RELEVANT AREAS AND INDICATORS OF QUALITY IN HIGHER EDUCATION INSTITUTIONS: EVALUATING THE SYSTEM OF HIGHER EDUCATION IN ECONOMICS*

Ljerka Cerović[**]
Andrea Arbula Blecich[***]
Ana Štambuk[****]

Received: 14. 2. 2014
Accepted: 29. 7. 2014

Preliminary communication
UDC 378.4:33>(497.5)

The main goal of this research is to define the relevant areas of activities for teachers and other stakeholders involved in assuring quality in higher education of the Republic of Croatia and to establish the relevance of their inclusion into the research model. Individual areas of activity have been confirmed based on the opinions expressed by experts from relevant institutions in the Republic of Croatia. The authors used the budget allocation method to aggregate expert opinion, assign weights to variables and define the aggregate index. Bootstrap testing of the hypothesis of arithmetic mean justified the inclusion of relevant areas of HEI quality into the model: teaching (X1), scientific research (X2), professional engagement (X3), participation in faculty and university bodies (X4) and support service activities (X5). Expert opinions have generated the following weights for individual quality areas: w1= 0.42; w2=0.27; w3=0.14; w4=0.08; w5=0.09. Given the specific characteristics of different institutions within a university community, this paper focuses on institutions of higher economic education of the

* Financed in part by the University of Rijeka/ Ministry of Science, Education and Sport, under the project number 13.02.1.2.09/081-0811272-1276 and in part by the University of Rijeka under the project number 13.02.1.2.04

** Ljerka Cerović, Ph.D., Associate Professor, (corresponding author), University of Rijeka, Faculty of Economics and Business, I. Filipovića 4, 51000 Rijeka, Croatia, E-mail: cerovic@efri.hr, Phone ++385-51-355147, Fax. ++385-51-212268

*** Andrea Arbula Blecich, MEcon, Novice Researcher, University of Rijeka, Faculty of Economics and Business, I. Filipovića 4, 51000 Rijeka, Croatia, E-mail: aarbula@efri.hr, Phone. ++385-51-355117, Fax. ++385-51-212268

**** Ana Štambuk, Ph.D., Assistant Professor, University of Rijeka, Faculty of Economics and Business, I. Filipovića 4, 51000 Rijeka, Croatia, E-mail: ana@efri.hr, Phone ++385-51-355168, Fax. ++385-51-212268

Republic of Croatia. Nevertheless, it is expected that, with appropriate changes in certain default attributes, the model could be widely applied in higher education institutions of other orientations.

1. INTRODUCTION

Croatian higher education system is facing an increase in standards and requirements. These primarily refer to the quality of the higher education service delivered to the end users, who are becoming more demanding in terms of its quality. They are now able to compare their knowledge and qualifications with those in the EU and are actually the ones who, for the most part, provide for the budget for financing higher education.

Higher education institutions (HEIs) are complex systems active in many areas: education, scientific research, professional activity and other. As a result, their quality has to be viewed from several perspectives, which is, for that matter, a complex task and represents the main *research problem* within this paper. In this regard, the *main goal* of this research is to define the main areas of HEI activity in the Republic of Croatia and empirically validate the justification for their inclusion into the research model. Moreover, the goal is to identify the indicators of relevant areas of HEI activity as well as the attributes that best define them. Derived from the above said, the hypothesis of this research is as follows: based on scientifically grounded notions about the specific features of work and activities of different constituents within the academic community, it is possible to determine the relevant areas of HEI activity and to identify the difference in their relative importance.

Therefore, based on theory and former research results the five core areas of activities to be included in the model for a comprehensive evaluation of teachers and administrative and technical staff (stakeholders) in HEIs, are: *teaching, scientific research, professional engagement, participation in faculty and university bodies and support service activities* for a comprehensive evaluation of teachers and administrative and technical staff (stakeholders) in HEIs. They reflect the key HEI areas of activity and play a significant role in achieving a better quality of studies. Such a model, apart from being an instrument for evaluating higher education institutions, would also provide for a possibility of defining reasonable limitations in monitoring and implementing quality systems in higher education.

Following the Introduction, the paper gives an overview of the history of quality assurance in the European Area of Higher Education and Croatia. The

overview starts with a brief elaboration on the fundamental features and differences between HEI efficiency and HEI quality. In the following section, the authors present the development of the model for evaluating the quality of studies in Croatian higher economic education. The mentioned model is constructed in two steps: 1) identification of the relative importance of relevant fields of HEI activity and 2) identification of indicators of the selected areas of HEI activity on the example of the Faculty of Economics and Business Rijeka (FEBR). This is followed by the presentation of research results, discussion and a conclusion.

2. THEORETICAL BACKGROUND

Quality, as a concept in the field of higher education, appeared in the 1960s (Hatch and Office of Education (DHEW), 1964; Vairo, 1965), and has become one of the key interest factors in most countries. Before elaborating on the quality of higher education, it is crucial to make a distinction between HEIs' quality and efficiency. Efficiency implies the best possible performance resulting in the maximum output obtained from the given inputs (resources) or by realizing the given output with minimum inputs. On the other hand, quality implies overall optimization of HEI goals and areas of activity by setting and applying certain standards. These terms are interrelated because quality assurance without efficiency is not sustainable and quality standards determine the direction and framework of efficient procedures and measures.

Although the efficiency of higher education has been studied in a large number of papers, there are very few analyses referring to Croatian higher education. The efficiency of Croatian higher education was taken into account by Aristovnik (2011a, 2011b), Aristovnik and Obadić (2011), Arbula (2012), Jafarov and Gunnarsson (2008). These papers studied the effect of public expenditure on the efficiency of higher education by making a comparison between EU and OECD countries including Croatia. In order to satisfy all HEI stakeholders, it is important that all areas of activity operate efficiently and at the highest possible quality.

A systematic quality assurance has become a challenge and a commitment of the contemporary society. In this regard, the Bologna Declaration was signed in 1999 with the aim to create a common European Higher Education Area. Following the Bologna Declaration, the basis of the quality assurance process in higher education institutions, in 2002, the European Association for Quality Assurance in Higher Education (ENQA) was founded. Moreover, in 2006, the European Parliament established the European Register of Quality Assurance

Agencies and determined the minimum requirements for an agency to enter the Register (ENQA, n.d.).

Most European countries have been working intensively on the development of internal and external mechanisms for quality assurance in higher education. Despite the intensive development of internal systems of quality assurance, the problem that remains is that these are mostly focused on the teaching activity. A very small number of institutions (less than one-third) are working on the development of quality assurance in research (scientific and professional). Moreover, less than a sixth of institutions include support services in quality assessment (NSF, 2007). The aforementioned limitations served as a direct stimulus for the research presented in this paper, which apart from the teaching aspect, also acknowledged other aspects of activities of HEI stakeholders.

