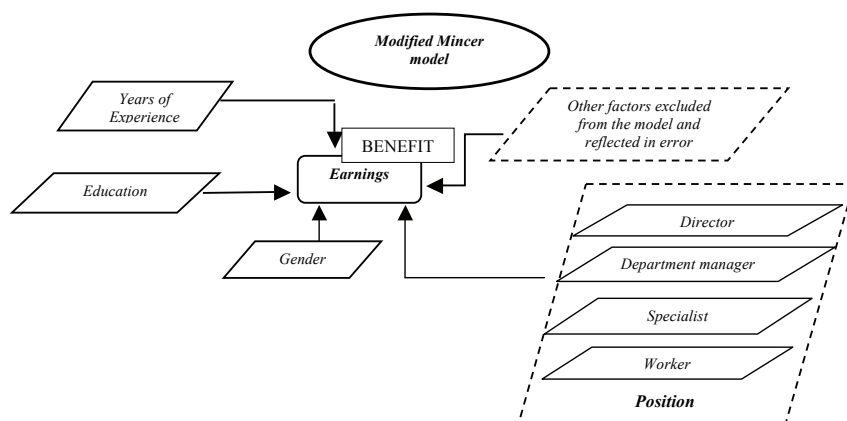


Figure 9. Modified Mincer model

Calculations carried out showed that all the variables included in the model are statistically significant and explain about a quarter of the surveyed sample wage variation. It was found that an additional year of study increases the wage by 9.7% on average, women earn on average about 29% less than men, the persons holding the highest level management positions earn 130% more in comparison with qualified and unqualified workers, while a middle-level manager earns on average 66% and a specialist 35% more than a qualified and unqualified worker.

In order to identify the factors affecting the private financial (pseudo) return on investment in human capital, the relations between wages and the indicators that reflect the factors have been investigated applying regression analysis, using the data collected during the questionnaire survey. Hypotheses of the research developed on the basis of the theoretical concepts and assessment of the impact of the factors are confirmed or denied during the research carried out.

Summarising the results of the research, the analysis of the hypotheses – the results of assessment of the private financial (pseudo)return on investment in human capital and the impact of the factors determining it are presented in Table 4.

Table 4

Analysis of research hypotheses: results of assessment of the private financial (pseudo)return on investment in human capital and the impact of the factors determining it

Tested hypothesis / Model	Confirmation/denial of relationship	Comment
<p>H1: The higher the education acquired, the higher the private financial pseudo-return expressed as a wage premium is</p> <p><i>1 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	<p>Not rejected only partly</p>	<p>The private financial pseudo-return on investment in higher non-university education equals zero.</p> <p>The private financial pseudo-return of the Bachelor's degree at university amounts to 23.9%, of the Master's degree – to 25.1%. It was found that there are no differences in the private financial pseudo-return of education between the Bachelor's and Master's degrees. The private financial pseudo-return of the Doctor's degree reaches 45.6%, and its difference compared to the Bachelor's and Master's degrees is statistically significant only when reliability is 90%.</p>
<p>H2: The largest private financial pseudo-return is provided by investment in Social sciences</p> <p><i>2.1 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach_soc}} \text{bach} + \beta_{\text{bach_phy}} \text{bach} \cdot \text{phy} + \beta_{\text{bach_tech}} \text{bach} \cdot \text{tech} + \beta_{\text{bach_hum}} \text{bach} \cdot \text{hum} + \beta_{\text{bach_art}} \text{bach} \cdot \text{art} + \beta_{\text{bach_biomed}} \text{bach} \cdot \text{biomed} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$ <p><i>2.2 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast_soc}} \text{mast} + \beta_{\text{mast_phy}} \text{mast} \cdot \text{phy} + \beta_{\text{mast_tech}} \text{mast} \cdot \text{tech} + \beta_{\text{mast_hum}} \text{mast} \cdot \text{hum} + \beta_{\text{mast_art}} \text{mast} \cdot \text{art} + \beta_{\text{mast_biomed}} \text{mast} \cdot \text{biomed} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	<p>Rejected</p>	<p>No statistically significant impact of the area of study on the private financial pseudo-return on investment in human capital has been found.</p> <p>The private financial pseudo-return on investment in human capital generated by Social sciences has not been determined as the largest among the separate study cycles and study areas.</p> <p>The largest private financial pseudo-return of the Bachelor's degree is after the completion of the studies in Arts.</p> <p>The largest private financial pseudo-return on investment in human capital after Master's studies is received after completion of studies in Physical and Biomedical sciences.</p> <p>The third cycle studies provide the largest private financial pseudo-return after obtaining the degree of the Doctor of Technological Sciences.</p>

Continued Table 4

Tested hypothesis / Model	Confirmation/denial of relationship	Comment
<p><i>2.3 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd_soc}} \text{phd} + \beta_{\text{phd_phy}} \text{phd} \cdot \text{phy} + \beta_{\text{phd_tech}} \text{phd} \cdot \text{tech} + \beta_{\text{phd_hum}} \text{phd} \cdot \text{hum} + \beta_{\text{phd_art}} \text{phd} \cdot \text{art} + \beta_{\text{phd_biomed}} \text{phd} \cdot \text{biomed} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$		
<p>H3: University, where education is acquired, has an impact on the private financial pseudo-return on investment in human capital</p>	Hypothesis is not rejected only partly	
<p>H3a: Studies at a highest ranked university create a higher private financial pseudo-return compared to other university studies</p> <p><i>3a. 1 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach_notbest}} \text{bach} + \beta_{\text{bach_best}} \text{bach} \cdot \text{best} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$ <p><i>3a. 2 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast_notbest}} \text{mast} + \beta_{\text{mast_best}} \text{mast} \cdot \text{best} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$ <p><i>3a. 3 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd_notbest}} \text{phd} + \beta_{\text{phd_best}} \text{phd} \cdot \text{best} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Hypothesis is not rejected only partly	<p><i>Bachelor's studies</i> at a highest ranked university according to the published rankings create the private financial pseudo-return on investment in human capital, which is 44.7 percentage points higher than similar studies at other universities. <i>Master's studies</i> at a highest ranked university provide the private financial pseudo-return on investment in human capital, which is 34.8 percentage points higher than <i>Master's studies</i> at other universities. Completion of the 1st and 2nd study cycles at the top ranked university is a statistically significant factor that has a marked impact on the private financial pseudo-return on investment in human capital. The private financial pseudo-return of <i>doctoral studies</i> at highest ranked university in the country does not statistically significantly differ from similar studies in other universities. The impact of the top ranked university in the country on the private financial pseudo-return of education acquired during <i>Bachelor's</i> and <i>Master's studies</i> is large and statistically significant only if not taking into account the possible concentration of graduates of this educational institution in the city where the investigated university is located. Considering the place of residence, only the private financial pseudo-return of completed <i>Master's studies</i> at a university rated best is higher than at other universities (however, it decreases from 34.8 percentage points to 17.7 percentage points).</p>

Tested hypothesis / Model	Confirmation/denial of relationship	Comment
<p>H3b: Studies at the five best universities according to the rankings create a higher private financial pseudo-return on investment in human capital compared to studies at other universities</p> <p><i>3b. 1 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach_not_best5}} \text{bach} + \beta_{\text{bach_best5}} \text{bach} \cdot \text{best5} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$ <p><i>3b. 2 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast_not_best5}} \text{mast} + \beta_{\text{mast_best5}} \text{mast} \cdot \text{best5} + \beta_{\text{phd}} \text{phd} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$ <p><i>3b. 3 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{col}} \text{col} + \beta_{\text{bach}} \text{bach} + \beta_{\text{mast}} \text{mast} + \beta_{\text{phd_not_best5}} \text{phd} + \beta_{\text{phd_best5}} \text{phd} \cdot \text{best5} + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Rejected	<p>Bachelor's and Master's degree acquired in the five best universities according to the published rankings, create a greater (28.5 percentage points and 12.8 percentage points respectively) private financial pseudo-return on investment in human capital compared to other universities. No statistically significant difference of the private financial pseudo-return of the obtained Doctor's degree has been found. Controlling the place of residence, the additional private financial pseudo-return on investment in human capital created in the five best universities according to the rankings both in Bachelor's and Master's studies becomes statistically insignificant, although it remains positive (respectively 9.7–9.8 percentage points and 4.5–4.7 percentage points higher than at the rest of universities).</p>
<p>H4: Male and female private financial pseudo-return on investment in human capital is equal</p> <p><i>4 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{educ}} \text{educ} + \beta_{\text{female}} \text{educ} \cdot \text{female} + \beta_2 \text{educ}^2 + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Not rejected	<p>Although females earn about 30 per cent less compared to males, the private financial pseudo-return on investment in human capital (education) for females is 0.1 percentage point higher than for males. The determined difference is not statistically significant, thus, it is possible to state that male and female private financial pseudo-return on investment in human capital is equal.</p>
<p>H5: When working in the private sector a greater private financial return on investment in human capital is created</p> <p><i>5 model</i></p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{public_sector}} \text{educ} + \beta_{\text{private_sector}} \text{educ} \cdot \text{private_sector} + \beta_2 \text{educ}^2 + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Not rejected	<p>Statistically significant differences of the private financial return on investment in human capital when working in the public and private sectors have been found. The private financial return is 0.5 percentage point higher in the private sector, i.e. work in the private sector has a statistically significant impact on the private financial return on investment in human capital.</p>

Tested hypothesis / Model	Confirmation/denial of relationship	Comment
<p>H6: The size of a company / organization has an impact on the return on investment in human capital: when working in a larger company a higher private financial return on investment in human capital is received</p> <p>6 model</p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{medium_sized_comp}} \text{educ} + \beta_{\text{micro_comp}} \text{educ} \cdot \text{micro_comp} + \beta_{\text{small_comp}} \text{educ} \cdot \text{small_comp} + \beta_{\text{large_comp}} \text{educ} \cdot \text{large_comp} + \beta_2 \text{educ}^2 + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Not rejected only partly	The private financial return on investment in human capital when working in a micro-company (up to 9 employees in the company) is 1.5 percentage points lower than when working in a medium-sized company. The received private financial return on investment in human capital increases when working in a larger company, but the differences found are not statistically significant.
<p>H7: The nature of activities of the company, where a person works, has an impact on the private financial return on investment in human capital</p> <p>7 model</p> $\ln(\text{wage}) = \beta_0 + \beta_{\text{mix_comp}} \text{educ} + \beta_{\text{service_comp}} \text{educ} \cdot \text{service_comp} + \beta_{\text{trade_comp}} \text{educ} \cdot \text{trade_comp} + \beta_{\text{proces_comp}} \text{educ} \cdot \text{proces_comp} + \beta_2 \text{educ}^2 + \beta_3 \text{exp} + \beta_4 \text{exp}^2 + \beta_5 \text{female} + \beta_6 \text{dir} + \beta_7 \text{vir} + \beta_8 \text{spec} + u$	Not rejected only partly	A statistically significant impact on the private financial return on investment in human capital was found only when working in a processing company (i.e. a company engaged in the production and sales of goods) – here the highest private financial return on investment in human capital is created, 11.3%. When working in trade and service companies the average private financial return on investment in human capital is about 10%, in the companies undertaking the mixed activities (production and provision of services) the average private financial return is very similar, it makes 10.3%.

wage – a person’s wage; *educ* – years of education of a person; *educ*² – number of years of education squared; *exp* – person’s work experience (years), *exp*² – work experience squared; *female* indicates the gender of a person (female); *dir*, *vir*, *spec* indicates a person’s position at work – director (top level manager), department manager, specialist respectively;

col – higher non-university (college) education acquired, *bach* – university Bachelor’s degree acquired, *mast* – Master’s degree acquired; *phd* – Doctor’s academic degree acquired;

phy – Physical sciences, *tech* – Technological sciences, *hum* – Humanities, *art* – Arts, *biomed* – Biomedical sciences, *soc* – Social sciences;

bach_best – Bachelor’s studies completed at a highest ranked university, *bach_notbest* – Bachelor’s studies completed at an educational institution which is not ranked highest, *mast_best* – Master’s studies completed at a highest ranked university, *mast_notbest* – Master’s studies completed at an educational institution which is not ranked highest, *phd_best* – doctoral studies completed at a highest ranked university, *phd_notbest* – doctoral studies completed at an educational institution which is not ranked highest;

bach_best5 – Bachelor’s studies completed at a highest ranked university, *bach_not_best5* – Bachelor’s studies completed at an educational institution which is not ranked highest, *mast_best5* – Master’s studies completed at a highest ranked university, *mast_not_best5* – Master’s studies completed at an educational institution which is not ranked highest, *phd_best5* – doctoral

studies completed at a highest ranked university, *phd_not_best5* – doctoral studies completed at an educational institution which is not ranked highest;

private_sector – private sector, *public_sector* – public sector;

micro_company – micro-company, *small_comp* – small company, *large_comp* – large company and *medium_sized_comp* – medium-sized company;

service_comp – service company, *trade_comp* – trade company, *procces_comp* – processing company, *mix_comp* – company undertaking mixed activities;

β_k – coefficient reflecting the impact of respective variable on the wage; u – model residual.

