



NATIONAL RESEARCH UNIVERSITY
HIGHER SCHOOL OF ECONOMICS

Daria P. Platonova, Dmitry S. Semyonov

PROGRAM DIVERSIFICATION AND SPECIALIZATION IN RUSSIAN HIGHER EDUCATION INSTITUTIONS

BASIC RESEARCH PROGRAM

WORKING PAPERS

SERIES: EDUCATION
WP BRP 17/EDU/2014

Daria P. Platonova¹, Dmitry S. Semyonov²

PROGRAM DIVERSIFICATION AND SPECIALIZATION IN RUSSIAN HIGHER EDUCATION INSTITUTIONS

This article explores the issue of program diversification within Russian higher education institutions (HEIs) and its major determining forces. Comparing several historical types of specialized institutions, which were mainly formed during the Soviet period, this study highlights two key issues. Firstly, we investigate how these specialized institutions have transformed, and secondly, we make an attempt to determine the cause of these transformations. We assume that the level of diversification and program drift is defined by two influential forces: state regulation and market forces. Empirical evidence on the changes of HEIs internal diversification includes quantitative analysis distributed throughout eight fields of education.

JEL Classification: I2, L31

Keywords: program diversification, specialization, higher education institutions, Russia, transformations of organizations

¹ National Research University Higher School of Economics. Laboratory for Universities Development. Analyst; E-mail: dplatonova@hse.ru

² National Research University Higher School of Economics. Laboratory for Universities Development. The Head; E-mail: dsemyonov@hse.ru

Introduction

Institutional diversity has become one of the most discussed features of modern higher education systems. Diversified systems consist of different types of institutions that operate differently according to their structure, their internal sources, and environment. We can compare HEIs from different perspectives and examine their vertical or horizontal diversification by taking into account their research and educational activities or, for example, their functions and missions. (Teichler U., 2004). There is no doubt that education is the basic mission of any HEIs and even slight changes dramatically influence the whole higher education system. Although educational activity is a complicated sphere to investigate, it can be analyzed quantitatively within the dimension of program supply. (Horta H., Huisman J., Heitor M. 2008) Educational activity is composed of a wide variety of characteristics: the level of education; number of programs; their specialization; and “richness”. Program diversity is assumed as one of the main ways to examine HEI activity.

A higher education institution (like any organization) is shaped by a complex set of internal and external forces. Generalizing to the system level, higher education is a balancing act between market forces and state regulations. Market structure and mechanisms have an undeniable affect on the behavior of HEIs. However, government values act as the most direct regulator and coordinator of the marketization of higher education.

Going further, HEIs face multiple demands and try to achieve bidirectional aims. (Dill, Teixeira 2000; Teixeira, Rocha, Biscaia, Cardoso 2014) Although the coexistence of state-regulation and market forces in higher education seems to be becoming a more permanent phenomenon in Western society, these factors have received little attention within the higher education system of post-Soviet countries. Nevertheless, in this very case we have seen extreme “zero market” by the end of Soviet-era and rapid marketization of higher education in the next few years.

In this context, we observe program diversification within HEIs, arguing that program diversification reflects the balance between market forces and state forces. The discussion regarding HEIs’ program supply, and its fluctuations inevitably touches upon the subject of societies’ demand for definite education fields. Thus, according to Ben-David, the competitive environment in higher education systems produces program diversity mainly in response to external demands. Ben-David provides an argument that competition influences the expansion of more practical fields of education, such as business, economics, social work, etc. (Ben-David J.

1972) Previously, this program drift was explored by Clark who suggested the appearance of the “enrollment economy” within the higher education system in the US, which determined the variety of curriculum. From Clark’s point of view, the appearance of the enrollment economy reflects a drift in the missions of higher education institutions, especially within liberal art colleges, in response to the fluctuations of students’ demand. (Clark B. 1956)

Transformations within American liberal arts colleges revealed that economic factors (more specifically market conditions) had a significant influence on HEIs’ activity and positioning. (Kraatz M. S., Zajac E. J. 1996; Jaquette O. 2013). Kraatz and Zajac empirically verified that market forces (especially consumer demand) caused organizational changes. Contrary to notions of institutionalism, that colleges are becoming more homogeneous, there was a significant increase in organizational heterogeneity in American liberal arts colleges. For 15 years (1971-1986) the number of issued diplomas in professional training programs in American liberal arts colleges increased from 11% to 38%. Changing the curriculum of these colleges towards business education, economic and legal education reflected fundamental changes not only in the management and organization development strategy, but also in the transformation of traditional goals and missions. The positioning of higher education institutions emerged as one of the most important issues related to the diversity. (Fumasoli T., Huisman J. 2013) Even the replacement of the word "institution" to "university" indicated not only a symbolic renaming, but also signaled a change in structure, development strategies, and perception of key stakeholders. (Glynn M., Marquis C. 2007; Morpew C. 2002; Jaquette O. 2013).

In this paper we will examine program diversity in Russian higher education institutions. The Russian case gives us an opportunity to look at diversification through the state-market dichotomy. Two decades after the USSR collapse, peculiarities of the diversification of Russian HEIs can be revealed through empirical analysis. The development of Russian higher education reflects how the market influences the state and how the state reacts to this economic influence.

Firstly, we will look at how the higher education system has changed **in the past 20** years since the introduction of the market economy. Then, we will look at the very specific group of specialized institutions, that reveal the most interesting example of transformations.

We will analyze the scope of program diversity at medical, industrial, agricultural, polytechnic, pedagogical (teachers’ training) institutions. Our results provide insight on the state-market influence on HEIs. Finally, we will make conclusions about the meaning of these institutional differences and potential objectives for further diversification studies. This study aims to

contribute to the understanding of specific features of HEIs, and trends of HEI transformations in changing environments.

The Effect of Market and State Regulation on the Russian Higher Education System

In comparison with the majority of developed countries, the circumstances within which the Russian higher education system has developed can be considered an extreme example. First of all, we should take into account the starting point of transformations within Russian HEIs. The Soviet zero-market system implies the existence of state regulation and control over the higher education (Clark B. 1983).

Soviet HEIs could not be seen as individual agents, as every organization was incorporated into the whole Soviet enterprise at the national level. This unique design could be put as “quasi-corporate” (Froumin I., Kuzminov Y., Semyonov D. 2014).

Due to economics reasons, after the USSR collapse, the government could not provide the same level of coordination as during the Soviet period. The 1990s were marked by a decrease of state funding and a loss of state control within the HEI system. (Figure 1) Despite this trend, household demand for higher education (due to the uncertainty in labor market) influenced the increase of supply. (Figure 2) New signals in the economy, such as uprising trade and service sectors also contributed to an accelerated increase in demand for higher education.

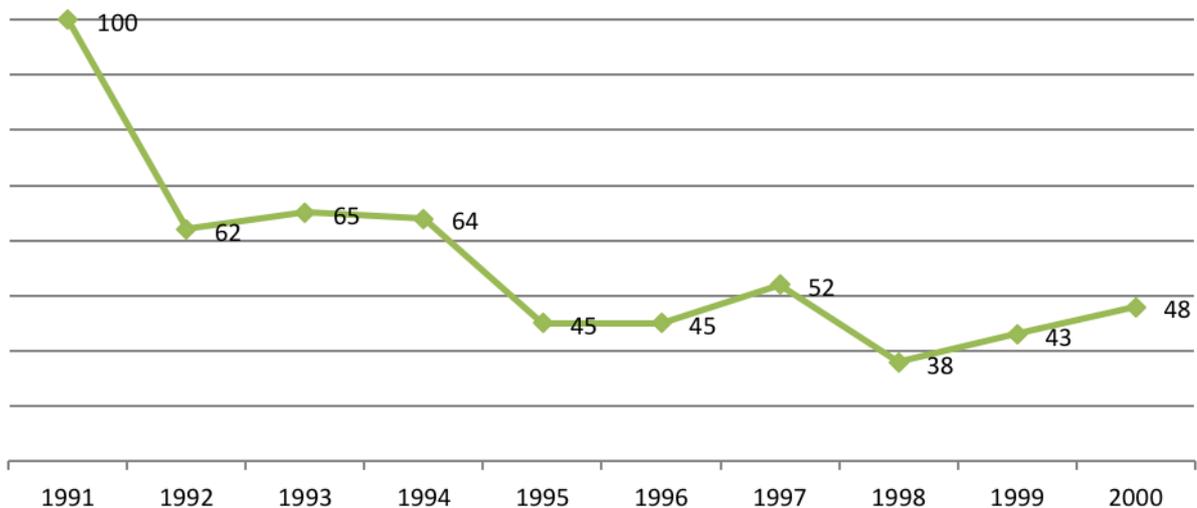


Figure 1 Public expenditures on education in Russia (1991=100)

