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FINANCIAL MANAGEMENT OF THE HUNGARIAN HIGHER EDUCATION, WITH ESPECIAL REGARD TO THE APPLICATION OF "3E" CRITERIONS

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1. BACKGROUND OF THE RESEARCH, OBJECTIVES

The level of state involvement and the financing of public tasks are one of the central topics nowadays because the weight of intervention and the scope of public tasks have started to grow significantly since the 20th century. The widening state involvement after the First and Second World Wars created welfare states, and their financing laid an increasing burden on national economies.

The scope of public tasks has gradually expanded over the decades. This resulted in the growing imbalance between the revenue and expenditure side of the budget which generated a significant budget deficit and an increasing public debt in many countries. Some nation states have to encounter more and more challenges in the last few decades when they would like to handle the problem of management with declining resources. One of the moves of the welfare states was the appearance of management reforms, which enabled the requirements of economy, efficiency and effectiveness to appear in the public sector in accordance with the practice of private companies.

In the course of reforms starting in the '70s only the concepts of economy and efficiency appeared for the first time. These are the more easily interpretable requirements on the basis of the available information in the case of public institutions. Whereas the requirement of effectiveness causes several problems because the budget institutions are not profit-oriented, so the social impact has come to the front as well in the measurement.

The objective of my dissertation is to analyse the effects and the application of New Public Management reforms in higher education.

My primary objective is to evaluate the characteristics of higher education systems in European countries, on the strength of task-based approach of management reforms. Based on the fact that the realization of higher education reforms happened in different countries and times, I suppose that there are significant differences in the characteristics of the higher education systems according to the several indicators.

Based on this, I have analysed the higher education from two perspectives. By means of cluster analysis I have examined the data of higher education inputs and outputs in European countries.

H1: Analysing the input data of higher education, homogeneous groups can be formed from European countries.

H2: Examining the output data of higher education, European countries can be grouped on the basis of common characteristics.

As a secondary objective, I have presented the economic importance of higher education. I have quantifed the role of higher education in the functioning of the local economy by analysing the income effect of an 'average, rural' institution.

H3: The income effect that is generated by higher education institutions can be considered significant in a specific economic area.

Finally, I have analysed the application and the appearance of the three criteria (economy, efficiency, effectiveness) on the basis of the reports of higher education institutions and in the light of the results I have determined the indicators that could be used to create a uniform assessment system.

Using the numerical and textual reports of the Hungarian higher education institutions, I have examined whether the evaluation of economy,

efficiency and effectiveness is uniformly applied in practice because this would be the basis for the comparability of universities.

H4: In the Hungarian higher education reports the evaluation of the "3E" criteria is uniform.

On the basis of numerical and textual reports, I have assessed whether the implementation of economy, effectiveness, effectiveness is realized in practice or there are conflicts of interests.

H5: The financial and operational planning of domestic higher education institutions conform to the "3E" requirements of the management reforms.

Finally my aim is to compile an indicator-system, taking three "E" criteria into account, which makes it easier to choose among the institutions.

H6: The choice of a higher education institution requires a comparable performance evaluation and a related index-system.

2. MATERIALS AND METHODS

During my examination, I used secondary and primary data. In the course of the analyses, I have made efforts to select the most important indicators for economy, effectiveness and efficiency.

In the international research, I used data on the Member States of the European Union. To analyse the higher education institutions in Hungary I used the publicly available numeral and textual reports of 19 state institutions (at the time of the survey there were 30 state institutions in total) because they were available to me for the whole period between 2007-2014.

The secondary data which I used for statistical analysis are derived from the databases and communications of the EU Statistical Office (Eurostat) and the Hungarian Central Statistical Office. Further secondary sources were the annual reports of Hungarian universities and colleges which provided detailed information on the management. I have not only considered the numerical data but have also analysed the information in the textual report.

As a primary source I compiled a questionnaire to analyse the income effect of higher education that could be filled in on paper or online.

To illustrate the role of higher education, I quantified different ratios which were presented in tables and graphs. Thereafter I examined the countries of Europe based on the input and output data of higher education. During the cluster analysis, I was looking for the possibility of creating homogeneous groups on the basis of the indicators. In consideration of the input and output data of higher education, I also analysed the correlation between two-two indicators.

In the research of income effect I started out from the results of the questionnaire on higher education expenditures, based on this I determined

the students' average income. I quantified the spent income in the specific area on the strength of three scenarios. I ranked the 'consumers" - the employees and students - into separate groups, and in the determination of the number of group members I used the reports and the statistics of the Education Office.

In the analysis of the reports, I separated the data on the performance of the higher education according to the user groups, and I compiled a uniform structure to be able to make the choice among the institutions easier.

