SZENT ISTVAN UNIVERSITY

DOCTORAL SCHOOL OF MANAGEMENT

AND BUSINESS ADMINISTRATION

THE PROMINENT ROLE OF EDUCATIONAL INVESTMENTS

IN THE COMPETITIVENESS OF HIGHER EDUCATION

SUMMARY OF (PhD) THESIS

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Gödöllő

2017

Doctoral school

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1.1. THE SIGNIFICANCE AND TOPICALITY OF THE ISSUE

This thesis examines the prominent role educational investments play in the competitiveness of higher education. On the one hand, educational investments are the investments in human capital, which refer to the knowledge building process along a time dimension. On the other hand, they refer to the financial investments in education. Educational investments in human capital are the necessary condition for the competitiveness of the economy and higher education, too. In the lifelong learning (LLL) process the knowledge gained during studies in higher education is of decisive importance in expanding a person's knowledge base. The significance of the topic is supported by the fact that the competitiveness of higher education plays an important role in socio-economic processes. These processes take place in the international arena as the functioning of the economy is determined by global cooperation and competition. The topicality of the issue is the question of specifying the extent to which the system of higher education institutions in transition can competitively meet the global challenges. Is the system of higher education institutions in fact the main venue for innovative thinking and acquiring high level skills and aptitudes? To what extent does it help an individual to succeed in society, become a responsible thinker, learn the ability of cooperation and enrich the knowledge base of the whole community? How affordable, profitable and available is it for the individual to participate in higher education? The timeliness of dealing with all these issues are underlined by growing tensions in societies, bad living conditions and the uncertainty of job opportunities.

1.2. RESEARCH PROBLEM

A highly skilled and educated workforce is an economic resource that is necessary for the functioning of a competitive economy. In this context it raises the importance of educational investment in human capital, which will benefit both the individual and society. University graduates with competitive diplomas are in high demand and are given earning advantage by the labour market. An important section of lifelong learning is the academic period. In this recognition it has been formulated that the magnitude of human capital is influenced by three dimensions of lifelong learning, which includes the length of learning time *(lifetime learning)*,

methods and environments of learning *(lifewide learning)*, as well as the deepening, quality of knowledge gained *(life in-depth learning)*.

A competitive economy requires highly trained human capital that is able to cooperate internationally. Thus, internationalization also plays an important role in making higher education competitive. In the strategy of educational institutions the implementation of foreign language training and the broadening of the opportunities for mobility is of great importance as well as to strengthen foreign relations and joint research programmes. Internationalization strategy is now an indispensable element of the institutional development plans, which sets out the short and long term development of an institution's international relations and the objectives with which the institution can increase its competitive potential on the knowledge market. The implementation of these strategic plans play an important role in the perception of institutions manifest in national and international rankings. In addition, there is rivalry on the domestic knowledge market for students, who prefer institutions offering study abroad opportunities and internships, which offer young career starters international experience during the learning process.

Appropriate level of funding is required for the operation of competitive higher education. Important components of the funding are tuition fees and student support systems. There are different funding systems of higher education from country to country, even within the European Union.

The OECD classified its countries using two indicators and grouped them in four models:

Model 1: no or low tuition fee and
developed student support system

Model 2: a high rate of tuition fee, however,
developed student support system

Model 3: the high rate of tuition fee and
less developed student support system

Model 4: the low rate of tuition fee and
less developed student support system (OECD, 2013).

It raises the question: based on their investments, do the countries in these four groups and the European Union member states examined in the study all have similarly efficient and competitive higher education?

1.3. OBJECTIVES AND HYPOTHESES OF THE THESIS

As a university lecturer I focused my research on especially important factors of internationalization and the competitiveness of higher education. After reviewing the literature related to my thesis and conducting research on the topic I formulated the following objectives:

1. To prove that the extent of educational investment in human capital is determined by the multi-dimensional lifelong learning process.

2. To explore whether the lack of investment in juvenile education has an effect on the adverse labour market and social situation of the individual.

3. To verify the mutual interaction between the competitive factors of higher education and its processes of internationalization.

4. To prove that the competitiveness of European countries' higher education is associated with the development level of their financial systems.

5. To prove that Hungarian economics and information technology programmes of higher education are competitive, as their graduates have several advantages in the job market.

Based on previous investigations and reviewing the key literature relating to factors of competitiveness and the internationalization processes of higher education, I have formulated the following hypotheses in relation to the objectives:

Hypothesis (H1): The magnitude of educational investment in human capital is significantly affected by the three dimensions of lifelong learning: the length of learning time (lifetime learning), methods and environments of learning (lifewide learning), and the quality of knowledge gained (life in-depth learning).

Hypothesis (H2): The proportion of low-skilled young people is linearly related to the proportion of population affected by poverty or social exclusion.

Hypothesis (H3): The internationalization factor is an indicator of the competitiveness of higher education. The internationalization of higher education institutions can be measured by their reputation, recognized institutional academic excellence, student satisfaction, student numbers, and the personal and professional development and employment opportunities of students.

