

Polarization of universities in the Central Federal District of Russia under reform

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Abstract

Purpose – The purpose of this paper is to analyze the changes in higher education under the new configuration of resources based on the income structure of universities located in the Central Federal District (CFD). Particular focus is given to the changes in the structure of public financing of higher education, considering the explicit priorities of increasing teaching staff salaries and promoting research. The study also assesses regional differentiation in financial resources for the maintenance of university property and the accumulation of funds from extra-budgetary sources.

Design/methodology/approach – Using statistical and economic analysis methods, the research reveals the main trends of structural changes in public funding of higher education in Russia as a whole, and the regional peculiarities of financial support in the universities of the CFD.

Findings – The results of this investigation of universities in the CFD point to inertia in the development of universities in the regions, and problems transitioning to new business models. Groups of universities in the region often lobby for the “previous rules of the game.” The results evidence a change in financial support from different income sources and in cost structures at the university level. These are the result of higher education reform and university support programs aimed at enhancing the academic and research capacity of the leading Russian universities and developing a competitive national education system.

Originality/value – A costs optimization policy has led to polarization of universities and reduced development opportunities for a significant proportion of regional universities. In order to maintain their properties in good condition, they have to make active efforts to seek non-budgetary funding sources against a fall in effective demand from the population.

Keyword Russia, Higher education, Universities, Budget constraints, Income structure

Paper type Research paper

Introduction

Universities’ financial stability still depends largely on increasing the volume of funds received from various sources (Belyakov *et al.*, 2008). This income has to support the provision of educational programs while still leaving some money over to invest in further development. A balanced revenue structure makes it possible to diversify and attract additional income from new and existing sources (Abankina, Vynaryk and Filatova, 2016). Issues concerning the structure of revenue universities receive and their diversification have been analyzed at various times in reports by global organizations and communities dealing with higher education matters (Deiningger and Squire, 1996; Thomas *et al.*, 2001) and in the works of educational experts (Tilak, 1989; Winegarden, 1979).

Estermann and Pruvot (2011) analyzed the behavior of stakeholders and the current income diversification of European universities, as well as the barriers preventing an increase in income from additional sources. The prospective financial sustainability of the



universities, in their opinion, depends on secure and adequate public financing but also on the status and autonomy of institutions.

Tilak, Johnstone and Marcucci argue that higher education involves high expenses requiring increasing private contributions to cover the costs, and they show how different countries meet similar challenges (Tilak, 1989; Johnstone and Marcucci, 2010). For example, a new funding regime introduced in English universities in 2012 has stimulated an increasing share of private contributions to tuition fees while ensuring social mobility (Chowdry *et al.*, 2012).

Many countries have taken drastic actions to reduce the state budget expenditures for education during recessions. As a result, salaries and social benefits of university teaching staff were cut in such countries as the Netherlands, Italy and Hungary. In other countries, e.g. in Ireland and Greece, budget cuts triggered not only a decrease in faculty salaries and social benefits, but also reduction of financing for support and development of university infrastructure (EUA, 2014).

In the context of financial constraints, the state policies of many countries are focused on granting more freedom to universities in managing their financial resources and developing fundraising strategies from alternative (non-budgetary) sources. Relations between the state and universities are changing and responsibilities for growth, innovations and diversification are being delegated to the universities, while state institutions retain authority in setting general development trends in higher education and its financing (Kaiser *et al.*, 2014). International studies also present evidence that financial autonomy drives universities' efficiency (Aghion *et al.*, 2010; Eykamp, 1995; Volkwein and Malik, 1997).

Governments of many countries allocate funds to promote priority research areas through academic funding and additional grants aimed at the integration of science and education as well as support of university science advancement (Abbott and Doucouliagos, 2003). They implement initiatives focused on building networks between leading universities, stimulating institutional transformations and fostering scientific work and research in universities (development of talent potential in university science, equipment upgrades, participation of universities in technological platforms, etc.). For example, Germany has launched the German Excellence Initiative, designed to promote cutting-edge research and enhance the quality of universities and research institutions. Support of science and science-related integration processes is a major component of these actions.

Foreign countries have striven to reduce pressure on the state budget using various efforts, tools and mechanisms to regulate the influx of funds to higher education from various sources. Income diversification is one such tool to manage financial resources using multiple mechanisms.

In Russia, Shenderova (2011) considers the issue of university profitability. In her opinion, it is necessary to increase the profitability of Russian universities through increasing the transparency and openness of their financial indicators, while enhancing their managerial expertise. According to Gamukin (2012), further development of the universities depends on the diversification of income sources with a focus on innovation.

Financial difficulties are unlikely to subside for universities: government funding is being reduced, income from tuition is unstable and service costs are rising, including teaching staff salaries. This means that every institution of higher learning must look for new sources of financing. Before they can attract additional funds, they must evaluate the current situation, analyze their institutional potential, their own features and capabilities, and, by comparing this with indicators from the external environment, arrive at an understanding of the university as a part of the regional economy (Abankina and Filatova, 2015).

This research work aims to reveal trends in the financing of higher education institutions using statistical and economic analysis, comparing the income structures of different groups of universities and their cost structures. Analyzing the dynamics of the aggregate indicators, we study cost structures while taking into account university priorities to

increase teaching staff salaries and income from their research and development projects. The study assesses the implications of increasing regional university differentiation (based on the example of the Central Federal District (CFD) of the Russian Federation) in terms of funding and income sources, which lead, considering the commitment to increase faculty salaries, to a shortage of funds for the maintenance of property. These circumstances force universities to make considerable efforts to find extra-budgetary funding sources in a situation of shrinking effective demand, jeopardizing the development opportunities for a large proportion of regional universities.