Although the Higher Education Act (1993) partially covered the external quality assurance mechanisms, the turning point in the development of a system of maintaining and improving quality in Croatia was in 2003 when the Act on Scientific Activity and Higher Education was passed. It upgraded the 1993 Act with organizational expert procedures in evaluating HEIs and their programs. It provided for the involvement of quality assurance offices in the process of evaluating programs and institutions and the establishment of the Agency for Science and Higher Education (ASHE, 2007; NSF, 2007).

The Agency looks after the external quality assurance system in science and higher education in Croatia by conducting external independent periodical audits of quality assurance every five years, whereas the internal quality assurance system is under the jurisdiction of individual HEIs and under the university's jurisdiction, which conducts, for each individual constituent, internal evaluations of the quality assurance systems every three years.

In the Berlin communiqué (2003), the European Ministers responsible for higher education from Bologna Declaration signatory countries call upon ENQA to develop, in cooperation with the European University Association (EUA), European Association of Institution in Higher Education (URASHE) and the European Students Union (ESU, then ESIB) "an agreed set of standards, procedures and guidelines for quality assurance" and "to explore ways of ensuring an adequate peer review system for quality assurance and/or accreditation agencies or bodies" (ENQA, 2009, p.5). Since the European Standards and Guidelines for Quality Assurance (ESG standards) are the result of cooperative work between experts and academic community umbrella

organizations, it is considered that the determinants of ESG standards represent a relevant base and scientifically founded starting point for the theoretical model for evaluating the quality of HEIs presented in this research.

The ESG standards are designed to be applicable to all higher education institutions and agencies for quality assurance in Europe, irrespective of their structure, function and size, and the national system they pertain to, taking into account their national systems of higher education, autonomy of institutions and agencies within those national systems and the particular requirements of different academic subjects.

3. MODEL FOR EVALUATING THE QUALITY OF STUDIES IN CROATIAN HIGHER ECONOMIC EDUCATION

In order to evaluate the quality of HEIs activities, primarily of those institutions with a socio–economic orientation for which this model was developed, but also those with a different orientation, due to the flexibility of the model, this paper presents the areas of quality of HEI performance and activities within individual areas which are held to be relevant carriers of quality in higher education. The emphasis is placed on HEI stakeholders as the internal factors of quality assurance systems, whereas external factors of quality assurance systems such as student employability, Triple Helix concept, etc., are not included in this analysis, but open space for further research.

The research on the quality of HEIs with an economics-based orientation was carried out in order to define the key factors affecting it. The goal of the research was to analyze expert opinion on the priority areas of the HEIs stakeholder activity in line with the fundamental ESG standards (European Standards and Guidelines for Quality Assurance), the national regulative framework and the strategies developed by the University of Rijeka and the Faculty of Economics and Business Rijeka, and accordingly define the areas and the level of additional efforts needed in order to ensure rationalization of costs and an increase in the benefits of implementing quality systems in the area of higher education.

Aggregated index $Y_n = \sum_{i=1}^{m} w_i X_{in}$ incorporates the areas of teacher and other stakeholder activities as carriers of higher education quality. Each of the areas of quality (variables - X_i) are composed of elements / indicators (see chapter 4) that best describe it, and are given corresponding weights (w_i) which define its

role in the model and set a reasonable limitation in the effort (cost) made to achieve the objective (benefit).

3.1. Methodology

The model was constructed and tested in three stages: 1) selecting relevant areas of quality – X_i; 2) assigning weights – w_i; 3) validating the model.

The criteria for the choice of the variables (X_i) in the model (relevant areas of HEI activity) derive firstly from the ESG standards, the national regulatory framework and the University of Rijeka and the FEBR Strategies. However, it should be noted that the proposition of the relevant areas of quality and HEI activities sprang from the guidelines for promoting quality at the *European* (ENQA, 2009; INQAAHE 2007; UNESCO/OECD, 2005) and *national* levels (ASHE, 2010a; 2010b; Act on Scientific Activity and Higher Education, 2003; Act on Quality Assurance in Science and Higher Education, 2009; Regulation of the Conditions for the Appointment into Scientific Positions, 2005), the *university level* (Regulations on Study Terms, 2008; Regulations on Quality Assurance at the University Rijeka, 2008; Manual for Quality of Study Terms, 2012; Regulations on the Procedure for the Appointment into Teaching, scientific and Associate Titles and Corresponding Positions at the University of Rijeka, 2006; Ordinance on the Evaluation of Lifelong Learning, 2009) and the *faculty level* (Regulations on the Study Terms, 2006; Regulations on Quality Assurance at FEBR, 2010; Regulations on the Procedures to be Taken upon Student Questionnaires Assessing FEBR Teachers' Performance 2010).

There are numerous methods in assigning weights (w_i), but no matter which method is applied, the weights always represent a value judgment (Maggino and Ruviglioni, 2009, OECD and EC/JRC, 2008). Moreover, it should be noted, that there is no consensus as to which method is best (Nardo et al., 2005).Within this research, the authors applied the Budget Allocation (BA) method, i.e. Expert Opinion (Moldan and Billharz, 1997), in which experts are given a budget of N points that has to be allocated to variables within the model by allocating more points (differentiated weights) to those considered more important. The method provides good results, but allocating the budget to more variables may cause cognitive stress to experts and may lead to inconsistent results.

Therefore, the number of variables should not exceed 10. Furthermore, it should be noted that weights depend on local conditions and are marked geographically, nationally or otherwise. Therefore, expert opinions from one

"area" should not be used in another "area". All these assumptions are satisfied in the model. The BA method assumes 3-4 stages (OECD and EC/JRC, 2008): 1) Selection of experts; 2) Budget allocation to individual variables; 3) Calculation of weights and 4) Repeated budget allocation until convergence is achieved (optional phase). This research included the three mandatory stages.

The questionnaire was distributed to experts, and was conducted during September 2012. Due to the fact that there was a target population, an intentional sample was used in this research. The desired opinion in the questionnaire was that of experts, as they have the adequate knowledge, dispose of the "best" information and have the most experience within the research topic. The respondents included deans, vice-deans and presidents of quality assurance boards at faculties and departments with an economics orientation in the Republic of Croatia, rectors, vice-rectors and presidents of Croatian university quality assurance boards, head officials from the Institute for the Development of Education, Universities, Science Foundation, the Croatian National Foundation for Science, Higher Education and Technological Development, the Institute of Economics in Zagreb, BVQI Croatia, members of the National Science Council – Central Committee for Economics, the National Science Council of the Republic of Croatia, the National Council for Higher Education, Council for Financing Scientific Activity and Higher Education, Council of Polytechnics and Colleges - Central Committee for Social Sciences, Interdepartmental Working Body for Labour Market Monitoring, the Agency for Science and Higher Education and the Ministry of Science, Education and Sports. The questionnaire was sent to 162 experts in this area of knowledge and there was a 27% response rate i.e. 44 valid replies.

The questionnaire within this research examined the importance of specific areas of quality of HEI activities (X_i). The task of the respondents was to assess to what proportion, based on their importance (w_i), the variables (X_i) impact the quality of study at higher education institutions. Based on experts' responses, weights (w_i) were assigned to each of the selected areas of quality. For the purpose of setting up the model, the share of individual variables is expressed on a scale from 0 to 1. The received data was processed using the IBM SPSS statistical tool and the R programming language.

