Credibility of the Russian higher education in the world: problems and solutions

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Abstract. The attractiveness of university for students and the credibility of the diploma for employers are largely determined by ranking of the education institution. Rankings of the best universities in the world are regularly compiled by various agencies. Recognition of the education institution at the international level is becoming increasingly important for universities around the world. Due to the relevance of this issue, the article examines the main methodology of well-known international rankings, namely QS World University Ranking, developed by consulting company Quacquarelli Symonds, and THE World University Rankings, based on the methodology of the British «Times Higher Education» edition. The purpose of this study is to analyze the factors affecting the international credibility of the Russian higher education. The article analyzes the ranking system of the Russian universities and identifies university priority development areas in order to increase the international outlook of the Russian higher education, as well as to enhance competitiveness in the global market for education and to enter the international rankings. Authors consider the status of the Russian higher education in the world educational process and identify the causes of unreasonably low ranking of the Russian universities according to leading ranking agencies. Also, a comparative study of the Russian and foreign universities was conducted in the context of QS ranking factors, and the necessity of the state incitement for improving competeveness of Russian universities was revealed and substantiated. The feasibility of using the estimated quantitative performance indicator to assess the scientific merit of publications is considered as well. The authors propose a set of measures that will help to ensure university departments to increase the number of publications in international scientific journals, and as a result, raise science citation index of the articles published by the Russian scientists.

Introduction

Investment highlights of any country are becoming increasingly important in a globalized economy. Annual surveys, conducted by various ranking agencies, testify that investors assess a combination of factors, such as affordable and professional workforce, a favorable institutional environment, and stable and well-defined legal system. In global ranking Doing Business-2012, Russia ranks 120th out of 183 countries that is by 4 scores better as compared with ranking of 2010. According to some Western experts, during the recent period Russia shows the signs of an integrated global economy, namely: strengthening economic relations, growing trend in the placement of production by foreign companies within the territory of the Russian Federation, increased mobility of the workforce, and a substantial improvement in the field of transport industry.

The education quality and the level of training specialists in the country are of great importance for the country's international credibility and its attractiveness to investors. Russia's accession in 2003 to the Bologna process and the adoption of uniform rules of the educational process contribute to the integration of the Russian higher education into the world educational process with the unconditional preservation of those achievements, which glorified the best Russian universities. The intense development of integration and harmonization processes takes place in the field of higher education that is reflected in government documents [1, 2], as well as printed media [3, 4, 5].

The attractiveness of university for students and the credibility of the diploma for employers are largely determined by ranking of the education institution that is widely confirmed by findings of foreign researchers [6, 7]. Rankings of the best universities in the world are regularly compiled by various agencies. Thus, for example, a list of 400 best universities in the world «THE World University Rankings» [5] are compiled annually based on the methodology of the British «Times Higher Education» (THE) edition with the involvement of the «Thomson Reuters» information group. This ranking is considered one of the most authoritative global rankings of the higher education in the world. In this ranking, the level of universities achievements is assessed on the basis of aggregate results of the statistical analysis of their activities, the independent

audit, the annual results of the expert survey of the international academic community, as well as employers, who express their opinions on universities and their graduates. Survey respondents are tens of thousands of scientists from various countries of the world; selection criteria used is based on scientometric analysis of productivity and citation, as well as teaching and research activities in higher education institutions. To date, there are 9,080 universities in 204 countries around the world [5]; experts are invited to analyze 6,000 preliminary selected universities. Ranking does not consider universities that provide only specific areas of research or have less than 200 publications per year.

Data and methodology

The article analyzes the factors influencing the international credibility of the Russian higher education. Evaluation of an educational institution, its rank, affecting, as noted earlier, its attractiveness to students and credibility of the diploma for employers, is carried out based on 13 performance indicators. A list of these indicators, as well as their weight in the rating scale is shown in Table 1.

Table 1. Performance indicators for the World University Rankings calculation. In Russian version of current article the table was translated from English by "Centre for Humanitarian Technologies" [8]