Source: Suvorov A., (2002) *Chto proishodit s rossijskim obrazovaniem?* [What is happening with Russian education?] *Demoscop Weekly*. October 7-20, 2002: <http://demoscope.ru/weekly/2002/083/tema02.php>

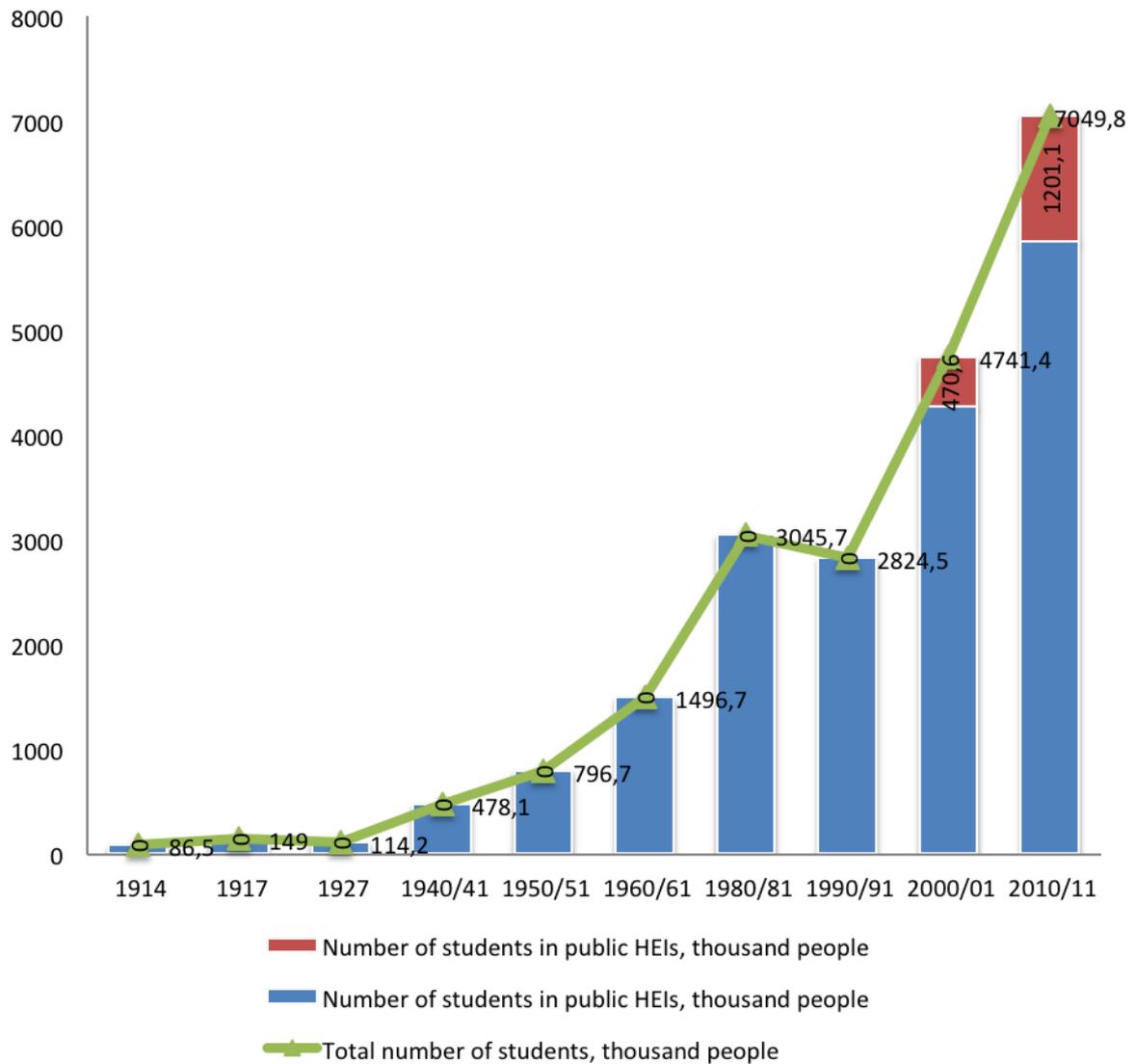


Figure 2 Growth in the student numbers in Russian HEIs.

Source: *Federalnaya sluzhba gosudarstvennoy statistiki* [Federal State Statistics Service]. 2013. *Ofitsialnaya statistika. Naselenie. Obrazovanie* [Official Statistics. Population. Education]. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/education/#

It should be mentioned that Russian state regulation could have been more intense during this period, however regulation was limited. Regarding the number and quality of supply for both public and private institutions, the lack of relevant resources and the need to save households' purchasing power made for a loose education policy.

By the beginning of the 2010s, Russia shifted from a zero-market to a system in which a third of funding was provided by households. (Figure 3) However, in the past decade, the Russian government has focused on Russian higher education as a way to finance and introduce new political mechanisms and measures.

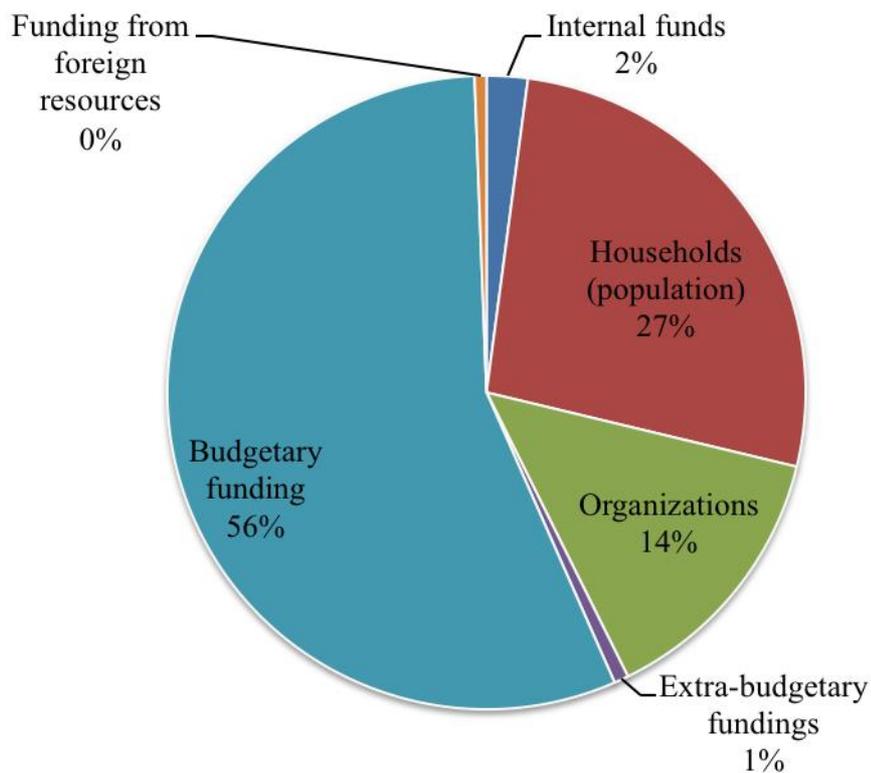


Figure 3 Distribution of funding for higher education institutions in Russia (2012)

Source: Federal State Statistics Service
http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1260453359625

Since the beginning of the 2000s, Russia has experienced a general economic revival, which has allowed the state to increase government funding for higher educational institutions. This

increase in government funding has steadily increased until now. We could say that the state “returned” to playing a role in higher education starting in 2002 when the state introduced the Unified State Examination. (Since 2009, the exam has been used nationwide). The Unified State Examination is a school graduation exam that is also an entrance exam for HEIs. This exam has increased mobility and has generally shaped the current higher education market.

The number of higher educational institutions in Russia has increased twofold since 1991 till 2005. (Figure 4) From 2006, the Russian government has been attempting to segment the educational system, starting with leading universities. Even before 2006 the government attempted to segment the educational system. For example, in 2004 special status (implying a particular model of autonomy and funding) was assigned to Moscow State University and Saint Petersburg State University (these universities are considered nationally leading universities within Russia).