To present the balance of planning and management, I quantified the four indicators below in the studied higher education institutions:

- preparation of planning,
- percent of modification,
- percent of financial performance,
- justification.

3. RESULTS

3.1. Characteristics of higher education systems in Europe

3.1.1. Common characteristics of inputs in higher education systems in Europe

By means of cluster analysis I examined data on the basis of the Eurostat database of higher education inputs for Europe. During the research I took 31 European countries[1] into account. The following four variables were included in the analysis:

- GDP per capita,
- Higher education expenditure in proportion to GDP,
- Number of students per teacher,
- The proportion of students in the population.

I have done the analysis for four years (2001, 2007, 2009, 2015). Examining the input data for the higher education in 31 European countries, four homogeneous groups can be formed on the basis of the characteristics. For countries which are classified as 'Outstanding', the ratio of spending money on higher education is average in a well-performing economic environment. 'The Developed' prioritised the quantitative training on the basis of input data. 'The Developers' fell behind for each analysed input data. 'The Lagging behind/Catching up' countries spend sums below the average for higher education, while the burden of teachers is high. In 2001 the higher education systems of Western and Eastern Europe could be clearly distinguished on the map by the analysed variables. In 2007 changes occured in the higher education of several countries but the level of state

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[1] Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Sweden, United Kingdom, Iceland, Norway, Switzerland, Turkey

involvement has continued to cause a problem for welfare states. There was a rearrangement among the countries on the strength of the four analysed indicators. In 2009 a reorganization of the groups can be observed as a result of the negative effects of the crisis. The higher education systems were characterized by structural reforms after the crisis which influenced the data for 2015 as well. In many European countries the financial sources of the institutions were reduced to eliminate the fiscal imbalances. The composition of the groups has considerably changed based on the development of the background variables.

3.1.2. Common characteristics of outputs in higher education systems in Europe

I also studied the statistics of higher education output by cluster analysis. The following four metrics were used for the analysis: The following four variables were included in the analysis:

- Higher education expenditure in proportion to GDP,
- Unemployment rate,
- The proportion of graduates in the 30-34-year-old population,
- The employment rate of recent graduates.

I have done the analysis for the same four years (2001, 2007, 2009, 2015) as in the case of the inputs. By analysing the output data for higher education, the European countries can be classified into four big groups. The group of the 'Outsider' countries have 'expensive' but high-quality higher education systems. 'The Developed' countries accomplish quality education with average spending. 'The Developers' spend money on higher education below the average and its effect is reflected in the output data as well. 'The Lagging behind/Catching up' countries spend only a low amount of money on education due to the unfavourable economic conditions, so

the role of this sector is much lower in the national economy than in other countries.

The borderline between the Western and Eastern countries cannot be observed in the groups as we can see it in the case of the analysis of input data, what is more, for 2007 the difference for the first three clusters is much smaller than in 2001. In 2009 the crisis determined the composition of clusters as a result of high unemployment rate. The educational expenditure was increased in proportion to GDP but this is also deceptive because the gross domestic product fell compared to 2007. In 2015 the impact of structural reforms was already noticeable in the data. Higher educational expenditures decreased while the proportion of people with tertiary education qualification increased among the 30-34 -year-old population.

3.2. Evaluation of income effect

The influence of the operation of the higher education institution system cannot only be analysed with the input and output data of the sector, but also by examining the direct and indirect effects which are generated by the institution. The institutions also have an impact on economic and social processes and characteristics. The income effect takes the income of those who are connected to the sector into account.

The evaluation of the income effect can be divided into two parts. On the one hand, we can examine how the unemployment rate is developing on the basis of the highest level of education. On the other hand, we can examine the additional income which is generated in the local economy.

Income effect is generated by university employees and students (full-time and part-time ones) because they create demand for the local products and services in the local economy. If they spend their income at local

entrepreneurs, they contribute to the functioning and developing of the local economy. Thanks to their purchases the businesses get revenue, make investments and increase their outputs furthermore.

To quantify the income effect, I separated the following groups of consumers in the case of the students:

- full-time, not boarder students (2448 people),

- full-time, boarder students (752 people),

- part-time students (1979 people).