#	Performance Indicator	Indicator weight
1.	Overall citations of scientific publications, normalized with respect to different research areas (based on analysis of 12,000 scientific journals over a five year period).	32.5%
2.	Scientific outlook of the university in certain areas (based on global expert survey of the international academic community).	19.5%
3.	Academic outlook of the university, including research activities and the quality of education (based on global expert survey of the international academic community).	15.0%
4.	Ratio of defended PhD thesis works to the number of teaching staff.	6.0%
5.	Amount of university research activity financing by third parties with respect to the number of faculty members.	5.5%
6.	Amount of university research activity financing by third parties with respect to the number of faculty members; (indicator is normalized by purchasing power parity, reasoning from the economy of the specific country).	5.25%
7.	Ratio of published scientific articles to the number of faculty members (analysis data of 12,000 scientific journals over a five year period).	4.5%
8.	Ratio of faculty members to the number of students.	4.5%
9.	Ratio of foreign representatives of the teaching staff to the number of local faculty members.	3,0%
10.	Ratio of defended PhD thesis works to the number of bachelors continuing study for a master's degree.	2.25%
11.	The average remuneration of the faculty member (indicator is normalized by purchasing power parity, reasoning from the economy of the specific country).	2.25%
12.	Ratio between the foreign and national students.	2,0%
13.	Ratio of public funding of the research to the total research budget of the university.	0.75%

On the basis of the performance indicators, listed in Table 1, authors analyze the status of the Russian higher education in the world educational process, as well as the causes of unreasonably low ranking of the Russian universities according to leading rating agencies. The table shows that the first three performance indicators (citation of scientific publications, scientific and academic outlook) are the most weighty indicators, making up in aggregate 67% of the integral ranking score. The largest share of these three indicators falls on the citation of scientific publications. In total, currently about 200,000 scientific journals are published in the world; among them 40,000 are ranked journals, whereas science citation index is based on 12,000 journals, most popular in the scientific community. Another 19.5% falls on the scientific outlook of the university, and 15% falls on its credibility in academic community. These indicators are directly related to both the number of publications, their quality and scientific merit that is both a cause and a consequence of the high scores of three the most significant indicators of the rating scale.

The authors examined the feasibility of using the estimated quantitative performance indicator to evaluate the scientific merit of publications. Based on the research findings, a set of measures is proposed that will help to ensure university departments to increase the number of publications in international scientific journals, and as a result, raise science citation index of the articles published by the Russian scientists.

Analysis and results

The report of the United Nations Conference on Trade and Development (UNCTAD) [4] presents fifteen countries with the highest rating in terms of direct foreign investments with due regard to the factors of their investments highlights. Table 2 shows the ranking scores based on eleven investments highlights of Russia as compared with the world average indicators.

Despite, in Russia the indicators on size and market growth are almost twice higher than those of the average level, such factor as "skilled labor" is given the minimum score. In Russia, especially low score is given to training of managerial personnel, due

to the fact that Western employers do not trust to education and training certificates issued by the Russian education institutions.

Table 2. Ranking score of evaluated investment highlights of Russia. The table is compiled based on data from UNCTAD [4]

Evaluated investment highlights	Ranking score	World average indicator
Domestic market size	31	17
Market growth	31	16
Availability of suppliers and partners	11	10
Access to international and regional markets	9	10
Competitive capacity	7	5
Motivation \ benefits	3	2
Access to natural resources	3	4
Cheap labor	2	6
Infrastructure quality	1	6
Stable and favorable business outlook	1	9
Skilled labor	1	8

In the list of 400 best universities of the world, the top ten includes 7 American and 3 British universities. Table 3 shows the university ranking distribution over the countries worldwide.

Table 3. Number of ranked national universities depending on particular country [8]

Country	Number of universities involved in the ranking		Country	Number of universities involved in the ranking	
	2011-2012	2012-2013		2011-2012	2012-2013
USA	113	111	Hong Kong	6	6
United Kingdom	52	48	New Zealand	6	6
Germany	22	25	Austria	5	6
Australia	21	19	Denmark	5	5
Canada	18	19	Finland	5	5
Japan	16	13	Ireland	5	5
Italy	14	14	Israel	4	3
The Netherlands	13	13	Norway	4	4
China	10	9	Portugal	4	3
Sweden	10	10	Turkey	4	5
France	8	12	South Africa	3	4
Spain	8	7	Brazil	2	2
Thailand	8	7	Poland	2	2
Belgium	7	7	Russia	2	2
South Korea	7	6	Singapore	2	2
Switzerland	7	8			

The analysis of the top universities distribution by countries shows that 40% of universities in the ranking are situated in the USA and UK that accounts for 111 and 48 universities, respectively, included in the "top 400 universities". Both in the 2011-2012 and 2012-2013 rankings Russia is represented by two universities. And if Moscow State University consistently held in the rankings and even improved its status, the St-Petersburg State University dropped out of Top-400. In return, the National Research Nuclear University MEPhI (Moscow Engineering Physics Institute) was included to the ranking. Let try to find out the reasons for such transformations, especially since ranking compilers grouped performance indicators into five areas for clarity reasons [9]:

Teaching is a characteristic of the learning environment; it includes academic and scientific outlook of the university, as well as opportunities for training and further academic development; worth 30% of the overall ranking score.