In 2006, the government established the first federal university – Siberian Federal University, by merging within Siberia several HEIs. (Semyonov D., 2014) Currently, there are nine federal HEIs in operation in Siberia. The merging process of these federal institutions occurred within teachers’ training institutions, comprehensive universities, and universities for the arts and humanities. From 2006 to 2008, 62 HEIs received special funding for implementing their “innovative educational programs”. From 2009 to 2013, the government substantially supported 29 national research universities. Furthermore, in 2013, Russia launched its Excellence Initiative. The Russian government, with the help of the Special International Council, selected 15 Russian universities to receive special funding in efforts to place these 15 universities in the top 100 universities (according to global rankings) by 2020.

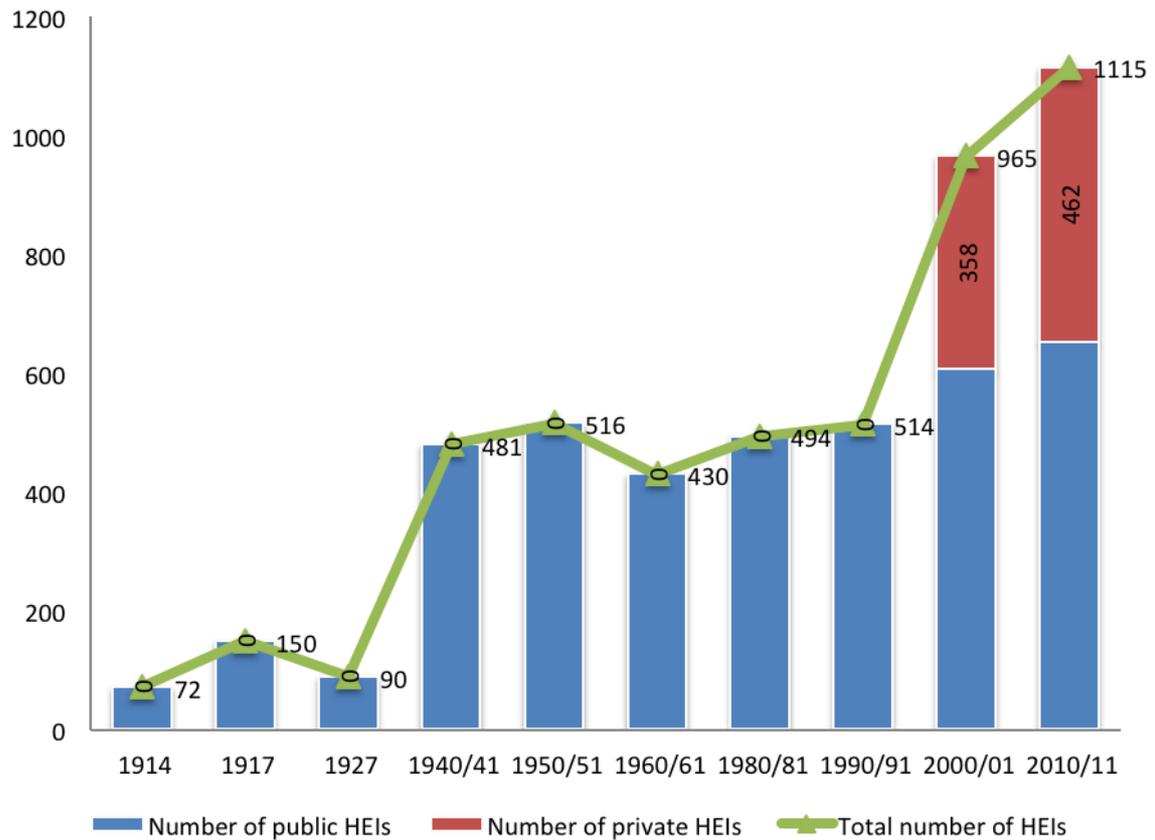


Figure 4 Growth in the number of HEIs in Russia

Source: *Federalnaya sluzhba gosudarstvennoy statistiki [Federal State Statistics Service]. 2013. Ofitsialnaya statistika. Naselenie. Obrazovanie [Official Statistics. Population. Education]. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/education/#*

These government measures can be seen as a sign of a new direction in education policy, especially in comparison with the education policy strategies of the 1990s. During the 1990s, the Russian state was committed to providing a minimally sufficient level of support for the educational system. At the same time, the Russian government pursued allocated resources for the development of potential institutions. In this way, the Russian government attempted to give clear signals to the market about their intentions for the whole system of higher education.

When the higher education system stopped growing, it became clear that the overall increase in the higher education system overextended the government's ability to concentrate resources. At the same time, the government's goals for the future of higher education within Russia remained unclear. Despite the **population decline**, the demand for higher education did not fall

substantially (even during the crisis years of 2008-2009). Due to the fact that the higher education system increased at an extremely rapid pace, it was not backed by the sufficient quality of staff and infrastructure, etc. The existence of low-quality infrastructure became more evident when the Ministry of Education launched a special “effectiveness monitoring” (from 2012) which has, in fact, been serving as the complement to the accreditation system. This monitoring system identifies HEIs that would be advantageous to merge. This “surgery” faced public misunderstanding and is still an issue of public debate.

Current higher education policy combines different approaches. The mechanism of centralized allocation of budgetary-funded slots comes with rather soft accreditation procedures. This soft accreditation is backed by rather strict effectiveness monitoring, which is aimed at cutting low-quality HEIs. Some specialized institutions kept their original industrial organizational ties – that is, subordination to a particular ministry, and ties with corporations (e.g. transport HEIs, agricultural HEIs). All educational institutions that have not kept their original industrial organizational ties are now subordinate to the Ministry of Education.

As the executor of the public will, the government should fit the regulation to the market. On the one hand, the rise of new demand for higher education is supported by the needs of economic development, and by the preferences of society. Furthermore, the rise of public and private universities specializing in social science and humanities is the only consequence of this phenomenon. Although central distribution of budget enrollment limits the HEIs in Russia, the government does not strictly determine the enrollment rates and the proportion of enrolled students within the educational fields (especially on the fee-paying programs). That is, market forces have become very influential for the all formalized types of institutions, and so-called specialized institutions are not an exempt from the influence of market forces.

Specialized Higher Educational Institutions in Russia

Due to the Soviet centralized control of social and economic life, the rigid system specifically differentiated higher education institutions. Along with traditional universities, which combined a wide range of specialized fields (mostly in the natural sciences), specialized institutions played a key role for providing manpower for the regional economy. Such specialized institutions were directly tied to a specific industry and were affiliated with a definite ministry or government department. Thus, besides medical or teachers’ training institutions, very specialized institutions in forms of HEIs were created. (Examples include the Moscow Technological Institution of Baking or the still-existing Institution of the Fish Industry (Chanbarisov Sh. 1988; Froumin I. et

al. 2014). These institutions were created mainly in the 1930s during the period of Soviet industrialization led by Stalin. One of the main factors that shaped education policy during this time was the so-called “*Otraslirovanie*”, which refers to the dividing of institutions by industrial fields and the building of ties with respect to specific industries (David-Fox M., 2012).

By the end of Soviet period, there were over 507 highly specialized institutions. Industrial institutions and teachers’ training institutions constituted the two main types of highly specialized institutions. There were 154 industrial institutions, which made up about 41% of students enrolled in highly specialized institutions, and 148 teachers’ training institutions, which comprised of 28% of all students enrolled in highly specialized institutions. (Figure 5) It should be emphasized that only the government had successfully worked out plans for enrollment within different fields of specialization within every institution, without the influence of free market forces.