When assessing the return on investment in human capital and the impact on the factors determining it, after assessment of the costs and the assumptions made, after making calculations, modelling several options: persons who have completed the Bachelor's studies and are continuing Master's studies either work or do not work, and they can study at the state-funded place or pay for their studies themselves, the received results of the private financial return on investment in human capital (higher education) are presented in Tables 5 and 6. The tables show the calculated average annual private financial return on investment in human capital by areas of study, following the assessment of the remaining time in the labour market after graduation.

The results obtained showed that levels and areas of acquired higher education generate different private financial return – i.e., it was found that the level of acquired higher education and the chosen study areas have an impact on the private financial return. The largest private financial return on investment in human capital is provided by the Bachelor of Arts studies (the average annual return is 17.0% a year if studies were state-funded, and 10.8% when paying tuition fees); assessment of differences of the private financial return of the 2nd cycle found that the largest private financial return is created by Biomedical sciences (respectively 5.6% a year, if the studies were state-funded, and 3.5% average annual private financial return after studies at fee-paying study places); the greatest private financial return of the 3rd cycle is created by Technological sciences (15.0% and 6.1% a year). Attention is drawn to the fact that although Master's studies in Biomedical sciences generate the largest private financial return compared with other alternatives of study areas, but after the completion of only Bachelor's studies of Biomedical sciences, the private financial return is negative, i.e. the average wage of persons is lower compared to the average wage, which is earned by lower-skilled individuals (who do not have a higher education diploma).

Table 5

**The private financial return on investment in human capital
by areas of study and study cycles
(when a person does not work during Bachelor's and Master's studies)**

Average annual return		Total average (male and female)		
		1st cycle	2nd cycle	3rd cycle
Total average	<i>SF*</i>	3.8%	1.8%	5.6%
	<i>FP**</i>	2.1%	0.6%	1.3%
Social sciences	<i>SF*</i>	3.2%	2.4%	5.3%
	<i>FP**</i>	2.4%	1.6%	1.5%
Biomedical sciences	<i>SF*</i>	-6.0%	5.6%	n.d.
	<i>FP**</i>	-	3.5%	n.d.
Physical sciences	<i>SF*</i>	7.0%	4.1%	3.6%
	<i>FP**</i>	4.7%	2.4%	0.4%
Technological sciences	<i>SF*</i>	3.3%	0.7%	15.0%
	<i>FP**</i>	1.9%	-0.2%	6.1%
Humanities	<i>SF*</i>	8.0%	-0.9%	2.0%
	<i>FP**</i>	6.4%	-	-0.2%
Arts	<i>SF*</i>	17.0%	2.1%	n.d.
	<i>FP**</i>	10.8%	0.6%	n.d.

Average annual return		Male			Female		
		1st cycle	2nd cycle	3rd cycle	1st cycle	2nd cycle	3rd cycle
Total average	<i>SF*</i>	6.2%	3.3%	-3.0%	3.0%	1.4%	6.4%
	<i>FP**</i>	3.9%	1.6%	-	1.6%	0.3%	1.7%

Social sciences	<i>SF*</i>	8.3%	4.0%	-7.2%	-0.3%	-0.1%	4.0%
	<i>FP**</i>	6.6%	2.9%	-	-	-	0.9%
Biomedical sciences	<i>SF*</i>	15.1%	9.3%	n.d.	-10.2%	1.1%	n.d.
	<i>FP**</i>	10.8%	6.2%	n.d.	-	0.1%	n.d.
Physical sciences	<i>SF*</i>	6.3%	0.5%	2.3%	3.9%	2.4%	2.4%
	<i>FP**</i>	4.2%	-0.3%	-0.2%	2.4%	1.1%	-0.2%
Technological sciences	<i>SF*</i>	0.7%	0.6%	n.d.	2.2%	-1.4%	10.3%
	<i>FP**</i>	0.0%	-0.2%	n.d.	1.1%	-	3.8%
Humanities	<i>SF*</i>	19.7%	-1.9%	n.d.	3.3%	-2.7%	-0.3%
	<i>FP**</i>	16.3%	-	n.d.	2.4%	-	-
Arts	<i>SF*</i>	15.8%	n.d.	n.d.	11.8%	-0.7%	n.d.
	<i>FP**</i>	10.0%	n.d.	n.d.	7.3%	-	n.d.

Table 6

**The private financial return on investment in human capital
by areas of study and study cycles
(when a person works during Master's and further studies)**

Average annual return		Total average (male and female)		
		1st cycle	2nd cycle	3rd cycle
Total average	<i>SF*</i>	3.8%	3.6%	9.1%
	<i>FP**</i>	2.1%	1.4%	2.0%
Social sciences	<i>SF*</i>	3.2%	4.5%	8.6%
	<i>FP**</i>	2.4%	2.8%	2.3%
Biomedical sciences	<i>SF*</i>	-6.0%	9.0%	n.d.
	<i>FP**</i>	-	5.2%	n.d.
Physical sciences	<i>SF*</i>	7.0%	6.8%	6.2%
	<i>FP**</i>	4.7%	3.7%	0.9%
Technological sciences	<i>SF*</i>	3.3%	2.0%	22.5%
	<i>FP**</i>	1.9%	0.5%	7.6%
Humanities	<i>SF*</i>	8.0%	-0.2%	4.0%
	<i>FP**</i>	6.4%	-	0.3%
Arts	<i>SF*</i>	17.0%	4.1%	n.d.
	<i>FP**</i>	10.8%	1.4%	n.d.

Average annual return		Male			Female		
		1st cycle	2nd cycle	3rd cycle	1st cycle	2nd cycle	3rd cycle
Total average	<i>SF*</i>	6.2%	5.7%	-3.1%	3.0%	3.0%	10.2%
	<i>FP**</i>	3.9%	2.7%	-	1.6%	1.0%	2.5%
Social sciences	<i>SF*</i>	8.3%	6.8%	-9.1%	-0.3%	0.8%	6.8%
	<i>FP**</i>	6.6%	4.6%	-	-	0.0%	1.5%
Biomedical sciences	<i>SF*</i>	15.1%	14.2%	n.d.	-10.2%	2.5%	n.d.
	<i>FP**</i>	10.8%	8.6%	n.d.	-	0.9%	n.d.
Physical sciences	<i>SF*</i>	6.3%	1.7%	4.3%	3.9%	4.4%	4.6%
	<i>FP**</i>	4.2%	0.3%	0.2%	2.4%	2.1%	0.3%
Technological sciences	<i>SF*</i>	0.7%	1.9%	n.d.	2.2%	-0.9%	15.7%
	<i>FP**</i>	0.0%	0.4%	n.d.	1.1%	-	4.9%
Humanities	<i>SF*</i>	19.7%	-1.7%	n.d.	3.3%	-2.8%	0.6%
	<i>FP**</i>	16.3%	-	n.d.	2.4%	-	-1.2%
Arts	<i>SF*</i>	15.8%	n.d.	n.d.	11.8%	0.0%	n.d.
	<i>FP**</i>	10.0%	n.d.	n.d.	7.3%	-1.0%	n.d.

Note. In Tables 5 and 6, given the negative private financial return of study at a state-funded place, calculations estimating what would be the private financial return on investment in human capital if a person pays tuition fees himself have not been performed.

*SF** – studying at a state-funded place.

*FP*** – studying at a fee-paying study place – a person pays tuition fees himself.

n.d. – no data / data insufficient to make judgements.

Meaning of colours: colour shift from red to yellow – greenish and green colours reflect the private financial return from negative – the least attractive (marked in red) up to a largest – the most attractive (marked in green).

Table 6 presents the results of assessment of the private financial return on investment in human capital, when persons studying for Master's degree work at the same time. Taking into account this assumption and the fact that in this case, when studying for the Master's degree the costs of study are lower because of the lower alternative costs incurred (compared to the results provided in Table 5), indicators of the private rate of return on investment in human capital increase at the second and third cycles of study, but the tendencies basically remain the same.

Results of the research carried out allow stating that a high cost of study, and low remuneration received reduce the benefit of investment in human capital (education), and at the same time the generated private financial return. As the results of the research show, some studies (e.g. Bachelor's studies of Biomedical sciences (for females and total (male and female) average), the 2nd cycle of Humanities studies) do not create a positive private financial return. Therefore, before investing in the obtaining of the diploma in higher education (especially when paying for studies), it is worth considering both the employment opportunities, potential wages and investment costs, assessing whether the investment made will provide financial benefit in the future, etc.

Studies providing a lower private financial rate of return than alternative investments (or those that do not generate a positive private financial return) are likely to provide not only financial, but also other “invisible” or “hidden” return in order to become more attractive from an individual's point of view, because certain areas of study, as shown by the results obtained, can hardly be selected and studied following a mere prospect of investments.

Calculations have shown that with the reduction of the cost of studies, the rate of private financial return would grow. However, a positive rate of private financial return would not be achieved in all subgroups, as the tuition fee of some study areas (Master's or doctoral studies in Humanities) does not have any significant impact on the changes of the rate of private financial return, the more so as a positive private financial return is not created after completion of these studies even at a state-funded study place.

Calculations of the rate of private financial return carried out and assessment of the results of the sensitivity analysis allow to state that expensive areas of study also generate a low rate of private financial return. As a result, given the public financing scheme, i.e. when the studies are funded by the state, the state is investing large amounts of money for students in certain areas of study (specialities) which do not give a large private financial return (or even do not

create a positive return in general), what leads to lower tax revenue – the basic component of financial social return. In order to justify such public funding from the investment perspective, the requirement would be a high social return, as otherwise, it signalises about a possible incorrect allocation of the public funds.

CONCLUSIONS AND DIRECTIONS OF FURTHER RESEARCHES

Solving the problem formulated in the dissertation and in order to reach the goal set in the dissertation and implement the tasks, after revealing and summarising the range of problems of assessment of the return on investment in human capital and the factors determining it, after preparing methodology of the research of assessment of the private financial return on investment in human capital and the impact of the factors determining it and composing the logical scheme of the research, integrating several assessment methods in the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it using the advantages provided by various research methods and having verified the reliability of the model prepared in the dissertation, the obtained theoretical and empirical results of the research can be summarised in the following conclusions:

1. After generalisation of the analysed scientific literature, the components of human capital, which can be grouped into two parts: acquired and inherent, have been distinguished. The inherent human capital can be divided into inherent physical abilities and intellectual-psychological capabilities, which may be influenced (increased/reduced) by the person's state of health and the capital acquired. The use of the latter depends not only on the circumstances related to the state of health, knowledge and skills acquired, but also on the impact of the environment in which the individual lives. In contrast to inherent, the acquired human capital is developed during the lifetime by a formal, non-formal education, self-education and accumulating experience. Formal education includes pre-school, primary, secondary and higher education. Non-formal education covers all the knowledge that people receive from members of their family, social environment and all types of knowledge acquired through self-education. Experience includes all situations experienced by an individual, in which he/she responds to new situations and circumstances by the new knowledge acquired.

Authors analyse and define the human capital based on different approaches. Therefore, summarising the approaches to the concept of human capital presented in scientific literature sources and empirical research, the definition

of human capital has been explicated, indicating the complexity of the concept and emphasising the key components characterising it, defining from a broad and narrow approaches.

Human capital in the narrow sense is the individual's knowledge, skills acquired, natural abilities, state of physical, emotional and mental health. In a broad sense, human capital is the individual's knowledge, skills acquired, natural abilities, experience, attitudes, behaviour, intelligence, creativity, entrepreneurship, motivation, innovativeness, insights, state of physical, emotional and mental health, energy, orientation in the environment, being able to use his/her knowledge and skills properly and timely, as well as other personal characteristics, enabling to improve work productivity and the individual's income in the form of wages, public welfare and economic growth.

2. The analysis of theoretical and empirical researches of assessment of the return on investment in human capital carried out allowed to identify and distinguish the factors that have an impact on the benefit, costs and the return on investment in human capital, on the basis of which the model of assessment of the private financial return on investment in human capital has been developed.

After discussing in the dissertation commonalities and differences of the results of the researches, and distinguishing the factors, some of which directly, others indirectly have an impact on the benefit, costs, and the generated amount of return created by investment in human capital, it has been concluded that the private financial return on investment in human capital is determined by an individual's level of education acquired, experience, specific skills, psychological characteristics, beauty and health, social capital, characteristics potentially related to discrimination, characteristics of the individual's family and social, cultural and economic environment, which makes an impact on the individual both in childhood and adolescence, and participating in the labour market, etc.