Hypothesis (H4): The groups of countries in the two-aspect funding model established by the OECD can be characterized by the proportion of tertiary attainment and the GDP proportional spending on higher education.

Hypothesis (H5): Two competitive segments of Hungarian higher education are the economics and information technology study programmes in the sense that their graduates are in great demand, enjoy earning advantage, and can find employment relatively fast in the labour market.

2. MATERIALS AND METHODS

2.1. SOURCES OF DATA USED IN THE RESEARCH

The research is based on the Europe 2020 flagship indicators focusing on education and employment. The Eurostat (2016a) study on Europe 2020 indicators grouped eight educational and employment indicators around seemingly distant, but two important concepts, namely, tertiary educational attainment and early leavers from education and training (Figure 1). The grouping includes lifelong learning, as investment in human capital, which provides and strengthens the link between the concepts. In this context, it is expected that the increase in the quality of education is to improve employment numbers, leading to the reduction of poverty. The condition of all these are continuous learning and competitive knowledge. It is vital to provide adequate public expenditure on education and ensure efficient and equitable allocation. One aim of this research is the analysis of the risk of poverty or social exclusion, which may appear as a possible result of early school leaving. The data can be used to present the proportion of tertiary attainment and public expenditure on higher education in the chosen countries.
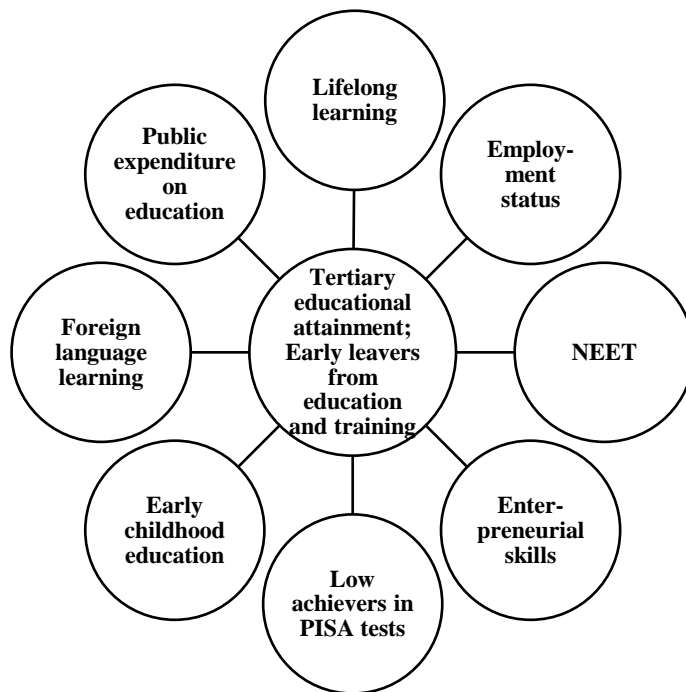

**Figure 1. Europe 2020 flagship indicators
focusing on education and employment**
Source: EUROSTAT (2016a)

The **secondary data sources** are based on the major Europe 2020 indicators focusing on education and employment. The main goal was the competitiveness analysis of education and higher education through exploring relationships between the variables describing the indicators. For the methodological analysis of the data series, Eurostat data for 2009 and 2011 years were selected, with the indicators specific to the European Union member states.

In addition to the Eurostat data, the competitiveness examination of the national higher education was analysed through higher education statistics of 2010/2011 academic year, published by the Education Bureau. Moreover, 15 fields of study published by FELVI[1], were analysed on two levels through self-financed programmes for the 2014/2015 academic year.

The student fees of full-time Business Informatics programmes announced in the 2014/2015 academic year were analysed at three levels of education (vocational higher education, Bachelor's, Master's) to present a competitive Hungarian segment of higher education. The labour market and income opportunities of economics and information technology graduates were presented through the studies on Fresh Graduates 2012 and 2015 by Educatio Nonprofit Ltd.

The **primary sources of data** were derived from research conducted among young people on their domestic and foreign higher educational experiences. The survey was based on the motivation, opinions and degree of satisfaction of Hungarian students. The competitiveness of Hungarian and foreign higher education was examined through qualitative and quantitative analysis. The academic experiences of students were aggregated on the basis of participation in foreign studies.

International and administrative departments of higher education institutions that were willing to contribute forwarded the online questionnaires to their current or former students. The students filled out one of two questionnaires depending on whether or not they participated in foreign studies. (In the study they are referred as Group 1 and Group 2.) The questionnaires were filled in on a voluntary basis, and the answers to the questions were summarized and evaluated anonymously. The data was collected during the period between September 2013 and January 2014. The low response rate of online questionnaires is widely known and this proved to be the case too this time. The survey was not representative, however, the significant number of respondents (545 people) made the research eligible to test the used methods in an exploratory manner, which later can be the basis of a

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[1] Felvi.hu homepage provides information on admission to Hungarian higher education

representative survey. The majority of respondents were economics and business students, but the questionnaires were also filled out by some agricultural, engineering and information technology students. The 187 students in the first group were studying abroad, typically for a half semester in the Erasmus programme between 2010 and 2013. The 358 students in the second group did not participate in foreign studies.