Number of students, %

Number of HEIs

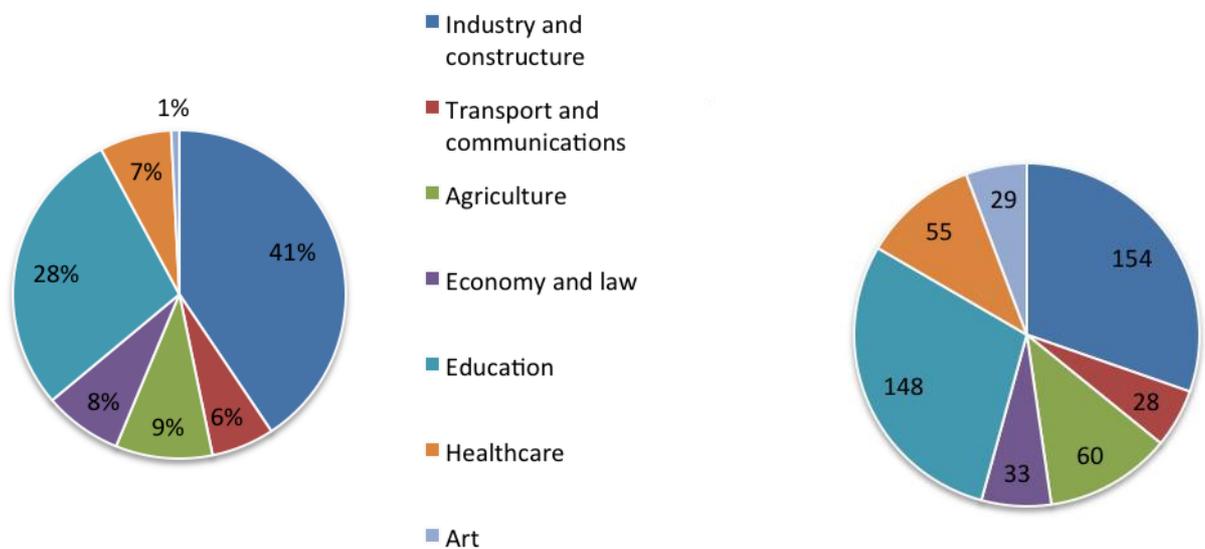


Figure 5 Higher education institutions within sectorial groups, Russian Soviet Federative Socialist Republic, 1989

Source: Kul'turnoe stroitel'stvo v SSSR, 1990 g. [Cultural construction in the USSR, 1990] Moscow. 1990. p. 198-212

A few years after the collapse of the Soviet Union? Russian HEIs suffered extreme and rapid change with respect to their external environment. The basic connections, which were adapted in Soviet era, between higher education institutions, production units and authorities were ruined. (Johnson M., 2008) Consequently, in the 1990s, the imposed interconnectedness between specialized HEIs and industry disappeared. Moreover, both internal and external factors influenced the decrease in funding higher education sector. (Johnson M., 2008; Klyachko T., Titova N., Kryshtanovsky A., Mikhailyuk M., Drugov M., Vasiliev D., Kapranova L., Zaborovskaya A., 2002) As a response, Russian HEIs faced a need to find new financial resources by entering new niches and widening their range of activities. (Titova N., 2008) The introduction of market forces into economic system and, particularly into higher education, has shaped the new structure of higher education system and theoretically influenced the creation of new organizational forms of HEIs.

The balance between market and state regulation over higher education system has been fluctuating during last 24 years. In 1992, new legislation allowed public and private institutions to attract fee-paying students; this indicated the beginning of privatization in the system. (Froumin et al. 2013) As for specialized institutions, public institutions were also allowed to open fee-paying slots and new fields of teaching and departments. Moreover, among specialized industrial institutions, teachers' training institutions, and medical institutions, the renaming of universities partially reflected the diversification of fields of study in the HEIs. (Alekseeva L.P., Shablygina N.S. 1999) The transitional period and overall situation in the Russian economy underlay the weak position of the state that manifested in dramatically decreased financing. (Education in the Russian Federation. Statistics. 2003)

One more feature of this picture of fluctuation between market and state regulation among Russian HEIs is the subordination of state institutions. During the Soviet period, specialized institutions were subordinated to a particular relevant national ministry (e.g. medical institutions to the Ministry of Public Health, textile institutions to the Ministry of Textile Industry). There have been several fluctuations of subordination during the Soviet period, and after the collapse, sequences of administrative reforms and restructuring of ministries occurred within the government. Now we can see the mixed-approach situation in which some of the specialized institutions (created during the Soviet era) were now subordinate to the Russian Ministry of Education and Science or to the branch ministry (some examples below in Table 1).

Table 1 Matchings between the nominal types of HEIs and branch ministries (2014).

<i>Nominal specialization of HEIs</i>	<i>Subordination</i>
Medical HEIs	Ministry of Healthcare
Agricultural HEIs	Ministry of Agriculture
Transportation (railway, water transport, civil aviation) HEIs	Ministry of Transportation
Teachers' training (pedagogical) HEIs	Ministry of Education and Science
Industrial HEIs of Oil & gas, textile, construction, etc.	Ministry of Education and Science
Polytechnic HEIs	Ministry of Education and Science

As the above discussion explains, the Russian higher education system and educational environment changed dramatically; however, there is still a lack of information on the concrete transformations that occurred within Russian HEIs. The following analysis aims to reveal the scope of internal institutional changes of Russian HEIs, and the possible causes and factors that determined the outcome of these transformations in the dimension of market-state balance. Toward this end, we think that the focus on the specialized Soviet-created institutions can advance the understanding of the main contemporary issues concerning program diversification of HEIs.

An Analysis of Program Diversification within Russian Higher Education Institutions

A wide range of articles examines the program diversification of Russian HEIs by comparing different types of institutions. The analyses of differentiation in terms of taught disciplines in HEIs provides an understanding of the differences between the behavior of public and private HEIs, universities and polytechnics (e.g. in Portugal, see Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. 2011; Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. 2013; in Europe, see Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. 2014; in Sweden, see Lepori, B., Huisman, J., Seeber, M. 2014). In this study, we also focus on the empirical analysis of diversity in Russian higher education systems with regards to program variety and specialization.

The focus of this research is related to the analysis of the level of diversification with HEIs and the field of specialization, while taking into account artificially strict specialization and the

“natural” development of Russian HEIs. In order to track the internal changes of HEIs and the whole educational system, it is necessary to understand the major factors that force institutions to transform or remain the same. We find that the level of program diversification is one of the most relevant measures in creating a general representation of the Russian higher education system. Due to the specific features of former Soviet institutions, the level and field of specialization is considered to be especially important. Previous papers aimed at examining and evaluating program diversity in HEIs included measuring how broadly institutions diversify their range of programs and in which particular educational field these institutions specialize in. (Rossi, F. 2009; Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. 2011). In order to measure this range of diversity, two indexes (that have been adopted from economic research) will be used.

First of all, for the aim of this study, it is more appropriate to analyze the number of students distributed over different areas of educational fields. As Teixeira et al. (2011) pointed out, this measurement has far less limitations than, for example, the number of programs and number of faculty members. When thinking about how to understand student distribution in different educational fields, the origins of measuring diversity (with respect to the richness of ecosystems within different species) can be regarded as a useful thought exercise. Students of different departments, metaphorically speaking, represent the variety of species found within a university, while the university itself can represent a forest or a lake. The most popular heterogeneity measure in ecology is the Simpson index, also known as the Herfindahl—Hirschman index. This heterogeneity index is also used to estimate market concentration. Following previous studies about program diversification in universities, we use a reciprocal form of the index that is equal to:

$$D_j = \frac{1}{\sum_i \left(x_{ji} / X_j \right)^2} \quad (1)$$

where x_{ji} is the number of students in an education field i of institution j , while X_j is the total number of students within an institution j . This equation means that if the number of students is relatively equal in all education fields, the index possesses the highest value. However, as a number of fields in an institution can vary considerably, it is necessary to normalize the index by number of education areas:

$$D_j^* = \frac{D_j - 1}{n - 1} \quad (2)$$

where n is the overall number of education fields and the index takes values from 0 to 1. The proximity to zero indicates a lower level of diversification. In other words, a zero-value means that there is an absolute specialization of one field of study in an institution. (Magurran A.E., 2004)

Moreover, it should be emphasized that the understanding of market forces lies in the fact, that institutions not only have become more diversified in their supply of education programs, but they have also changed their focus. Hence, it is the degree of specialization in different educational areas that can reveal the impact of external forces on HEIs' internal transformations. The usefulness of a Revealed Comparative Advantage index, developed by Balassa (1965), to measure the HEIs specialization on the particular education field, is confirmed by Teixeira et al. (2011), Rossi (2009), Huisman et al. (2012). This index is constructed as follows:

$$S_{ji} = \frac{x_{ji}/X_j}{x_i/X} \quad (3)$$

where, as previously, x_{ji} is the number of students in an education field i of institution j , while X_j is the total number of students of institution j , x_i is the number of students in the field in all HEIs and X is number of all students in all institutions. It is also necessary to normalize the indicator to reduce the effect of the HEIs' size:

$$S_{ji}^* = \frac{(S_{ji} - 1)}{(S_{ji} + 1)} \quad (4)$$

Focusing on specialization and diversification, these heterogeneity indicators are assumed to be relevant to the investigation of internal diversity of HEIs. We will try to show with empirical evidence that there is a program drift under several external forces with regards to the case of the Russian higher education system.

In order to understand the Russian higher education system, these specialization and diversification indicators will be implemented into a quantitative analytical framework. Data of student numbers⁴ in specialized HEIs in 1998/1999 and 2013/2014 will be used.

