

UNIVERSITIES' COMPETITIVENESS MODELS IN ACADEMIC MANAGEMENT: A NATIONAL-LEVEL APPROACH

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The developing international education market requires additional qualitative and detailed information on the comparative characteristics of universities. This study suggests a single synthetic model for describing and assessing universities' competitiveness at the national level for advanced, emerging, and transitioning economies. The model is based on the same methodology as international university rankings, but employs different techniques for initial clustering and further analysis. We identified four different university clusters in the Russian Ministry of Education and Science database, distinguished by specific development goals. We argue that applying these clear and well-defined criteria as clustering attributes allows us to compare competitiveness in different settings, formulate academic management strategy and recommend policy guidelines tailored precisely for each university's requirements.

Key words: education market, higher-education competitiveness, models of competitiveness, academic management, university rankings.

JEL Codes: I21, I23.

1. Introduction

Since the late 1980s, one of the most important trends in world development has been the modernization of the welfare state concept, which includes the educational multicultural component (Kuznetsova, 1998), the globalization of markets, the scales and spheres of competition and expansion above state and regional borders. 'National competitiveness' has become a commonly used term that includes specific statistical components, such as the Global Competitiveness Index (by WEF, World Economic Forum) and IMD World Competitiveness Ranking (by IMD, International Institute for Management Development).

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Since human capital, knowledge, and innovations are important elements of national competitiveness, educational and research systems (universities, primarily) became widely represented in these studies.

The developing international education market, the increasing cross-border mobility of students and teachers, and the improving international cooperation in research required more qualitative and detailed information on the comparative characteristics of universities. Consequently, description, presentation, measurement, and assessment of the problems of universities' competitiveness have gained wide representation in scientific literature (OECD, 2009; Salmi, 2009; Clark, 2011; Supjan, 2012; Khalin, 2015; Douglass, 2016; Project, 2018). These developments have further stimulated the growing demand for comprehensive and easy-to-access comparative information. Several public educational and private informational bodies have responded to the demand and started to provide relevant data. Among them, such entities as Shanghai Jiao Tong University, Times Higher Education (THE) magazine, and Quacquarelli Symonds (QS, provider of business education) have become de-facto global standard setters. By the end of 2010, the developed indices of the Academic Ranking of World Universities (ARWU, since 2003), THE World University Rankings (THE WUR, since 2004), QS World University Rankings (QS WUR, since 2010), and the corresponding databases became the most popular sources of information on the comparative positions of different countries' universities.

The mentioned indices quickly turned into universally recognized models of international competitiveness and began to shape the behavior of potential students, academics, and managerial officers of education. Being included in the world's top universities list became a coveted position and both universities and government bodies began making that a policy target. By 2008, that is, 4–5 years after the establishment of the rating system, improvement in the universities' positions was reflected in educational policy priorities in such diverse countries as Australia, Germany, China, Korea, Malaysia, Russia, France, and Japan (Hazelkorn, 2008). In most countries, academic administrations and management have adjusted their activities to improve competitiveness (Carson, 2013).

The wide use of the ratings results has led to changes in both educational and research activities of universities worldwide. As the developments in the United States, Australia, and Europe are well documented (Lombardi, 2016; LH Martin Institute, 2014; Paleari, 2015), we focused mostly on Asian and Eurasian dynamics just due to a lack of data mining and research in these regions. We found out that the rich oil-producing Persian Gulf countries aimed at attracting high-rating foreign universities to specially created educational zones (Ashour, 2016). Moreover, large Muslim countries, such as Indonesia, have developed an optimal policy for the speediest increase in international positions for the single largest university in each country (Dewi, 2015).

The most relevant developments for Russia and other transitional economies (from the standpoint of educational system reformation and experience implementation) were those seen in the countries and territories of East Asia belonging to the

Chinese (Confucian) cultural area, that is, Hong Kong, China, Korea, Malaysia, Singapore, Taiwan, and Japan. A catching-up type of industrialization and mentality of these countries' ruling class can be considered a common feature of the listed states. In these countries, increased international competition in higher education and the emergence of university rankings in the early 2000s led to a strong sense of them lagging behind the leading economies and a desire to catch up (Shin, 2015). The result was the adoption of programs to eliminate gaps and enhance national education competitiveness. These programs, although differing from country to country, generally had several common features. The implemented policies were aimed at strengthening the positions of leading universities in world rankings. The policies focused on public universities' corporatization and expanding independence, developing and implementing measures to attract foreign students and teachers, strengthening the competition for research funds, and consolidating higher education institutions (Belov, 2014). Systematic work within the framework of adopted programs has significantly increased the competitiveness of higher education in most East Asian countries (Chan, 2018).