2.2. STATISTICAL METHODS

In this section the statistical methods used in the thesis are presented, which are operating with the previously described primary and secondary data sources. The methodological toolbox of the thesis is provided by regression analysis, cluster analysis, different concentration measurements based on secondary data, and the widely used analysis of variance (ANOVA) operating with both primary and secondary data sources.

The change in the socio-economic phenomena is usually attributed to several explanatory factors. The effect of several criteria on a response variable is examined by **multivariate linear regression analysis**, thereby obtaining a multiple stochastic connection. The goal of the analysis is to test the predictive ability of the independent variables on the dependent variable. The question is how much change in the dependent variable is predicted by a unit of change in the independent variables. Three out of the selected nine indicators of Eurostat indicators focusing on education, employment and economy were analysed and related by regression analysis. Using the method of multivariate regression analysis, the aim is to present the consequences of early school leaving and economic development to the population at risk of poverty or social exclusion in the European Union.

It is often the case that nonlinear models are used in economic and social contexts. The relationship between quantitative variables is described by **nonlinear regression function** and the measurement of the impact on x to y varies depending on the size of x variable. The main types of curvilinear regression are described by power, exponential, parabolic and hyperbolic functions. The parameter of power regression is interpreted as the coefficient of elasticity. It shows that one percent change in x value results in how much percent of change in y value. The parameter of exponential regression specifies what a unit of absolute change in the independent variable results in in the average relative change of the dependent variable. Nonlinear regression analysis was applied in

presenting the relationship between tertiary attainment and public expenditure on higher education.

In the research method of **cluster analysis** the observed units are aligned into relatively homogenous groups based on the variables involved. The aim is that the elements of a group show similarities and derogate from other classes of elements. The cluster analysis basically reduces the number of observation units by grouping, but it is also suitable for reducing the number of variables. In cluster analysis there is no prior knowledge that the items belong to which group. The task is to find the variables that cause differences between groups. These are often the variables created by factor analysis (OBÁDOVICS, 2009, SZELÉNYI, 2009). In this case the two variables that characterize European Union countries are the proportion of tertiary attainment and the GDP proportional spending on higher education.

In developed countries the largest and fastest growing industry is the service sector. Since the end of the 20th century higher education has also become part of the service industry, which has brought about a change in the sense that higher education is now also affected by market factors (PAPP, 2003). This research examines the market structure of the Hungarian higher education sector based on the number of students enrolled for the 2010/2011 academic year. The market concentration of higher education has been calculated and presented by the Lorenz curve, the Gini index (G), the concentration coefficient (C) and the Herfindahl-Hirschman Index (HHI).

In social research a major role is given to **analysis of variance** (ANOVA), which is a statistical method for analysing the variances of factors of the population. It is used to analyse the differences between and within group means, comparing and assessing the significance of more than two means. The precondition used for the analysis of variance were the homogeneity of variances (homoscedasticity), the independence of observations and that the distributions of the residuals are normal (GROEBNER et al., 2008, MCDONALD, 2013, SZUCS, 2008). ANOVA was applied in the analysis of both the secondary and primary data as part of the cluster analysis, regression calculations and during the analysis of student satisfaction.

3. RESULTS

The **proportions of educational attainment** are considered an important measure of human capital. The economic state of a country and the social situation of its citizens are affected by the level of educational qualifications. In 2009 in the European Union approximately one third of young people aged 30-34 years obtained a college or university degree. According to surveys carried out in the member states the increase in the proportion of graduates was higher among women who surpassed the European Union target by 43.4% in 2015, while for men the figure was only 34%. I have examined the proportion of tertiary attainment in the context of public spending devoted to higher education in the proportion of GDP in Europe. I have determined three clusters along the two dimensions: *spearheading, middle-ranking and emergent* countries. The OECD has classified its member countries into four basic models based on the level of tuition fees and the development of student support systems. The Nordic countries have similarly leading position in my classification of the European countries and in the OECD model, too, which suggests that higher education in these countries is competitive in these aspects (Figure 2).

In this research I have carried out linear and non-linear regression analyses on the two variables indicated in Figure 2., and the logarithmic function fitted the best to the series of points out of the significant correlations. Among the functions fitted to the points representing European countries indicate a slightly higher than average stochastic relationship between the two variables (logaritmic R = 0.581, linear: R = 0.58, exponential: R = 0.557). Therefore the public expenditure on higher education as percentage of GDP is in positive logarithmic regressive relation with the proportion of tertiary attainment in the 30-34 age group.