The choice of universities in the CFD is conditioned by the need to counterbalance the natural and climatic diversity of Russia's regions that influences the scale of state support. So, for example, the costs of salaries, utility services and consumer goods between Russia's northern, southern and far eastern regions may differ fivefold. This is why the scope of government support to universities, though intended for similar education programs, differs dramatically. The CFD lacks such differentiation, with universities being more or less under the same conditions, and this makes it possible to disregard territorial factors influencing incomes of universities, and to identify universities' reactions to the national economic situation.

During the first decade of the twenty-first century, Russia implemented a priority national project to modernize of education, taking a number of steps to upgrade higher education content and incorporate Russian professional education into the international educational landscape. This primarily meant integration of Russia into the Bologna process, enhancing flexibility of educational programs, and overcoming a historical tendency for narrow academic focus. Since 2011, Russia has leveraged a two-tier system of education, based on bachelor- and master-level programs instead of a single specialist training program. In 2011, for the first time in Russia, 80 percent of students were admitted to bachelor degree programs rather than specialist programs aimed at training focused specialists in five years. In 2010, only 7–8 percent of Russian high school graduates had applied for bachelor degree programs, the rest applying for outdated specialist programs. Based on this, we have selected 2011 as the starting year for the mass transition to a two-tier system of education in Russia.

Implementation of the Federal Targeted Program for 2009–2013, "Research and Academic Talents for Innovative Russia," and widespread activities to attract leading Russian and international scientists to Russian universities (as part of the implementation of Russian Federal Government Decree No. 220 of April 9, 2010 "On Measures to Attract Leading Scientists to Russian Educational Institutions of Higher Professional Education"), became positive factors for enhancing personnel potential in universities. This was another reason to choose 2011 as the starting year for analysis and 2014 as the final stage in the targeted program supporting research and academic staff.

The process of piloting and implementing institutional reforms was based on a mechanism of competitive financial support for modernization projects in education, using the principle "money in exchange for commitments," i.e. financing was conditional upon project success.

Adoption of Russian Federal Government Decree No. 218 of April 9, 2010 "On Measures of State Support to Further Cooperation of Russian Higher Education Institutions and Organizations, Implementing Comprehensive Projects in Building Hi-Tech Manufacturing," along with programs for innovative development of companies and technological platforms, constituted a milestone event in stimulating manufacturers to exploit the potential of Russian universities.

Another line of reforms during the period under review was dynamic development of innovative infrastructure in universities, in accordance with Russian Federal Government Decree No. 219 of April 9, 2010 "On State Support for Development of Innovative Infrastructure in Federal Educational Institutions of Higher Professional Education." This support was targeted and allocated on a competitive basis.

One of the key trends in structural transformation of the higher education system was recognition of a category of leading universities with the aim to intensify the whole system of higher education (modernization drivers). The leading universities have designed and implemented development programs with financial support from the government, accepting specific responsibilities and defining target development indicators.

In 2011, 55 universities within the system of the Ministry of Education and Science of the Russian Federation were announced as winners of the strategic development programs' competition. Their development programs are also implemented with state support.

Implementation of Federal Law No. 83-FZ of May 8, 2010 "On Amendments to Certain Statutes of the Russian Federation in Order to Improve Legal Position of State (Municipal) Institutions" prompted the emergence of a new institutional model for the Russian educational system. The key element of this system is transparency and engagement of the public and all stakeholders. In 2012, the new law "On Education in the Russian Federation" was adopted. This formalized institutional changes, including those concerning financial support of universities. In particular, after adoption of the law, a normative financing model was launched in 2013, based on universities' achievements and introduction of performance-based employment contracts with faculty and academic staff. The "performance-based employment contracts" envisage labor relations between employees and employers on the basis of:

- The current public contract and target performance indicators of the organization.
- An employee performance assessment system (set of indicators and criteria for assessing labor input and quality of labor).
- An employee compensation plan, reflecting differences in complexity of work as well as labor input and quality of labor).
- A performance standards system taking into account industry specifics in labor contracts, job descriptions of employees, indicators and criteria of labor assessment, and terms of payment for labor. Labor relations between an employer and an employee, including the amount of salary, are formalized in the signing of a labor agreement.

Development of a modern infrastructure for professional education (construction of campuses, halls of residence, educational laboratory facilities) was launched in 2013 to provide for real mobility of students and faculty as a condition for Russia's integration into the Bologna process.

In 2012, a Plan of Actions for the development of leading universities was adopted, boosting their competitiveness among top global educational and academic centers (approved by Government Executive Order No. 2006-p of October 29, 2012). This Plan envisages enhancement of the role of employers and public-private partnerships in developing professional education, along with revolutionary reform of educational methods and technologies. In view of this, the present paper compares the year 2011, when universities shifted to the bachelor-master degrees system, with the year 2014, when the new law "On Education in the Russian Federation" was implemented. This law granted academic freedoms and financial autonomy to universities.