3. Following the analysis of scientific researches, possible methods of assessment of the private financial return on investment in human capital have been provided, highlighting their advantages and problematic aspects. It was found that the following three methods are generally distinguished: Full Discounting method or the Internal Rate of Return method, the Short-Cut method and the Mincer earnings function method, which are related in particular to the calculation and assessment of the return on investment in human capital. However, considering the fact that the investment in human capital is equated to the investment project, in order to assess the return on the latter investment, other traditional methods of assessment of efficiency of investment projects, such as Payback Period, Net Present Value, Profitability Index, etc. can be used as well.

After disclosing the range of problems of assessment of the private financial return on investment in human capital and the impact of the factors determining

it and distinguishing the limitations and advantages of the methods of assessment of the return on investment in human capital, the latter (advantages) have become the basis for the formation of the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it during the development of the research methodology.

4. After summarising the results of the theoretical and empirical researches analysed, the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it has been developed.

The benefit created by investment in human capital, the costs incurred and the private financial return on the investment is determined by various economic and non-economic factors, including the economic situation of the country, taxation (and governmental in general) policies, cultural and social environment and security, unemployment and employment rates in the country, as well as the individual's gender, age, education, family status, number of children, health and physical state, religion, political views, personal beliefs and attitudes, personal and psychological characteristics, awareness, social integration, behaviour (lifestyle, preferences, etc.), natural and acquired skills, migration and mobility opportunities, the surrounding culture. The latter factors interacting with each other have an impact on the individual's wages (income) – on the benefit and the costs of investment in human capital, and determine the private financial return on investment in human capital.

5. The prepared methodology of the research of assessment of the private financial return on investment in human capital and the impact of the factors determining it is based on the advantages provided by different research methods, taking into account the purpose of the research, the objectives, and the character of the necessary data collected using the survey method. In the presented methodology of the research of assessment of the private financial return on investment in human capital and the impact of the factors determining it, that consists of several stages, the assessment of the private financial return on investment in human capital is carried out by combining several methods, i.e., the modified Mincer function, and the benefit-cost ratio (Discounted Profitability Index), in order to eliminate the limitations of the methods of assessment applied.

The chosen methods (the Mincer function and the discounted profitability index) provide an opportunity to distinguish the impact of investment in human capital on wages, controlling other factors, which affect a person's wage and allow to assess the impact of the factors on the private financial (pseudo)return, as well as the benefit-cost ratio calculated enables to assess the comparative profitability, allows to assess and compare the differences of profitability of alternative options of the use of the capital, is easy to understand.

6. On the basis of the developed model of assessment of the private financial return on investment in human capital and the impact of the factors determining

it, methodology of the research of assessment of the private financial return on investment in human capital and the impact of the factors determining it has been prepared and the logical scheme of the research has been drawn up. The assessed private financial return on investment in human capital showed that an additional year of study increases the wage by 9.7% on average. It was found that a positive financial return, without assessing the costs of education, is generated by virtually all years spared for learning over a person's lifetime.

6.1. The results of the analysis carried out suggest that the private financial return on investment in higher non-university education without estimating the costs equals zero, as monitoring other factors determining the wages, the wages of the group of persons with the college higher education do not statistically significantly differ from those who have not acquired higher education. The private financial pseudo-return (disregarding the costs) of the acquired Bachelor's degree in higher university education amounts to 23.9%, of the Master's degree to 25.1%, thus, it can be stated that there are no differences in the private financial pseudo-return on investment in human capital between the Bachelor's and Master's degree. The private financial return of the Doctor's degree, disregarding the costs of acquiring the education is 45.6%.

6.2. On the basis of the prepared model of assessment of the private financial return on investment in human capital and the impact of the factors determining it, it was found that the area of study and the acquired degree have an impact on the private financial return on investment in human capital: different rates of the private financial return are created depending on the study area chosen and the degree acquired. It was found that the taken decision of what and where to study may have a significant influence on a person's future income. The largest private financial return of the acquired Bachelor's degree, excluding the cost for acquiring education, is after the completion of the studies in Arts (about 75.8%) and Humanities (40.6%). The largest private financial pseudo-return on investment in human capital in Master's studies is obtained after completion of the Biomedical and Physical science studies (about 47.4% and 38.3% respectively). The third cycle studies provide the largest private financial return after obtaining the degree of the Doctor of Technological sciences (99.8%) and the Doctor of Social sciences (43.2%). Comparing the private financial pseudo-return on investment in human capital generated in each cycle of studies, it was found that the lowest private financial pseudo-return is received after the completion of studies of a Bachelor of Biomedical science (it is negative and makes -14.4%), but after acquiring the Master's degree in Biomedical sciences, a private financial pseudo-return reaches 47.4%. The lowest private financial pseudo-return is received after acquiring the Master's degree in Humanities (about 9.3%), and the private financial pseudo-return created on the third cycle of studies by the degree of Doctor of Humanities is about 26.1%.

After carrying out the assessment of the private financial return, when

assessing the costs of acquiring education it was established that the trends remain the same, i.e., those areas of study that were distinguished by a high rate of private financial return excluding the costs, generate a greater private financial return compared to other study alternatives having assessed the costs and vice versa. The assessment of direct and alternative costs of acquiring higher education shows that the largest private financial return generated by the 1st study cycle of Arts falls from 75.8% to 17% (and 10.8%, if a person has to pay for his/her studies himself/herself). The largest average private financial return on investment in human capital at the 2nd cycle is provided by the Biomedical studies – 5.6% (3.5% if a person has to pay for his/her studies himself/herself), at the 3rd cycle the degree of the Doctor of Technological sciences provides the average annual private financial return of 15% when a person's education is state-funded, and 6.1% if a person pays tuition fees himself/herself.

6.3. The results of the research carried out showed that although females in comparison with males earn about 30% less, but the private financial pseudo-return on investment in human capital (excluding the costs) for females and males is equal.

The assessment of the impact of gender factor has found that the private financial return on investment in human capital (after assessment of costs) differs for male and female because of the pay gap. The differences are determined not only by the gender aspect, but also by gender differences related to females' choice of professions.

6.4. In order to find out whether the educational institution can have an impact on the size of the private financial return on investment in human capital, it was determined that excluding the costs, the Bachelor's studies at a highest ranked university in the country according to the published rankings, create the private financial pseudo-return on investment in human capital which is 44.7 percentage points higher than similar studies at other universities. Master's studies at a highest ranked university in the country provide the private financial pseudo-return on investment in human capital which is 34.8 percentage points higher than Master's studies at other universities. Meanwhile, the completion of doctoral studies at a highest ranked university in the country does not have a significant impact on the private financial pseudo-return on investment in human capital, i.e. it little (2.1 percentage points) differs from the similar doctoral studies at other universities. However, it should be noted that the impact of the highest ranked university on the private financial pseudo-return on the education obtained during bachelor's and master's studies is large and statistically significant only in the case if the possible concentration of the graduates of the educational institution in the city where the latter research institution is located is not taken into account. Controlling the uneven distribution of the persons who have and have not graduated from a highest ranked university in the country according to the published ranking between the city where the investigated

research institution is located and the rest of Lithuania, the impact of the highest ranked university on the private financial pseudo-return of Master's studies decreases, and becomes insignificant for Bachelor's studies.

6.5. After examination of the extent to which the graduation from five highest ranked universities in the country according to the published rankings has an impact on the private financial pseudo-return on investment in human capital it was found that a Bachelor's and Master's degree obtained in the five highest ranked universities of the country according to the published rankings, create a higher private financial pseudo-return on investment in human capital compared to other universities (28.5 percentage points and 12.9 percentage points respectively). No statistically significant difference of the private financial pseudo-return of the obtained Doctor's degree has been found. Monitoring the uneven territorial distribution of graduates of the best five universities and graduates of other universities, and territorial wage differences, the obtained results of the research showed that the additional private financial pseudo-return on investment in human capital created in the best ranked universities according to the published rankings is also statistically insignificant.

6.6. The obtained results of the analysis allow to state that the type of the sector has an impact on the private financial return on investment in human capital – the private financial return on investment in human capital when working in the private sector is 0.5 percentage points higher than in the public sector.

6.7. The performed calculations showed that the size of the company only partly affects the private financial return on investment in human capital. The private financial return on investment in human capital when working in a micro-company (up to 9 employees) is 1.5 percentage points lower than when working in a medium-sized company. When working in a larger company, the received private financial return on investment in human capital increases: from 6.5% in a small-sized company to 6.8% in a large company, but it is not statistically significantly different from the return received by the persons with the same educational level working in medium-sized companies.

6.8. It was found that when working in trade and service companies the average private financial return on investment in human capital is about 10%, in the companies undertaking the mixed activities (production and provision of services) the average private financial return is very similar, it makes 10.3%, and when working in a processing company (i.e. the company engaged in the production and sales of goods), the largest average private financial return on investment in human capital (11.3%) is created. The results of the analysis allow stating that there are no significant differences in the private financial return on investment in human capital when working in the mixed, trade and services sectors, while the private financial return in the processing sector is higher compared to the three other sectors.

7. When comparing the average rate of the private financial return of the individual study areas chosen to study with the investment in higher education and the cost of studies, no positive correlation between the tuition fees and the obtained benefit, calculated when assessing the private financial return on investments for different education alternatives has been observed. Calculations of the rate of private financial return carried out and evaluation of sensitivity of the analysis results allow for the conclusion that expensive areas of study also generate a low rate of the private financial return. When the state funds such studies, large resources are invested in certain areas of study (specialities), which do not lead to large private financial return (or even do not create any positive private financial return in general), therefore, the low tax revenue is received as the main component of financial social return. In order to justify such state financing from the investment perspective, it is likely that such financing of certain areas of study provides a high social return, as otherwise it gives a signal that the funds are possibly allocated wrongly.

8. The empirical research carried out allows formulating the advantages and disadvantages of the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it. The essential advantages of the model are as follows: 1) the model and the prepared research methodology, consisting of several stages, involve several methods of assessment, using the benefits provided by different research methods; 2) the designed model integrates identification and assessment of the benefits created by investments and the costs; 3) an investment alternative in respect of the individual's financial benefit, generating the highest rate of return, can be selected; 4) financial benefit created by investment directly related to the individual is identified; 5) the model takes into account the time value of money; 6) the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it can be used to research the cases of different countries. The following limitations of the model can be identified: 1) the model does not provide an opportunity to assess the benefit of investments which cannot be measured by money; 2) the impact of investment in human capital on the society, i.e. public/social benefit is not assessed; 3) assumptions formulated for assessment of private costs can have an influence on the result of the assessment. However, it should be noted that the limitations of the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it can be eliminated by extending the model, integrating the assessment of the non-monetary benefit for the individual, public/social benefit and costs.

9. To sum up the scientific discussion about the methods applied for assessment of the return on investment in human capital and the factors determining it, it can be stated that the model of assessment of the private

financial return on investment in human capital and the impact of the factors determining it proposed in the dissertation deals with the following main scientific and practical problems:

- assessment of the return: applying the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it, following the principle of consistency, the private financial return is assessed by estimating the costs incurred and the benefits created by the investments;
- identification of the factors: the designed model provides the opportunity to assess the impact of the factors on the private financial return on investment in human capital.

10. The main distinction of the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it designed in the dissertation compared to the models of assessment proposed by other scientists is emphasizing and assessment of the significance of the benefits created by investment – the impact of education on wages, controlling the impact of other factors on the wages. It is worth noting that the distinction of the model of assessment of the private financial return on investment in human capital and the impact of the factors determining it and the research methodology prepared is emphasized by explication of the factors that affect the return and combination of several methods aiming to assess the return, and the entirety of the principles of assessment, assumptions and methods used ensures the assessment of the private financial return created by investment in human capital.

The designed model of assessment of the private financial return on investment in human capital and the impact of the factors determining it and the prepared methodology of empirical research, assessing the private financial return on investment in human capital and the impact of the factors determining it, can be applied and used to research the case of any country in the world. The dissertation work complements the already existing scientific sources by new information. The obtained results of the research can also be used for the creation and development of the questions on the problems of assessment of the return on investment in human capital and the impact of the factors determining it.

Potential directions of further research of the author of the dissertation. The findings of the theoretical analysis and the results of empirical research carried out in the dissertation open the opportunities for further and more elaborate research of assessment of the return on investment in human capital and the factors affecting it.