The same measures that were applied in the countries of East Asia have formed the basis of higher education modernization in Russia since the late 2000s. For almost 10 years, the country's universities have changed dramatically, but the overall assessment of the ongoing reform results has been contradictory (Dokukina, 2016). Why did similar measures in Russia and East Asia produce different results? What factors have determined the uncertain dynamics of Russian educational institutions? Unequivocal answers to these questions are hardly possible, as the comparative positions of universities are determined by a wide range of macro and micro characteristics (OECD, 2016).

In order for universities (as well as national research and educational systems) to gain a sustainable competitive advantage, the application of a sophisticated and multi-dimensional strategy is required. In this regard, describing and assessing universities' competitiveness plays an indispensable role in compiling detailed qualitative information for academic management. Most countries analyze their respective educational entities by applying the same approaches as those used in comparatively simple international ratings, which are based on two general parameters: the goal and the means. The goal is to acquire a competitive edge in order to win investments and grants as well as attract capable researchers, teachers, and students. The means involves infrastructure development, productivity and quality gains, and amongst other factors reputation enhancement.

We assert that at the national level, research and education policy modelling should expand beyond these narrowly defined boundaries of market competitiveness and find a way to determine the scope of the public and private sectors, establish clear rules for competition and cooperation, and develop effective institutions for the market and non-market provision of public goods. The complexity of the mentioned tasks in practice leads to the grouping of national universities and the formulation of academic policies separately for each group. Such a multi-layered approach to the

development of universities in several Asian countries allowed significant achievements and therefore, can be regarded as the internationally viable best practice example. We argue that the application of such a multilayered approach to the definition of academic policy can be beneficial for economies in transition.

Effective use of global best practices is indeed a challenging task for academic management. However, for this particular field of research meaningful results can be obtained by applying novel analytical tools. The hypothesis of this study is that a single synthetic model for describing and assessing universities' competitiveness can be developed and used effectively for both advanced, emerging, and transition economies, including Lithuania and other Baltic states. The goal of the study is construction of the principal framework for such a model.

The methodology is based on the comparative analysis and clustering of the universities, according to the world ratings data and the database for monitoring the effectiveness of higher education institutions compiled by the Russian Ministry of Education and Science (Ministry..., 2018). In our previous study, we performed a cluster analysis of the competitiveness level of some 300 universities in terms of education quality, scientific research level, degree of internationalization, and contribution to territorial development (Khalin, 2018). In this research, we conducted an expert assessment of these universities' competitiveness policies, taking into account the results previously observed but employing different techniques for initial clustering and further elaboration. More specifically, we categorized the policies into four components: 1) sustaining present positions within university groups; 2) acquiring better placement within a group; 3) rising to a higher-level group; and 4) entering a group from a 'non-grouped' zone. We then divided our dataset into four different clusters, distinguished by these specific development goals. Finally, to test our hypothesis, we revisited the original data and checked the clusters hypothetically identified against the policies actually implemented by the universities. Therefore, this study's methodology involved consistently applying expert estimation, theoretical generalization, and empirical verification techniques. The rest of this paper presents the theoretical framework for competitiveness modelling, suggests the general models for specific university clusters, and discusses the connections between the general models and existing world university rankings. The study concludes by summing up the findings and providing some policy implications.

2. General models of university competitiveness

Institutional changes in the Russian higher education system over the past decade have led to the formation of leading federal and national research system-forming universities clusters, etc.

The main reason for the allocation of universities clusters is the large differentiation of specific goals for the universities' functioning and development, as well as the potential and real universities' capacity to achieve these goals.

Specific objectives of the university operation and development, as well as the task of evaluating and improving their own competitiveness predetermined their clustering capability according to a variety of properties. For Russia, having a vast territory, it is extremely important the allocation of a regional universities cluster.

Universities' clustering can be carried out on the basis of a subject area of training – for example, clusters of higher education institutions with basic training of students in natural sciences and clusters of universities with basic training in the humanities can be singled out.