The years 2011 and 2014 were deemed advantageous for analysis in the context of universities' reactions to economic recessions in Russia. Economic indicators fell significantly in 2008-2010, causing budget cuts and, consequently, higher risks of decreasing public investment into universities. However, the 2008-2010 crisis did not cause reduction of personal income in real terms; it only significantly slowed down income growth rates. The number of fee-paying students did not therefore decline and the universities managed to offset incomes at their expense. In contrast, a new wave of the crisis in 2014 resulted not only in reduction of economic indicators, but also in the share of educational expenses in the federal budget, as well as in decline of real household incomes. For this reason, the paper suggests a

hypothesis that, unlike the crisis of 2008–2010, which did not cause a decline in non-budgetary income (at the expense of fees paid by the population), the crisis of 2014 triggered a downturn in universities’ non-budgetary income. Benchmarking these periods makes it possible to detect differences in universities’ reactions to economic crisis.

The findings may be used by universities in the process of designing policy to diversify educational activities and prioritize academic research. The findings may be also utilized by the Ministry of Education and Science of the Russian Federation in determining volumes of state support broken down by federal districts.

Higher education system in Russia

Universities are seen as key institutions in social change; their main activity is producing qualified personnel and conducting research to meet expected economic needs. The need for graduates in all sectors of the Russian economy is almost completely filled by the higher education system. The share of employees with university degrees in all sectors of the Russian economy was 32.2 percent as of the end of 2014. That year, 1.2 million people graduated from higher education institutions. The average annual inflow of employees with university degrees in all professional spheres was 470,000 in 2010–2014 (Figure 1)[1]. This was particularly notable in the wholesale and retail sectors, as well as motor vehicle repair (14.5 percent of total inflow). These were followed by real estate (13.9 percent) and manufacturing (11.8 percent). In the education system, the share of employees with university degrees decreases annually, reaching 13.3 percent in 2014.

However, unlike other sectors of the economy, the number of graduates in the education system has fallen by an average of 9,000 annually in 2010–2014 (5,000 in higher professional education institutions; 4,000 in general education institutions).

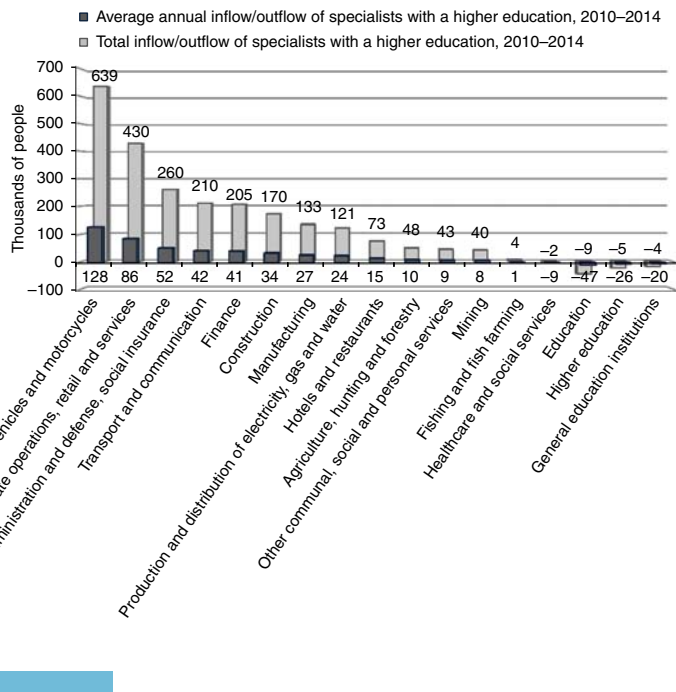


Figure 1.
Inflow (outflow) of specialists with university degrees by type of economic activity in 2010–2014, thousands of people

Graduates in entirely new types of activity related to real estate, the service economy and new technology management, including manufacturing, come mainly from the Russian higher education system and not from abroad (*Russian Statistical Yearbook*, 2015, table 12.13). Meanwhile, the index of gross value added in education has not grown over the last five years, with 2014 representing 99.3 percent of 2013s figures (Table I)[2].

The higher education system, which defines the requirements for professional qualifications, can impact structural changes in employment and foster dynamic economic development and increased competition. It was one of the first sectors to be exposed to market failure. This is more characteristic of a crisis in the sector compounded by the decrease in the gross value added index in higher education. The higher education system services other sectors, and does not develop new markets or distribute intellectual products to create additional value (Abankina, Abankina and Filatova, 2016).

The reforms of the higher education system were an attempt to overcome this situation. Established universities strive to get funds not only from their educational activities but also through expanding research and development. However, in most cases, universities receive income from their educational activities (not from research and development) and this may be a factor slowing down the development of the higher education sector.

A new configuration of university income in the CFD

This analysis of the revenue structure of universities in the CFD is based on data from the State Statistics Service on the economic development potential of these regions from 2011 to 2014. Using this district as an example makes it possible to identify the main trends in higher education financing and reforms in a relatively homogeneous region, to demonstrate the differentiation of state policy in relation to university financing, the concentration of support for the leading universities in the “5 top 100” program, and the accumulation of funds from non-budgetary sources.