There are two approaches to the elicitation and aggregation of the expert opinion: mathematical and behavioral (Clemen and Winkler, 1999). In the behavioral approach, experts are encouraged to interact and share their assessment in order to reach a group consensus. The mathematical approach does not presuppose interaction; the opinions are combined using procedures

and analytical models (Clemen and Winkler, 1999; McBride and Burgman, 2012). According to Mosleh et al. (1988) mathematical methods generally give better results than the behavioral ones. The most commonly used mathematical method is the experts' opinion mean (Simola, Mengolini and Bolado-Lavin, 2005). Although it is a simple method, many more complex methods often do not give better results (Clemen, 1989; Genre, et al., 2013).

In their assessments, the experts typically do not allocate mean values; their opinions are significantly dispersed (Burgman et al., 2006; Meyer and Booker, 2001). The multivariate normality of expert assessments, which is necessary for a parametric analysis, is very rare (Meyer and Booker, 2001). The normality of the distribution of expert responses regarding the model's variable weights was tested by the Shapiro-Wilk test. The test showed that the answers are not normally distributed at the 0.05 significance level. Since the parametric analysis is possible even on transformed data, if the achieved data meets the required conditions, the normality of transformed data was also tested. The transformations applied were the Box-Cox transformation, angular (arcsin-root) transformation, logarithmic transformation and logit and probit transformation of expert responses. None of the transformed variable had character of normality.

Since the data were not normally distributed, the question that arose was whether there was a reason for using the mean or it would be better to use medians. In order to determine which central tendency measure was better to use, the M-estimators, as a robust alternative to the mean and median were calculated. Four M-estimators were evaluated: Huber's, Hampel's, Andrew's and Tukey's, which were then normalized to sum 1.

The testing of the hypotheses about the arithmetic mean (parametric analysis) so as to determine whether the weights were significantly different from zero, examined whether the experts agreed to include the proposed variables in the model.

Since neither the original data nor the transformed data were normally distributed and did not allow parametric testing, the bootstrap method (founder Efron, 1979) was applied. This is a simulation method for inferential statistics and falls into the broader class of re-sampling methods. The assumption in applying the bootstrap simulation is that the sample reflects all the relevant aspects of the population.

If $X = (x_1, x_2, ..., x_n)$ is the sample of size N from the distribution $F(x)$, and $\theta(F)$ is the parameter θ of distribution to be estimated e.g. the mean and if $\hat{\theta} = \hat{\theta}(X)$ is the estimator of parameter θ e.g. the population mean $\theta = \int x dF(x)$ is calculated from the sample mean $\hat{\theta} = \frac{1}{n}\sum_{i=1}^{n} x_i$.

However, it is not enough to solely estimate the parameter, it is also necessary to evaluate the reliability of the parameter estimator, which is possible by applying the bootstrap method. If the distribution $F(x)$ is known, then it is possible to accurately estimate the distribution of the parameter $\hat{\theta}$ estimator, i.e. the parametric bootstrap method is applied. If the distribution $F(x)$ is unknown, the sample is small or the function of the parameter estimator is complex, then the non-parametric bootstrap method is used.

In non-parametric bootstrap simulation, the empirical distribution of the data $\hat{F}(x)$ is used instead of the unknown distribution $F(x)$. This is achieved by re-sampling, when samples with repeating elements are randomly chosen from the original data. Obtained samples $x_b^* = (x_1^*, x_2^*, ..., x_b^*)$ where $b = 1, 2, ..., B$ represents bootstrap samples and has the same number of elements as the original data. The bootstrap parameter estimator $\hat{\theta}_b^* = \hat{\theta}(x_b^*), b = 1, 2, ..., B$ has to be calculated for each bootstrap sample x_b^*. The distribution of the estimator $\hat{\theta}$ is approximated by the distribution of the bootstrap estimator $\hat{\theta}^*$, i.e. the distribution $F(\hat{\theta})$ is approximated by the distribution $\hat{F}(\hat{\theta}^*)$ for sufficiently large number B.

There is no consensus in the literature as to how many bootstrap samples should be made, but Efron and Tibshirani (1993) recommend 1,000 to 2,000 bootstrap samples when estimating a 95% confidence interval. There are different types of bootstrap methods; within this research the methods of second (simultaneously higher) order of accuracy were applied: bootstrap BCs and bootstrap-t including 2,000 bootstrap samples.

However, the bootstrap method has its limitations and it should not be used for point estimate (Haukoos and Lewis, 2005). Moreover, the basic limitation lies in the fact that bootstrap samples are formed only from the original sample

under the assumption that the distribution of data from the sample reflects the function of the distribution of the population. If the data is not adequate, the bootstrap method may lead to erroneous estimates (Haukoos and Lewis, 2005; Meyer and Booker, 2001). However, the bootstrap method has proven to be the best method in surveying experts' opinion as in such cases the distribution of expert decisions is unknown, and the samples are commonly small (Meyer and Booker, 2001).

In order to determine whether the mean of expert opinions equals zero, the bootstrap hypothesis testing was conducted for each distribution of expert responses regarding model's variable weights. As to verify the validity of differential weights use, weight means were compared by means of the bootstrap *repeated measure ANOVA* method. Research has shown that, when the normality and sphericity conditions required in the repeated measure ANOVA method are violated, the introduction of bootstrap procedure gives good results (Berkovits, Hancock and Nevitt, 2000; Keselman and Lix, 2012). The Mauchly's test indicates that sphericity is violated.

The correlation between the pairs of variable weights was also tested by the bootstrap correlation. The bootstrap method was introduced because the assumption of normality required for correlation was not satisfied (Chan and Chan, 2004; Field, Miles and Field, 2012). The order of individual areas, in terms of their importance, according to expert opinion and the degree of agreeability on the order of variables' importance was tested by Kendall's coefficient of concordance.

3.2. Results and discussion

This research resulted in the aggregate index of HEI quality assessment consisting of the selection of relevant quality areas – the variables, assignment of their weights and model validation. According to the proposed criteria, five areas were singled out as the relevant areas of HEI activity: X_1 - teaching; X_2 - scientific research; X_3 - professional engagement; X_4 - participation in faculty and university bodies; X_5 - support service activities.

The descriptive statistics of the variable weights within the model according to the experts is listed in Table 1.

It can be noted that according to experts' opinion, there is a significant difference in the importance of the evaluated variables. Namely, the respondents

gave highest importance to teaching, almost, on an average, half of that to scientific research and then along this path to other areas of the HEI activities.