The factor negatively influencing tertiary attainment rate is the dropout rate of youths, that increases the proportion of the population at risk of poverty or social exclusion according to my research. The social impact of the rate of low level education and economic development was modeled by a linear regression equation through multivariate statistical analysis.
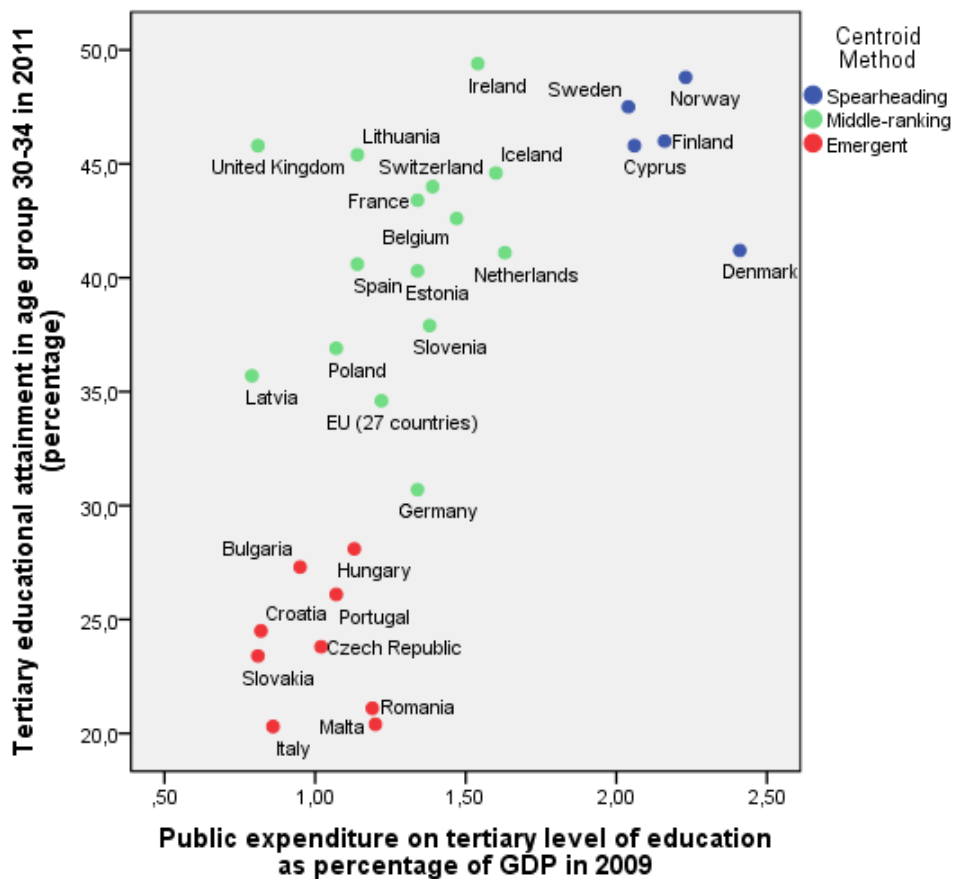
Figure 2. Scatterchart on the position of clusters generated by public expenditure on tertiary level of education and tertiary educational attainment in European countries
Source: own work based on (EUROSTAT (2011)

I have examined the **market concentration in the Hungarian institutions of higher education** in relation to the number of students and institutions. In Hungary, 43.6% of students pursue their degree in 18.9% of higher education institutions, so a certain extent of concentration can be observed in terms of the number of students and institutions. Hungarian higher education institutions with the largest number of students are University of Debrecen, Eötvös Loránd University, University of Pécs, University of Szeged and Budapest University of Technology and Economics. The calculated Gini index (G = 8760.9) was the base of the concentration coefficient (K = 0.42), which shows a slightly weaker than average concentration. The Herfindahl-Hirschman index (HHI) measures the concentration considering two approaches. First, it takes into account all state-funded higher education institutions as participants. Second, considering the

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number of students it reflects the difference in size between them. The value of Herfindahl-Hirschman index is 611.4. In this case, the operation of the quasi-market of higher education is provided.

Based on data analysis it was proven that state-funded institutions with a greater number of students are more likely to receive privileged status. Institutions with a large number of students are usually associated with academic excellence. However, the title itself may be awarded to institutions based on the criteria laid down in the Higher Education Act of 2005. CXXXIX. In addition, there are smaller institutions that also receive high ranks. The awarded institutions could potentially benefit from their excellence ranks by attracting more applicants, which is manifested in greater student numbers. Those colleges and universities that were awarded the title of applied sciences also have a relatively high number of students. These institutions are recognised and motivated in the field of scientific research and have become more attractive for applicants.

