

MECHANISMS OF HIGHER SCHOOL DEVELOPMENT IN THE PARADIGM OF ITS GLOBAL COMPETITIVENESS (ON THE EXAMPLE OF THE KAZAN FEDERAL UNIVERSITY)

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Abstract. The study examines the mechanisms for assessing the competitiveness of universities in accordance with various methodological approaches used in the system of international rankings; determines the degree of convergence of the rankings in question both in integral and in private performance assessments, and identifies the most significant indicators on this basis, followed by focusing some tools, mechanisms and directions to improve the competitiveness of Russian universities on them. Particular attention is paid to the identification of regional features of the territories that form the potential and direction of development of federal universities, adapted to the existing competitive advantages.

The method of works conduct is based on the use of tools for econometric analysis of the evaluation of the convergence of international academic rankings (ARWU (The Academic Ranking of World Universities), THE (Times Higher Education), QS (Quacquarelli Symonds)) by determining the values of Spearman ratios, as well as tools of statistical analysis and other special methods that help define and search for key areas for the development of federal universities that ensure the growth of their global competitiveness.

The novelty of study consists in the developed conceptual approach of determining the key directions of the development of universities of the Russian Federation taking into account the assessment of their global competitiveness, as well as relying on territorial aspects and peculiarities of their functioning.

Key words: International rankings, competitiveness of Russian universities, regional features of development, knowledge economy, regional development.

1. INTRODUCTION

In modern conditions, characterized by the globalization of development mechanisms and tools, an appropriate range of approaches is needed to assess the competitiveness of economic entities that are more or less integrated into the system of world reproductive chains. This issue formulation is especially relevant in the context of studying the current and prospective development of the system of higher education - one of the key drivers of scientific and technological development of the national economy. Higher school, acting as an educational system, simultaneously, in accordance with modern approaches to the interpretation of its development paradigm (Concept University 3.0) is the basic element that forms the basis of scientific and technological breakthroughs and their commercialization, triggering mechanisms for changing technological structures. Thus, it can be argued that the level of competitiveness of HEIs, as the main elements of the Higher School, determines the current and prospective correspondence of the competitiveness of national economy on a global scale.

Understanding the current positions of Russian HEIs in the system of world research and educational rankings forms an idea of the prospective potential of the Russian higher school in the system of global competitiveness, as well as determines the range of the most acute problems and directions of development. In our opinion, the assessment of competitiveness of scientific and educational institutions at the level of a single national economy leads to the risk of a significant "narrowing" in identifying the existing problems.

Undoubtedly, it causes both scientific and practical interest to define and understand the factors that generate the ranking positions of HEIs in the focus of a single socio-economic system. However, this approach is not able to fully reveal the severity of issues related to the assessment of global competitiveness of higher educational institutions (*Shanghai Ranking Consultancy*, 2016). Meanwhile, taking into account the high level of globalization of economic, social and other processes, an approach based on an integrated, systematic evaluation of the effectiveness of functioning of scientific and educational institutions in comparison with the leading universities of the world should be the most promising direction for assessing the competitiveness of higher education institutions (QS Top universities, 2016).

2. METHODS

At the current time there are several global rankings that assess the competitiveness of higher education and research institutions around the world in the world (Times Higher Education, 2016). The very international rankings are a relatively new phenomenon in university life and have emerged relatively recently: ARWU (Safiullin, M. & Saveliche, 2014) ("Shanghai") - in 2003, an appendix to the newspaper Times - in 2004, later, in 2009, this ranking broke up into the ranking of QS and Times Higher Education (THE). A little earlier, the ranking of the publication US News and World Report, originally intended for American HEIs, arose in the USA. (*Global Entrepreneurial University Metrics*)

It is noteworthy that all the above-mentioned published global rankings differ to various extents (both in the estimation methodology and in relation to the obtained rank estimates), which is of interest not only in the context of their representativeness, but also in the context of their choice and applicability to assessing the competitiveness of Russian higher educational institutions on a global scale. In this regard, it is of scientific and practical interest to determine the degree of convergence of the rankings in question both in integral and in private performance assessments, and on this basis the identification of the most significant indicators, followed by focusing some tools, mechanisms and directions for the development of Russian universities on them. In this paper, this type of works is implemented on a comparative analysis of the ARWU, THE and QS rankings - the most significant and authoritative international rankings of the universities.

Based on the data published for 2016 (*Shanghai Ranking Consultancy*, 2016; QS Top universities, 2016; Times Higher Education, 2016), we made some estimates of the convergence of rankings by determining the values of the Spearman ratios. The calculation results are presented in Table 1.