⁴ The analysis is based on data provided by the Ministry of Higher Education and Science (Monitoring *effectivnosti vuzov* [Monitoring of effectiveness of higher education institutions]). We use a normalized number of students that is measured as the overall number of full-time students, 25% of evening courses' students and 10% of part-time students. Moreover, we do not distinguish between bachelor's, master's or specialist's degree programs. The calculations of a normalized number of students in 1998/1999 are made by authors.

The sample includes 216 higher education institutions⁵ that have a similar Soviet origin. (Table 1) As we are aiming to investigate program drift specifically focusing on the transformations of HEIs' specialization, we will not include a comprehensive list of universities in this research. Furthermore, we will not examine social, economic, humanities HEIs whose existence and tremendous numerical increase indicates the appearance of new demands in Russian economy and society.

Table 2 The number of HEIs and their types in the sample

Type of HEI	Number of HEIs
Industrial	37
Medical	45
Teachers' training	33
Polytechnic	46
Agricultural	55
Total	216

In order to analyze the specialization of Russian higher education institutions, we divided students in each university into eight different educational fields. These fields are: *Humanities, Health and Welfare, Engineering, Manufacturing and Construction, Arts, Mathematics and the Natural Sciences, Social Science, Education, Agriculture*.⁶

All selected types of universities reflect one of the educational fields that these universities used to specialize in. The only exception is within industrial HEIs and polytechnics. Originally, industrial universities also provided training in “engineering, manufacturing and construction”. The difference between the two types of HEIs within the fields of education lies in that so-called industrial HEIs had an extremely narrow specialization, which was indicated by their names.⁷

⁵ The total number of such HEIs in the country during these time periods can differ due to active merging and appearance of new universities. However, the difference is miniscule.

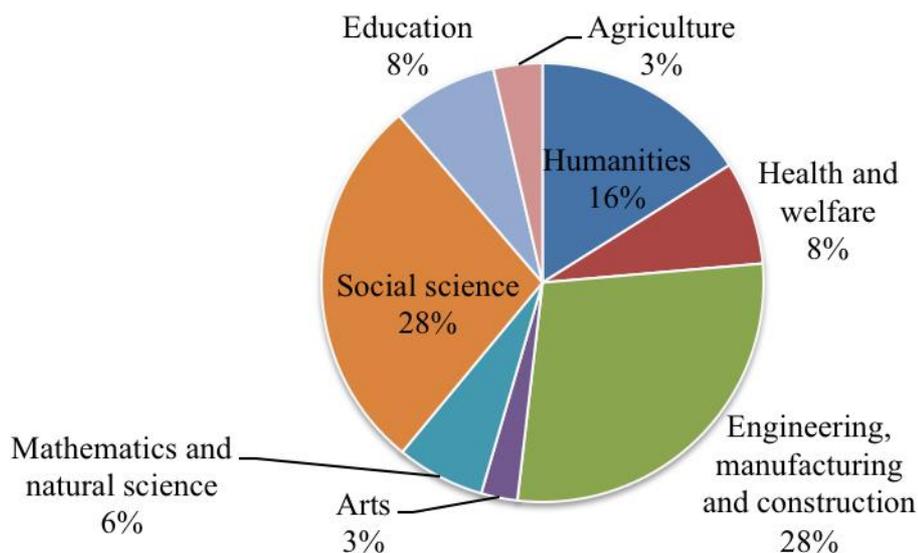
⁶ When calculating, the enlarged groups of specialties are divided into professional fields formalized in Russian legislation. It is quite similar to the fields division of the International Standard Classification of Education - UNESCO, 2011

⁷ The illustrative example was the institute in St. Petersburg which name could be literally translated as the institute of cold and food production

Moreover, the presence of the natural sciences in polytechnics should have been higher. Ultimately, the significant difference in the original field of specialization and the low degree of internal diversification in Russian HEIs gives us an opportunity to track the evolution of Russian HEIs over the last fifteen years.

Program Diversity and Specialization in Russian higher education

Before proceeding with the analysis of program diversification and HEI specialization, we will briefly describe the data regarding the students’ distribution over different educational fields. Figure 6 provides the overall percentage of students within educational areas within Russia.⁸ We emphasize the fact that such fields as “*Humanities*”, “*Social science*”, “*Engineering, Manufacturing and Construction*” have the most significant values. While Figure 6 represents the rise of popular programs since the Soviet period, the figure also suggests market processes are at work. Going further, the existence of the broad group of students in “*Engineering, manufacturing and construction*” can indicate that state forces are trying to balance HEIs’ program supply.



⁸ We should take into account that number of students are not absolute (normalized). Moreover, this dataset include almost all public and private HEIs.

Figure 6 *Students' distribution over educational fields in Russia (2013)*

Source: *Calculated by authors, (Monitoring effektivnosti vuzov [Monitoring of effectiveness of higher education institutions])*

The analysis of the diversification index shows that all groups of institutions have different patterns of internal diversification. Figure 7 depicts the normalized diversification index, whose average value within types of institutions varies significantly.

First of all, we observe lowest level of diversification is within medical HEIs. Since 1998, medical HEIs have become even more specialized, as the value of the diversification index approximated to zero in 2014. Secondly, although there is a 14% decrease of program diversity within agricultural HEIs, they are considered to be the most diversified type of HEI within Russia. Even polytechnic universities are less diversified than agricultural universities. Even more surprising, the diversification index indicates a growth of program diversity within industrial institutions. Comparing patterns of diversification, the industrial HEIs and polytechnic universities have become more similar in terms of the range of educational fields and their "richness". The extreme changes in diversification level are observed in the first steps of analysis in the case of teachers' training institutions. These institutions have been transformed from one of the most diversified HEIs to the one of the most specialized HEIs.