Fee-paying courses in 15 fields of science and two levels have been included in the data for the academic year 2014/2015 for comparison analysis. In terms of disciplines, courses were the most expensive in the arts, health and medicine, teacher education, art mediation and technical courses. This is partly due to their resource-intensiveness and popularity. On average, majors in the agricultural sciences, humanities, public administration and law, as well as religious studies had the most favourable prices. According to the secondary data from Graduate Career Monitoring System and FELVI, a statistical relationship cannot be detected between the starting salary of graduates and the programme fees by fields of science. Consequently, there is no significant correlation ($R = 0.285$, sig. $= 0.370$) between the salary of fresh graduates and programme fees at the undergraduate level. Similarly, there is no significant correlation between fees by academic disciplines and the proportion of students who were recruited within one month after obtaining their degrees.

The primary data collection has covered the national and international academic experiences of Hungarian students, and the measurement of their competency and professional development. The research has focused on the **internationalization and competitiveness factors of higher education**. One aspect of the research was the students' motivation in the applications. The most common reasons for applying to domestic institutions were: the reputation of institution, degree programmes in the field of interest, practice-oriented programmes, quality of education, foreign languages taught, degree recognized by employers, proximity of accommodation to higher educational institution, marketable skills and the

foreign relations of the educational institution. Those students who plan to study abroad typically choose the higher education institution on the basis of their foreign partner institutions, mainly from the Western and Southern European region. Their main motivations are language learning in the native environment, the existence of active exchange, research or professional connection between the home and the host institution, personal reasons and the relatively low cost of living in the chosen country. They expect significant additional advantage in terms of professional development and networking from the participation in the mobility programme. According to the results of the student satisfaction survey, the host institution has received a more positive assessment on the basis of the quality of programmes, technical equipment, university life, administration and finally, the overall impression. The students participating in foreign studies have reported greater progress in the area of social, intercultural, linguistic and personal skills, while only the professional competences of students who have not participated in foreign studies have developed to a greater extent. The self-assessment of students made it possible to measure the development of personal competences such as openness, inquiry, adaptation, tolerance, self-awareness, self-confidence, decisiveness and self-learning.Those studying abroad have reported a higher level of personal competency development in all qualities, except self-learning. The statistical results have proven rank correlation between the impact of foreign studies on the competitiveness of the degree and professional mobility. Internationalization is a factor of competitiveness in both the economic and the higher education sector. As a result of analysing both primary and secondary data it was confirmed that competitiveness can be measured by the internationalization of higher education, reputation and recognized institutional academic excellence, student satisfaction, student numbers, the personal and professional competency development of students and their employability. The results of investments in education are realised through education, research and the third mission of higher education. Based on the results of the literature review and the conducted research, it has become clear that the development of skills cannot be limited to a single educational period since the learning process is life-long. Recognizing this fact, I have set up a competitiveness pyramid of higher education, which indicates internationalization as a prominent factor and lifelong learning as a core value (Figure 3).
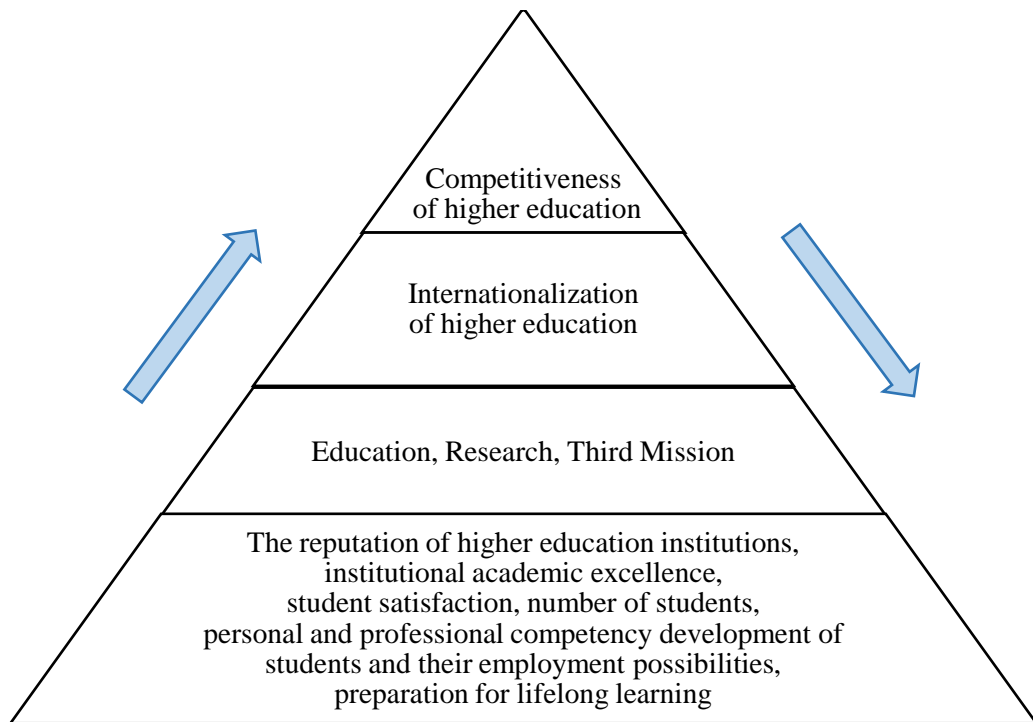
Figure 3. The competitiveness pyramid of higher education
Source: own work (2016)