Full-time, non-boarder students (2448 people)

↓

Monthly spending per person (HUF)	
Travel	9 413
Meal	14 243
School equipment	3 424
Culture, entertainment	7 652
Clothing	7 403
Catering	4 969
Other expenditures	10 700
ALL	**57 804**

↓

Monthly spending for 2448 people
141 504 192 HUF

↓

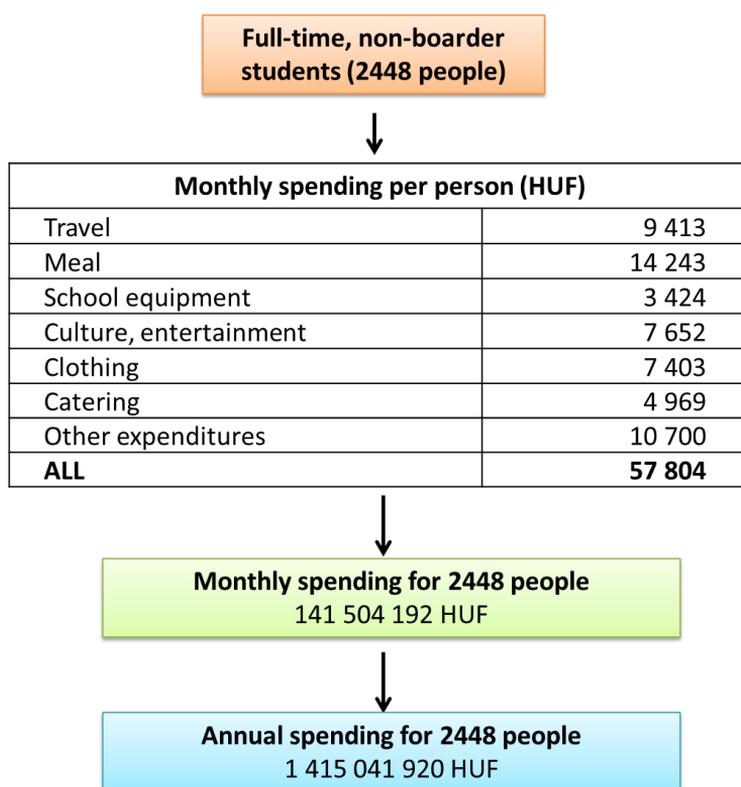Annual spending for 2448 people
1 415 041 920 HUF

Figure 1: Spending of full-time, non-boarder students

Source: Own design

In the case of full-time students, we can observe a high consumption (Figure 1, 2). In the case of non-boarder students the average monthly expenditures are 57 804 HUF, while for boarder students 69 519 HUF. This

difference originates from the fact that boarder students use more local services because they are unable to enjoy the benefits of paternal home.

All in all, the full-time, non-boarder students of a typical, rural higher education institution spend nearly one and a half billion HUF in the local economy.

Full-time, boarder students (752 people)

↓

Monthly spending per person (HUF)	
Travel	12 685
Meal	17 488
School equipment	3 531
Culture, entertainment	7 674
Clothing	7 600
Catering	5 042
Other expenditures	15 500
ALL	**69 520**

↓

Spending per person (for 20 days) 46 340 HUF

↓

Monthly spending for 752 people 34 847 680 HUF

↓

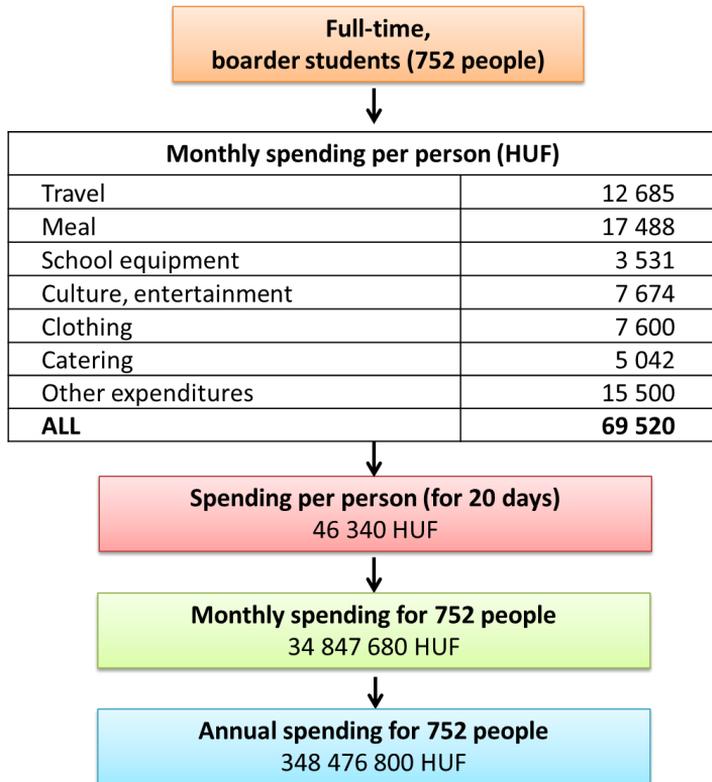| Annual spending for 752 people 348 476 800 HUF |
| --- |

Figure 2: Spending of full-time, boarder students

Source: Own design

The number of students in dormitories is lower than that of the non-boarder students, but they still spend considerable amounts of money because they often use the services of the local entrepreneurs due to their situation.