Table 1. Descriptive statistics of the variable weights within the model

	N	Min	Max	M	SD	Median	Norm. median [a]
Teaching	44	0.20	0.70	0.42	0.14	0.40	0.38
Scientific research	44	0.10	0.55	0.27	0.09	0.30	0.29
Professional engagement	44	0.05	0.30	0.14	0.06	0.14	0.13
Participation in faculty and university bodies	44	0.00	0.20	0.08	0.04	0.10	0.10
Support service activities	44	0.00	0.20	0.09	0.05	0.10	0.10

Source: Empirical research. a. Median normalized to sum 1

Such a difference in favor of teaching is understandable if one takes into account that the teaching variable actually summarizes the elements within other variables (e.g., the use of information resulting from scientific research and/or experience gained through different professional projects aimed at enriching the curricula), and as such, itself represents the aggregate index "in small" in relation to the overall aggregate index (Y).

This opens up the questions for further research which would examine the additive and interactive relationship between the selected variables. However, this is not the subject of this research.

As the data was not normally distributed at the 0.05 level (Shapiro-Wilk test for teaching: $W=0.916$, $p=0.004$, scientific research: $W=0.925$, $p=0.007$, professional engagement: $W=0.895$, $p=0.001$, work in the faculty and university community: $W=0.866$, $p<0.001$ and operation support services: $W=0.908$, $p=0.002$) a comparison between the means and the normalized M-estimators and normalized medians was made, as shown in Table 2.

Comparing the normalized M-estimators with the mean and normalized medians listed in Table 1, we can see that all the normalized M-estimators are equal or nearly equal to the variable mean, which is not the case with the normalized median. The means of normalized M-estimators are identical to

variable means. Accordingly, it can be concluded that the application of the mean is justified.

Table 2. M-estimators of expert opinions on the variable weights within the model

	M-estimators				**Normalized M-estimators [e]**				
	Huber's [a]	Tukey's Biweight[b]	Hampel's[c]	Andrews' Wave [d]	Huber's	Tukey's Biweight	Hampel's	Andrews' Wave	**Mean**
Teaching	0.404	0.401	0.408	0.401	0.415	0.414	0.418	0.414	**0.42**
Scientific research	0.265	0.266	0.266	0.266	0.273	0.276	0.272	0.276	**0.27**
Professional engagement	0.139	0.135	0.137	0.135	0.143	0.140	0.140	0.140	**0.14**
Participation in faculty & university bodies	0.078	0.078	0.078	0.078	0.080	0.081	0.080	0.081	**0.08**
Support service activities	0.087	0.087	0.087	0.087	0.090	0.090	0.089	0.090	**0.09**

Source: Empirical research.

a. Weighting constant is 1.339. b. Weighting constant is 4.685. c. Weighting constants are 1.700, 3.400 and 8.500. d. Weighting constant is 1.340*π. e. M-estimators normalized to sum 1.

The results of the bootstrap hypothesis testing for means, testing the validity for inclusion of selected variables (X_1 – X_5) within the model, are shown in Table 3.

It is evident that the 95 percent bootstrap confidence intervals do not contain zero and that the bootstrap significance $\hat{p}$ value is < 0.001. The means of variable weights are significantly different from zero at the 0.05 level, indicating that the experts agree that the proposed variables should be included in the model. The abovementioned confirms the research hypothesis that based

on scientifically grounded notions about the specific features of work and activities of different constituents within the academic community, it is possible to determine the relevant areas of HEI activity.

Table 3. Results of the bootstrap testing of the hypothesis that the mean value of individual variable weights within the model equals zero

	Mean difference	Bootstrap				
		Error (bias)	Std. error	Sig. (2-way)	95% confidence interval	
					Lower limit (LL)	Upper limit (UL)
Teaching	0.42	0.00	0.02	.000	0.38	0.46
Scientific research	0.27	0.00	0.01	.000	0.25	0.30
Professional engagement	0.14	0.00	0.01	.000	0.12	0.16
Participation in faculty & university bodies	0.08	0.00	0.01	.000	0.07	0.09
Support service activities	0.09	0.00	0.01	.000	0.07	0.10

Source: Empirical research.

Justification of the decision to use differentiated weights was tested by the bootstrap repeated measure ANOVA, since there was neither normal distribution nor sphericity of data (the Mauchly's test of sphericity: $W=0.077$, $\chi2(9)=106.116$, $p<0.001$). The results suggest the rejection of the null hypothesis that the means of all quality area weights are of same value ($F=104.50$, $F_{krit}=3.12$, $p<0.05$). It can be concluded that the experts agree that differentiated weights should be used rather than equal weights. The above mentioned confirms the hypothesis that it is justifiable to introduce differentiated weights into the model for evaluating the quality of HEI activity as different areas of HEI activity (according to expert opinion) have different relative importance.

The bootstrap post-hoc test was used to contrast pairs of responses on variable weights: in case of the *participation in faculty & university bodies* and the *support service activities*, the null hypothesis stating that there is no difference between the mean weight values was not rejected $\hat{\Psi}$ =-0.91, 95% CI

[-3.31, 1.50], p<0.05. For all other pairs of variables, the difference in weight means is significant at the 0.05 level.

Results of the bootstrap correlation between variables are shown in Table 4.

Table 4. Results of the bootstrap correlation analysis of the variable weights within the model

			N=44				
			1	**2**	**3**	**4**	**5**
1. Teaching							
2. Scientific research	r		-.601**				
	Bootstrap	LL	-.762				
	95% CI	UL	-.376				
3. Professional engagement	r		-.599**	.117			
	Bootstrap	LL	-.736	-.118			
	95% CI	UL	-.429	.335			
4. Participation in faculty & university bodies	r		-.577**	-.032	.148		
	Bootstrap	LL	-.749	-.276	-.111		
	95% CI	UL	-.329	.219	.432		
5. Support service activities	r		-.367*	-.291	.018	.567**	
	Bootstrap	LL	-.640	-.546	-.247	.321	
	95% CI	UL	-.034	.009	.302	.751	

Source: Empirical research. * p<0.05; ** p<0.01

There is a negative correlation between the weights of the teaching variable and the weights of all other variables, and this interactive relationship results from the fact that the teaching variable in itself sublimates the elements from all other variables. Moreover, there is a correlation between *the participation in faculty and university bodies* variable weights and the *support service activities* variable weights, which was expected, given that the contrasting results suggest a correlation between these two variables. Regardless of the dispersion of expert opinions in assigning weights to each variable, experts agree, to a large extent, as to the order of variables in terms of their importance. Kendall coefficient of concordance (W=0.787, p<0.001) indicates rejection of the null hypothesis stating that there is no association among experts. The experts ranked highest the teaching variable (4.68), which was followed by other variables: scientific

research (4.08), professional engagement (2.65), support services activities (1.90) and participation in faculty and university bodies (1.69).