Table 1: Spearman correlation ratios between ARWU, THE, QS

	ARWU	THE	QS
ARWU	-	0,78 (N = 364)	0,68 (N = 366)
THE	0,78 (N = 364)	-	0,79 (N = 385)
QS	0,68 (N = 366)	0,79 (N = 385)	-

The correlation dependence of ranking results is significant. This means that, a university that has a good reputation under one ranking, most likely has also proved itself well according to other two rankings.

A similar study was carried out in the context of key sub-indices (indicators of the University effectiveness) involved in determining the ranking values of HEIs in accordance with ARWU, THE, QS (the rank values of the analyzed sub-indices were identified based on data published by ARWU, THE, QS (*Shanghai Ranking Consultancy*, 2016; QS Top universities, 2016; Times Higher Education, 2016)).

3. RESULTS

In accordance with this approach to the interpretation of the importance of performance indicators, Table 2 shows the most significant parameters (performance indicators) of the University functioning, identified by the results of the study on convergence conducted. In total, 47 indicators participated in the calculations (a detailed description of the indicators is presented in the description of the methodology for calculating the ARWU, THE, QS rankings (*Shanghai Ranking Consultancy*, 2016; QS Top universities, 2016; Times Higher Education, 2016)).

Table 2: The most significant performance indicators according to ARWU, THE, QS (data were obtained on the basis of Spearman ratio calculations), 2016

Performance indicator	Degree of convergence			Number of points (at least 4)
	ARWU	THE	QS	
Indicators characterizing the University's students				
Number of Doctoral Degrees Awarded	strong	moderate	moderate	4
Indicators characterizing the University's economic efficiency				
Total Amount of Institutional Income	strong	strong	moderate	4
Income from Public Sectors	strong	moderate	moderate	4
Total Amount of Research Income	strong	strong	strong	5
Research Income from Public Sectors	strong	strong	strong	5
Indicators characterizing the University's research activity				
Total Number of Papers	strong	moderate	strong	4
Number of Citations (Self-Citations Excluded)	very strong	strong	strong	5
Citations Per Paper	moderate	strong	moderate	4

(Self-Citations Excluded)				
Number of internationally Co-authored Papers	strong	strong	strong	5
Number of Highly Cited Papers	very strong	strong	strong	5
Number of SCIE and SSCI Papers	strong	strong	strong	5

Table 3 presents a comparative analysis of the selected indicators for the Kazan Federal University in comparison with three foreign universities corresponding to its scale: Helsinki University (UH), Peking University (PKU), Lund University, Sweden (LU).

Table 3: Comparative analysis of the efficiency of KFU activity on the basis of the most significant performance indicators identified according to ARWU, THE, QS, 2016

Performance indicator	KFU	UH	PKU	LU
Indicators characterizing the University's students				
Number of Doctoral Degrees Awarded	167	478	942	408
Indicators characterizing the University's economic efficiency				
Total Amount of institutional Income, mln. US dollars	193	957	1,396	1,104
Income from Public Sectors, mln. US dollars	121	794	593	865
Total Amount of Research Income, mln. US dollars	32	621	381	746
Research Income from Public Sectors, mln. US dollars	23	526	304	584
Indicators characterizing the University's research activity				
Total Number of Papers (2011-2015)	2,416	20,901	30,973	19,11
Number of Citations (Self Citations Excluded) (2011-2015)	11,33	320,97	368,55	279,1
Citations Per Paper (Self-Citations Excluded) (2011-2015)	3.88	15.11	11.73	14.45
Number of internationally Co-authored Papers (2011-2015)	987	12,377	11,662	12,64
Number of Highly Cited Papers (2011-2015)	10	573	660	488

The data specified in Table 3 demonstrate some lag of the KFU for a number of competitiveness indicators against the background of the universities chosen for comparison. However, it should be noted that the "top" position in the world rankings are occupied by the latter: according to the results of 2016 - UH (56 position), PKU (71 position) universities entered the top 100 ranking. They are followed by LU, located at the 138th place of the ARWU.

It is noteworthy that the Kazan Federal University, showing moderate indicators of global competitiveness, is the leader in most performance indicators among federal universities in Russia. At the same time, it also demonstrates confident positive growth dynamics of its rank indicators in the system of international rankings (Figure 1). Thus, it can be stated that this problem is of a systemic nature and requires a comprehensive solution for the early exit of the Russian higher school to a high level of global competitiveness.