Research, along with teaching, is important in terms of its weight; it includes not only the scientific significance of the research conducted, but also revenues from these studies and even the level of

payment of faculty members; similarly to teaching, this category is worth 30% of the overall ranking score.

Citation is citation index of scientific articles, being the most influential category in the overall ranking score, worth 32.5%.

Industry income is the ratio of income from innovative projects, conducted in the framework of the industrial enterprises orders, and the number of faculty members; this category is worth just 2.5% of the overall ranking score.

International outlook allows one to evaluate the ability of the university to attract the best scholars from around the world, as well as foreign students; this category is worth 5% of the overall ranking score that is slightly higher than the previous one.

To observe how variations in these indicators affect the rank occupied by the university, let consider a few universities, the most interesting in terms of their dynamics in the rankings for the last two years (Table 4).

Table 4. Influence of aggregate performance indicators on the university rank

		Teaching	International outlook	Industry income	Research	Citation	Rank
California Institute of Technology	2012-13	96.3	59.8	95.6	99.4	99.7	1
	2011-12	95.7	56,0	97,0	98.2	99.9	1
Massachusetts Institute of Technology	2012-13	92.9	81.6	92.9	89.2	99.9	5
	2011-12	92.7	79.2	94.4	87.4	100,0	7
National University of Singapore	2012-13	74.4	92.3	77.4	87.2	67.2	29
	2011-12	65.7	93,0	60.7	79,0	63.4	40
Peking University	2012-13	81.5	54.1	99.9	67.9	64.3	46
	2011-12	82.3	51.7	99.9	64.1	51,0	49
University of New South Wales, Sydney	2012-13	52.6	84.8	50.5	63.8	56.7	85
	2011-12	36.1	85.1	53.1	40.2	46.8	173
Moscow State University named after Lomonosov	2012-13	63.5	50.3	70.1	48.1	19.7	214
	2011-12	47.9	53.3	80,0	27.5	11,0	289
National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)	2012-13	20.9	18.8	59.6	10.6	100,0	242
	2011-12	-	-	-	-	-	-
St-Petersburg State University	2012-13	-	-	-	-	-	-
	2011-12	37.6	38.1	26,0	19.7	3.1	389

The data presented in Table 4 demonstrate undisputed leadership of the California Institute of Technology in the global education market. Some fluctuations of most weighty indicators, and the fact that this University has scored less than 60 points out of 100 possible in terms of international outlook, did not affect its integral evaluation. The top five also includes the Massachusetts Institute of Technology (we will explain later our interest to this institution). Quite dignified status in the world ranking belongs to Singapore, where on the area of just 700 square meters there are two high rated universities. During the year the National University of Singapore has improved its ranking status by 11 scores, moving from 40th to 29th position; at that, the greatest progress has been made in the most important performance indicators. It should be noted that the Peking University was able to move from 49 to 46 position, owing to increase of *Research* index by 3.8 scores and *Citation* index by 13.3 scores [10]. It is worth noticing the success of the University of New South Wales of Australia, which made the jump from 173 to 85, i.e.

increased its status by 88 scores just in one year. This rise has also been achieved through significant growth of the three most important above noted performance indicators.

The best Russian university, Moscow State University named after Lomonosov (MSU) is ranked 214 in the 2012-2013 ranking. Improving its status by 75 scores does not reflect the real significance of the Russian scientific school. And once again, the crucial role was played by the same three indicators: teaching, research and citation. However, if in terms of *Teaching*, MSU exceeds the University of New South Wales, in terms of *Research* it loses 15 scores and the citation index is almost three times worse. This results in a noticeable difference in their ranking scores.

Last year St-Petersburg State University (SPSU) ranked 389 in the TOP-400, i.e. was among the outsiders. The main reason for this was a very low value (3.1 scores) of citation index.

Low rating level of universities result in fact that the diplomas of the Russian universities are recognized in advanced countries with great exceptions.