The performed theoretical analysis allowed to highlight the system of the factors that influence the return on investment in human capital consisting of

the groups of various factors, and the significance of the factors affecting the wages and the private financial return on investment in human capital and the size of the impact determined/found during the empirical research allowed to assess the private financial return on investment in human capital. Directions of further research could be a broader and more detailed assessment of the private financial return on investment in human capital, taking into account not only the qualification/research degree obtained, the study area, the type of the sector in which one works, but also other factors: the type of economic activity of the workplace, the chosen study field, etc. Elaborating the research according to the study fields, it is possible to continue going deeper and extend the research in order to determine the study field, choosing which a person receives the largest private financial return, taking into account the gender aspect. On the basis of information obtained during the conducted research, and after supplementing it by the missing data, it would also be possible to carry out the assessment of the return on investment in human capital at the level of the state, focussing on public and social return, its differences in the countries of the European Union, etc. On the basis of the data collected during the research, it would be possible to expand the research area focussing on analysis and assessment of the factors affecting wages as well.

REZIUMĖ

Temos aktualumas. Investicijos į žmogiškąjį kapitalą yra vienas pagrindinių veiksnių, lemiančių technologinį vystymąsi, gamybą, taigi ir ekonomikos augimą bei konkurencingumo didėjimą. Šiuolaikinėmis ekonomikos sąlygomis, kai žmogiškasis kapitalas ir investicijos į jį tampa neatsiejami nuo valstybės ir visuomenės augimo, investicijos į žmogiškąjį kapitalą įgyja pirmumo reikšmę, todėl nuolat didinamos. Didėjant investicijoms ypač aktualia problema tampa investicijų į žmogiškąjį kapitalą grąža. Daugelyje šalių yra skaičiuojami investicijų į žmogiškąjį kapitalą grąžos rodikliai, kuriais remiantis reguliuojamas išteklių paskirstymas mokslui, švietimui, profesiniam pasirengimui, vertinamas investicijų efektyvumas pagal atskiras studijų sritis, įgytą kvalifikacinį / mokslo laipsnį ir pan. Įvairių šalių ir laikotarpių tyrimais patvirtinta, kad labiau išsilavinę asmenys gauna didesnius atlyginimus, susiduria su mažesne nedarbo rizika, turi daugiau galimybių įsidarbinti prestižiniame darbe, dirbti patrauklesnį, įdomesnį ir perspektyvesnį darbą, užima geresnę padėtį visuomenėje, pelno daugiau pagarbos iš aplinkinių, geba geriau prisitaikyti prie ūkio pokyčių nei asmenys, turintys žemesnį išsilavinimą. Šis teigiamas ryšys tarp užd darbo ir investicijų į žmogiškąjį kapitalą yra patvirtintas daugelyje empirinių tyrimų. Be to, naujausi literatūros šaltiniai nurodo papildomus investicijų į žmogiškąjį kapitalą teikiamos naudos privalumus, tokius kaip ilgesnė gyvenimo trukmė ar aukštesnis „laimės“ laipsnis.

Investicijų į žmogiškąjį kapitalą grąža ir jos vertinimas aktualūs visiems investuotojams – tiek privačiam asmeniui, tiek įmonei / organizacijai, investuojančiai į savo darbuotoją, tiek valstybei. Kiek investuoti į žmogiškąjį kapitalą (išsilavinimą, kaip vieną iš esminių investavimo į žmogiškąjį kapitalą formų), yra vienas svarbiausių ekonominių sprendimų, su kuriuo susiduria kiekvienas individas. Informacija apie investicijų grąžą ekonominiu požiūriu gali padėti asmenims priimti geresnį sprendimą dėl tolesnio mokymosi ir investavimo į save. Paskutiniiais dešimtmečiais daugelyje šalių pastebimas privataus indėlio, siekiant aukštojo mokslo, augimas, todėl svarba vertinti investicijų grąžą kaip privataus sprendimo kriterijų vis didėja. Žinant, kokią grąžą gali užtikrinti skirtingos studijų alternatyvos (net jei aukštasis mokslas yra finansuojamas iš valstybės biudžeto), galima padaryti moksliškai reikšmingas išvalgas, apibrėžiant prioritetus, kaip valstybės lėšos turėtų būti paskirstytos tarp skirtingų švietimo sričių, taip pat gauta informacija gali padėti paaiškinti skirtingų studijų kryptį paklausą.

Investicijų į žmogiškąjį kapitalą grąžos vertinimas, siekiant priimti racionalius ir efektyvius investicinius sprendimus, yra aktuali mokslinių diskusijų tema. Todėl pasirinkta darbo tematika patvirtina jos aktualumą. Nepaisant to, kad žmogiškojo kapitalo koncepcija pasaulyje intensyviai studijuojama daugiau

nei 60 metų, vis dar plėtojamos diskusijos apie investicijų į žmogiškąjį kapitalą privačią finansinę grąžą, jos skirtumus ir grąžos vertinimo metodus.

Reikia pabrėžti, kad investicijų į žmogiškąjį kapitalą grąžos vertinimo tyrimuose nėra išskiriama vieno priimtinausio vertinimo metodo. Daugelyje atliktų empirinių tyrimų investicijų į žmogiškąjį kapitalą grąža skaičiuojama taikant Mincerio pajamų lygtį, kurioje vertinami veiksniai, turintys įtakos asmens darbo užmokesčiui, tačiau pagal šį metodą apskaičiuota investicijų į žmogiškąjį kapitalą grąža negali būti prilyginama „tikrajai“ grąžai, nes apskaičiuojant grąžą nėra įvertinami kaštai, t. y. naudojant Mincerio funkciją apskaičiuojama ir pateikiama pseudogrąža, ignoruojant kaštus. Tuo tarpu investicijų į žmogiškąjį kapitalą grąžos apskaičiavimas ir įvertinimas turėtų įskaičiuoti ir kaštus, kurie patiriami siekiant numatomos naudos (darbo užmokesčio padidėjimo).

Kitas grąžos vertinimo metodas, dažnai taikomas empiriniuose tyrimuose, yra vidinė grąžos norma, kurią skaičiuojant (vertinant investicijų į žmogiškąjį kapitalą grąžą) yra įvertinami kaštai, tačiau apsiribojama aukštąjį išsilavinimą įgijusių ir jo neįgijusių asmenų darbo užmokesčio skirtumais, neatsižvelgiant į kitus veiksnius, galinčius daryti įtaką atlyginimų skirtumams. Todėl, vertinant investicijų į žmogiškąjį kapitalą grąžą ir jos skirtumus, pastaroji gali būti nevisiškai įvertinama arba priešingai, pervertinama dėl neįvertintų kitų veiksnių, darančių įtaką gaunamam asmens darbo užmokesčiui.

Reikia pažymėti, kad investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimas, grąžos skaičiavimo metodikos pagrindimas sąlygoja tam tikras teorines prielaidas ir praktinius sprendimus, kuriems priimti būtini teoriniai išaiškinimai bei empiriniai patikrinimai.

Nepaisant šiuo metu vis didėjančio susidomėjimo žmogiškuoju kapitalu, investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimas lieka sudėtingas ir toliau diskutuojamas mokslininkų tyrimo objektas. Taigi, temos aktualumą atspindi investicijų į žmogiškąjį kapitalą svarba ir poreikis, būtinybė įvertinti būsimą grąžą prieš priimant investicinį sprendimą, o mokslinės diskusijos atskleidžia investicijų į žmogiškąjį kapitalą grąžos vertinimo problematiką.

Mokslinė problematika ir jos ištyrimo lygis. Praėjus daugiau nei pusei amžiaus nuo žmogiškojo kapitalo teorijos atsiradimo, ši tema vis dar plačiai nagrinėjama daugelio pasaulio mokslininkų darbuose ir tiriama įvairiais aspektais. Mokslinėse diskusijose galima rasti skirtingų žmogiškojo kapitalo apibrėžčių, įvairios apimtys ir ištirtumo investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimo interpretacijų, taikomų empirinių tyrimų metodų ir jų rezultatų. Žmogiškojo kapitalo svarba, jo įtaka ekonomikos augimui ir technologinei pažangai, darbo našumui, atlyginimų augimui ir diferenciacijai vertinama daugelio mokslininkų – T. W. Schultz (1961, 1971), J. Mincer (1958, 1974), J. Mincer ir S. Polachek (1974), E. F. Denison (1964), G. S. Becker (1964), R. Nelson ir E. S. Phelps (1966), M. P. Romer (1998), E. R. Lu-

cas (1993), P. David (2001), L. Oxley, T. Le, J. Gibson (2003, 2005, 2006, 2008), B. A. Weisbrod (1961), H. Wei (2003), P. Wachtel (1997), H. L. Tao ir T. F. Stinson (1997), R. Judson (2002), C. Dagum ir D. Slottje (2000), D. L. Millimet, M. Nieswiadomy ir D. Slottje (2010), M. Bullen, K. A. Eyler (2010), W. Guo, H. Xiao ir X. Yang (2012), L. Romele, M. Purgailis (2013), D. Lazarov ir G. Petreski (2016) – darbuose. Yra atlikta nemažai empirinių tyrimų, siekiant patikrinti žmogiškojo kapitalo teorijos teiginius, kuriais patvirtinama daugelis šios teorijos postulatų: *ryšio tarp išsilavinimo ir darbo našumo* (Madison, 1986), *sukaupto žmogiškojo kapitalo ir ekonomikos augimo* (Benhabib ir Spiegel, 1994, 2005; Seo, 2005; Paulsen ir Fatima, 2007; Santos 2009; Chaudhry ir Rahman, 2009; Siqueira, 2007; Mullin, 2010; Baldwin ir Borrelli, 2008; Afzal, Malik, Begum, Sarwar ir Fatima, 2012), žmogiškojo kapitalo poveikio technologiniams pokyčiams ir inovacijoms (Wang, Yen, Tsai ir Lin, 2008; Davenport ir Prusak, 1998) ir kt.

Daug dėmesio pasaulio mokslininkai skiria žmogiškojo kapitalo įtakos atlyginimų augimo ir jo diferenciacijos nagrinėjimui – tai J. Mincer (1958, 1974), J. Mincer ir S. Polachek (1974), R. Tchernis (2010), H. H. Son (2010), P. Trostel, I. Walker, P. Woolley (2002), G. Psacharopoulos ir H. A. Patrinos (2004, 2011) ir kt. *Investicijų į žmogiškąjį kapitalą grąžą individo aspektu* tyrė ir savo darbuose vertino G. S. Becker (1964, 1993), W. W. McMahon ir A. Wagner (1982), J. G. Altonji (1998), O. Ashenfelter ir A. Krueger (1994), K. Wilson (2001), D. Acemoglu (2002), L. Dearden (1998), R. J. Barro ir J. W. Lee (2010), A. Leigh (2008), V. Kharbanda (2012), *išsilavinimo grąžą, lygindami dvynių, įgijusių skirtingą išsilavinimą, darbo užmokesčio dydžius*, analizavo O. Ashenfelter ir A. Krueger (1994), C. E. Rouse (1999), J. R. Behrman, M. R. Rosenzweig (1999) ir kt. Atsižvelgiant į tai, kad investicijos į žmogiškąjį kapitalą teikia ne tik privačią, bet ir visuomeninę / socialinę naudą (Schultz, 1963; Fatima, 2009), atlikti tyrimai (McMahon, 1991, 1998, 1999; Acemoglu ir Angrist, 1999; Kara, 2009) parodė, kad *visuomeninė / socialinė investicijų į žmogiškąjį kapitalą grąžos norma* yra svarbi, reikšminga ir didesnė už investuotų lėšų į kitą turtą grąžą.

Reikia pažymėti, kad mokslinėje literatūroje gausu tyrėjų, analizavusių *grąžos normas priklausomybę nuo įgyto išsilavinimo laipsnio* (Becker, 1993; Grubb, 1995, 1996; Kane ir Rouse, 1995; Leigh ir Gill, 1997; Lewis, Hearn, Zilbert, 1993; McMahon ir Wagner, 1982; Monk-Turner, 1994; Psacharopoulos, 1981, 1985, 1995, 2009, 2011; Said, 2016; Tzannatos, Diwan, Ahad, 2016; ir kt.), kurių tyrimų rezultatai yra prieštaringi. Pavyzdžiui, V. H. Herrera, M. Madrid-Aris (2000), A. A. Amin ir W. J. Awung (2005), J. Gibson ir O. K. Fatai (2006), Q. Zhang ir H. Zou (2007), L. A. Amaghionyeodiwe, T. S. Osinubi (2007), T. Kifle (2007) ir kt. nurodo, kad išsilavinimo grąža didėja didėjant išsilavinimo lygiui, o kitų tyrėjų – K. Michaelowa (2000), C. Sakellariou (2003), T. P. Schultz (1993), L. A. Riveros (1990) ir kt. duomenimis, investicijų į išsilavinimą grąža yra didžiausia žemesniuose išsilavinimo lygiuose ir mažėja augant išsila-

vinimo lygiui. Tačiau tarp šios diskusijos dalyvių reikia išskirti ir J. J. Heckman, L. J. Lochner ir P. E. Todd (2008), P. Trostel (2005), O. Kara (2009) ir kt., kurie nurodo, kad išsilavinimo grąža nėra tiesinė, t. y. ji didėja arba mažėja didėjant išsilavinimo lygiui.