To counterbalance the differences in costs of educational programs in universities located in different Russian regions, it is appropriate to introduce territorial coefficients that

Economic activity	2006	2007	2008	2009	2010	2011	2012	2013	2014
Agriculture, hunting and forestry	102.7	101.3	106.4	101.5	87.9	114.7	96.4	104.3	101.5
Fishing and fish farming	104.0	99.1	94.2	105.6	90.9	104.1	102.2	102.6	95.9
Mining	97.1	97.8	101.0	97.6	106.6	103.4	101.6	96.2	100.7
Manufacturing	106.6	107.5	97.9	85.4	108.6	106.3	102.8	103.9	102.5
Production and distribution of electricity, gas and water	104.5	96.6	100.7	95.3	104.0	100.0	101.2	97.8	99.9
Construction	112.8	113.0	111.1	85.3	104.4	107.6	102.6	98.6	94.9
Wholesale and retail trade, repair of motor vehicles and motorcycles	114.1	111.7	109.9	94.2	105.8	103.2	103.4	100.5	100.6
Hotels and restaurants	107.9	113.6	110.1	85.1	106.5	106.6	104.4	103.3	98.0
Transport and communication	109.7	104.8	105.2	91.4	105.5	106.5	104.1	103.0	100.3
Finance	125.4	129.1	113.5	101.5	100.3	103.5	118.9	112.3	108.8
Real estate operations, retail and services	110.0	120.8	110.9	95.5	106.0	102.2	107.0	102.9	100.7
Public administration and defense, social insurance	102.5	103.9	103.0	99.9	99.7	96.8	100.8	99.6	99.7
Education	100.5	101.1	99.9	98.6	98.2	99.2	98.9	100.1	99.3
Higher education	103.5	102.1	100.7	98.7	95.3	93.2	94.3	92.6	92.5
Healthcare and social services	101.4	101.1	100.9	99.8	100.3	101.1	102.0	100.7	101.0
Other communal, social and personal services	107.5	108.6	101.4	80.0	102.2	99.6	102.5	99.4	97.3
Total gross value added at basic prices	107.9	108.4	105.2	93.3	104.1	103.8	103.5	101.4	100.7

Table I.
Index of gross value added by type of economic activity in 2006–2014, percent of the previous year's figures

would level the conditions in which universities operate, while maintaining the focus on supporting leading universities in macro regions.

The CFD, which includes Moscow, is an administrative formation occupying 3.8 percent of the territory of Russia. It is home to nearly 27 percent of the country's population (as of January 1, 2013). There are 17 regions in the district, plus Moscow as a separate political entity of the Federation.

According to the Education and Science Ministry (ESM), there were 99 institutions under its jurisdiction in the CFD in 2011 (89 universities in 2014), or 33.9 percent (in 2014, 31.3 percent) of the ESM universities in Russia. Moscow universities accounted for 50.6 percent of the CFD university structure in 2014. The processes of demographic decline have resulted in decreasing university enrollment in the CFD in 2014, with the number of students being 3.3 percent lower than in 2013. In Moscow universities the decline in student numbers was 5.5 percent. However, even under such conditions, the share of Moscow students was still over half the total number of students enrolled in the CFD: 56.8 percent in 2014. In 2014, 52.7 percent of students enrolled in CFD universities paid for their tuition (the remainder are awarded scholarships based on school results).

Universities derive their revenue from educational activities, research activities and various other sources, such as rent of premises, bank interests, etc. (Table II)[3]. CFD universities focus mainly on educational activities, and this is where they derive most of their revenue – over 66 percent of total revenue in 2011, and 65 percent in 2014. Moscow universities derived a smaller share of revenue from educational activities (63 percent). In Moscow Region, the share was 47.8 percent in 2011 and 46.7 percent in 2014; this is likely to be because universities in Moscow Region are closely associated with the city of Moscow.

The share of revenue from educational activities at universities in Belgorod, Ryazan and Yaroslavl Regions was lower than in other regions of the CFD, but they differ in their sources of the remaining revenue. In Belgorod Region, most of the remaining revenue is miscellaneous income (e.g. rent payment), while in Ryazan and Yaroslavl Regions, this comes from research activities. For four years, the revenue from educational activities of the

Regions of the CFD	Revenue from educational activities		Revenue from research activities		Other revenue	
	2011	2014	2011	2014	2011	2014
Moscow	62.5	62.7	20.1	23.3	17.4	14.0
Moscow Region	47.8	46.7	26.1	29.7	26.0	23.7
Bryansk Region	84.9	89.8	3.0	4.2	12.1	6.0
Vladimir Region	77.9	83.7	10.9	9.6	11.2	6.7
Ivanovo Region	84.0	77.4	8.9	12.0	7.1	10.6
Tver Region	73.7	73.9	9.2	10.9	17.1	15.2
Kaluga Region	97.1	60.8	2.9	5.2	0.0	34.0
Kostroma Region	94.3	90.2	3.8	6.2	1.9	3.6
Oryol Region	85.4	83.1	4.6	7.9	10.0	9.0
Ryazan Region	74.0	72.9	14.5	15.4	11.5	11.7
Smolensk Region	92.9	84.7	2.5	7.4	4.6	7.9
Tula Region	82.9	81.3	6.8	7.5	10.3	11.1
Yaroslavl Region	76.4	64.9	17.9	32.0	5.7	3.1
Belgorod Region	64.2	58.7	16.9	27.3	18.9	14.0
Voronezh Region	83.8	75.4	12.3	11.3	4.0	13.3
Kursk Region	84.6	74.4	13.3	17.5	2.1	8.2
Lipetsk Region	94.9	88.6	3.5	4.8	1.6	6.6
Tambov Region	86.5	84.9	8.9	10.6	4.6	4.5
CFD	66.8	65.2	17.7	21.3	15.4	13.5
CFD, excl. Moscow	76.1	70.8	12.7	16.8	11.2	12.4

Table II.
Revenue structure
of universities in the
CFD (percent)

universities in these regions has decreased, mainly due to the intensification of their research activities. The reduction in 2014 in the share of revenue from educational activities in Kaluga Region's sole ESM university was related to a sharp increase in other income sources. In the remaining regions, universities are engaged solely in educational activities, training staff for other industries. In other words, the economic development in these regions, including the growth of new industries, is directly related to the universities' focus on education, including training graduates for new programs. That said, we cannot accurately determine the number of graduates who remain in the region to work. However, the period saw a trend of increasing CFD universities' revenues from research and the reduction in miscellaneous income sources.