The part-time students represent a special group which is also reflected in the income effect (Figure 3). In the case of this group, I quantified the spending of their income for 8 days per a month, but we still have

significant items of expenditure on a yearly basis due to the high number of part-time students.

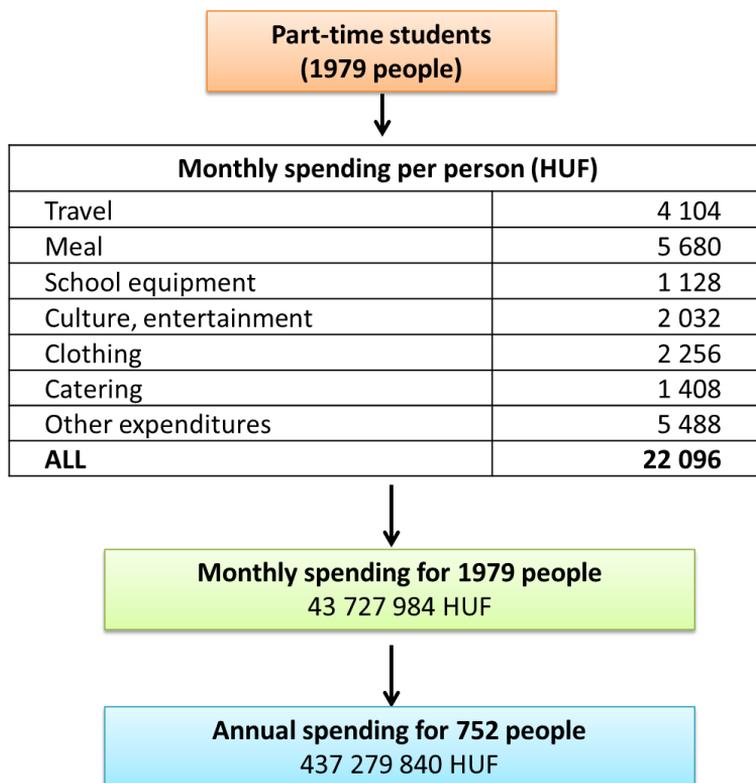| Part-time students (1979 people)	
Monthly spending per person (HUF)	
Travel	4 104
Meal	5 680
School equipment	1 128
Culture, entertainment	2 032
Clothing	2 256
Catering	1 408
Other expenditures	5 488
ALL	**22 096**
Monthly spending for 1979 people 43 727 984 HUF	
Annual spending for 752 people 437 279 840 HUF	

Figure 3: Spending of part-time students

Source: Own design

To determine the consumption expenditure of employees (Figure 4), I started out from the salary table for 2015 and from the consumption structure published by KSH (Hungarian Central Statistical Office). In order to analyse the income effect, I calculated the expenditures on the basis of the consumption structure from the net incomes.
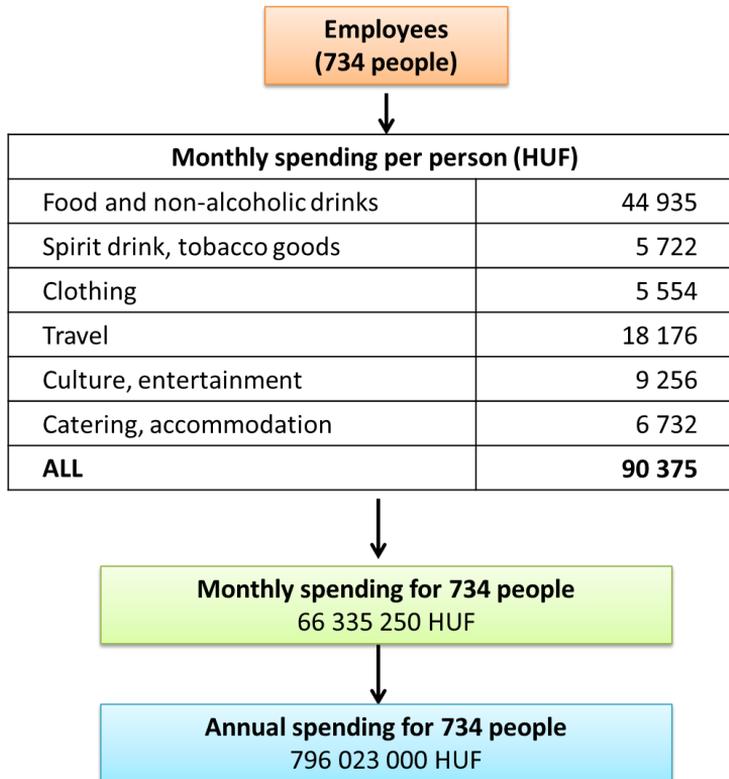
Employees (734 people)	
Monthly spending per person (HUF)	
Food and non-alcoholic drinks	44 935
Spirit drink, tobacco goods	5 722
Clothing	5 554
Travel	18 176
Culture, entertainment	9 256
Catering, accommodation	6 732
ALL	**90 375**