Investicijų į žmogiškąjį kapitalą grąžos vertinimo tyrimuose yra akcentuojama pasirinktos studijuoti *studijų srities* (Stark, 2007; Görlitz, Grave, 2012; Brunello, Comi, Lucifora, 2000; Yong, Heng, Thangavelu, Wong, 2007; ir kt.) ir *lyties veiksnio* įtaka investicijų į žmogiškąjį kapitalą grąžos dydžiui (Arai, 2001; Stark, 2007; Wahrenburg, Weldi, 2007; Mincer, Polachek, 1974; Brown, Monn, Zoloth, 1980; Groshen, 1991; Schumann, Ahlburg, Mahoney, 1994; Psacharopoulos, 1985; Sánchez-Pérez, 2012; ir kt.). Šių tyrimų rezultatai yra prieštaringi arba nepalyginami dėl skirtingo studijų sričių skirstymo šalyse (pavyzdžiui, vienuose tyrimuose akcentuojama teisės, sveikatos mokslų, informacinių technologijų, inžinerijos mokslų studijų sričių aukšta grąžos norma, o kituose – ekonomikos, technologijos, gamtos mokslų ir pan.). Tačiau, kaip rodo atlikta empirinių tyrimų analizė, dažniausiai apsiribojama pastarųjų veiksmų poveikio vertinimu grąžos dydžiui. Ir nors remiantis atliktų empirinių tyrimų rezultatais galima rasti mokslininkų išskirtą ir kitų veiksmų poveikį grąžai, pavyzdžiui, sektoriaus tipo (viešajame ir privačiame sektoriuose dirbančių asmenų investicijų į žmogiškąjį kapitalą minimus grąžos skirtumus) (Brunello, Comi, Lucifora, 2000; Lauer, Steiner, 2004; Okuwa, 2004; Budría, 2006; Chirwa, Matita, 2009; Javed ir Arshad, 2013; ir kt.), bet iš esmės tyrimuose dažnai apsiribojama darbo užmokesčio diferenciacija vertinant, kiek ir kaip atskiri veiksniai turi įtakos darbo užmokesčiui, nesutelkiant dėmesio, ar tie patys veiksniai, darantys poveikį darbo užmokesčiui, turi įtakos investicijų į žmogiškąjį kapitalą grąžos dydžiui. Todėl empiriniuose tyrimuose pasigendama veiksmų identifikavimo – kokie veiksniai ir kaip veikia investicijų į žmogiškąjį kapitalą grąžą ir jos dydį.

Atlikta tyrimų analizė žmogiškojo kapitalo teorijos klausimais leidžia teigti, kad Lietuvos mokslininkai žmogiškąjį kapitalą nagrinėja daugiau organizaciniu lygmeniu. Galima paminėti tik keletą autorių, savo darbuose skaičiavusių ir vertinusių investicijų į žmogiškąjį kapitalą grąžą, – tai A. Šileika ir Z. Tamašauskienė (2003), Z. Tamašauskienė ir V. Damašienė (2004), J. Palumickaitė, I. Kleivienė (2005), V. Gižienė (2011), V. Gižienė, Ž. Simanavičienė, O. Palekienė (2012), P. Grigas ir B. Leiputė (2015). Tyrimų rezultatai Lietuvoje rodo, kad investicijų į aukštąjį išsilavinimą grąža individui svyruoja nuo 6 proc. iki 25 proc. priklausomai nuo tyrimuose naudojamos informacijos ir taikomos metodikos, tačiau neišskiriami veiksniai, kurie gali turėti didelę įtaką investicijų į žmogiškąjį kapitalą naudai (įgijusiųjų aukštąjį išsilavinimą būsimoms pajamoms) ir grąžai – lytis, įgytas kvalifikacinis / mokslo laipsnis ir pasirinkta studijų sritis. Todėl prasminga sudaryti modelį, vertinantį šių veiksmų poveikį investicijų į žmogiškąjį kapitalą grąžai, atsižvelgiant ir į tai, kad studijų kaina pagal sritis ir laipsnius skiriasi.

Reikia pabrėžti, kad, nepaisant plataus aptariamąsios srities mokslinių tyrimų spektro, nėra detalios analizuojami ir vertinami veiksniai, turintys įtakos investicijų į žmogiškąjį kapitalą grąžai, nepaaiškinamas jų poveikis, o ir vertinant jų poveikį dažnai apsiribojama pseudogražos skaičiavimais taikant Mincerio funkciją (Alstadsæter, 2004; Pereira, Martins, 2004; Ciccone, 2004; Ulrick, 2007; Leigh, 2008; Ciccone, Cingano, Cipollone, 2006; Brenner, Rubinstein, 2011; Fiaschi, Gabbriellini, 2013; Alqattan, Al-Zayer, Stergioulas, 2013; Said, 2016; Tzannatos, Diwan, Ahad, 2016; ir kt.), ignoruojančią išsilavinimo įgijimo kaštus, todėl pateikiama didesnė investicijų į žmogiškąjį kapitalą grąža dėl neįvertintų kaštų. Tuo tarpu investicijų į žmogiškąjį kapitalą grąžos vertinimo tyrimuose, įvertinančiuose kaštus, taikant vidinės grąžos normos metodą (Collins ir Davies, 2005; Boothby ir Rowe, 2002; Constantatos ir West, 1991; Dickson, Milne, Murrell, 1996; Wahrenburg ir Weldi, 2007; Kara, 2009; Harberger ir Guillermo-Peón, 2012; Heckman, Lochner, Todd, 2008; García-Suaza, Guataquí, Guerra, Maldonado, 2009; Gižienė, 2011; Lazarov ir Petreski, 2016; ir kt.), apsiribojama darbo užmokesčio skirtumais (įgijusiųjų aukštąjį išsilavinimą ir jo neįgijusiųjų), neatsižvelgiant į kitus veiksnius, galinčius daryti įtaką darbo užmokesčio skirtumams. Tai gali lemti netikslios investicijų į žmogiškąjį kapitalą grąžos apskaičiavimą: grąža gali būti nevisiškai įvertinta arba priešingai, pervertinta dėl neįvertintų kitų veiksnių, lemiančių darbo užmokesčių skirtumus, poveikio. Be to, taikant vidinės grąžos normos metodą, daroma prielaida, kad gaunamas pajamų srautas yra reinvestuojamas su grąžos norma, lygia vidinei grąžos normai. Tačiau realioje situacijoje gaunama papildoma nauda (darbo užmokesčio padidėjimas) dėl įgyto aukštesnio išsilavinimo nėra reinvestuojama, todėl galima teigti, kad reinvestavimas vyksta nepilnai, kas kelia diskusinių klausimų dėl šio metodo taikymo tinkamumo, vertinant investicijų į žmogiškąjį kapitalą grąžą, ir pan.

Apibendrinant mokslinės problematikos ištirtumo lygį, galima teigti, kad mokslinėje literatūroje atkreipiamas dėmesys į tokias svarbias investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimo problemas: kaip įvertinti investicijų į žmogiškąjį kapitalą grąžą; kaip išmatuoti investicijų į žmogiškąjį kapitalą teikiamą naudą; koks ryšys tarp įgyto aukštesnio išsilavinimo ir grąžos; kaip įvertinti atskirų veiksnių poveikį grąžos dydžiui ir pan. Reikia pabrėžti, kad gauti mokslininkų tyrimų rezultatai dažnai yra prieštaringi dėl pasirinktų skirtingų vertinimo metodų taikymo ar neįvertintos / ignoruotos kitų veiksnių įtakos, nevertintų kaštų, kas lemia netikslus galutinius tyrimo rezultatus ir (ar) pateikiamas abejotinas rezultatų interpretacijas. Pažymėtina, kad moksliniu aspektu investicijų į žmogiškąjį kapitalą grąžos vertinimas analizuojamas gana fragmentiškai, nagrinėjami tik atskiri elementai ir požiūriai, mokslinėje diskusijoje trūksta kryptingumo ir kompleksinio požiūrio. Todėl pastebėjus, kad (ypač Lietuvoje) žmogiškojo kapitalo teorijos tyrimuose per mažai dėmesio skiriama investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiks-

nių poveikio vertinimui, ir įvertinus šios problemos aktualumą tiek teoriniu, tiek praktiniu požiūriu, jos sprendimui skiriamas šis disertacinis darbas.

Atsižvelgiant į anksčiau pateiktus investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo ribotumus, **disertacijoje formuluojama mokslinė problema** – kokie veiksniai lemia investicijų į žmogiškąjį kapitalą privačią grąžą ir kaip ją įvertinti identifikuojant skirtingų veiksnių poveikį.

Tyrimo objektas – investicijų į žmogiškąjį kapitalą privati grąža.

Tyrimo tikslas – atlikus žmogiškojo kapitalo ir investicijų į jį privačios grąžos bei ją lemiančių veiksnių vertinimo teorinę analizę, įvertinti investicijų į žmogiškąjį kapitalą privačią finansinę grąžą ir ją lemiančių veiksnių poveikį, taikant sukurtą vertinimo modelį.

Siekiant išsikelti tikslo, disertacijoje sprendžiami tokie **uždaviniai**:

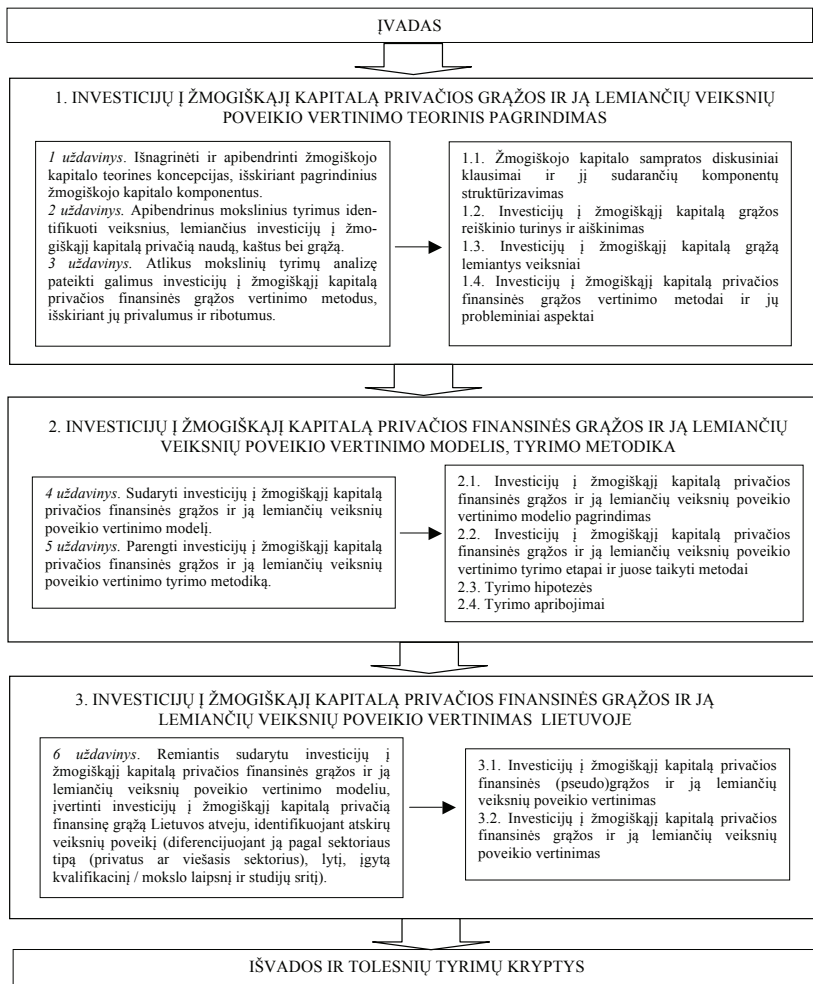
1. Išnagrinėti ir apibendrinti žmogiškojo kapitalo teorines koncepcijas, išskiriant pagrindinius žmogiškojo kapitalo komponentus.
2. Apibendrinus mokslinius tyrimus, identifiikuoti veiksnius, lemiančius investicijų į žmogiškąjį kapitalą privačią naudą, kaštus ir grąžą.
3. Atlikus mokslinių tyrimų analizę, pateikti galimus investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimo metodus, išskiriant jų privatumus ir ribotumus.
4. Sudaryti investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelį.
5. Parengti investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodiką.
6. Remiantis sudarytu investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modeliu, įvertinti investicijų į žmogiškąjį kapitalą privačią finansinę grąžą Lietuvos atveju, identifiikuojant atskirų veiksnių poveikį (diferencijuojant ją pagal sektoriaus tipą (privatus ar viešasis sektorius), lytį, įgytą kvalifikacinį / mokslo laipsnį ir studijų sritį).