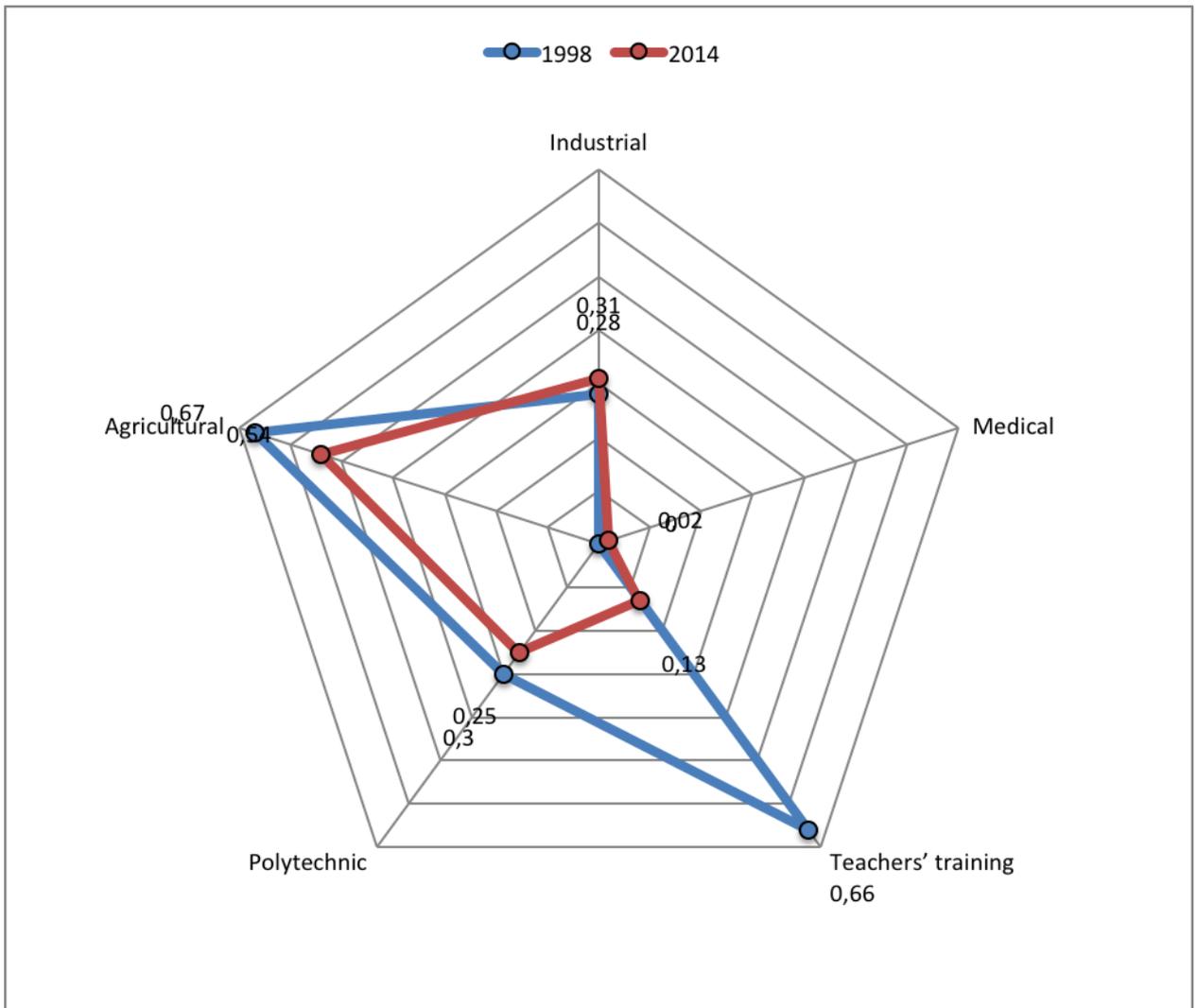


Figure 7 Median values of diversification index for Russian HEIs

Source: Calculated by authors

Although the median values of the diversification index gives us an overall understanding of the differences between formal types of institutions, it should be emphasized that the variation within each group of institutions is quite high. For instance, in 2014 the gap between the most specialized and the most diversified institutions can approximate to 0.62. Figure 8 makes this point clear. For example, in agricultural institutions the diversification index varies dramatically. Although we cannot prove definitively what factors influenced agricultural HEIs to become so heterogeneous, a two-way stretch can be suggested. State and market forces are very closely intertwined, and therefore we can only hypothesize whether the phenomenon of heterogeneity within HEIs can be determined by economic sector shrinkage or government instability. This is particularly relevant to the branch ministry, in which these HEIs are affiliated to provide support. Thus, we can suggest that external forces have influenced the HEIs (with the same historical

external forces) quite differently. The program drift depends on complex conditions, which include not only the decrease of societal demand, but also local and national economic demand for certain specialties (the best example is agricultural programs). We are interested in understanding the ability of HEIs to follow two coordinates in their internal development, and how definite types of HEIs maintain the balance between responsiveness to the market and their public mission, which could be determined by their initial specialization in a finite number of education areas. The significant differences between patterns of program supply reflect an uneven influence of circumstances on the development of HEIs. Similarly, the agricultural and industrial HEIs can be considered a good example of how these heterogeneous factors have influenced a defined level of program diversification. The analysis of specialization patterns can provide a deeper understanding of how this drift occurred.

Preliminary analysis has revealed that, on average, within all 216 institutions, the normalized index of diversification is higher in such educational fields as engineering, manufacturing, construction, and social science. Therefore, the separation of these two fields of education is becoming more interesting, taking into account the exception in the sample of the HEIs in which specialization originally could be relative to the economy, management, sociology, and other programs within the social sciences.

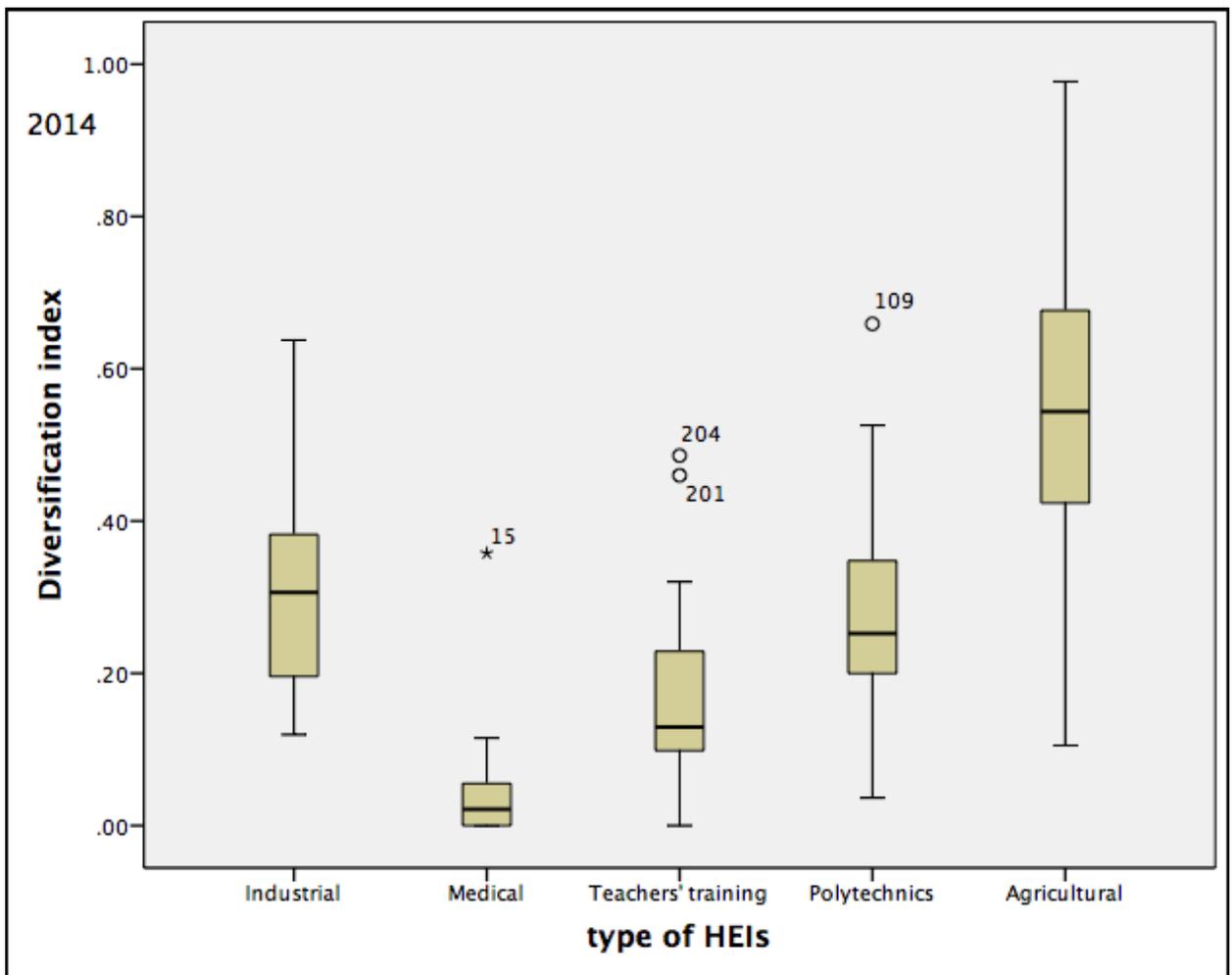


Figure 8 Diversification index within Russian HEIs in 2014

Source: Calculated by authors

We complement the analysis of program diversification by introducing the specialization index. Table 3 provides data on the average degree of specialization within eight educational fields for every group of HEIs. According to the specialization index (4) the positive values indicates that institutions are over-specialized in the educational area and negative – under-specialized.

Table 3 Specialization index within eight fields of education

	Industrial		Medical		Teachers' training		Polytechnic		Agricultural	
	1998	2014	1998	2014	1998	2014	1998	2014	1998	2014
Humanities	-1,00	-0,69	-1,00	-0,79	0,45	-0,45	-0,94	-0,58	-0,98	-0,82
Health and welfare	-1,00	-1,00	0,86	0,84	-0,98	-1,00	-1,00	-0,97	-1,00	-1,00
Engineering, manufacturing and construction	0,42	0,40	-0,99	-0,99	-1,00	-0,86	0,34	0,36	-0,60	-0,38
Arts	-0,91	-0,82	-1,00	-1,00	-0,09	-0,26	-0,92	-0,77	-1,00	-1,00
Mathematics and natural science	-0,76	-0,30	-0,94	-0,98	0,33	-0,55	-0,77	-0,21	-0,89	-0,37
Social science	-0,39	-0,12	-0,94	-0,94	-0,44	-0,56	-0,22	-0,13	-0,10	0,04
Education	-1,00	-0,96	-0,93	-0,99	0,56	0,74	-0,99	-0,93	-1,00	-0,86
Agriculture	-0,79	-0,95	-1,00	-1,00	-1,00	-0,95	-0,53	-0,76	0,82	0,83

Source: Calculated by authors

The results of this analysis reveal a high level of specialization among almost all medical institutions. This analysis was conducted using the diversification index. Notably, during the past 15 years, medical institutions have only changed their names, often from “academic institution” to “university”. These changes reflect the desire to become more prestigious without actually increasing activity in other fields. Moreover, according to the Monitoring of admission quality in higher education institutions (National Research University “Higher School of Economics” 2009-2013), medical HEIs attract the most talented students who tend to have excellent scores on the Unified State Exam.