Moscow universities have a high share of revenue from research activities in the CFD (20 percent), though the share of revenue from this is higher in Moscow Region (over 26 percent). This is thanks largely to Pushchino State Institute of Natural Sciences and the Moscow Institute of Physics and Technology. It can be argued that this offers new potential for the region's economic development. Universities in Yaroslavl Region derive significant revenue from scientific research (18 percent), as do those in Belgorod Region (17 percent). The share of revenue from other activities among institutions of higher learning in the CFD was 15 percent, while it was 17 percent in Moscow and 11 percent in other regions. In 2014, the situation regarding revenues from research activities in the CFD universities improved as they began to receive more money from their research and development work. Nevertheless, the share of revenue obtained from research activities is still significantly lower than it would need to be to qualify for international university rankings.

Other revenue sources include services provided involving use of the institution's resources; non-operating income, and other earnings (Figure 2). But this revenue is minimal compared to that of the world's leading universities and cannot be a driver of regional development.

The leading private global universities derive around 20 percent of their revenue from tuition, and this share is lower at state universities. The educational activities of the world's leading university are undeniable, but the share of funds that they receive from research ranges from 26 percent (Stanford Facts, 2015) to 35 percent (University of Copenhagen, 2015), with the state funding a significant share of this.

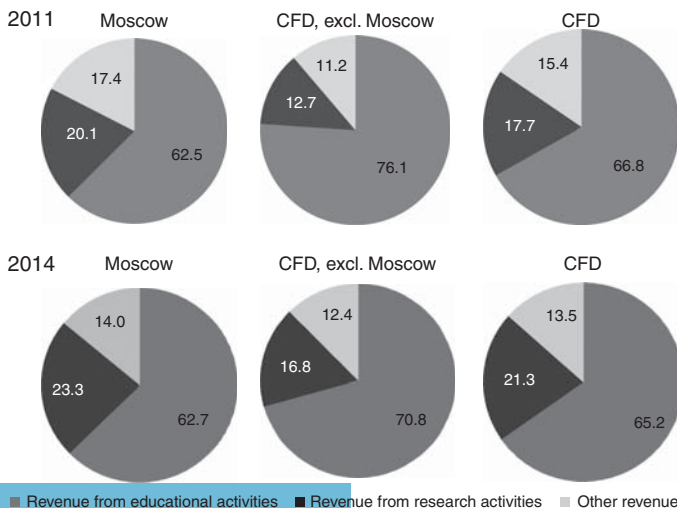


Figure 2. University revenue structure in the CFD (percent)

Revenue sources of the universities in the CFD

The proportion of CFD university revenue from educational activities remained about the same throughout the period (Table III). In all universities, more than half of revenue comes from the state. In 2014 and 2011, the major share of non-budget revenue was funds received by the universities from individuals (80–99 percent). However, in Kaluga Region in 2011, 55.1 percent of non-budget revenue from educational activities came from organizations. Universities in Moscow Region receive 27.9 percent of their non-budget revenue from organizations, with the largest share being that for the Moscow Institute of Physics and Technology (28.9 percent). In Oryol and Smolensk regions, organizations account for nearly 20 percent of universities' non-budget revenue.

In 2014, the universities of Bryansk Region almost tripled their share of funds received from organizations, up 11.4 percent compared with 2011, and for the universities of Lipetsk Region it doubled to 15.5 percent. Tambov Region universities started to receive funds from organizations in 2014. However, the total shares of these revenues in all CFD universities decreased by almost 1 percent. But overall, this revenue is simply an inorganic accumulation of funds that supplement a university's budget.

Figure 3 shows the 2011 and 2014 revenue structure from universities' educational activities in the CFD, and though the share of budgetary funds for educational activities in Moscow is lower than in other regions, the difference in the structure of non-budget revenue is insignificant. In Moscow, up to 87.3 percent of non-budget revenue comes from individuals, with the figure for the CFD excluding Moscow reaching around 89.6 percent. All universities in the region follow the same strategy for attracting supplemental revenue for educational programs—money from the individuals for paid services accounts for 85–90 percent of non-budget revenue, with roughly 6–8 percent coming from organizations.

In Moscow, non-budget revenue accounted for over 40 percent of revenue from educational activities in 2011 (36.9 percent in 2014). In the regions it was 28.9 percent in 2011 (28.3 percent in 2014), while 85 percent of non-budget revenue comes from research activities