For all universities that are part of the same cluster or of different clusters with the same or different goals of their development, the problem of competitiveness assessment and improvement is relevant. Therefore, it is very important to represent the university's activities in such a way that the possibility of different target settings for the functioning and development of different universities is taken into account, as well as a chance of the level of university's competitiveness reflection.

A specific feature of the competitiveness problem consideration in the writings of well-known specialists is the originality of their models of universities' competitiveness, which is tied to the universities of a particular cluster, status or level, for example, the competitiveness model for world-class universities, national research universities, etc. However, the need for a uniform description of any university competitiveness, including those belonging to different clusters, necessitates a certain formalized description of the university's activity reflected in its competitiveness.

Such a description can be a model of the university's competitiveness, representing a set of values observing two main parameters of its activity:

- the purpose of the university's functioning and development;
- a set (list) of conditions and requirements for the university's activities, the simultaneous and mandatory implementation of which guarantees the university under consideration certain competitive advantages.

The variety of goals for universities functioning and development, the compulsory conditions they meet, the requirements that guarantee the University certain competitive advantages, determines a variety of universities competitiveness different models. Naturally, the content of these models, described by two main parameters, will also be different (Table).

We note that the conditions and requirements, the compulsory and simultaneous implementation of which meet certain university's competitive advantages, have specifics of their own for different models and determine the criteria for the competitiveness of the university for each of them. If the relevant conditions and requirements for competitive advantages determined by the model are met, the university within the corresponding model is competitive.

Table. Variants of parameters content for the specific university competitiveness model

Model number	The purpose of the university functioning and development	Conditions and requirements, compulsory and simultaneous implementation of which meets certain university competitive advantages	Note
Model 1	The status of a university preservation that corresponds to a certain cluster of universities	Conditions and requirements, the compulsory and simultaneous implementation of which guarantees the university's preservation (availability) of competitive advantages that correspond to the status of a certain universities' cluster.	The University is in a certain cluster
Model 2	Obtaining the university status that corresponds to the desired cluster.	Conditions and requirements, the compulsory and simultaneous implementation of which guarantees the university's competitive advantages gain allowing the university to enter a desired cluster.	The university is in a certain cluster and sets the goal of moving to another cluster (usually with higher requirements for competitiveness)
Model 3	Obtaining the status of a university that corresponds to the cluster in which the university wants to enter	Conditions and requirements, the compulsory and simultaneous implementation of which guarantees the university the receipt of competitive advantages that correspond to the cluster in which the university wishes to enter	The University sets a goal - to enter a certain cluster of universities (regardless of its initial location in any cluster)
Model 4	Increase of one's own competitiveness on the basis of a concrete task decision making	Conditions and requirements, simultaneous and compulsory implementation of which will meet the stated objective of their own competitiveness increase	The university has a specific task of its own competitiveness increase

Model 1 of the University's competitiveness is a model of maintaining the existing status of the university. It is used to describe a university competitiveness already in a certain cluster. The purpose of such a university functioning and development is to preserve its status, which corresponds to the cluster in which this university already belongs. The criterion for maintaining the status of the university is the compulsory and simultaneous fulfillment of those conditions and requirements imposed on the university's activities, which guarantee the university's preservation of competitive advantages corresponding to the corresponding cluster.

Model 2 is a model of the university's competitiveness in its transition from one cluster to another.

The peculiarity of this model is the following. Initially, the university belongs to a certain cluster (for example, to a cluster of flagship universities). This means that its activity is adequate to the competitiveness characteristics of flagship universities.

The goal of moving to another cluster of universities, (for example, in a cluster of world-class universities), involves meeting the conditions and requirements that determine the competitive advantages for the universities of the new cluster of world-class universities.

The criterion for a new university status acquisition based on this model is the compulsion and simultaneity of those conditions and requirements fulfillment for the university's activities that guarantee the university's competitive advantages gain that meet the new cluster of world-class universities.

For different clusters of universities, some of the verbal conditions and competitiveness requirements may coincide. However, it must be remembered that the specification of these conditions for different clusters may be different. Moreover, the similarity of the verbal formulations of individual conditions and requirements for different clusters also does not guarantee that this is actually the same requirement.