The text inside the pyramid, from top to bottom:

Competitiveness
of higher education

Internationalization
of higher education

Education, Research, Third Mission

The reputation of higher education institutions,
institutional academic excellence,
student satisfaction, number of students,
personal and professional competency development of
students and their employment possibilities,
preparation for lifelong learning

4. NEW AND NOVEL SCIENTIFIC RESULTS

The competitiveness of a country's economy and its higher education mutually influence each other, and are both closely related to knowledge and human capital. Investing in human capital is a long process of knowledge building, which is acknowledged in the definition of lifelong learning. The thorough examination of the research problem has led to the following new and novel scientific results:

1. Lifelong learning is an opportunity of investment in human capital. Its prominent role, with regard to the different methods and environments of learning (lifewide learning) has long been part of the literature. In my thesis I introduced the concept of knowledge building, which expresses the **quality and competitiveness factors** of knowledge acquisition **(life in-depth learning)** in the context of lifelong learning. I also introduced the time dimension of lifelong learning **(lifetime learning)** and set up a **three-dimensional model of lifelong learning** showing the connection of the three concepts (Figure 4).
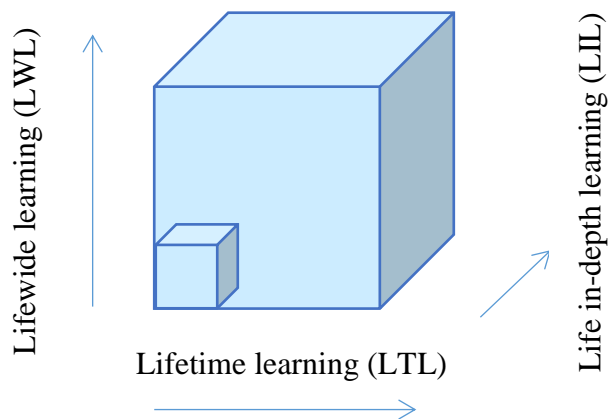

Figure 4. The dimensions of lifelong learning
Source: own work (2012)

2. Mapping the competitiveness indicators of the business sector to the higher education sector, I concluded that the competitiveness of Hungarian higher education is determined by **an internationalization factor**. Through analysing the self-assessed values of student satisfaction and competence development according to participation in mobility programmes, the quantitative and

qualitative evaluation of survey data showed that internationalization is a value-added factor of higher education. To illustrate this point, I designed a higher education competitiveness pyramid (Figure 3).

3. In my paper using cluster analysis I grouped the European countries according to the proportion of tertiary attainment and the GDP ratio of public spending on higher education. I pointed out that the "spearheading" Scandinavian countries are in the first model of the OECD grouping. In conclusion, I found that in Europe **the Nordic countries have the most competitive higher education** in terms of low tuition fees, enhanced student support system, the GDP ratio of public spending on higher education and tertiary attainment are both prominent.

5. CONCLUSIONS AND DISCUSSIONS

Today higher education is facing serious challenges because the growing social and economic needs have to be satisfied via sustainable funding. The traditional functions of higher education institutions such as high quality education and research are essential requirements and, therefore, they cannot allow the quality of these to fall, despite the difficulties. In fact, they have to comply with the expectations of the global international labour market that requires highly qualified professionals with intercultural experience.

Hypothesis (H1): The magnitude of educational investment in human capital is significantly affected by the three dimensions of lifelong learning: the length of learning time *(lifetime learning)***, methods and environments of learning** *(lifewide learning)***, and the quality of knowledge gained** *(life in-depth learning)***.**

Among the internationalization and competitiveness factors of higher education investing in human capital has a prominent role, and there is a return for both the individuals and society. Educational investment in human capital is a long-term process that is an integral part of lifelong learning. The academic period is an important stage in the process. Competitive qualifications acquired in higher education are expected to influence the individual's living standard prospects. Competitiveness is strengthened by international experiences, the acquisition of foreign languages and information technology skills. To achieve these goals an academic and research community is needed, who are able to transfer professional skills and knowledge in foreign languages. Such courses should be included in the curriculum in addition to language lessons. It has been demonstrated in the literature review and in the conducted research that the amount of educational investment in human capital is determined by the multi-dimensional lifelong learning process. Therefore, the first hypothesis has been verified.

Hypothesis (H2): The proportion of low-skilled young people is linearly related to the proportion of population affected by poverty or social exclusion.