Regions of the CFD	Budget		Non-budget		Share of non-budget revenue from organizations		Share of non-budget revenue from the population		Share of non-budget revenue from other sources	
	2011	2014	2011	2014	2011	2014	2011	2014	2011	2014
Moscow	58.7	63.1	41.3	36.9	7.7	7.4	85.4	87.3	6.9	5.3
Moscow Region	76.0	81.8	24.0	18.2	27.9	7.0	72.1	81.8	0.0	11.2
Bryansk Region	65.9	70.2	34.1	29.8	3.8	11.4	94.3	88.3	1.9	0.3
Vladimir Region	69.4	74.9	30.6	25.1	17.0	6.9	61.2	86.9	21.9	6.2
Ivanovo Region	77.4	79.4	22.6	20.6	5.2	8.0	93.1	91.8	1.8	0.2
Tver Region	64.2	65.6	35.8	34.4	2.9	5.5	97.1	90.9	0.0	3.6
Kaluga Region	72.6	62.6	27.4	37.4	55.1	5.7	44.9	94.3	0.0	0.0
Kostroma Region	76.8	77.2	23.2	22.8	0.2	8.5	99.8	91.1	0.0	0.4
Oryol Region	80.7	79.8	19.3	20.2	19.9	10.7	80.1	81.1	0.0	8.2
Ryazan Region	62.9	66.8	37.1	33.2	2.4	1.2	97.6	97.3	0.0	1.6
Smolensk Region	88.5	79.8	11.5	20.2	19.0	5.1	81.0	94.9	0.0	0.0
Tula Region	70.6	69.8	29.4	30.2	8.8	5.4	91.2	90.4	0.0	4.2
Yaroslavl Region	75.8	78.2	24.2	21.8	4.4	3.8	93.5	94.3	2.1	1.9
Belgorod Region	60.1	61.4	39.9	38.6	2.0	3.5	98.0	90.7	0.0	5.8
Voronezh Region	64.1	66.0	35.9	34.0	6.3	5.0	93.7	93.8	0.0	1.2
Kursk Region	64.3	58.3	35.7	41.7	5.1	0.8	94.9	96.0	0.0	3.2
Lipetsk Region	83.5	86.2	16.5	13.8	8.4	15.5	91.6	82.7	0.0	1.9
Tambov Region	73.5	66.4	26.5	33.6	0.0	7.8	92.9	70.4	7.1	21.8
CFD	63.2	66.1	36.8	33.9	7.9	7.0	86.6	87.9	5.5	5.2

Table III.
Revenue structure from educational activities of universities in the CFD (percent)

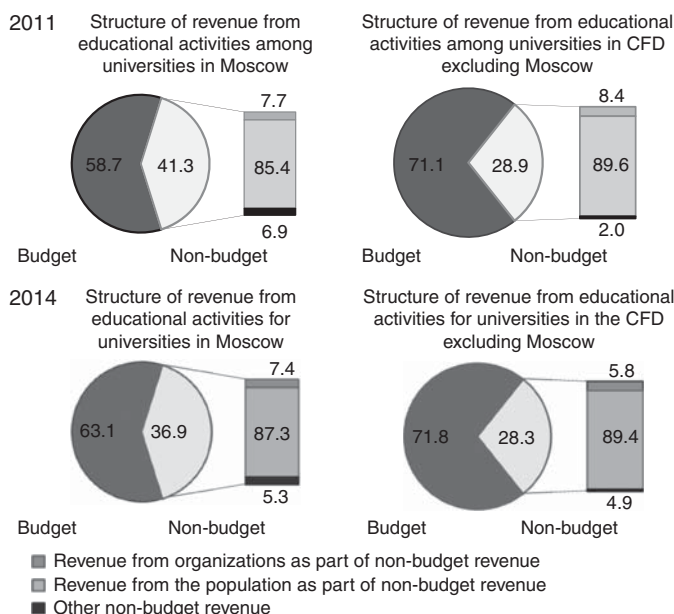


Figure 3. Revenue structure of universities' educational activities in the CFD (percent)

in Moscow and 56 percent in the regions. In other words, there is much less support for research than for education. The wealthier the region, the less resources the authorities allocate to universities to develop research. Other CFD university revenue is almost evenly split between budget and non-budget income. While universities generate resources from educational activities, they cannot count on budget funds to finance their research activities (Abankina *et al.*, 2012).

Revenue structure by type of CFD universities

If we group the institutions by the programs they offer, we find that revenue comes predominantly from educational activities for all types – technical and technological, classical university (offering a wide range of educational programs), pedagogical, economic, architecture and art, humanities, law and service (Figure 4).

The largest share of income from research activities is observed at technical and technological universities (22.2 percent in 2011 and 24.4 percent in 2014), regardless of their location, with most of this coming from non-budget funds. Classical universities come in second place by this metric; their revenues from research and other sources are significant, while revenue from educational activities accounts for 60.4 and 65.0 percent, respectively. All other types of universities are positioned as purely educational institutions that obtain most of their income from education (80 percent or more).

Economic universities earn the most non-budget funds, largely drawn from tuition, as these institutions have the most paying students. Technical and technological universities also receive a significant share of revenue from non-budget sources. In 2011, pedagogical universities had the lowest share of revenue from non-budget sources, with architectural and art universities having the lowest in 2014 (Figure 5).

Technical and technological universities in the CFD generated 84 percent of non-budget revenue from research. At other types of institutions, budget funds account for around one-third of revenue from research activities, except for architectural and art universities,

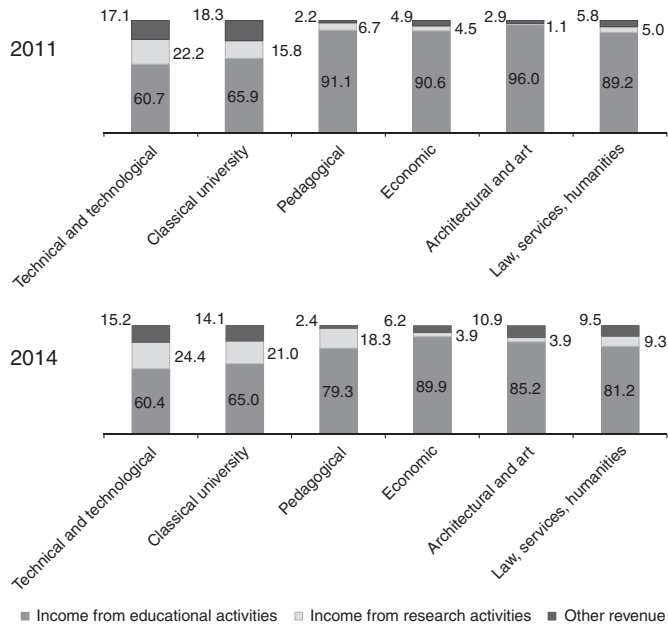


Figure 4.
Revenue structure of universities in the CFD by type of institution (percent)