An example is the condition of the talents availability for a cluster of world-class universities and flagship universities. The model of Jamil Salmi (2009) for world-class universities presupposes that the verbally presented demand for the compulsory availability of talent at the university sounds like "the concentration of talents", and in Douglas model for the flagship universities the talents availability is presented as "the development of individual human capabilities". Consider that when a university moves from a cluster of flagship universities to a cluster of world-class universities, the requirement for talent is the same for both clusters, only if its specification in both cases is the same. Otherwise, when a university moves from a cluster of flagships to a cluster of world-class universities, it is necessary to fulfill the requirement of having talents in interpreting the model of competitiveness of a cluster of world-class universities, i.e. cluster, in which the given university enters.

The model 3 of university competitiveness is the model of the university entering into a certain cluster. The purpose of the functioning and development of the university in this model is its entry into a certain cluster, regardless of the starting situation of the university (either regardless of one's initial conditions), i.e. getting the university status corresponding to the cluster in which the university wants to enter. Criterion for the university to enter a certain cluster, i.e. the criterion for acquiring a new status is the compulsory and simultaneous fulfillment of those conditions and requirements imposed on the university activities, which guarantee the university gain of competitive advantages corresponding to the chosen cluster. For example, the goal of the university is to obtain the status of a research university. To achieve this goal, the university must meet the conditions and requirements that meet its competitive advantages, corresponding to the status of the research university.

Model 4 of the universities competitiveness is a model of self-competitiveness increase. The specifics of this model include the following. The purpose of the functioning and development of the university at a certain stage can be the solution of a specific task of increasing the competitiveness of its own, for example, the task of educating talented youth at the university. The solution of this task

must meet certain conditions and requirements, the fulfillment of which will correspond to the solution of the task. For example, it may be the requirements for the establishment of a student scientific society, the holding of international student Olympiads and conferences, etc. The criterion for increasing the university competitiveness in this case is the compulsion and simultaneity of the fulfillment of conditions and requirements concentrated on decision-making of increasing the competitiveness of the university.

The solution of a specific task of increasing one's own competitiveness involves the formation of the above-mentioned model, and an assessment of the feasibility of this task. Thus, the reasons for such an assessment may be:

- the need to analyze the chances (financial, labor, personnel, etc.) of this model implementation aiming to increase self-competitiveness, either to formulate the final decision on this model adoption, or to construct an intermediate solution when there are doubts, for example, on the resource possibilities for such model realization;
- the need to analyze the results of intermediate and / or final results.

The assessment carried out in these cases involves a comparative analysis of the values of parameters (indicators) meaning conditions and requirements that correspond to the adopted model of increasing self-competitiveness, with their actual values. These models of university competitiveness can be used to solve other problems related to the universities competitiveness.

3. The University Competitiveness Rating Model

Nowadays, the prestigious world rankings of universities mentioned above, such as the Times Higher Education World University Rankings (THE WUR), Quacquarelli Symonds World University (QS), Academic Ranking of World Universities (ARWU) are widely spread in universities' competitiveness assessment. These models could be called additional as far as they are usually used in case of not enough clear identification of universities' competitiveness on the basis of general models. A feature of the proposed models of university competitiveness ratings is the following.

The usual model of the university competitiveness belonging to a particular cluster is characterized by two parameters – the status of the university that corresponds to this cluster and the set of conditions and requirements that meet the competitive advantages of any university in this cluster and therefore provide the university with a certain status. If for a particular university, at least some of the criteria for the competitiveness of this cluster are not fulfilled. Nevertheless, this same university would like to assess its competitiveness in relation to competitiveness of other universities, which belong to the particular cluster.

To solve the problem the particular university competitiveness assessment in relation to the competitiveness of other universities, one can build a university competitiveness rating.