Darbo struktūra ir apimtis. Disertaciją sudaro įvadas, trys dalys, išvados ir literatūros šaltinių sąrašas. Pateikta 12 priedų. Darbo apimtis yra 208 puslapiai, jame yra 17 lentelių ir 35 paveikslai, panaudoti 539 literatūros šaltiniai.

Disertacijos loginę struktūrą lėmė suformuluota mokslinė problema, apibrėžtas disertacijos objektas, iškeltas tikslas ir jam įgyvendinti numatyti uždaviniai, kurių loginė seka atsispindi trijose disertacijos dalyse. Disertacijos loginė struktūra ir sprendžiami uždaviniai parodyti 1 paveiksle.

Pirmojoje disertacijos dalyje sprendžiami trys pirmieji uždaviniai. Šioje dalyje nagrinėjami diskusiniai žmogiškojo kapitalo sampratos klausimai, įvardijami pagrindiniai žmogiškojo kapitalo komponentai, pateiktos investicijų į žmogiškąjį kapitalą formos, teoriniu lygmeniu pagrįsta investicijų į žmogiškąjį kapitalą nauda individo ir visuomenės požiūriu, aptarti investicijų į žmogiškąjį kapitalą kaštai, įvardytos ir pristatytos investicijų į žmogiškąjį kapitalą grąžos

rūšys. Apibendrinant mokslinės literatūros šaltiniuose ir empiriniuose tyrimuose pateikiamus žmogiškojo kapitalo sampratos požiūrius, siekiant conceptualaus aiškumo, akcentuojant sąvokos kompleksiskumą, suformuluota išplėtotą žmogiškojo kapitalo apibrėžtis. Atliktas investicijų į žmogiškąjį kapitalą teorinių ir empirinių tyrimų rezultatų apibendrinimas, identifikuoti veiksniai, turintys įtakos investicijų į žmogiškąjį kapitalą kaštams, kuriamai naudai ir privačiai grąžai. Išskirti galimi investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimo metodai, pažymint jų privalumus ir ribotumus, atskleista investicijų į žmogiškąjį kapitalą grąžos vertinimo problematika.



1 pav. Disertacijos loginė struktūra

Antrojoje dalyje sprendžiamas ketvirtasis ir penktasis disertacijos uždaviniai. Rengiant tyrimo metodiką, sudaromas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis, aptariami empirinio tyrimo etapai, pagrindžiamas tyrimo imties parinkimas, parinktas ir pagrįstas taikomas metodas, nurodomi tyrimo ribotumai.

Trečiojoje disertacijos dalyje sprendžiamas paskutinis mokslinio tyrimo uždavinys. Joje pateikiami atlikto kiekybinio tyrimo rezultatai, pasitelkiant surinktus duomenis tikrinamas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis, atliekamas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimas, nustatomi grąžos skirtumai, susiję su įgyto aukštojo išsilavinimo laipsniu, pasirinkta studijuoti sritimi, atsižvelgiant į lyties aspektą ir kt.

Mokslinio tyrimo metodai. Siekiant disertacijoje išsikelto tikslo ir sprendžiant numatytus uždavinius, pritaikyti bendrieji mokslinio tyrimo metodai. Tiriant disertacijos mokslinės problematikos ištirtumo lygį, analizuojant žmogiškojo kapitalo bei investicijų į jį privačios grąžos ir ją lemiančių veiksnių poveikio vertinimo aspektus, atskleidžiant investicijų į žmogiškąjį kapitalą grąžos vertinimo ribotumus, naudoti mokslinės literatūros analizės, palyginimo metodai, atliktų empirinių tyrimų rezultatų grupavimas, apibendrinimas, išvadų formulavimas. Sudarant investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelį bei atliekant empirinį tyrimą, taikyti modeliavimo ir ekonometrinės analizės metodai, integruojant kiekybinius aprašomosios statistikos, regresinės analizės metodus. Siekiant identifikuoti veiksnus, darančius poveikį darbo užmokesčio dydžiui bei investicijų į žmogiškąjį kapitalą privačiai finansinei grąžai, ir nustatyti jų poveikio stiprumą, duomenims surinkti atliktas anketinis tyrimas.

Moksliniame darbe naudoti informacijos ir duomenų šaltiniai:

- tiriant ir analizuojant teorinius žmogiškojo kapitalo bei investicijų į jį privačios grąžos ir ją lemiančių veiksnių poveikio vertinimo aspektus ir tyrimo metodus, sudarant investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelį, disertacijoje remtasi užsienio ir Lietuvos mokslininkų darbais, atliktais tyrimais;
- esant pirminių duomenų trūkumui, empirinio tyrimo pagrindą sudaro anketinio tyrimo metu surinkti duomenys.

Tyrimo apribojimai. Siekiant disertacijoje išsikelto tikslo, investicijų į žmogiškąjį kapitalą grąža vertinama individo požiūriu, atsiribojant nuo visuomeninės ir socialinės grąžos, paremtos platesniu tiek naudos, tiek kaštų vertinimu. Pastarasis aspektas traktuojamas kaip tolesnių tyrimų objektas.

Sudarytas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis, kuriame išskirti vidiniai ir išoriniai grąžą lemiantys veiksniai, yra vienas iš galimų variantų, todėl negalima teigti, kad jis apima visus investicijų į žmogiškąjį kapitalą privačią finansinę grąžą lemiančius veiksnius.

Disertaciniame tyrime žmogiškasis kapitalas suprantamas kaip išsilavinimas. Toks požiūris paremtas nuostata, kad išsilavinimas yra pagrindinis žmogiškojo kapitalo kūrimo svertas, t. y. išsilavinimas užtikrina žinių ir įgūdžių, kurie asmenims suteikia galimybę padidinti darbo našumą, pajamas, įgijimą. Įgyvendinant disertacijos tikslą, atliekant tyrimą vertinama investicijų į aukštąjį išsilavinimą grąža.

Vertinant investicijų į žmogiškąjį kapitalą grąžą ir ją lemiančių veiksnių poveikį, atsiribojama nuo nefinansinės naudos vertinimo.

Šis darbas papildo jau esamus mokslinius šaltinius nauja informacija. Disertacijos autorės žiniomis, tai yra pirmas Lietuvoje atliktas tyrimas, kuriame apskaičiuojama investicijų į žmogiškąjį kapitalą privati finansinė grąža, naudojant klasikinę Mincerio pajamų funkciją, ir grąža vertinama pagal lyties, įgyto kvalifikacinio / mokslo laipsnio ir pasirinktos studijuoti srities bei sektoriaus, kuriame dirbama, tipą, įmonės veiklos pobūdį ir kt. Kadangi vertinant investicijų į žmogiškąjį kapitalą grąžą atsižvelgiama į studijų kaštus, todėl tyrime yra siejami du metodai, kurie naudojami siekiant apskaičiuoti privačią finansinę grąžą, gaunamą iš įgyto aukštojo išsilavinimo. Sukonstruotas ekonometrinis modelis, besiremiantis Mincerio pajamų funkcija, leido analizuoti ir nustatyti veiksnius, darančius poveikį darbo užmokesčio dydžiui ir investicijų į žmogiškąjį kapitalą privačiai finansinei (pseudo)grąžai, ir apskaičiuoti privačią finansinę pseudogrąžą. Kitas metodas – diskontuotas pelningumo indeksas leido įvertinti patiriamus kaštus mokymosi laikotarpiu ir apskaičiuoti vidutinę metinę privačios finansinės grąžos normą. **Darbo mokslinį naujumą nusako šie gauti rezultatai:**

- Išanalizuota mokslinė literatūra investicijų į žmogiškąjį kapitalą grąžos vertinimo srityje, išskirti žmogiškojo kapitalo komponentai, suformuluota patikslinta žmogiškojo kapitalo apibrėžtis, akcentuojant sąvokos kompleksiskumą ir apibrėžiant ją siauruoju bei plačiuoju požiūriais. Išplėta sąvokos apibrėžtis į ją įtraukiant asmens nuostatas, kūrybingumą, verslumą, motyvaciją, inovatyvumą, orientaciją aplinkoje, gebant savo žinias ir įgūdžius tinkamai ir laiku panaudoti, bei kitas asmens savybes, leidžiančias padidinti darbo našumą ir individo pajamas darbo užmokesčio forma.
- Identifikuoti investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimo metodai bei jų privalumai ir ribotumai, taikymo problemos empiriniuose tyrimuose. Išskirti metodų privalumai tapo pagrindu rengiant investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių

veiksnių poveikio vertinimo tyrimo metodiką, siekiant eliminuoti taikomų vertinimo metodų ribotumus.

- Atlikta teorinių ir empirinių investicijų į žmogiškąjį kapitalą mokslinių tyrimų analizė leido identifikuoti ir išskirti veiksnius, lemiančius investicijų į žmogiškąjį kapitalą naudą, kaštus ir grąžą, juos sugrupuoti į dvi pagrindines grupes: išorinius veiksnius, apimančius makroekonominę aplinką, vyriausybės politiką ir kt., bei vidinius veiksnius, daugiau priklausančius nuo paties individo ir apimančius jo elgseną, psichologinius, išsilavinimo ir kitus su juo pačiu susijusius veiksnius. Jų pagrindu sukonstruotas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis.
- Mincerio funkciją papildžius atskirais veiksniais (pvz., asmens einamos pareigos ir pan.) ir ją modifikavus įtraukiant išsilavinimo kvadratą, siekiant atspindėti galimą netiesinį išsilavinimo poveikį darbo užmokesčiui, sudarytas ekonometrinio tyrimo modelis, leidžiantis įvertinti išsilavinimo teikiamą finansinę naudą (darbo užmokesčio padidėjimą) – investicijų į žmogiškąjį kapitalą privačią finansinę pseudogražą ir ją lemiančių veiksnių poveikį.
- Sudarytas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis bei parengta empirinio tyrimo metodika apima kelis vertinimo metodus ir integruoja investicijų kuriamos naudos ir kaštų identifikavimą bei vertinimą, atsižvelgiant į pinigų laiko vertę.

Praktinė disertacijos rezultatų reikšmė:

- Disertacijoje pateiktas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis bei parengta empirinio tyrimo metodika praplečia jau esamų investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimo modelių sritį, gali būti taikomi bei naudojami kitų šalių atvejams tirti.
- Sudarytas klausimynas gali būti naudojamas veiksnių poveikio darbo užmokesčio vertinimui bet kurios pasaulio šalies atveju.
- Nors kitų tyrimų metu buvo atskleista, kad iš aukštojo mokslo galima tikėtis kur kas didesnės grąžos nei iš alternatyvių investicijų, disertacijoje atlikus tyrimą nustatyta, kad priklausomai nuo pasirinktos studijų sritys ir įgyjamo kvalifikacinio / mokslo laipsnio yra sukuriamos skirtingos grąžos normos (kai kurios studijų sritys, vertinant ekonominiu požiūriu, yra ne tokios patrauklios), todėl sprendimas, ką studijuoti (ir kokią mokymo įstaigą pasirinkti), gali turėti didelę įtaką asmens būsimums pajamoms.
- Remiantis sudarytu investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modeliu, atlikto tyrimo rezultatai gali būti naudingi mokslininkams, tiriantiems investicijų į

žmogiškąjį kapitalą gražos vertinimo ir darbo apmokėjimo problematikos klausimus, bendrojo ugdymo mokyklų abiturientams ir kitiems asmenims, besirenkantiems studijų sritį, priimantiems sprendimą dėl studijų pakopos pasirinkimo ir pan., taip pat šalies žmogiškojo kapitalo valdymo politikos formuotojams.

- Gauti tyrimo rezultatai gali būti panaudoti studijų bei tęstinio mokymo procese ir atliekant tolesnius mokslinius tyrimus.