Monthly spending for 734 people
66 335 250 HUF

Annual spending for 734 people
796 023 000 HUF

Figure 4: Spending of employees

Source: Own design

The calculations show that the employees or students in higher education institutions generate significant consumption in the life of a rural town, so universities and colleges have an important role to activate the local economy on the basis of the income effect.

3.3. Assessment of "3E" criterions

3.3.1. The "3E" criterions in the reports of the Hungarian higher education institutions

To apply the "3E" criteria, it is necessary that the institutions should be careful during the planning. The problems of the compilation of the

elementary budget continue in the management which has a negative impact on efficiency and effectiveness.

To present the balance of planning and management, I quantified the four indicators below in the studied higher education institutions (Table 1):

- preparation of planning,
- percent of modification,
- percent of financial performance,
- justification.

Table 1: Analysis of the reports of higher education institutions

	2007	**2009**	**2011**	**2013**	**2014**
EXPENDIURES					
Preparation of planning (%)	116,50	114,78	126,06	130,30	118,96
Percent of modification (%)	204,10	122,24	141,50	150,12	147,47
Percent of financial performance (%)	57,08	93,90	89,08	86,80	86,99
Justification (%)	49,00	81,81	70,67	66,61	73,12
REVENUES					
Preparation of planning (%)	123,40	121,86	142,37	147,49	144,82
Percent of modification (%)	204,10	122,24	141,50	150,12	147,47
Percent of financial performance (%)	98,35	99,69	100,61	98,24	98,80
Justification (%)	79,70	81,80	70,67	66,61	68,22

Source: Based on reports, own design

All in all, on the basis of the data from the recent reports, it can be stated that planning does not meet the requirements of efficiency and effectiveness based on management reforms because the budget that has no deficit in planning cannot be realized in practice. There are big differences between the original appropriations, the modified appropriations and the real accomplishment.

Examining the "3E" criteria in the reports, it can be observed that most indicators quantify the input data only because they are the most easily accessible indices for higher education institutions.

3.3.2. Grouping the indicators in the higher education on the basis of user target group

It is recommended that the indicators should be categorized on the basis of the user target group because it can be used to highlight the areas which should have more attention. In the following two figures (Figure 5 and 6) and in a table (Table 2) I present which index has to be classified where from the point of view of the information users. I have evaluated the data on economy, efficiency and effectiveness separately.
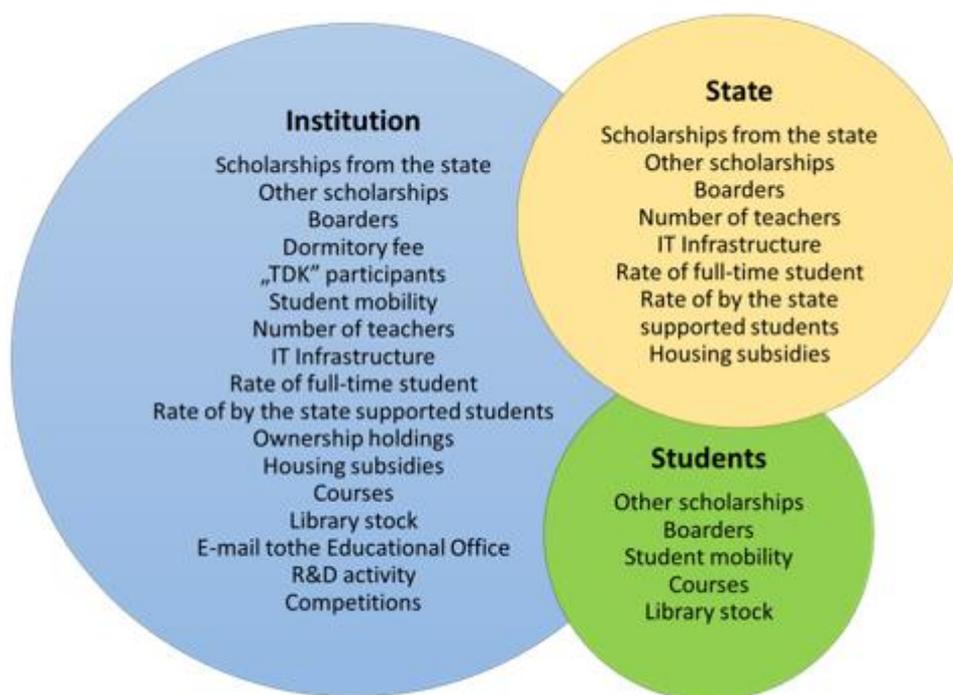