Usually, any rating is understood as a set of objects, ordered by the value of any indicator or attribute. Any university competitiveness rating is described by the two main parameters:

- the purpose of a university competitiveness rating construction is to determine the degree of proximity of the university's performance indicators that characterize its competitiveness to the relevant performance indicators of the best universities in a particular cluster participating in such rating. For example, the aim of St. Petersburg State University's participation in authoritative world rankings (ARWU, THE WUR universities, QS World University) is to assess the opportunities for St. Petersburg State University to enter the cluster of world-class universities. All three rankings are associated with a cluster of world-class universities, but differ in the specificity of the conditions and requirements for competitiveness, as well as by methods for the final ratings calculation that determine the place of the university in the ranking. The values received in these ratings should reflect the closeness of the SPbU performance indicators that characterize its competitiveness to the corresponding indicators of the world-class universities;

- the place of the university in an orderly (increasing or decreasing) sequence of universities, built on the values of the performance indicators of these universities, meeting certain competitive advantages characteristic of the universities of this cluster. For example, 93rd place of Moscow State University named after M. Lomonosov in the authoritative ranking ARWU-500 in 2017 argues that MSU is far from the advanced universities of this cluster, and those universities stand above MSU in this rating.

The university's competitiveness rating, i.e. their ordered totality, is necessary to construct in accordance with the value of the indicator reflecting the degree of the considered university fulfillment of those conditions and requirements, the simultaneous and compulsory implementation of which ensures competitiveness, corresponding to the universities of a particular cluster. If the rating is built for universities entering or wishing to enter the cluster of world-class universities, the place of a particular university in the rating should be determined by the value of the final indicator (index) of this university activity, showing the degree of proximity of its competitiveness to the competitiveness of the university of the initial cluster, i.e. already having the world-class university cluster.

The constructed University's competitiveness rating will match to an expanded rating cluster compared to original cluster. The expansion happens due to the fact that it will include not only those universities for which all conditions for competitive advantages are met, and therefore these universities have the status of an initial cluster university, but also those that assess the degree of their competitiveness in comparison with the competitiveness of the initial cluster universities, i.e. evaluate the degree of the requirements for the competitive advantages fulfillment provided for the initial cluster university.

Similar ratings can be built for any initial clusters - for world-class universities, national flagship universities, etc. In addition, ratings can be constructed for certain areas of knowledge and field of expertise. For example, the subject ranking of Shanghai Ranking's Global Ranking of Academic Subjects 2017 (Shanghai ..., 2017) identifies such subject areas as "Finance", "Management", "Economy".

3. Conclusion

1. The classification and comparison of universities at the national level requires formalized techniques for initial clustering as well as for further analysis. Therefore, we suggest a general model of competitiveness with two parameters for different university clusters. These are distinguished by four university-specific development goals: 1) entering the cluster, 2) retaining positions, 3) gradual improvement, and 4) climbing to the higher ranked cluster.

2. The model employs the same methodology as international university rankings. Simultaneously, using the clear and well-defined criteria as clustering attributes, we can better compare the ability to compete in national settings. We can also formulate policy guidelines that are tailored more precisely for the requirements of each university. An empirical check confirms that the model effectively describes nearly all types of development strategies observed amongst the 300 Russian universities that were analyzed. In general, the model can be effectively applied to several emerging and transitioning economies.

3. This study does not exhaustively analyses the enormous pool of problems associated with the adequacy of information provided for the purpose of enhancing educational competitiveness. At the same time, university clustering with development goals as attributes, elaborated in this research, is a novel idea, without direct parallels in the related literature. Despite of the inevitable sketchiness of the topic, this study may develop a solid foundation for a broader scientific discussion.

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UNIVERSITETŲ KONKURENCINGUMO MODELIAI: NACIONALINIS POŽIŪRIS Į AUKŠTOJO MOKSLO VALDYMĄ

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Santrauka

Straipsnyje lyginamas skirtingų šalių universitetų konkurencingumas, kuris apsprendžia specialų metodologinį požiūrį į konkrečių konkurencingumo modelių nustatymą. Tyrimo tikslas yra empirinis tokių modelių nustatymas. Tikslui pasiekti autoriai naudojo apie 300 tarptautinių ir Rusijos universitetų duomenų bazes bei jų plėtros programas. Siūlomi bendri konkurencingumo modeliai, atspindintys universitetų vystymosi tikslus ir konkurencinio pranašumo reikalavimus. Šie parametrai skirtingiems universitetams skiriasi, o tai lemia modelių įvairovę. Straipsnyje siūlomas papildomas universitetų konkurencingumo vertinimo modelis, siekiant paaiškinti aukštojo mokslo reitingavimo skirtumus.

Raktiniai žodžiai: švietimo rinka, aukštojo mokslo konkurencingumas, konkurencingumo modeliai, akademinis valdymas, universitetų reitingai.

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