Disertacijos išvados ir tolesnės tyrimų kryptys

Sprendžiant disertacijoje suformuluotą problemą ir siekiant išsiskelto tikslo bei uždavinių įgyvendinimo, atskleidus ir apibendrinus investicijų į žmogiškąjį kapitalą gražos ir ją lemiančių veiksnių poveikio vertinimo problematiką, sudarius investicijų į žmogiškąjį kapitalą privačios finansinės gražos ir ją lemiančių veiksnių poveikio vertinimo modelį bei tyrimo loginę schemą, į investicijų į žmogiškąjį kapitalą privačią finansinę gražą ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodiką integravus kelis vertinimo metodus pasinaudojant skirtingų mokslinių tyrimo metodų teikiama is privalumais ir pritaikius disertacijoje sukurtą modelį bei parengtą tyrimo metodiką, gautus teorinius ir empirinius tyrimo rezultatus galima apibendrinti šiose išvadose:

1. Apibendrinus išanalizuotą mokslinę literatūrą, išskirti žmogiškojo kapitalo komponentai, kuriuos galima sugrupuoti į dvi dalis: įgimtus ir įgytus. Įgimtą žmogiškąjį kapitalą galima išskirti į įgimtus fizinius gabumus ir intelektualinius-psichologinius gebėjimus, kurie gali būti veikiami (didinami / mažinami) asmens sveikatos būklės ir įgyto kapitalo. Pastarųjų panaudojimas priklauso ne tik nuo aplinkybių, susijusių su sveikatos būkle, įgytų žinių, įgūdžių, bet ir nuo aplinkos, kurioje individas gyvena, poveikio. Priešingai nei įgimtas, įgyjamas žmogiškasis kapitalas yra kuriamas viso gyvenimo laikotarpiu formaliojo, neformaliojo švietimo ir savišvietos būdu bei kaupiant patirtį. Formalusis švietimas apima ikimokyklinį, pradinį, vidurinį ir aukštąjį išsilavinimą. Neformalusis švietimas apima visas žinias, kurias asmenys gauna iš jų šeimos narių, socialinės aplinkos, ir visų žinių tipus, įgytus savišvietos būdu. Patirtis apima visas individo patirtas situacijas, aplinkybes, kurių metu įgytomis naujomis žiniomis jis reaguoja į naujas situacijas ir aplinkybes.

Įvairūs autoriai analizuoja ir apibrėžia žmogiškąjį kapitalą remdamiesi skirtingais požiūriais. Todėl apibendrinant mokslinės literatūros šaltiniuose ir empiriniuose tyrimuose pateikiamus žmogiškojo kapitalo sampratos požiūrius, išplėtota žmogiškojo kapitalo apibrėžtis, pažymint sąvokos kompleksiskumą ir akcentuojant pagrindinius jį charakterizuojančius komponentus, apibrėžiant siauruoju ir plačiuoju požiūriais.

Siaurąja prasme žmogiškasis kapitalas – tai individo žinios, įgyti įgūdžiai, įgimti gebėjimai, fizinė, emocinė ir psichinė sveikatos būklė. Plačiaja prasme

žmogiškasis kapitalas – tai individo žinios, įgyti įgūdžiai, įgimti gebėjimai, patirtis, nuostatos, elgsena, intelektas, kūrybingumas, verslumas, motyvacija, inovatyvumas, išvalgos, fizinė, emocinė ir psichinė sveikatos būklė, energija, orientacija aplinkoje, gebant savo žinias ir įgūdžius tinkamai ir laiku panaudoti, taip pat kitos asmens savybės, leidžiančios padidinti darbo našumą ir individo pajamas darbo užmokesčio forma bei visuomenės gerovę ir ekonomikos augimą.

2. Atlikta teorinių ir empirinių investicijų į žmogiškąjį kapitalą grąžos vertinimo mokslinių tyrimų analizė leido identifikuoti ir išskirti veiksnius, turinčius poveikį investicijų į žmogiškąjį kapitalą naudai, kaštams bei grąžai, kurių pagrindu sudarytas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimo modelis.

Disertacijoje aptarus tyrimų rezultatų bendrumus ir skirtumus, išskyrus veiksnius, kurių vieni tiesiogiai, kiti netiesiogiai turi poveikį investicijų į žmogiškąjį kapitalą kuriamai naudai, kaštams, o kartu ir generuojamam grąžos dydžiui, padaryta išvada, kad investicijų į žmogiškąjį kapitalą privačią finansinę grąžą lemia individo įgytas išsilavinimo lygis, patirtis, konkretūs įgūdžiai, psichologinės savybės, grožis ir sveikata, socialinis kapitalas, charakteristikos, potencialiai susijusios su diskriminacija, individo šeimos charakteristikos ir socialinė, kultūrinė ir ekonominė aplinka, kuri atitinkamai daro poveikį individui tiek vaikystėje ir paauglystėje, tiek jau dalyvaujant darbo rinkoje ir kt.

3. Atlikus mokslinių tyrimų analizę pateikti galimi investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimo metodai, akcentuojant jų privalumus ir probleminius aspektus. Nustatyta, kad dažniausiai yra išskiriami trys metodai: visiškai diskontuotas, arba vidinės grąžos normos, metodas, trumpasis metodas ir Mincerio funkcijos metodas, kurie siejami konkrečiai su investicijų į žmogiškąjį kapitalą grąžos skaičiavimu ir vertinimu. Tačiau atsižvelgiant į tai, kad investicijos į žmogiškąjį kapitalą yra prilyginamos investiciniam projektui, norint įvertinti pastarųjų investicijų grąžą, galima naudoti ir kitus tradicinius investicinių projektų efektyvumo vertinimo metodus, tokius kaip atsipirkimo laikas, grynoji dabartinė vertė, pelningumo indeksas ir pan.

Atskleidus investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimo problematiką bei išskyrus investicijų į žmogiškąjį kapitalą grąžos vertinimo metodų ribotumus ir privalumus, pastarieji tapo pagrindu rengiant investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodiką.

4. Apibendrinus analizuotų teorinių ir empirinių tyrimų rezultatus, sudarytas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis.

Investicijų į žmogiškąjį kapitalą kuriamą naudą, patiriamus kaštus ir investicijų privačią finansinę grąžą lemia įvairūs ekonominiai ir neekonominiai veiks-

niai, apimantys šalies ekonominę situaciją, mokesčių (ir apskritai vyriausybės) politiką, kultūrinę ir socialinę aplinką bei socialines garantijas, nedarbo ir užimtumo lygį šalyje, taip pat individo lytį, amžių, išsilavinimą, šeiminių padėčių, vaikų skaičių, sveikatą ir fizinę būklę, religiją, politines pažiūras, asmeninius įsitikinimus bei nuostatas, asmenines ir psichologines savybes, informuotumą, socialinę integraciją, elgseną (gyvenimo būdą, teikiamas pirmenybes ir pan.), įgimtus ir įgytus gebėjimus, migracijos ir mobilumo galimybes, supančią kultūrą. Pastarieji veiksniai, tarpusavyje sąveikaudami, daro poveikį individo darbo užmokesčiui (pajamoms) – investicijų į žmogiškąjį kapitalą naudai, kaštams ir lemia investicijų į žmogiškąjį kapitalą privačią finansinę grąžą.

5. Parengta investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodika remiasi skirtingų mokslinių tyrimo metodų teikiamais privalumais, atsižvelgiant į tyrimo tikslą, uždavinius ir reikalingų duomenų, surinktų naudojant apklausos metodą, pobūdį. Disertacijoje pateiktoje investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodikoje, susidedančioje iš kelių etapų, investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimas atliekamas apimant kelis metodus, t. y. modifikuotą Mincerio funkciją bei naudos ir kaštų santykį (diskontuotą pelningumo indeksą), siekiant eliminuoti taikomų vertinimo metodų ribotumus.

Pasirinkti tyrimo metodai (Mincerio funkcija ir diskontuotas pelningumo indeksas) suteikia galimybę išskirti investicijų į žmogiškąjį kapitalą (aukštąjį išsilavinimą) poveikį darbo užmokesčiui, kontroliuojant kitus veiksnius, darančius poveikį asmens darbo užmokesčiui, ir leidžia įvertinti privačiai finansinei (pseudo)grąžai turinčių veiksnių poveikį, taip pat apskaičiuotas naudos ir kaštų santykis sudaro galimybes įvertinti santykinį pelningumą, leidžia įvertinti ir palyginti alternatyvių kapitalo panaudojimo variantų pelningumo skirtumus, yra lengvai suprantamas.

6. Remiantis sudarytu investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modeliu, parengta investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo tyrimo metodika ir sudaryta tyrimo loginė schema, įvertinta investicijų į žmogiškąjį kapitalą privati finansinė grąža, kuri parodė, kad papildomi studijoms skirti metai darbo užmokestį padidina vidutiniškai 9,7 proc. Nustatyta, kad teigiamą privačią finansinę grąžą, nevertinant išsilavinimo kaštų, generuoja iš esmės visi per asmens gyvenimą mokymuisi skirti metai.

6.1. Atliktos analizės rezultatai leidžia teigti, kad investicijų į aukštąjį universitetinį išsilavinimą privati finansinė grąža, nevertinant kaštų, yra lygi nuliui, nes, kontroliuojant kitus darbo užmokestį lemiančius veiksnius, koleginių išsilavinimą turinčios asmenų grupės darbo užmokestis statistiškai reikšmingai nesiskiria nuo tų, kurie nėra įgiję aukštojo išsilavinimo. Įgyto aukštojo univer-

sitetinio bakalauro laipsnio privati finansinė pseudograža (ignoruoiant kaštus) siekia 23,9 proc., magistro – 25,1 proc., todėl galima teigti, kad investicijų į žmogiškąjį kapitalą privačios finansinės pseudogražos skirtumų tarp bakalauro ir magistro laipsnio nėra. Daktaro mokslo laipsnio privati finansinė graža, nevertinant išsilavinimo įgijimo kaštų, sudaro 45,6 proc.

6.2. Remiantis sudarytu investicijų į žmogiškąjį kapitalą privačios finansinės gražos ir ją lemiančių veiksnių poveikio vertinimo modeliu nustatyta, kad studijų sritis ir įgyjamas laipsnis turi poveikį investicijų į žmogiškąjį kapitalą privačiai finansinei gražai - priklausomai nuo pasirinktos studijuoti srities ir įgyjamo laipsnio sukuriamos skirtingos privačios finansinės gražos normos. Nustatyta, kad priimtas sprendimas, ką ir kur studijuoti, gali turėti didelę įtaką asmens būsimoms pajamoms. Didžiausia įgyto bakalauro laipsnio privati finansinė graža, nevertinant išsilavinimo įgijimo kaštų, yra baigus menų studijas (apie 75,8 proc.) ir humanitarinius mokslus (40,6 proc.). Magistro studijose didžiausia investicijų į žmogiškąjį kapitalą privati finansinė pseudograža gaunama baigus biomedicinos ir fizinius mokslus (atitinkamai apie 47,4 proc. ir 38,3 proc.). III pakopos studijos suteikia didžiausią privačią finansinę pseudogražą įgijus technologijos mokslų daktaro laipsnį (99,8 proc.) ir socialinių mokslų daktaro laipsnį (43,2 proc.).

Atlikus privačios finansinės gražos vertinimą, vertinant išsilavinimo įgijimo kaštus, nustatyta, kad tendencijos išlieka tos pačios, t. y. tos studijų sritys, kurios, nevertinant kaštų, išsiskyrė aukšta privačios finansinės gražos norma, įvertinus kaštus, generuoja didesnę privačią finansinę gražą, palyginti su kitomis studijų alternatyvomis, ir priešingai. Įvertinus tiesioginius ir alternatyviuosius aukštojo mokslo įgijimo kaštus, didžiausia I pakopoje menų studijų privati finansinė graža sumažėja nuo 75,8 proc. iki 17 proc. (ir 10,8 proc., jei asmeniui pačiam reikia mokėti už studijas). II pakopoje didžiausią vidutinę investicijų į žmogiškąjį kapitalą privačią finansinę gražą teikia biomedicinos mokslų studijos – 5,6 proc. (ir 3,5 proc., jei asmeniui pačiam reikia mokėti už studijas), III pakopoje – technologijos mokslų daktaro laipsnis teikia 15 proc. vidutinę metinę privačią finansinę gražą, asmeniui mokantis valstybės finansuojamoje vietoje, ir 6,1 proc. – pačiam mokant studijų įmokas.

6.3. Įvertinus lyties veiksnio įtaką, atlikto tyrimo rezultatai parodė, kad nors moterys, palyginti su vyrais, uždirba apie 30 proc. mažiau, tačiau investicijų į žmogiškąjį kapitalą vyrų ir moterų privati finansinė pseudograža (nevertinant kaštų) yra vienoda.

Tačiau, įvertinus kaštus, nustatyta, kad dėl darbo užmokesčio skirtumų vyrų ir moterų investicijų į žmogiškąjį kapitalą privati finansinė graža skiriasi. Skirtumus lemia ne tik lyties aspektas, bet ir su lyčių skirtumais susijęs moterų profesijų pasirinkimas.