Figure 5: Evaluation of economy by user target group
Source: Based on reports, own design

Table 2.: Evaluation of efficiency by user target group

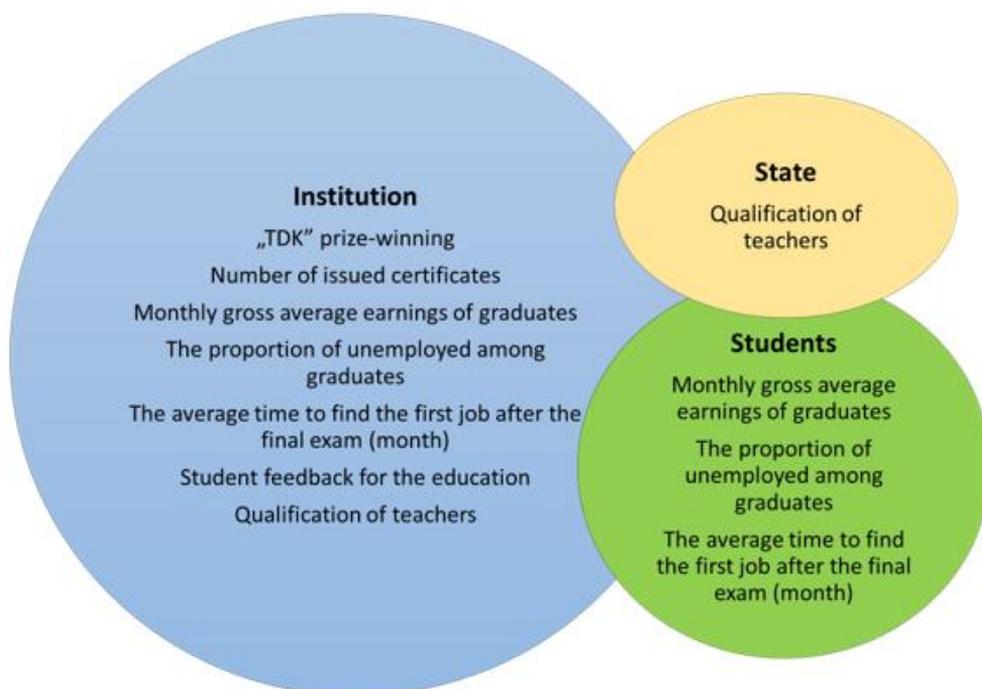| Index	State	Institution	Students
Average number of staff / authorized staff	X	X	
Publication activity		X	
Realized investments		X	
Operating expenses per student	X	X	
Total budget support for a state-subsidized student	X	X	
Own (operating) income for a fee paying student	X	X	
Normative subsidy per student	X	X	
Financing level of education	X	X	
State-subsidized student per one teacher		X	X
Student per one teacher		X	X
Ratio of receivables / liabilities	X	X	
Proportion of participants in master course		X	X
Library - number and composition of readers		X	X
Volume of library - interlibrary borrowing		X	X
Office of Educational Affairs - Served Clients / Student Number		X	
Office of Educational Affairs - student number per staff		X	X
Number of electronically initiated types of cases (in Neptun)		X	X
Conference participation		X	
Conference organization		X	
Dormitory utilization		X	
Career Center attendance		X	X

Source: Based on reports, own design

Figure 6: Evaluation of effectiveness by user target group
Source: Based on reports, own design

3.3.3. Index-system which helps to choose among higher education institutions

The choice of prospective students should be assisted by publishing information on the operation of higher education institutions. At present the performance indicators are not separated on the basis of user target groups, so it is difficult to determine what information is needed for prospective students to choose in which institution they would like to pursue their studies.

Taking the international and national processes and experiences into consideration, I have collected the indicators in three groups that affect the choice of students among institutions in the changed economic conditions (Table 3).