On obtaining the expert responses, it is justifiable to involve the following areas of quality (X_1-X_5): *teaching, scientific research, professional engagement, participation in faculty and university bodies and support service activities* in the model for evaluating the quality of higher education institutions. The expert opinions generated the following weights of individual areas of quality and implicated the following model:

$$Y_n = 0.42\ X_{1n} + 0.27\ X_{2n} + 0.14\ X_{3n} + 0.08\ X_{4n} + 0.09\ X_{5n}$$

By defining the role of each area of quality within the model, and through the resulting weights, there is a specific reasonable limitation in terms of the effort (cost) to be made in achieving the objective (benefits). Since the quality of study has become a key area of HEIs interest, and its importance keeps growing, there is no doubt that, given the increasing demand in the field of HEI promotion, quality committees, which currently operate within the institutions, will not be sufficient. In view of the upcoming requirements, it will be necessary to form services that would, as such, deal only with the area of quality. These efforts would naturally result in additional costs. The highest costs would be that of engaged staff, reflected in their compensation, followed by the costs of additional training, equipment and office supplies, and other (opportunity costs for "wasting" committee members' time, etc.).

The incurred costs would be used to achieve the benefits that could, as such, be reflected in the improvement of study quality and the international recognition of the institution itself. Moreover, the benefits could be reflected in increased student satisfaction, higher pass rates of students who are "recruited" on the labor market and do not burden the public budget, in the quality of graduates that can, as such, compete on domestic and international labor markets, in the number of internationally renowned researchers, the number of citations, the impact factor of the institution's journal, the number of published papers in leading national and international journals and other. In view of the fact that the resulting benefits are of both qualitative and quantitative nature, there is a need for integrating all realized benefits and putting them in relation to the costs of managing and improving the quality assurance system in higher education. The presented arguments give special importance and weight to the process of assuring and promoting quality in the higher education area and are an impetus for further research on the benefits and costs of the quality assurance system.

4. QUALITY ASSURANCE AT THE FACULTY OF ECONOMICS AND BUSINESS RIJEKA

This section can be viewed as a step forward in the evaluation of higher education institutions; it is certainly a step forward in relation to the expected methodological concept of the presentation of this paper's research problem. However, as it considerably contributes to the quality of this paper and represents a challenge for further research, the authors decided to include it in this paper. Within the process of systematic evaluation, assurance and improvement of quality as well as promotion of high standards in professional and vocational development of HEI stakeholders and in accordance with the guidelines for quality assurance in the European Higher Education Area, with respect to the European and national legislation and the specific criteria of the University of Rijeka and FEBR, first of all the University Strategy and the FEBR Strategy, the proposal of areas for evaluating FEBR teachers and other stakeholders, as well as indicators determining them, is presented in Table 5.

Table 5. The areas and indicators of quality of FEBR's teaching and administrative staff

1) Evaluation of teaching based on:
a. results of student assessment of teachers' performance at undergraduate and graduate studies
b. results of student assessment of teachers' performance at postgraduate specialist (PSS) and postgraduate doctoral studies (PDS)
c. management of PSS and PDS programs
d. cooperation (course co-holders, visiting professors, guest lectures - ERASMUS, CEEPUS, etc.) with domestic and foreign higher education institutions
e. received awards / recognitions for teaching
f. …
2) Evaluation of scientific research based on:
a. number of published scientific papers in domestic and international publications
b. referencing of papers in relevant databases (especially those in journals with an impact factor more than 1 and databases such as CC, SSCI, SCI, Scopus, etc.)
c. WoS citation index, the Hirsch citation index, etc.
d. participation in national projects (Ministry of Science, Education and Sports, Croatian Science Foundation)
e. participation in European Union Projects (European Commission)
f. review of studies, programs, projects, books, research papers, etc. in Croatia and abroad
g. appointments to scientific association bodies, appointments to national and international scientific publication committees, appointments to domestic and foreign scientific conference committees, presiding of sessions, invited lectures

at scientific conferences in Croatia and abroad, etc.
h. mentoring in postgraduate studies (defended scientific degree)
i. received awards / recognitions for scientific research
j. …

3) Evaluation of professional engagement (impact in the community) based on:
a. number of published expert papers in domestic and international publications
b. participation in development projects, expertise, studies, feasibility studies, etc.
c. participation in student projects (Student startups - project developed by FEBR and the local community)
d. review of studies, programs, projects, books, research papers, etc. in Croatia and abroad
e. appointments to the boards of national and international professional publications, appointments to professional conference committees, organization of training courses, lifelong learning programs and other forms of education and training in the country and abroad (e.g., summer school), presiding of sessions, invited lectures at professional conferences in Croatia and abroad, etc.
f. appointments to professional association bodies, supervisory and other board in economic subjects, public administration, etc.
g. media appearances
h. received awards / recognition for professional engagement…

4) Evaluation of the participation in faculty & university bodies based on:
a. appointments to the leading positions at institutional and university level (dean, vice-dean, head of department, rector, vice-rector, etc.)
b. appointments to university bodies (senate, council, working bodies, ...)
c. appointments to permanent faculty council committees
d. other forms of teacher engagement: ISO, ERASMUS, ALUMNI, …
e. …

5) Evaluation of support service activities (student affairs office, library, computer center,…) based on:
a. results of student evaluations
b. results of teacher evaluations
c. results of the evaluation by the faculty management
d. results of the evaluation by the individuals heading administrative and technical services
e. appointments to leading positions in support services (heads of administrative and technical services
f. …

Source: Empirical research

Relevant *indicators* for each of the five areas of quality of HEI activities sprang from the guidelines for promoting quality at European, national,

university and faculty level, and the Strategies of the University of Rijeka and FEBR, that have been used in the selections of relevant areas of HEI activities – variables (see section 3.1, second paragraph).

Once the constructs (quality indicators) were set, they were adapted to real life situation and validated according to the opinions from "the field" (teachers and associates at FEBR, a total of 72 respondents). The validation of quality indicators was conducted via e-mail in November 2012 (a response rate of 34.72%), upon which constructs underwent necessary supplementation (correction), resulting in the formation of the final list of relevant quality indicators.

Therefore, the process of determining indicators for individual quality areas underwent 3 phases: 1) constructs were set based on the guidelines for quality assurance in the European Higher Education Area, the national regulatory framework and the strategies of the University of Rijeka and FEBR; 2) quality indicators were validated in a real situation at FEBR, 3) the list of quality indicators was modified based on the opinion gathered from the field.

As previously stated, the justification for the introduction of each of the *five relevant areas of quality* for activities performed by HEIs in the model, as well as the significance of each area within the model, was confirmed by the opinions given by experts in this area of knowledge. The quality area indicators were defined based on the proposal made by the FEBR's *Quality Assurance Committee* and were later modified and amended by the FEBR teachers and research associates.

There are five areas of relevant quality areas of HEI activity, standing out in Table 5, and each is determined by a series of indicators, which are assessed, by FEBR teachers, as describing the specific areas of HEI activity in general well, along with FEBR's activities, as well. However, it should be noted that, at this point, FEBR is systematically evaluating only two of five areas included in the proposed model, according to only some of the indicators proposed in Table 5. Moreover, although this paper suggests the relevant quality areas of HEI activity and assigns each of them a corresponding relative importance, it does not define the methodology for evaluating the indicators for each area, but leaves this challenge for further research aimed at promoting the quality of HEIs.