The link between education, the labour market and earnings is indisputable. A higher level of education, which is a measurable parameter of human capital, is in a positive stochastic relation with higher levels of earnings that are described by age-earnings profiles. In addition, the employee may receive additional revenue and enjoy improved labour market opportunities. However, obtaining a higher

level of education is not only beneficial and necessary for the individuals and society. It is necessary as it is considered the pillar of sustainable growth in the knowledge economy. The positive effects of education and training are reflected in the recognition of the increase in the average level of education in the past decades in OECD countries. More than 40% of women in the 30-34 age group have a higher education qualification, which is 8 percentage points higher than that of men. Unfortunately, the labour market does not remunerate the efforts of women, which is reflected in the pay gap between women and men, in favour of men. It is important for society and individuals that more people pursue higher education studies, but this is only possible for those with solid knowledge from primary and secondary education. It is not an opportunity for dropouts, who are at risk of unemployment and poverty and social exclusion. As a result of the research, in addition to the per capita GDP, the proportion of early school leavers had the biggest impact on the rate of risk of poverty or social exclusion. The negative social consequences of early school leaving have been proven in the second hypothesis.

Hypothesis (H3): The internationalization factor is an indicator of the competitiveness of higher education. The internationalization of higher education institutions can be measured by their reputation, recognized institutional academic excellence, student satisfaction, student numbers, and the personal and professional development and employment opportunities of students.

A basic requirement in the competitiveness of higher education institutions is to strengthen the process of internationalization. The strategic objectives include close contact with the foreign partner institutions and broadening student and staff mobility programs. It enhances the development of social and intercultural competences of students, if the institution has a wide range of relations with international companies, for example in the form of internships. This also applies to economics programmes, which are in the focus of my research. One of the most explicit forms of internationalization of higher education is student mobility. The foreign study experience has several positive effects in terms of personal and professional competency development. Creativity, flexibility and complex thinking can lead to better career and labour market opportunities. The primary data collection included a survey that summarized and analyzed the academic experiences of students. The respondents were grouped on the basis of participation or non participation in foreign studies. The students applied to domestic and foreign higher education institutions with different motivations and

opportunities. The comparative analysis of the two groups has shown significant differences in terms of student satisfaction and competency development. Student satisfaction of those who participated in mobility programmes were reported higher on average by assessing the host institutions on the basis of several factors, such as the quality of programmes, technical equipment, administration and campus life. Considering the personal and professional development of students, the self-assessment of their personal and linguistic competences was higher among those who studied abroad for a certain period of time. The participants of mobility programmes have experienced the most progress in terms of openness, inquiry, adaptation and self-knowledge. The main difference between the two groups (participants in foreign and Hungarian studies) was indicated in their personal development, tolerance, self-confidence and self-awareness. There has been a large difference in the level of student satisfaction to the advantage of the host institution, which suggests that the domestic higher education system needs to be improved in several respects. The students who participated in foreign studies have reported outstanding results in terms of personal development and language skills. There are clear advantages of participation in foreign studies for students, so it is highly recommended that institutions support it, in spite of the growing administrative and financial difficulties involved. Institutional support should be well-organized, based on written rules, and applied along the same terms, for instance, in the case of credit transfer. The possibility of a study abroad experience can contribute to institutional reputation and to the increase in the competitiveness of a degree. Based on the primary and secondary data analysis, the third hypothesis has been accepted.

Hypothesis (H4): The groups of countries in the two-aspect funding model established by the OECD can be characterized by the proportion of tertiary attainment and the GDP proportional spending on higher education.

The transition from secondary to tertiary education includes disincentives in the forms of high student fees and other charges (such as housing). Higher education studies can delay the entry into the labour market, and thus the amount of lost earnings may increase. This is especially true in case of intermitting studies. The amount of associated costs and the level of student support systems are associated with the proportion of entrants into higher education. In addition, education policy is to ensure sustainable financing of higher education, as measured by the GDP ratio of public expenditure on higher education. In general, the higher rate of entry entails lower fees and more developed student support system. The opportunities to participate in higher education can be improved and equitable issues are also

easier to handle with advanced student support systems such as providing student loans and social supports. The high level of individual and social demand for higher education are indicated in the large number of participation and enrollment data. It is vital that young people thrive in life and continue to learn beyond compulsory education or take part in the world of work. A higher level of education can lead to better labour market opportunities and other benefits. However, the funding of higher education studies is an important cost for the student and his family. One form of expenses is the tuition fee. Taking into account the fees and student support systems the OECD countries are grouped into four models. It is clearly inferred from the comparison of data that among the European countries the Nordic countries have the most competitive higher education with low tuition fees, developed student support systems, and because the GDP proportion of their public spending on higher education and tertiary attainment are prominent. Based on the results of the cluster analysis, the fourth hypothesis has been partially proved because only countries of the *"spearheading"* group are similar to the countries of model 1.

Hypothesis (H5): Two competitive segments of Hungarian higher education are the economics and information technology study programmes in the sense that their graduates are in great demand, enjoy earning advantage, and can find employment relatively fast in the labour market.

One of the indicators of economic competitiveness is the labour market position, while the efficiency of higher education is measured in the knowledge market. The paper shows the competitiveness of higher education through competitive segments of Hungarian higher education, namely the economics and information technology study programmes. Student fees for full-time business informatics programmes in the 2014/2015 academic year vary widely from institution to institution within the three levels of training (higher education vocational, undergraduate, master's level). Higher education institutions with excellence awards usually have higher fees. The difference in programme fees is also attributable to regional factors.