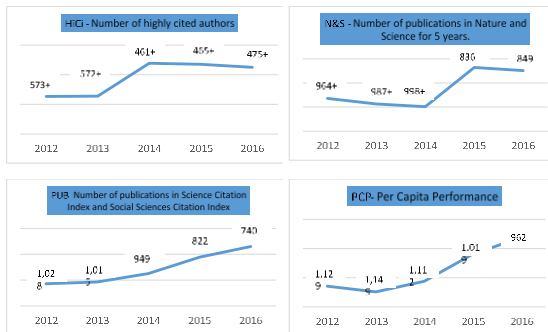


Figure 1. Dynamics of key performance indicators of the Kazan Federal University in accordance with the ARWU international ranking (Shanghai Ranking Consultancy, 2016)

4. CONCLUSIONS

One of the main reasons for the moderate values of global competitiveness of Russian HEIs, determined on the basis of the system of international rankings, is an outdated model of approach to higher education, where, in many respects, the universities have only a "service", infrastructural role in the socio-economic development (Safiullin, Сейпулаев, Safiullin & Safiullin, 2013). In fact, higher education in Russia lives in an industrial culture of the middle XX century, since the vast majority of higher educational institutions work exclusively as educational institutions that supply employees for the needs of national economy.

This form of organization of higher education in the world literature is traditionally classified as "University 1.0" (Tornatzky, & Rideout, 2014). The number designation means the number of university missions. So, if University 1.0 is positioned only as an educational institution, University 2.0 is aimed at learning and research; and at the University 3.0 in the form of which most universities work in the developed countries, the knowledge commercialization is added to the last two missions.

In general, we can state that most of our HEIs have not reached model 2.0 (Kuznetsov, 2015), which, on the one hand, does not improve their competitiveness, as well as the development effectiveness of the territories where they operate, and on the other hand, that says in the coming years we not only will not be able to attract talented young people from the outside, but we also run the risk of encountering the leakage of our personnel, and in this case we will inevitably lose the opportunity to develop innovative directions in the economy faster than others. Unfortunately, this trend exists in Russia today, and whatever efforts we make to work with the younger generation, no matter what resources we invest in the search and development of young talents, without becoming truly research universities capable of solving the problems of the commercialization of scientific discoveries and developments (the concept of University 3.0), we will not solve the problem of preserving promising young people and even more so of attracting them from the outside.

Essential conditions for an industrial breakthrough could be ensured by creating technoparks at the higher educational institutions and, above all, at those where scientific research is actually carried out, because, unfortunately, it's impossible to immediately step over from 1.0 to 3.0, bypassing the intermediate phase, because it is the scientific researches that are the basis for the creation of technological production (Rideout & Gray, 2013).

Also, a necessary condition for increasing the competitiveness of higher educational institutions, in our view, is the development of mechanisms for allocating resources to support the projects and small enterprises of students, masters and postgraduate students, as well as companies established with the participation of universities (if its share is at least 25% plus one share) within the state programs to support entrepreneurship and industrial development.

It is important to create conditions for the development of domestic entrepreneurship in the large state corporations (Forbes.com, 2015). To stipulate simplification and cheapening of procedures for the establishment of university departments on their sites. To enable universities to place their equipment on them and to implement educational programs.

The development of regional initiatives is also a key element in increasing the global competitiveness of Russian universities, (Salmi, 2009) including activating the implementation of specialized Research Programs, focusing on priority areas for each region. For example, for the Republic of Tatarstan, which is the research center of the Volga Federal District, in which the Kazan Federal University is located, it is expedient to choose the following directions as such priorities:

1. Medicine and pharmaceuticals;
2. IT field;
3. Agricultural science.

The choice of these directions for the region is due to the fact that these are complex, transdisciplinary topics, which means that there will be a field of activity for the representatives of other scientific fields in the course of their development and implementation. These directions are in demand by the whole society, since they affect the interests of the majority and fall within the competence of the region at the same time. At the same time, the development of these areas as answers to existing global challenges is reflected in the "Strategy for Scientific and Technological Development of the Russian Federation". In addition, the Republic of Tatarstan has very good starting conditions for the development of these areas.

Undoubtedly, in relation to the region under consideration - the Republic of Tatarstan, it is important to develop engineering, aviation, machine building and other industries. However, it should be noted that the solution of these tasks only on resource attraction will already take on a federal scale, and the above-listed areas are feasible at the regional level (Gafurov & Gafurov, 2014).

5. SUMMARY

Stating the foregoing assessments and directions of development, it is necessary to note that for a full-fledged transition to an innovation economy and a

knowledge economy, it is necessary to revise the attitude towards the higher educational institutions as "service institutes", realizing their status as not only independent, but also the main drivers of economic growth of a new type and legislating them with necessary rights and resources for the implementation of the territory development potential laid in them. This paradigm of development will significantly increase the level of global competitiveness of the Russian higher educational institutions and create sustainable bases for accelerated innovative and technological development of the socio-economic environment.

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