Table 3: Index-system, which helps to choose among higher education institutions

Input	Output	Outcome
• Boarders' number • Dormitory fee • „TDK" participants • Students mobility • IT infrastructure • Rate of state supported students • Supply of courses • Library stock • Other service fees	• Number of issued certificates • Proportion of students with language exams • State-subsidized student per one teacher • Student per one teacher • Proportion of participants in master course • „TDK" prize-winning • Proportion of student wastage • Scientific activity • Number of electronically initiated types of cases (in Neptun) • Office of Educational Affairs - student number per staff • Dormitory utilization • Career Centre attendance	• Quality of students • Value of degree • Employers' opinions • Students' evaluation of institution services • Proportion of finding a job • Initial salary • Qualification of teachers • The average time to find the first job after the final exam (month) • The proportion of the unemployed among graduates

Source: Based on reports, own design

4. CONCLUSIONS AND SUGGESTIONS

Lifelong learning has come into prominence, the number of students participating in higher education have increased and the imbalance of public budgets have caused problems. These reasons all influenced the operation of the international and national higher education systems.

I have analysed data on higher education inputs by the means of cluster analysis. Based on the results, four groups have separated. I named them 'The Outsiders', 'The Developed', 'The Developers', 'The Lagging behind/Catching up' countries. The cluster centres were modified for each examined years, however, the distinction between homogeneous groups was clear. Particularly the Western-Eastern division can be well observed, which can be explained by the temporal differences of the spread of higher education as well.

H1: Analysing the input data of higher education, homogeneous groups can be formed from European countries.

Based on the above results, **I accept hypothesis H1**. The level of development of higher education systems is clearly defined and the characteristics of the sector are greatly influenced by the input data of the sector.

I used the method of cluster analysis to evaluate the output data as well.

H2: Examining the output of higher education, European countries can be grouped on the basis of common characteristics.

On the basis of the results I have separated four groups in this case as well. I gave them the same name as in the case of the inputs, 'The Outsiders', 'The Developed', 'The Developers', 'The Lagging

behind/Catching up' countries. The members of the first group have an 'expensive' but quality higher education system. The second group achieves quality education with average spending. In the third cluster, the countries allocate sums below the average to the higher education, and its effect is reflected in output data as well. The fourth group spends only a low amount of money on education due to the unfavourable economic conditions, so the role of this sector is much lower in the national economy than in other countries. Based on the above **I accept hypothesis H2**.

As a secondary objective, I would like to demonstrate the economic importance of higher education.

H3: The income effect that is generated by higher education institutions, can be considered significant in the specific economic area.

Based on the results, the role of a 'typical, rural' higher education institution in the local economy is significant. A part of the employees' and students' income appears in the local economy as an additional consumption, so **I accept hypothesis H3**.

Suggestion

In order to maintain the income effect in the long run, long-term cooperation agreements should be concluded with the other participants of the economy, especially with businesses, in which the higher education institution undertakes the provision of skilled labour force, so the highly qualified workforce can remain in the local economy, and it further enhances the competitiveness of the region.

Finally, I have analysed the application of the three criteria (economy, efficiency, effectiveness) in practice on the basis of the reports of higher education institutions.

H4: In the Hungarian higher education reports the evaluation of the "3E" criteria is uniform.

The appearance of the "3E" criteria in the management of the institutions is not as significant as in the Anglo-Saxon countries, where in the previous decades reforms started on the basis of the New Public Management. The evaluation of the activity is difficult without the properly compiled aspect-system.

After examining the appearance of economy, efficiency, and effectiveness in reports, it can be stated that most indexes apply to only the input data. In the light of the results, **I do not accept hypothesis H4**.

Efficient management is based on appropriate planning.

H5: The financial and operational planning of domestic higher education institutions conform to the "3E" requirements of the management reforms.

Examining the preparation of planning, we can also see differences in the revenue and expenditure side. There was a significant difference between the original appropriation and the real accomplishment, which has increased further since 2010. In addition, the percentage of the modification shows that there is a significant difference between the modified and the original appropriation, which refers to ineffective planning. In 2007, its value was outstanding (204.1%), by 2014 it decreased (147.47%), but this is still a major deviation. The financial performance does not show any better picture either. In 2014, the expenditures were 13% lower than the modified appropriation, while the revenue was only 1.2% lower. In

conclusion, the planning of higher education institutions does not meet the requirement of efficiency, so **I do not accept hypothesis H5**.

Suggestion:

In the financing system the evolution of the results should be taken into consideration on the basis of different indicators. In compliance with the institutional development plans, a multi-year financing strategy should be developed, which would ensure the framework conditions of long-term planning.

Finally, I had the objective of compiling an indicator-system taking the "3E" criteria into account which besides focusing on efficiency, provides help for university and college applicants to choose among the institutions.

H6: The choice of a higher education institution requires a comparable performance evaluation and a related index-system.