Discussion

The performance indicators listed in Table 1, which are taken into account when ranking universities, gives the grounds to identify the main reasons for the lack of the Russian universities in the world rankings. The fact is that cited scientific publications have the maximum weight (32.5%) when compiling ranking. Out of 12,000 academic periodicals, overwhelming majority of scientific journals, most popular in the world, are published in English. Therefore, even today the majority of Russian scientists lack knowledge of foreign languages; as a consequence, the world's scientific publications in the periodicals are difficult of access to them, their scientific works are published in the Russian editions. This makes the Russian science less noticeable in the world, especially as the number of scientists, who can read in Russian outside Russia, is quite small. This is evidenced also by comparative statistics. Take quantitative indicator, the number of publications in the world press issued in English, and qualitative indicator, the citation index of scientific articles of individual author, organization, etc. for a certain period. For 10 years, from 1996 to 2007, the Russian authors have published in total 367,560 articles in various ranking journals regardless of the publisher. Citation index of the Russian articles equals 206, whereas, in the USA, the leading country, these figures are equal to 3872,452 and 889, respectively. Over the same period, China had 960,669 publications; however their citation index, equal to

189, was less than ours. The countries, such as Spain (387,279 and 283), Italy (532,598 and 374), and Canada (548,280 and 416) were ahead of Russia [10]. However, these two performance indicators do not fully reflect knowledge content of the publications. In our opinion, more objective is the ratio of citation index and the total number of published articles. Proposed estimated indicator of scientific merit indicates the average number of citations per 100,000 articles, written by authors from concerned countries (Table 5).

Table 5. Knowledge content of publications

Country	Number of publications	Citation index	Scientific merit
Canada	548 280	416	$76 \cdot 10^{-5}$
Spain	387 279	283	$73 \cdot 10^{-5}$
Italy	532 598	374	$70 \cdot 10^{-5}$
Russia	367 560	206	$56 \cdot 10^{-5}$
USA	3 872 452	889	$23 \cdot 10^{-5}$
China	960 669	189	$20 \cdot 10^{-5}$

Analysis of the data in Table 5 clearly shows that the USA and China are behind Russia in terms of quality of materials published in ranked journals. If per 100,000 articles, belonging to authors from Russia, there are 56 citations made by other researchers of the international scientific community, this index for the publications of the authors from the USA is 23 per 100,000 articles, while similar index of Chinese scholars is even lower and equals 20. Obviously, increase in the number of publications while maintaining their scientific merit will raise our high school in the global rankings.

Summary

The current world trend of non-confidence towards quality of the Russian professional training and low credibility of diplomas issued by the Russian educational institutions is, to a certain extent, of inertial nature, as the Government of the Russian Federation declared their intention to actively promote the process of enhancing the international status of higher education in Russia.

A draft regulation of the Government, approving a package of measures, aimed at increasing the share of publications by Russian researchers in the total number of publications in international scientific journals, indexed in the Web of Science database, is put on the website of the Ministry of Education and Science of the Russian Federation. It is planned to increase the share of Russian publications by 2015 from 1.68 to 2.44% of the global total [1]. To increase the share of publications by Russian researchers in the international scientific press, as well as indicators, considered when compiling the world university rankings, university managements need to take certain efforts. Since, as noted above, the citation of publications, which depends on the number of articles by Russian scientists, published in peer-reviewed foreign journals, is a key indicator, authors propose the following package of measures (action plan).

1) Identify a list of ranking journals within the specific areas and make it available to the university staff that can be fulfilled by the International Department of the University together with the library.

2) Provide access to electronic versions of peer-reviewed journals. Nowadays, much more researchers are quite fluent in foreign languages, primarily English, to become familiar with the publications of their interest.

3) Organize field-specific expert council to provide selection of articles worthy of publication in international journals.

4) Provide a translation of selected articles into a foreign language. This can be accomplished by the university departments on foreign languages. Such cooperation will be mutually beneficial for both the author, whose article is transferred, and a teacher performing translation. Author may activate his knowledge of a foreign language, while teacher may deepen familiarity with relevant terminology in the specific area and use this knowledge when training students.

5) Submit these articles for publication in international ranking journals. At that, international department of the university can become intermediary between the author and the journal.

6) Introduce incentive scheme for the academic teaching staff to encourage regular publication of articles in the ranking journals.

7) Post online to the university library web-page electronic versions of articles published in the international (West) journals, both in Russian and foreign language. This will help deepen skills in working with foreign periodicals.

The research conducted allowed authors to evaluate the status of Russian universities in the world educational environment. Authors were unable to identify the most promising research areas in terms of the Russian university science recognition. In the future, more detailed study is necessary on the issues related to representation of the achievements, obtained by the Russian scientists in various fields, in the international scientific press. The publications of the research performed in the Russian universities should become an important part of this activity. Thus, the research areas, most demanded in the world, will be revealed that will enable to implement targeted incentive of publication activity of the Russian scientists in specific fields, including members of university science.

Investment of sufficient financial resources to improve the image of the university and thereby its

international outlook, will definitely increase the interest of foreign students to study in the prestige Russian university. Active involvement of students from abroad will give a distinct possibility of additional funding of the national high school and will become another reason to raise its global credibility and gain international recognition.

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6/26/2014