A systematic evaluation of FEBR is conducted within two areas, i.e. teaching (once a year for undergraduate and graduate studies; upon the

completion of course lecturing for postgraduate specialist studies; upon the completion of first and second year of course lectures at postgraduate doctoral studies) and support service activities (once a year). The systematic evaluation of scientific research is in progress (final preparation stage), whereas the evaluation of professional engagement and participation in faculty and university bodies are part of FEBR's future activities in promoting the quality of study terms.

Evaluation of teaching and support service activities are done according to the already well-known evaluation criteria. However, a new platform, that would complement the existing criteria for the evaluation of teaching and support service activities and that would ensure a comprehensive evaluation of the remaining three areas of FEBR quality, is being set. This platform is conceived as a type of portfolio of all FEBR stakeholders that would enable the monitoring and capturing of all activities within the mentioned areas of FEBR's activity. The gathered data on achievements would be set against the objectives and standards and would be followed by corrective measures directed towards meeting the same. The described activities would serve as a pattern for HEI self-evaluation and would directly contribute to the quality of their work.

At FEBR, the evaluation of the following areas of study terms quality, with special emphasis on given quality indicators, is being conducted. As previously mentioned, only two areas of HEI activity and only some of the indicators suggested in Table 5 are being assessed in this research. However, it is precisely Table 5 that suggests complementing the evaluation of each area by increasing the number of indicators, which will provide a more relevant evaluation of the quality of studies at HEIs in Croatia.

1) Evaluation of teaching at FEBR:

- *student assessment of teachers at undergraduate and graduate studies*
- *student assessment of teachers at postgraduate specialist and doctoral studies.*

While the first indicator stems from the European and national guidelines for quality assurance in higher education and the guidelines recommended by the University of Rijeka and FEBR, the second one can be described as a recommendation and an example of good practice. It is believed that the mentioned quality area of FEBR activities is *in the advanced phase* (all reference and relevant documents for quality assurance are prescribed, existence of systematic evaluation, public disclosure of results on the FEBR's website,

continuous improvement based on the results). Therefore, it is recognized as the strongest area of FEBR's activity in terms of quality (w_1=0.42).

2) Evaluation of scientific research at FEBR:

- the *number of published scientific papers in domestic and international publications*
- *the referencing of the same in relevant databases*
- the *WoS citation index, the Hirsch citation index.*

The described indicators are a prerequisite for teachers' scientific progress, regulation of mentoring at postgraduate studies, but also represent a part of the requirements at European, national, university levels, and the FEBR level. In this regard, active preparations for a systematic evaluation of this area of teacher activities are underway i.e. the existence of an action plan for the advancement of scientific research of the FEBR staff. It is believed that the mentioned quality area of FEBR activities can be positioned *in the phase on the line between the initial and the developed phase* (the majority of required references and relevant documents assuring quality have already been prescribed, evaluation is in progress), and the need for further development in this area can be seen in its weight (w_2=0.27).

3) Evaluation of professional engagement (impact in the community)

4) Evaluation of participation in faculty and university bodies at FEBR

The mentioned quality areas of FEBR activities can be positioned in *the preparatory phase* (only individual reference and relevant documents assuring quality have been prescribed). Although the first stems from the European and national guidelines for quality assurance in higher education and the guidelines recommended by the University of Rijeka and FEBR, and the second represents just an example of good practice, it is expected that their contribution to the promotion of study quality and significance in future evaluation will increase. The above is confirmed by the weights assigned by experts in this field (w_3=0.14 and w_4=0.08).

5) Evaluation of support service activities (student affairs office, library, computer center, etc.) at FEBR:

- *evaluation by students*
- *evaluation by teachers*
- *evaluation by the FEBR management*

- *evaluation by the individuals heading administrative and technical services.*

The mentioned quality area of FEBR activities is *now in the phase on the line between the developed and the advanced phases* (the majority of reference and the relevant documents for quality assurance are prescribed, systematic evaluation exists, the results are publicly disclosed on the FEBR's website, there is continuous improvement based on the results). Although all of this is merely an example of good practice (in accordance with the ESG standards and guidelines for quality assurance in the European Higher Education Area, in the segment dealing with learning and student support), it is believed that it significantly contributes to the promotion of quality study, which is also confirmed by experts' opinion(w_5=0.09)

It should be noted that the ASHE criteria was used to determine the degree of development of the study quality areas, according to which, the level of development of a quality assurance system (QAS) is categorized into four basic phases: 1) preparatory phase, 2) initial phase, 3) developed phase, 4) advanced phase (ASHE, 2010).

Although the model does not explicitly cover the area of international cooperation, it goes through all the areas of teacher activity i.e. academic, scientific and professional activities, thus ensuring the coherence of the system and approximation to the European quality standards in higher education. Moreover, even though the student-assessed quality is not defined as a specific area in the model, it is contained within the variable X_1, the area of teaching quality.

The quality of teaching activities, among other indicators, consists of student assessment of teachers' performance (cf. table 5, no. 1a, and 1b). The students' quality and the teaching quality are reciprocally being improved through student evaluations. The student evaluations offer a valuable feedback to teachers who use them to improve the teaching methods. Better teaching methods are likely to improve the students' quality, skills and knowledge.

Finally, the evaluation of higher education institutions based on staff performance, as described in this paper, opens just a single niche within the whole process of evaluation and ranking of higher education institutions, as that provided by the *Berlin Principles* on *Ranking* of *Higher Education Institutions* (IREG, n.d.). However, it is expected that this research will contribute to the methodology used in evaluating quality in the higher education area.

5. CONCLUSION

Acknowledgement of the relevant quality areas of HEI activity and the enclosure of the proposed quality indicators provide conditions for evaluating and improving the quality of higher education. The diversity and the specific features of individual areas and quality indicators, both quantitative and qualitative, require different approaches in the process of evaluating individual constructs, and should be viewed as a research challenge in developing the quality of higher education.

For the purposes of this research, the aggregate index method was applied to aggregate expert opinions and to define the variable weights as the mean values of the allocated budget. The bootstrap method (bootstrap testing of the hypothesis on the arithmetic mean, the bootstrap repeated measure ANOVA method with post-hoc test, bootstrap correlation, etc.) justified the introduction of all five quality areas of HEI activity into the model, as well as the differentiation in their weights: teaching (0.42), scientific research (0.27), professional engagement (0.14), participation in faculty and university bodies (0.08) and support service activity (0.09), with a 5% significance. Moreover, the methodology applied to determine the relative share of individual indicators within the variable was of crucial importance as well as the methodology for determining the relative share of each variable in the overall (single) assessment (Y). This is the aggregate index, for which it is, prior to its use, necessary to determine the robustness i.e. its sensitivity to different methods of indicator composing.

After defining and justifying the selection of the five quality areas (X_1-X_5) of Croatian HEIs, indicators forming individual areas were proposed. Based on these indicators, current activities and future efforts of FEBR were presented. However, the selection of indicators and the definition of their weights should be a subject of future research. In doing so, it is necessary to expand the research sample of the respondents (to define the indicators for all five quality areas) by including teachers outside the FEBR. These results would complement the proposed model and contribute to the overall concept of quality measurement of HEIs.