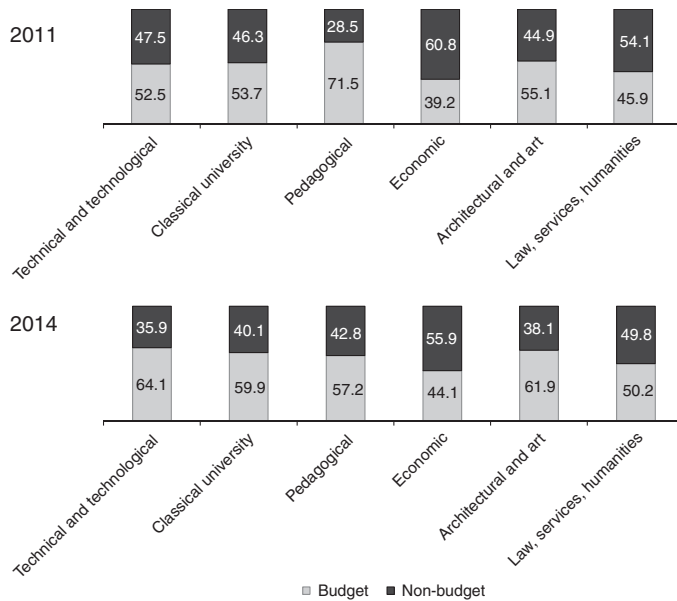


Figure 5.
Structure of budget and non-budget revenues of universities in the CFD, by type of universities (percent)

where the revenue structure from research activities is the exact opposite of that at technical and technological universities as these institutions do much less research.

The revenue structure for national research universities (NRU) in the CFD is different than that for other universities in the district (10 out of Russia's 28 NRUs are located in the

CFD, with only Belgorod State University being located outside of Moscow). Their share of revenue from educational activities in 2011 and 2014 was 20 percentage points less than the average for all universities in the CFD, while the share of revenue from research activities was 6 percentage points higher in 2011 and 11 percentage points higher in 2014.

The significantly higher share of other revenue at the NRUs is related to the greater volume of work performed using the educational institution’s resources, including consulting services for making certain products (Figure 6).

The NRUs’ structure of revenue from educational activities also differs from that of other universities in the CFD. NRUs are among the largest and most prestigious universities in Russia and most tuition is paid for by the government. The share of budget funds in the educational income of the NRUs was 10 percent higher than for other universities in Moscow; and 16 percent in 2014.

Although the share of funds derived from individuals for educational income in non-budget revenue is still high at NRUs, its overall share in the structure is lower (73 vs 85 percent in 2011, and 74 vs 87 percent in 2014). Businesses and organizations invest more actively in education at NRUs. The share of other revenue from educational activities is still nearly twice the average for all universities in the CFD (such as professional development, paid university prep courses, foreign language classes and Russian as a foreign language courses).

For a university to become a global leader, it has to have strong research capabilities and sufficient funds to conduct fundamental research. In Russia, only a few universities have serious financing for research and this sphere represents only 10 percent of their budget. At some foreign research universities, 50 percent budget is spent on research.

Endowment funds

Endowment is an efficient tool to ensure universities’ financial stability. Endowment funds allow educational organizations to accumulate financial resources from various donors and to create a long-term stable income source. To provide stable support for their research activities, universities often use the resources generated through endowment revenues.

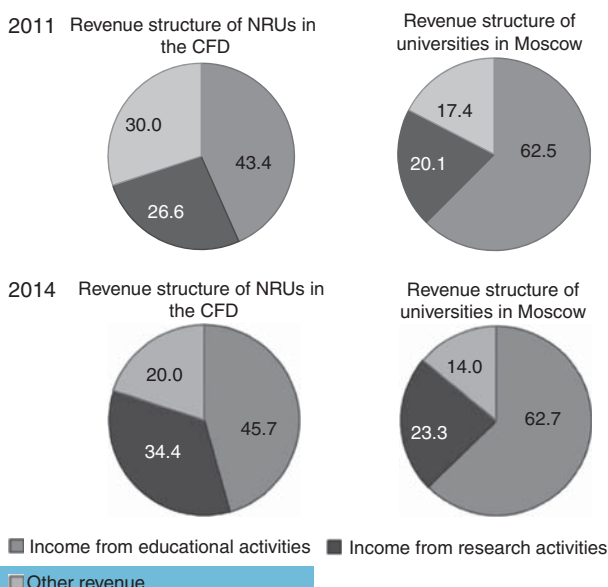


Figure 6. Revenue structure of NRUs and universities in the CFD (percent)

For example, 2011–2012 revenues from tuition fees at Harvard University were around 20 percent of the total income, revenues from the endowment were 32 percent, government grants and contracts – 18 percent, non-government grants and contracts – 4 percent, other income – 26 percent (Harvard University, 2012). At Stanford University the share of income from research and development in 2013–2014 was 28.1 percent, with 83 percent of the research supported by the federal government, 21 percent of the university's revenues came from the endowment funds and 16 percent from tuition fees (Stanford Facts, 2014, p. 45). At the University of Heidelberg, government funding in 2015 was 61 percent of total revenues, 14.6 percent came from the German Research Foundation, and 5.7 percent from German industry (Universität Heidelberg, 2015). The Technical University of Munich receives 53.5 percent of its total revenue in the form of state subsidies, and 4.2 percent from tuition fees. The university's own earnings were 8.5 percent, and 32.4 percent of funds come from third parties. The University receives 10.7 percent of its total revenues for research and development from the German Research Foundation, and 6.4 percent from German private industrialists (Technische Universität München, 2015).