Along with the changed economic environment and the transformation of the higher education system, at present more students have to pay for the education than earlier. For example, in order to choose the institution of higher education, it would be important to know the statistics of the average time of graduates to find the first job after the final exam, and how much is the average starting salary they have. In the light of the results **I accept hypothesis H6.**

Suggestion:

An online database should be compiled meeting the students' requirements which not only contains the final ranking of higher education institutions, but also expatiate on the information of the operation and effectiveness. Publishing input, output and outcome data in a modified economic environment would also make it easier to choose an institutions.

5. NEW SCIENTIFIC RESULTS

1. Examining the input data for higher education in 31 European countries, four homogeneous groups can be formed on the basis of the characteristics, but the biggest difference can be found between the countries of western and eastern Europe. For countries, which are classified as 'The Outstanding', the ratio of spending money on higher education is average in a well-performing economic environment. 'The Developed' prioritised the quantitative training on the basis of input data. 'The Developers' fell behind in the case of each analysed input datum. 'The Lagging behind/Catching up' countries spend sums below the average on higher education, while the burden of teachers is high.

2. By analysing output data for higher education, the European countries can be classified into four big groups. The group of the 'The Outsider' countries have an 'expensive' but high-quality higher education systems. 'The Developed" countries accomplish quality education with average spending. 'The Developers' spend money on higher education below average, and it is reflected in the output data as well. 'The Lagging behind/Catching up' countries spend only a low amount of money on education due to the unfavourable economic conditions, so the role of this sector is much lower in the national economy than in other countries.

3. I developed a possible method of measuring the income effect of a 'typical, rural' higher education institution, based on which I quantified the amount of income spent in the local economy. A 'ypical, rural' university due to the different development levels of counties can contribute to the economy to a different degree, in 2015 the income effect value represented 3.21% from the average county income tax revenue – 88.87 billion forints (NAV, 2016).

4. Based on the reports of the Hungarian higher education institutions (2007-2014), I have found that under the current conditions it is not possible to make an effective planning. There are significant differences between the performance and the original appropriations in budgets, so the grounding of the planning is not appropriate. The financial and operational planning of the national higher education based on quantified indicators does not meet the "3E" requirements of management reforms.

5. Having examined 19 reports of the Hungarian higher education institutions between 2007-2014, I have found that the evaluation of economy, efficiency and effectiveness does not appear in a uniform form. Different information is quantified and published in the reports, and it does not make the comparability of higher education institutions possible.

6. Based on the New Public Management reforms, I have identified the indicators in the reports of Hungarian higher education institutions based on user interest groups, separating the criterions of economy, efficiency and effectiveness.

7. Taking the international and national processes and experience into consideration, I have compiled an indicator-system, which substantiates and measures the performance of the higher education institutions, and is able to ensure the choice of students among institutions in the changed economic conditions.

6. PUBLICATIONS IN THE TOPICS OF THE DISSERTATION

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Ágoston A. – Wickert I. – Balogh L.: Current issues of the new public finance management. 3rd International Conference of Economic Sciences. Kaposvár, 2011. május 19-20. Regional and Business Studies Vol 3, No 1 (2011), pp. 353-365

Ágoston A. - Balogh L. - Wickert I.: Internationale Erfahrungen der Verwaltungsreformen [Közigazgatási reformok nemzetközi tapasztalatai], Változó környezet - Innovatív stratégiák: nemzetközi tudományos konferencia a Magyar Tudomány Ünnepe alkalmából, Sopron, 2011. november 2. ISBN:978-963-9883-87-1

Ágoston A. – Balogh L.: The Relationship between Higher Education and Regional Competitiveness. Proceedings of the 4th International Conference of Economic Sciences. 602 p. Kaposvár, Magyarország, 2013.05.09-2013.05.10. pp. 346-355. ISBN:978-963-9821-62-0

Ágoston A. – Őrffy L. –Urbán Z.: The economic side of higher education. 11th Annual International Conference on Economics and Business: Challenges in the Carpathian Basin: Global Challenges, Local Answers. 1109 p. Csíkszereda, Románia, 2014.05.16-2014.05.17. pp. 222-231. ISBN:978-973-53-1287-9

Ágoston A.: Income effect of the higher education. Challenges in the Carpathian Basin. Integration and modernization opportunities on the edges of Europe: 13th Annual International Conference on Economics and Business. 1102 p., Csíkszereda, Románia, 2016.10.20-2016.10.22. Kolozsvár: Editura Risoprint, 2016. pp. 28-46. ISBN:978-973-53-1855-0

FULL SCIENTIFIC PUBLICATIONS IN HUNGARIAN

Balogh L. – **Ágoston A.** – Wickert I.: A kameralizmustól az eredményszemléletig. "Hitel, Világ, Stádium" Nemzetközi Tudományos Konferencia tanulmánykötete, Sopron, Magyarország, 2010.11.03. pp. 1-12. ISBN:978-963-9883-73-4

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