The high specialization of medical institutions may represent an interesting example of consensus between market and state regulation. The public demand for specialization among medical HEIs has not influenced these institutions dramatically. Medical HEIs still have a rather high quality of admission despite the rumor of corruption within medical HEIs in 1990s. The differences in specialization between agricultural or transportation HEIs either reflect the ambiguousness of public demand or the difference between authorities’ management approaches.

Going further, we have already mentioned that there has been a rise of specialization among polytechnics. These institutions are on average over-specialized in the fields of engineering, manufacturing and construction, and under-specialized in all other fields. However, the level of specialization of polytechnics in engineering, manufacturing and construction is relatively low, and has not changed in the past 15 years. In fact, the specialization index displays higher values in the fields “humanities”, “social science” and “mathematics and the natural sciences” in 2014, than in 1998. If the case of specialization in polytechnics can indicate the expansion of their core activities, then the rise of specialization in humanities and the social sciences is a consequence of the ongoing process of boosting enrollments by introducing more popular programs. Similar results can be noticed in industrial institutions. The differences between industrial HEIs and polytechnic universities, in practice, are not as evident as we previously stated. This is especially true, if we examine the specialization of industrial HEIs within aggregated educational areas. The industrial HEIs should be especially focused within a narrow field of education, but they are now conceptualized within a broad educational field. This conceptual misalignment limits the understanding of the historical drift concerning the specialization of industrial HEIs.

Agricultural institutions, similar to industrial HEIs, are one of the examples of institutions that were originally very specialized institutions, and have since become homogeneous. Since 1998, the specialization index in the social science disciplines has become relatively higher all other

cases of HEIs. In the past 15 years, social science disciplines have achieved positive values—this indicates a weaker ability to resist external forces among the social science disciplines. If institutions are grouped according their nominal belonging to the professional area that was formed in Soviet times, we can assume that this kind of grouping reflects their path dependence. In other words, if institutions still identify themselves within this typology (and it is conserved in their names), then they are not able to overcome institutional forces.

Analyzing the group of teachers' training institutions, we argue that teachers' training HEIs have become more specialized in terms of diversification. The results of the specialization indexes within educational areas also highlight the rise of the degree of specialization in the educational disciplines. It must be noted that the examination of program diversification in these HEIs is limited due to: changes in counting the disciplines' proper examination and limitations of the chosen sample. (Most likely, statistics do not take into account new classifications of programs in educational fields.) In the sample we include only 33 teachers' training institutions, which have this "code of identification" in their names. However, it is critical to emphasize that within this group (of teachers' training institutions) many of HEIs changed their type. The wide range of teachers' training institutions that existed 1998 does not exist today. In fact, teachers' training institutions have participated more than any other kind of institutions in the merging processes. Teachers' training HEIs often have one of the departments in comprehensive universities or institutions of humanities. Two reasons for the dimension of forces can underlie this fact. Firstly, there is significant pressure from government to reduce the number of HEIs and to raise the quality of education in this sphere.⁹ Secondly, teachers' training institutions are supposed to have a weak ability to determine themselves as a special type of institution and, consequently, it is easy for them to deny their identity. Frequently, the demand considers those institutions more as a social mobility mechanism – even in Soviet times. We can assume that the growth of competition in the field of "socialization" institutions (or precisely, "social lockers") has challenged their significantly legitimacy. Furthermore, until recently, the unpromising career perspectives for graduates (due to the depressing situation of the teachers' labor market) greatly reduced demand.

Historical types of Russian HEIs, which were formed under the rigid state control of the Soviet Union have since adapted to new circumstances. The analysis of these historical and

⁹ According to the Monitoring of admission quality in higher education institutions (National Research University "Higher School of Economics" 2009-2013), students of teachers' training institutions, on average, have the lowest level of knowledge, that, in some way, indicates the lower level of education quality within these institutions.

contemporary HEIs is an attempt to examine institutional' transformations by assessing the diversification and specialization of educational fields. Due to unstable financing, which depends on the overall economic conjecture, policy-making, societal well-being, implementation of different, sometimes isolated, governmental measures, the Russian situation concerning higher education systems can be characterized as uncertain. Theoretically, in a situation of uncertainty, organizations have reasons to diversify their range of activities. (Zammuto R., Cameron K. 1982) Furthermore, on one hand, there is pressure to become more differentiated from the point of program supply; while, on the other hand, it is assumed that: the appearance of an enrollment economy in Russia will spur discussion over the extensive expansion of "popular" disciplines.

Going further, the results of our empirical analysis highlights that the powerful force of the market does not equally influence HEIs. The case of the Russian specialized HEI provides us with some suggestions on other "independent variables" that underlie different patterns of diversification in HEIs.

These differences could be interpreted as evidence of reforms, but they do not give us an essential explanation of HEI transformations. Most of the measures that have been targeted on the whole system are rarely considered in the branch profiles. The only policy direction potentially reshaping the situation was declared intentionally to increase the engineering budget.

Concluding remarks

This research aims to provide insight into the issue of current program drift among HEIs in Russia. The empirical analysis of Russian specialized institutions highlights that, on the one hand, most HEIs are forced to introduce and expand popular educational fields with respect to demand. On the other hand, we investigated that there are the differences in the level and intensity of internal diversification within historical types of HEIs.

These differences can be explained by a wide variety of factors. The impacts of these differences are objective, and require separate research and assessment. If we look at these differences through the lens of state-market balance, then these differences should be explained with the role of state regulation and different outcomes of government actions in particular.

In industrial, agricultural, polytechnic HEIs, we see relatively similar diversification results which can be explained by market forces. These forces have impacted these three institutions at a level comparable with privatization in Russian higher education in general. Besides intense

competition between HEIs, these three HEIs similarly face vast changes of external environment: privatization in industries, changes in the labor market, and decline of some industries.

As for medical HEIs, their level of specialization may result in a relevant managing of a branch ministry that may provide a sufficient level of support and control for diversification. As a subject of policy the ministry has been pursuing the strategy of saving the specialization (despite changing ministers and environments for policy-making). Another reason might be that there are exceptional public and political expectations oriented towards the medical sector. Following this logic, government as an executive of public will could not give up controlling medical HEIs because accessibility to social care is an integral part of the Russian social contract. The market factor brings changes that could result in public disaffection, however, it is the responsibility of the government to correct for these particular failures.

Similar explanations of social importance should also apply to teachers' training institutions (as in this field, the state has played a major role and the relevant "industry" has not been privatized sufficiently). However, the analysis has shown that there is actually a higher level of specialization in teachers' training HEIs. This could be explained by the different subordinate strategies (and ministries' strategies). However, this is not the only point. The roots can be found in the different disciplinary nature and in history. Pedagogical HEIs, even during Soviet times, were considered a way for social mobility (often, in urbanization processes) contrary to the medical field that traditionally reproduced a particular community. Moreover, the pedagogical institutions originally had a comprehensive design. Organizational departments were based on different disciplines (mathematics, physics, literature, languages, etc.). That is why they might have been less resistant to diversification because of the organizational nature of the institutions.

These explanations bring us to an interesting reflection on the institutional determination of the diversification process. We should pay more attention to the factors lying outside the market-state dichotomy. Following Burton Clark who placed academic oligarchy in one of the ends of his triangle of system coordination, we can assume that the third force regarding institutional change is situated inside a university (Clark B. 1983). The diversification is a result of complex processes both outside the university and inside it – even if we deal with groups of HEIs associated by the nominal specialization. As Scott distinguishes between institutional and technical environments, we can suggest that institutional forces can also be observed internally.

If the difference between the institutions could be defined by state and market forces, only then would we see the major line between the “new” HEIs and the “old” ones as an environmental situation that is precisely different for “greenfields” and “brownfields”. Although there is substantial backing in the literature for such a conclusion, the data on “brownfields” that were examined in this paper show us that the pathways of “greenfields” and “brownfields” are not very similar. Thus, the Russian case provides support for the hypothesis of institutional intention.

Practically, the Russian higher education system takes a form of institutional path dependence. The issue of self-determination is one of the core points on the micro-level that is related to the attitude to the past of a HEI. A lot of university leaders define their universities primarily as successors of the respectful Soviet intuitions they used to be, often, disadvantaging the present with a lack of disregard to the present identity formation. Economists revealed the similar problem in the concept of path dependence (David P. 1985; Leibowitz S., Margolis S. 2000). The Russian situation has also been interpreted by this concept of path dependence (Froumin et al. 2014). Some of HEIs choose to bet on their industrial identity and history. Others HEI got rid of it and choose path creation. Usually these HEIs collect the institutional profile by mixing “old” and “new” – their traditional (even narrowly specialized) programs with new highly market-oriented programs.