The competitiveness of economics study programmes is supported by the fact that in the general application process in 2016 the total number of applications, the number of first applications, the number of applications to full-time bachelor and undivided master programmes in both self-financed and state-funded forms, the number of applications to both part-time and full-time state-funded programmes on all levels and the number of admissions were also the highest in this field, 16.235 people.

The Hungarian education policy was correct in its assumption that information technology programmes should be invested in. Consequently, it began to increase the number of state-funded places proportionally to admitted students. However, it does not explain the decision of the education authorities to dramatically reduce the number of state-funded places in the field of economics in 2007 and in 2012. The transformation of higher education should only be implemented over a long term, and based on well thought through and pre-agreed policy principles. The large-scale change in quota numbers from one year to another creates a disadvantage for those planning to continue their education and causes confusion in the system of higher education.

In 2015, the average monthly net income of fresh graduates in Hungary rose to 189,000 HUF, which exceeded the national average net income by 30,000 HUF. Therefore, it confirmed the individual educational return on investment. Similarly to previous years, graduates of information tehnology had the highest average income. The extremely high average wage of 263,000 HUF exceeded the 2012 data by 51,000 HUF. In second place, the average wage of economics graduates was 217,000 HUF, ahead of the technical and engineer graduates whose average income per month was 212,000 HUF. The job seeking graduates initiated an average of 27 contacts with employers (for example, sending a curriculum vitae, telephone inquiry or application for job advertisements). From this, an average of five contacts were successful, that is, the employer responded. Initiating contact was among the highest (32.3) of economics graduates, and the number of realized relations was the highest (6.3) here too. Compared to 2012, the proportion of feedback increased, with graduates reporting an average of 6.8 realized connecions from 42.4. The highest percentage of graduates employed at a company after work placement was from the economic fields of study.

The gender pay gap appeared among fresh graduates; in 2015 women earned less than 53,000 HUF on average per month compared to men. The biggest income differences, (60-70,000 HUF) have been reported among information technology and economics graduates. The high degree of inequality is a specificity in the private sector, where women suffer greater disadvantages than in the public sector. Accordingly, the fifth hypothesis has been accepted.

The state-funded higher education is in a unique position as the institutional framework of universities and colleges, such as institutional capacity is determined by the state. In this framework, the higher education institutions need to find answers to the market challenges. In times of economic crisis, the Hungarian government drastically reduced funding of public higher education. The greatest number of subsidized places decreased in the fields of economics and law in 2012. By 2013 the financial support of state-funded higher education institutions was significantly less, halved in real terms compared to 2008. Higher education institutions came up with different marketing strategies in the face of this challenge. The rapid and unpredictable changes in the socio-economic environment reinforce the view that there is a need for strategic thinking, like marketing management approach in higher education. Renewal and the cost-benefit analysis of course contents needs further work and will require new research directions. The Hungarian institutions have to take into account new tasks to meet the expectations of the labour market. The nationally coordinated Graduate Career Tracking System (GCTS) informs about the professional development of graduates. This provides an opportunity to develop ways of sustainable education using different pricing methods. Many institutions are likely to implement new pricing methods in the future, not just the self-financing mode, with charges entirely on the student.

Another important area of the attractiveness of higher education institutions is the way to develop and communicate the system of grants and loans. The expected reduction of subsidized places and the demographic downturn will lead to a reduction in the number of students, therefore the institutions need to find breakthrough points. Additional exploratory studies, regional research studies are required in order to retain domestic students. Another breakpoint for the institution is to start foreign language programs in Hungary and / or abroad, which is attractive to international students. These new challenges mean novel marketing responsibilities for institutions of higher education. Today, the media play a major role in informing and influencing the applicants, and making higher education rankings public.

Education researchers have long claimed that not only lexical knowledge, but the actual required knowledge acquisition ability is needed. It is equally important to work and think in groups, looking for the most optimal solutions by consensus. In many cases the still hierarchical structure of higher education leads to isolation or conflicting interests, which are not conducive to common thinking, decision-making in terms of further developments, such as the curriculum. The curriculum would require the compilation of a number of programmes that favour team-work, giving an opportunity to students to acquire the ability of joint co-reflection, learning from each other. This would greatly help them integrate into new communities after graduation and adapt to new challenges. This is the ability of lifelong learning, which is supposed to mean that learning in childhood and early adulthood is not an external pressure, but rather a joyful and enjoyable process. Most of the students experience this first during their short-term foreign studies. We have to think of how we can motivate students in the home conditions to proactively take part in the educational process during their studies. The graduation years should not be a compilation of involuntary and unpleasant experiences. Therefore, adults with balanced and contented life are the best quality workers.

6. LIST OF PUBLICATIONS RELATED TO THE DISSERTATION

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