Finally, future research should examine the need to include new areas of HEI activities in the research model. The extension of the model should be linked to the changes in HEI's daily operations, growth and development, as well as the changes in its environment.

It should be pointed out that the results of the evaluation of the quality of HEI activities need to be monitored not just based on the totality of results achieved by individuals (overall past achievements), but primarily through the trends in their achievements, i.e. their contribution to the quality of the entire higher education institution as a dynamic category. Therefore, systematic work is needed in evaluating and developing quality in all areas of HEI activity. The efforts in assuring and promoting the quality of studies, with the increase in volume, will lead to an increase in expenses related to these activities. However, the achieved benefits should be manifold and should outweigh the costs. The quantification of these categories and their juxtaposition represent yet another challenge in further research on this issue, in which, the evaluation of the quality of studies becomes a first-class research and policy issue and a must for HEIs in Croatia.

REFERENCES

1. Arbula, A. (2012). Using Data Envelopment Analysis to Evaluate the Efficiency of Higher Education Expenditure in Europe. *Journal of International Scientific Publications. Economy & Business*. 6, 59-69.
2. Aristovnik, A. (2011a). An analysis of the efficiency of education spending in Central and Eastern Europe, *Knowledge as Business Opportunity: Proceedings of the Management, Knowledge and Learning International Conference 2011*, International School for Social and Business Studies, Celje, Slovenia, 277-286.
3. Aristovnik, A. (2011b). The relative efficiency of education and R&D expenditures in the new EU member states, *Public administration of the future: Proceedings of the 19th NISPAcee Annual Conference*, Varna Free University, Varna, Bulgaria
4. Aristovnik, A., Obadić, A. (2011). The funding and efficiency of higher education in Croatia and Slovenia: a non-parametric comparison with EU and OECD countries, *William Davidson Institute Working Paper Number 1007*, University of Michigan. Retrieved on 10 December 2012 from: http://wdi.umich.edu/files/publications/workingpapers/wp1007.pdf
5. AZVO (2010a). *Kriteriji za prosudbu stupnja razvijenosti i učinkovitosti sustava osiguravanja kvalitete visokih učilišta u RH*. Retrieved on 10 December 2012 from: http://www.azvo.hr/images/stories/vanjska_prosudba/Kriteriji.pdf
6. AZVO (2010b). *Priručnik za vanjsku neovisnu prosudbu sustava osiguravanja kvalitete (audit) visokih učilišta u RH, drugo izdanje*. Retrieved on 13 October 2012 from: http://www.azvo.hr/images/stories/vanjska_prosudba/Prirucnik%20za%20vanjsku%20prosudbu.pdf

7. Berlinsko priopćenje (2003). Retrieved on 12th October 2012 from: http://www.iro.hr/hr/javne-politike-visokog-obrazovanja/pravo-na-obrazovanje/medjunarodni-dokumenti/
8. Berkovits, I., Hancock, G. R., & Nevitt, J. (2000). Bootstrap resampling approaches for repeated measure designs: relative robustness to sphericity and normality violations. *Educational and Psychological Measurement*, 60(6), 877-892.
9. Burgman, M., Fidler, F., McBride, M. Walshe, T., & Wintle, B. (2006). *Eliciting Expert Judgments: Literature Review. First project report*. Australian Centre of Excellence for Risk Analysis, University of Melbourne. Retrieved on 20th April 2013 from: http://www.acera.unimelb.edu.au/materials/endorsed/0611.pdf
10. Chan, W., Chan, D. W. (2004). Bootstrap standard error and confidence intervals for the correlation corrected for range restriction: a simulation study. *Psychological Methods, 9*(3), 369-385.
11. Clemen, R. T. (1989). Combining forecasts: A review and annotated bibliography. *International Journal of Forecasting, 5*(4), 559-583.
12. Clemen, R. T., Winkler, R. L. (1999). Combining probability distributions from experts in risk analysis. *Risk Analysis, 19*(2), pp. 187-203.
13. Efron, B. (1979). Bootstrap methods: another look at the jackknife. *The Annals of Statistics, 7*(1), 1–26.
14. Efron, B., Tibshirani, R. J. (1993). *An introduction to the bootstrap* (Vol. 57). New York: Chapman & Hall/CRC.
15. ENQA (2009). *Standards and Guidelines for Quality Assurance in the European Higher Education Area - 3rd edition (ESG)*. Retrieved on 16th April 2013 from: http://www.eqar.eu/fileadmin/documents/e4/050221_ENQA_report.pdf
16. ENQA (n.d.). *ENQA and the Bologna Process*. Retrieved on 11th October 2012 from: http://www.enqa.eu/bologna_overview.lasso
17. Field, A., Miles, J., Field, Z. (2012). *Discovering Statistics Using R*. London: SAGE Publications Limited.
18. Genre, V., Kenny, G., Meyler, A., & Timmermann, A. (2013). Combining expert forecasts: Can anything beat the simple average?. *International Journal of Forecasting, 29*(1), 108-121.
19. Hatch, W. R., Office of Education (DHEW) (1964). *What Standards Do We Raise?: New Dimensions in Higher Education.* ERIC Clearinghouse, Washington, DC.
20. Haukoos, J. S., Lewis, R. J. (2005). Advanced statistics: bootstrapping confidence intervals for statistics with “difficult” distributions. *Academic emergency medicine*, 12(4), 360-365.

21. INQAAHE (2007). *Guidelines of good practice in quality assurance*. Retrieved on 7 September 2012 from: http://www.inqaahe.org/admin/files/assets/subsites/1/documenten/1231430767_inqaahe---guidelines-of-good-practice%5B1%5D.pdf
22. IREG (n.d.). *Berlin Principles on ranking of higher education institutions*. Retrieved on 11 September 2012 from: http://www.ireg observatory.org/index.php?option=com_content&task=view&id=41&Itemid=48
23. Jafarov, E., Gunnarsson, V. (2008). Efficiency of Government Social Spending in Croatia, *Financial Theory and Practice*, 32(3), 289-320.
24. Keselman, H. J., & Lix L. (2012). Analysis of Variance (ANOVA). In Arthur, J., Waring, M., Coe, R., Hedges, L. V. (Eds.), *Research methods and methodologies in education (pp. 338-347)*. London: SAGE Publications Limited.
25. Maggino, F., Ruviglioni, E. (2009). Obtaining weights: from objective to subjective approaches in view of more participative methods in the construction of composite indicators. In *Proceedings NTTS: New Techniques and Technologies for Statistics* (pp. 37-46). Brussels, European Commission, EUROSTA. Retrieved on 15 April 2013 from: http://epp.eurostat.ec.europa.eu/portal/page/portal/research_methodology/documents/POSTER_1A_OBTAINING_WEIGHTS_MAGGINO_RUVIGLIONI.pdf
26. McBride, M. F., & Burgman, M. A. (2012). What Is Expert Knowledge, How Is Such Knowledge Gathered, and How Do We Use It to Address Questions in Landscape Ecology? In Perera, A. H., Drew, C. A., Johnson, C. J. (Eds.), *Expert knowledge and its application in landscape ecology* (pp. 11-38). New York: Springer.
27. Meyer, M. A., Booker, J. M. (2001). *Eliciting and Analyzing Expert Judgment: A Practical Guide*. Philadelphia: SIAM Press.
28. Moldan, B., Billharz, S. (1997). *Sustainability Indicators: Report of the Project on Indicators of Sustainable Development*. (SCOPE 58). Chichester and New York: John Wiley & Sons.
29. Mosleh, A., Bier, V. M., & Apostolakis, G. (1988). A critique of current practice for the use of expert opinions in probabilistic risk assessment. *Reliability Engineering & System Safety*, 20(1), 63-85.
30. NZZ (2007). *Kvaliteta u visokom obrazovanju*, Lučin, P. (Ed.). Retrieved on 12 October 2012 from: http://www.hrzz.hr/docs/pub/nzz-kvaliteta_za_web.pdf
31. Nardo, M., Saisana, M., Saltelli, A., & Tarantola, S. (2005). *Tools for composite indicators building*. (EUR 21682 EN). Ispra, Italy: European Commission Institute for the Protection and Security of the Citizen, JRC.