6.4. Siekiant išsiaiškinti, ar mokymosi įstaiga gali turėti poveikį investicijų į žmogiškąjį kapitalą privačios finansinės gražos dydžiui, nustatyta, kad, neverti-

nant kaštų, bakalauro studijos universitete, turinčiame aukščiausius įvertinimus šalyje pagal skelbiamus reitingus, sukuria 44,7 proc. punkto didesnę investicijų į žmogiškąjį kapitalą privačią finansinę pseudogražą nei analogiškos studijos kituose universitetuose. Magistro studijos universitete, turinčiame aukščiausius reitingus šalyje, teikia 34,8 proc. punkto didesnę investicijų į žmogiškąjį kapitalą privačią finansinę pseudogražą nei magistro studijos kituose universitetuose. Tuo tarpu doktorantūros studijų baigimas universitete, turinčiame aukščiausius įvertinimus šalyje, investicijų į žmogiškąjį kapitalą privačiai finansinei pseudogražai reikšmingo poveikio neturi, t. y. nedaug (2,1 proc. punkto) skiriasi nuo analogiškų doktorantūros studijų kituose universitetuose. Tačiau pažymėtina, kad universiteto, turinčio aukščiausius įvertinimus, poveikis bakalauro ir magistro studijose įgyto išsilavinimo privačiai finansinei pseudogražai yra didelis ir statistiškai reikšmingas tik tuo atveju, jei neatsižvelgiama į galimą baigusiujų šią mokslo įstaigą koncentraciją mieste, kuriame yra pastaroji mokymo įstaiga. Kontroliuojant netolygų asmenų, baigusiu studijas ir nestudijavusių universitete, turinčiame aukščiausius pagal skelbiamus reitingus įvertinimus šalyje, pasiskirstymą tarp miesto, kuriame yra tiriama mokslo įstaiga, ir likusios Lietuvos, aukščiausius reitingus turinčio universiteto poveikis magistro studijų privačiai finansinei pseudogražai sumažėja, o bakalauro studijoms tampa nereikšmingas.

6.5. Ištyrus, koku mastu mokslų baigimas penkiuose šalies geriausiuose pagal skelbiamus reitingus universitetuose turi poveikį investicijų į žmogiškąjį kapitalą privačios finansinės grąžos dydžiui, nustatyta, kad pagal skelbiamus reitingus geriausiuose penkiuose universitetuose įgytas bakalauro ir magistro laipsnis sukuria didesnę (atitinkamai 28,5 proc. punkto ir 12,9 proc. punkto) investicijų į žmogiškąjį kapitalą privačią finansinę pseudogražą lyginant su kitais universitetais. Statistiškai reikšmingo įgyto daktaro mokslo laipsnio privačios finansinės pseudogražos skirtumo nenustatyta. Kontroliuojant nevienodą teritorinį asmenų, baigusiu geriausius penkis universitetus ir baigusiu kitus universitetus, pasiskirstymą ir teritorinius darbo užmokesčio skirtumus, gautieji tyrimo rezultatai parodė, kad geriausiuose pagal skelbiamus reitingus universitetuose sukuriama papildoma investicijų į žmogiškąjį kapitalą privati finansinė pseudogražą yra taip pat statistiškai nereikšminga.

6.6. Gauti analizės rezultatai leidžia konstatuoti, kad sektoriaus tipas turi poveikį investicijų į žmogiškąjį kapitalą privačios finansinės grąžos dydžiui: investicijų į žmogiškąjį kapitalą privati finansinė grąža dirbant privačiame sektoriuje yra 0,5 proc. punkto didesnė nei viešajame sektoriuje.

6.7. Atlikti skaičiavimai parodė, kad įmonės dydis tik iš dalies turi įtakos investicijų į žmogiškąjį kapitalą privačios finansinės grąžos dydžiui. Investicijų į žmogiškąjį kapitalą privati finansinė grąža dirbant mikroįmonėje (iki 9 darbuotojų) yra 1,5 proc. punkto mažesnė nei dirbant vidutinio dydžio įmonėje. Dirbant didesnėje įmonėje gaunama investicijų į žmogiškąjį kapitalą privati

finansinė grąža didėja – nuo 6,5 proc. punkto smulkioje įmonėje iki 6,8 proc. punkto stambioje įmonėje, tačiau ji statistiškai reikšmingai nesiskiria nuo vidutinio dydžio įmonėse dirbančių asmenų, įgijusių tą patį išsilavinimo lygį, gaunamos grąžos.

6.8. Nustatyta, kad dirbant prekybos ir paslaugų įmonėse vidutinė investicijų į žmogiškąjį kapitalą privati finansinė grąža sudaro apie 10 proc., mišria veikla (gamyba ir paslaugų teikimas) užsiimančiose įmonėse vidutinė privati finansinė grąža yra labai panaši, sudaro 10,3 proc., o dirbant perdirbimo įmonėje (t. y. įmonėje, užsiimančioje produkcijos gamyba ir pardavimu) investicijų į žmogiškąjį kapitalą privati finansinė grąža sukuriama didžiausia – 11,3 proc. Analizės rezultatai leidžia teigti, kad nėra investicijų į žmogiškąjį kapitalą privačios finansinės grąžos reikšmingų skirtumų dirbant mišriajame, prekybos ir paslaugų sektoriuose, o perdirbimo sektoriuje privati finansinė grąža yra didesnė, palyginti su kitais trimis sektoriais.

7. Lyginant vidutinę atskirų pasirinktų studijuoti studijų sričių privačią finansinę grąžos normą su investicijomis į aukštąjį mokslą ir studijų kaina, nepastebėta teigiamos sąsajos tarp mokesčio už studijas ir gaunamos naudos, apskaičiuotos vertinant investicijų privačią finansinę grąžą skirtingoms išsilavinimo alternatyvoms. Atlikti privačios finansinės grąžos normos skaičiavimai ir rezultatų jautrumo analizės vertinimas leidžia teigti, kad brangios studijų sritys taip pat generuoja žemą privačios finansinės grąžos normą. Valstybei finansuojant tokias studijas, yra investuojamos didelės lėšos tam tikrose studijų srityse (specialybėse), kurios neduoda didelės privačios finansinės grąžos (ar net apskritai nesukuria teigiamos privačios finansinės grąžos), todėl gaunamos mažos mokestinės įplaukos kaip pagrindinis finansinės socialinės grąžos komponentas. Norint pateisinti tokį valstybės finansavimą iš investicinės perspektyvos, tikėtina, kad toks tam tikrų studijų sričių finansavimas teikia didelę socialinę grąžą, nes priešingu atveju tai duoda signalą, kad piniginės lėšos galimai yra neteisingai viešai paskirstomos.

8. Atliktas empirinis tyrimas leidžia formuluoti investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelio privalumus ir trūkumus. Esminiai modelio privalumai yra šie: 1) sukurtas modelis ir parengta tyrimo metodika, susidedanti iš kelių etapų, apima, pasinaudojant skirtingų mokslinių tyrimo metodų teikiamais privalumais, kelis vertinimo metodus; 2) sukurtas modelis integruoja investicijų kuriamos naudos bei kaštų identifikavimą ir vertinimą; 3) gali būti parenkama investicinė alternatyva individo finansinės naudos atžvilgiu, generuojanti didžiausią grąžos normą; 4) identifikuojama tiesiogiai su individu susijusi finansinė investicijų kuriama nauda; 5) modelyje atsižvelgiama į pinigų laiko vertę; 6) investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis gali būti naudojamas įvairių šalių atvejams tirti. Galima įvardyti šiuos

modelio ribotumas: 1) modelis nesuteikia galimybės įvertinti pinigais neišmatuojamą investicijų kuriamą naudą; 2) nevertinamas investicijų į žmogiškąjį kapitalą poveikis visuomenei, t. y. visuomeninė / socialinė nauda; 3) privačių kaštų vertinimui formuluojamos prielaidos gali turėti įtakos vertinimo rezultatui. Tačiau atkreiptinas dėmesys į tai, kad investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelio ribotumai gali būti eliminuoti praplečiant modelį, integruojant individui kuriamos nepiniginės naudos bei visuomeninės / socialinės naudos, kaštų vertinimą.

9. Apibendrinant mokslinę diskusiją apie investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikiui vertinti taikomus metodus, galima teigti, kad disertacijoje siūlomas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis sprendžia šias pagrindines mokslines ir praktines problemas:

- grąžos įvertinimo: taikant investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelį, laikantis nuoseklumo principo, įvertinama investicijų į žmogiškąjį kapitalą privati finansinė grąža, atsižvelgiant į patiriamus kaštus ir investicijų kuriamą naudą;
- veiksnių identifikavimo: sudarytas modelis suteikia galimybę įvertinti veiksnių poveikį investicijų į žmogiškąjį kapitalą privačiai finansinei grąžai.

10. Pagrindinis disertacijoje sudaryto investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelio išskirtinumas, lyginant su kitų mokslininkų siūlomais vertinimo modeliais, yra investicijų kuriamos naudos ir išsilavinimo poveikio darbo užmokesčiui, kontroliuojant kitų veiksnių poveikį darbo užmokesčiui, reikšmingumo akcentavimas ir įvertinimas. Verta pažymėti, kad investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelio bei parengtos tyrimo metodikos išskirtinumą pabrėžia veiksnių, turinčių įtakos grąžos dydžiui, išplėtojimas ir kelių metodų taikymas kartu siekiant įvertinti grąžos dydį, o naudojamų vertinimo principų, prielaidų ir metodų visuma užtikrina investicijų į žmogiškąjį kapitalą kuriamos privačios finansinės grąžos įvertinimą.

Sudarytas investicijų į žmogiškąjį kapitalą privačios finansinės grąžos ir ją lemiančių veiksnių poveikio vertinimo modelis bei parengta empirinio tyrimo metodika, įvertinanti investicijų į žmogiškąjį kapitalą privačią finansinę grąžą ir ją lemiančių veiksnių poveikį, gali būti taikomi ir naudojami bet kurios pasaulio šalies atvejui tirti. Disertacinis darbas papildo jau esamus mokslinius šaltinius nauja informacija. Gauti tyrimo rezultatai taip pat gali būti naudojami kuriant ir plėtojant investicijų į žmogiškąjį kapitalą grąžos ir ją lemiančių veiksnių poveikio vertinimo problematikos klausimus.

Potencialios tolesnių disertacijos autorės tyrimų kryptys. Disertacijos teorinės analizės ir empirinio tyrimo rezultatų išvados atveria tolesnių ir detalesnių investicijų į žmogiškąjį kapitalą grąžos vertinimo bei jai poveikį darančių veiksnių tyrimų galimybes.

Atlikta teorinė analizė leido išryškinti investicijų į žmogiškąjį kapitalą grąžai įtaką darančių veiksnių sistemą, susidedančią iš įvairių veiksnių grupių, o empirinio tyrimo metu nustatytas darbo užmokesčiui ir investicijų į žmogiškąjį kapitalą privačiai finansinei grąžai darančių veiksnių reikšmingumas ir poveikio dydis leido įvertinti investicijų į žmogiškąjį kapitalą privačią finansinę grąžą. Tolesnių tyrimų kryptys galėtų būti platesni ir detalesni investicijų į žmogiškąjį kapitalą privačios finansinės grąžos vertinimai, atsižvelgiant ne tik į įgytą kvalifikacinį / mokslo laipsnį, studijų sritį, sektoriaus, kuriame dirbama, tipą, bet ir į kitus veiksnius: darbovietės ekonominės veiklos rūšį, pasirinktą studijų kryptį ir pan. Detalizuojant tyrimą pagal studijų kryptis, būtų galima toliau gilinantis praplėsti tyrimą, siekiant nustatyti, kokią studijų kryptį pasirinkęs asmuo, atsižvelgiant į lyties aspektą, sulaukia didžiausios privačios finansinės grąžos. Taip pat, remiantis atlikto tyrimo metu gauta informacija ir ją papildžius trūkstamais duomenimis, būtų galima atlikti investicijų į žmogiškąjį kapitalą grąžos vertinimą valstybės lygmeniu, dėmesį sutelkiant į visuomeninę ir socialinę grąžą, jos skirtumus Europos Sąjungos šalyse ir pan. Remiantis sukauptais tyrimo metu duomenimis, būtų galima plėsti tyrimų sritį sutelkiant dėmesį ir į veiksnių, darančių poveikį darbo užmokesčiui, analizę bei vertinimą.

APPROVAL AND DISSEMINATION OF RESULTS OF THE DISSERTATION / DISERTACIJOS REZULTATŲ APROBAVIMAS IR SKLAIDA

Papers in peer-reviewed scientific publications / Disertacijos tema paskelbtoje publikacijos recenzuojamuose mokslo leidiniuose:

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**ASSESSMENT OF THE PRIVATE RETURN ON INVESTMENT
IN HUMAN CAPITAL AND THE IMPACT OF THE FACTORS
DETERMINING IT**

Summary of Doctoral Dissertation
Social Sciences, Economics (04 S)

Redaktorius Algirdas Malakauskas
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