Ultimately, in order to understand the origin of modern HEIs, even in the dimension of program supply, quantitative analysis can be implemented at the level of diversification and transformations of their specialization. Undoubtedly, the analysis of the development patterns of HEIs can touch upon a great variety of questions. However, more comprehensive investigation of program drift is needed to understand the underlying forces that influence the HEIs.

References

1. Alekseeva, L., Shablygina, N. (1999) Process universitizacii vuzov Rossii i nekotorye podhody k ocenke ih dejatel'nosti. [The process on “universities-making” of HEIs in Russian and some approaches to estimation their activity] Problemy zarubezhnoj vysšej shkoly: Analiticheskie obzory po osnovnym napravlenijam razvitija vysshego obrazovanija. Moscow.
2. Balassa, B. (1965) Trade liberalization and “revealed” comparative advantage, Manchester School, 33, pp. 99–123
3. Ben-David, J. (1972) American higher education: directions old and new. New York: McGraw-Hill
4. Chanbarisov, Sh. (1988) Formirovanie sovetskoy universitetskoj sistemy [Formation of the Soviet University System]. Moscow: Vysshaya shkola.
5. Clark, B. (1956) Organizational adaptation and precarious values: A case study. American Sociological Review, 21(3), 327–336.
6. Clark, B.R. 1983. The Higher Education System. Berkeley and Los Angeles: University of California Press.
7. David-Fox, M. 2012. “Nastuplenie na universitety i dinamika stalinskogo Velikogo pereloma (1928–1932 gg.)” [An Attack On Universities and Dynamics of Stalin’s Great Turn (1928–1932)]. Raspisanie peremen. Oчерki istorii obrazovatel'noy i nauchnoy politiki v Rossijskoj imperii — SSSR (konets 1880-kh — 1930-e gody) [A Schedule of Changes: Outlines of The Education and Scientific Policy History in The Russian Empire — The USSR (late 1880s — 1930s)]. Moscow: Novoe literaturnoe obozrenie
8. David, P. (1985) “Clio and the Economics of QWERTY.” American Economic Review 75 (2): 332–337.
9. Dill, D., Teixeira, P., (2000) Program diversity and higher education% economic perspective. Higher Education Policy, 13, pp. 99-117
10. Education in the Russian Federation. Statistics. 2003. Moscow: CRSS. p. 255
11. Federalnaya sluzhba gosudarstvennoy statistiki [Federal State Statistics Service]. 2013. Ofitsialnaya statistika. Naselenie. Obrazovanie [Official Statistics. Population. Education]. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/education/#
12. Froumin, I., Kuzminov, Y., Semyonov, D. (2014) Institutional diversity in Russian higher

- education: revolutions and evolution. *European Journal of Higher education*. p. 1-26
13. Fumasoli, T., Huisman, J. (2013) Strategic Agency and System Diversity: Conceptualizing Institutional Positioning in Higher Education. *Minerva*, 51 (2), pp. 155-169.
 14. Glynn, M. A., & Marquis, C. (2007). Legitimizing identities: How institutional logics motivate organizational name choices. In C. A. Bartel, S. Blader, & A. Wrzesniewski (Eds.), *Identity and the modern organization*. Philadelphia: Psychology Press.
 15. Horta, H., Huisman, J., Heitor, M. (2008) Does competitive research funding encourage diversity in higher education? *Science and Public Policy*, Vol. 35(3) p. 146–158
 16. Jaquette, O. (2013) Why Do Colleges Become Universities? Mission Drift and the Enrollment Economy, *Research in Higher Education*, 54 (5), pp .514-543
 17. Johnson, M. (2008) Historical Legacies of Soviet Higher Education and the Transformation of Higher Education Systems in Post-Soviet Russia and Eurasia. *The Worldwide Transformation of Higher Education*. edited by D. P. Baker, A. W. Wiseman. Emerald Group Publishing Limited. pp. 159–176.
 18. Klyachko, T., N.Titova, A.Kryshtanovsky, M.Mikhailyuk, M.Drugov, D.Vasiliev, L.Kapranova, A.Zaborovskaya, S.Zaretskaya, (2002) Strategii adaptatsii vysshikh uchebnykh zavedeniy: ekonomicheskii i sotsiologicheskii aspekty [Adaptation Strategies of The Higher Education Institutions: An Economic and A Sociological Aspects]. Moscow: HSE.
 19. Kraatz, M. S., Zajac, E. J. (1996) Exploring the limits of the new institutionalism: The causes and consequences of illegitimate organizational change. *American Sociological Review*, 61(5), pp. 812–836.
 20. Kul'turnoe stroitel'stvo v SSSR, 1990 g. [Cultural construction in the USSR, 1990] Moscow. 1990. p. 198-212
 21. Lepori, B., Huisman, J., Seeber, M. (2014) Convergence and differentiation processes in Swiss higher education: an empirical analysis. *Studies in Higher Education*, 39 (2), pp. 197-218.
 22. Liebowitz, S., Margolis S. (2000) Path Dependence. *Encyclopedia of Law and Economics* edited by B. Bouckaert, G. De Geest, Ghent: Edward Elgar and the University of Ghent

23. Magurran, A., (2004) *Measuring Biological Diversity* Blackwell Science Ltd, Blackwell Publishing company
24. Ministry of Education and Science of Russian Federation, Monitoring effektivnosti vuzov [Monitoring of effectiveness of higher education institutions], <http://xn--80abucjiibhv9a.xn--p1ai/%D0%BD%D0%BE%D0%B2%D0%BE%D1%81%D1%82%D0%B8/2775>
25. Morphew, C. (2002). A rose by any other name: which colleges became universities. *The Review of Higher Education*, 25(2), 207-224.
26. Rossi, F. (2009) Increased competition and diversity in higher education: An empirical analysis of the Italian University system. *Higher Education Policy*, 22 (4), pp. 389-413.
27. Scott, W. R. (2001) *Institutions and organizations*. Thousand Oak, CA: Sage. 255 p.
28. Semyonov, D. (2014) Russian Excellence Initiative in the Post-Soviet Context. *Higher Education in Russia and Beyond*, 1, pp. 15-16
29. Smolentseva A. (2006) Russia, in: *International Handbook of Higher Education*. Springer, pp. 953-972.
30. Suvorov A., (2002) Chto proishodit s rossijskim obrazovaniem? [What is happening with Russian education?] *Demoscop Weekly*. October 7-20, 2002: <http://demoscope.ru/weekly/2002/083/tema02.php>
31. Teichler U. 2005. Changing Structures of the Higher Education Systems: The Increasing Complexity of Underlying Forces. in UNESCO Forum Occasional Paper Series Paper No. 6 “Diversification of Higher Education and the Changing Role of Knowledge and Research” p. 3-16
32. Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. (2012) Competition and diversity in higher education: an empirical approach to specialization patterns of Portuguese institutions. *Higher education*, 63, pp. 337-352
33. Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. (2013) Competition and diversification in public and private higher education *Applied Economics*, 45 (35), pp. 49-58.
34. Teixeira, P., Rocha, V., Biscaia, R., Cardoso, M.F. (2014) Policy changes, marketisation trends and spatial dispersion in European higher education: Comparing public and private sectors *Cambridge Journal of Regions, Economy and Society*, 7 (2), pp. 271-288.

35. Titova, N. (2008) Put uspekha i neudach: strategicheskoe razvitie rossiyskikh vuzov [Path of Success and Failures: A Strategic Development of Russian Higher Education Institutions]. Moscow: MAKS Press.
36. Vught, F. van (2008) Mission diversity and reputation in higher education, Higher Education Policy 21(2), pp. 151–174.
37. Zammuto, R., Cameron K. (1982) Environmental decline and organizational response. In Research in organizational behavior: an annual series of analytical essays and critical reviews Greenwich, Conn: JAI Press. pp. 223-262

Authors:

Daria D. Platonova. National Research University Higher School of Economics. Laboratory for Universities Development. Analyst; E-mail: dplatonova@hse.ru. Mob.: +7(915)3891114

Dmitry S. Semyonov. National Research University Higher School of Economics. Laboratory for Universities Development. The Head; E-mail: dsemyonov@hse.ru. Mob.: +7(926)5647448

Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE.

© Platonova, Semyonov, 2014