32. OECD & EC/JRC (2008). *Handbook on Constructing Composite Indicators: Methodology and User Guide* (302008251E1), Paris and Brussels.
33. Pravilnik o postupanju po provedenoj anketi studenata o evaluaciji rada nastavnika Ekonomskog fakulteta u Rijeci (2010). Retrieved on 5 September 2012 from: http://www.efri.uniri.hr/dokumenti/PRAVILNIK_O_POSTUPANJU_PO_PROVEDENOJ_ANKETI_STUDENATA.pdf
34. Pravilnik o postupku izbora nastavnika, znanstvenika i suradnika u zvanja i na odgovarajuća radna mjesta na Sveučilištu u Rijeci (2006). Retrieved on 13 October 2012 from: http://www.uniri.hr/hr/propisi_i_dokumenti/pravilnik_o_izboru_u_zvanja.pdf
35. Pravilnik o studijima – pročišćeni tekst (2008). Retrieved on 5 September 2012 from: http://www.uniri.hr/hr/propisi_i_dokumenti/Pravilnik_o_studijima-procisceni_tekst.pdf
36. Pravilnik o studiranju (2006). Retrieved on 5 September 2012 from: http://www.efri.uniri.hr/prikaz.asp?txt_id=3497
37. Pravilnik o sustavu za kvalitetu Ekonomskog fakulteta u Rijeci (2010). Retrieved on 5 September 2012 from: http://www.efri.uniri.hr/dokumenti/PRAVILNIK_O_SUSTAVU_ZA_KVALITETU.pdf
38. Pravilnik o sustavu za kvalitetu Sveučilišta u Rijeci – pročišćeni tekst (2008). Retrieved on 7 September 2012 from: http://www.uniri.hr/hr/propisi_i_dokumenti/Pravilnik_o_sustavu_za_kvalitetu.pdf
39. Pravilnik o uvjetima za izbor u znanstvena zvanja (2005). *Narodne novine*, 84/2005.
40. Pravilnik o vrednovanju programa cjeloživotnog učenja (2009). Retrieved on 9 September 2012 from: http://www.uniri.hr/hr/cjelozivotno/Pravilnik_o_vrednovanju_programa_cjelozivotnog_ucenja.pdf
41. Priručnik za kvalitetu studiranja (2012). Retrieved on 7 September 2012 from: http://www.uniri.hr/files/kvaliteta/PRIRUCNIK%20ZA%20KVALITETU%202012_01_lipanj.pdf
42. Simola, K. Mengolini, A., & Bolado-Lavin, R. (2005). *Formal expert judgement: An overview* (EUR21772). European Commission, General Joint Research Centre (DG JCR), Institute for Energy.
43. Strategija Ekonomskog fakulteta u Rijeci (2010). Retrieved on 12 October 2012 from: http://www.efri.uniri.hr/dokumenti/Strategija_EFRI_2010-2015.pdf
44. Sveučilište u Rijeci Strategija 2007.-2013. (2007). Retrieved on 12 October 2012 from: http://arhiva.uniri.hr/hr/propisi_i_dokumenti/Strategija%20UniRi%2019Lip_2007.pdf
45. UNESCO/OECD (2005). *Guidelines for Quality Provision in Cross-border Higher Education.*

Retrieved on 12 October 2012 from: http://www.oecd.org/dataoecd/27/51/35779480.pdf
46. Vairo, P. D. (1965). Faculty Quality - A Challenge to the Community College, *Journal of Higher Education,* 36(4), The Ohio State University Press, Ohio. Retrieved on 15 April 013 from: http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED017240
47. Zakon o osiguravanju kvalitete u znanosti i visokom obrazovanju (2009). *Narodne novine,* 45/2009.
48. Zakon o visokim učilištima (1993). *Narodne novine,* 96/1993.
49. Zakon o znanstvenoj djelatnosti i visokom obrazovanju (2003). *Narodne novine,* 123/2003.

RELEVANTNA PODRUČJA I INDIKATORI KVALITETE U INSTIUTCIJAMA VISOKOG OBRAZOVANJA: EVALUACIJA SUSTAVA VISOKOG OBRAZOVANJA U PODRUČJU EKONOMIJE

Sažetak

Temeljni cilj ovog istraživanja je definiranje relevantnih područja aktivnosti za nastavnike i druge dionike osiguranja kvalitete u visokom obrazovanju u Republici Hrvatskoj (RH). Također se želi utvrditi relevantnost uključivanja dionika u istraživački model. Pojedinačna područja aktivnosti se potvrđuju na temelju mišljenja eksperata iz odgovarajućih institucija u RH. Autori koriste metodu alokacije budžeta da bi agregirali mišljenja eksperata, odredili težinske koeficijente te definirali agregatni pokazatelj. Testiranje hipoteze o aritmetičkoj sredini „bootstrap" metodom potvrdilo je uključivanje relevantnih područja kvalitete institucija visokog obrazovanja u istraživački model. Ova područja su: podučavanje (X_1), znanstveno istraživanje (X_2), stručni angažman (X_3), sudjelovanje u radu fakultetskih i sveučilišnih tijela (X_4) te aktivnosti podrške (X_5). Na temelju mišljenja eksperata, utvrđeni su sljedeći težinski koeficijenti za pojedina područja kvalitete: w_1= 0.42; w_2=0.27; w_3=0.14; w_4=0.08; w_5=0.09. Uzevši u obzir specifične karakteristike različitih institucija unutar akademske zajednice, ovaj se rad fokusira na ekonomsko visoko obrazovanje u RH. No, uz odgovarajuće promjene relevantnih pokazatelja, može se očekivati da bi se predmetni model mogao primijeniti i u institucijama visokog obrazovanja u nizu drugih područja.