Funds from endowments at Russian public higher education institutions are less than 1 percent of the total funds from all revenue sources. The lack of systematic approaches determining income from endowments reduces the regularity of donations which are important for the planning of expenditure. This indicates a low quality of financial management in Russian universities and a lack of the modern endowment management methods which are widely used in other countries and based on such factors as expenditure rate, adjustment for inflation and average assets value. The share of university costs covered by income from endowments in most state higher education institutions is much less than 1 percent; only the Moscow State Institute of International Relations has it around 2.8 percent (Dyachkova, 2016). However, even the leading universities, which have larger incomes from endowments, do not have sufficient income to support their research projects. Income diversification and attracting non-public funding is developing extremely slowly in Russia and increasing student fees is still the main way to increase university income.

It is necessary to facilitate the dissemination of endowment management practices although these do not yet have a significant effect on universities' financial sustainability due to the extremely small size of endowment funds. Currency fluctuations have affected the accumulation of endowment funds by reducing the value of assets and income. The winners were those universities which spent endowment income on the development of their institutions rather than on endowment accumulation.

Cost dynamics in Russian higher education: distinctive features of CFD universities

Increasing teaching staff salaries in accordance with Presidential Decree No. 597 through revenue diversification depends strongly on the development of the local business environment and household solvency. The concentration of leading universities with a significant proportion of the faculty staff with a high level of salaries in the regions requires a considerable additional inflow of funds to the higher education system, but their sources are limited. This creates new challenges for universities to develop economic activities and initiatives.

The 2014 redistribution of university spending in state (municipal) higher education institutions of the Russian Federation to increase the gross payroll resulted in a reduction of spending on the development and maintenance of property: equipment (80.2 percent), computer hardware (80.6 percent), library acquisitions (96.4 percent) and material inventories (95.3 percent). In 2014, however, the costs of maintaining property increased by tenfold compared to 2013, given the growing fixed assets value of state higher education institutions in Moscow (Table IV)[4]. Moscow has 16 percent of state higher education institutions, in 2014

Costs	Russian Federation			Higher education institutions, excluding Moscow			Moscow		
	2013, bn rubles	2014, bn rubles	Growth rate, %	2013, bn rubles	2014, bn rubles	Growth rate, %	2013, bn rubles	2014, bn rubles	Growth rate, %
Total costs	574	616	107.3	420	444	105.8	154	172	111.5
Labor costs and charges	366	399	109.1	265	282	106.6	101	117	115.8
Works, services payments	118	122	103.3	82	87	106.5	36	35	96.1
Social security	4.961	5.466	110.2	4	5	111.9	0.622	0.613	98.5
Other expenses	85	89	105.0	69	70	101.6	16	19	119.3
Increase in value of fixed assets	67	157	233.5	48	39	80.2	19	119	623.4
Including: machinery and equipment	30	24	80.2	23	17	75.0	7.294	7.035	96.5
Of which: computer equipment	5	4	80.6	4	3	72.2	0.925	1.100	118.9
Library acquisitions	1.186	1.143	96.4	1	0.9	96.0	0.213	0.209	98.1
Other types of fixed assets	36	132	366.5	25	21	84.4	12	111	966.8
Increase in value of material inventory	30	29	95.3	24	23	93.7	5.815	5.925	101.9
Maintenance of students dormitories	17	19	112.5	13	14	109.4	4	5	123.5

Table IV.
Costs of the state higher education institutions in 2013–2014

these universities spent 111bn rubles to maintain property or 70.8 percent of the total cost of the increase in value of fixed assets; the rest of 84 percent state higher education institutions spent 21bn rubles or 13.2 percent of the total cost of the increase in value of fixed assets. The official euro and pound sterling (GBP) to ruble equivalent is given at the end of the year according to the Central Bank of the Russian Federation (Table V)[5].

These facts confirm a change in the structure of state higher education financing to maintain and develop the property of higher education institutions in the most promising regions and to develop local potential for the leading group of universities. Decreasing growth in revenues from the budget (down to 104.8 percent in 2012 vs 114.7 percent in 2011) did not affect the labor costs (with charges) in state higher education institutions. In 2014, the increase in total costs was 11.1 percent compared to 2013 when growth rates were slightly higher, at 12.3 percent compared to 2012. At the same time, the total volume of labor costs of state higher education institutions in 2014 amounted to 399bn rubles, which is comparable to the volume of total budget expenditure at 396bn rubles. Therefore, regardless of the redistribution scheme for the funds received from different sources allocated for the main activities of higher education institutions, the total amount of the budget funds only allow the universities to cover labor costs, including teaching staff.

	2010	2011	2012	2013	2014
Official exchange rate: Russian ruble to €1.0 (at the end of the year)	40.3	41.7	40.2	45.0	68.3
Official exchange rate: Russian ruble to £1.0 (at the end of the year)	47.3	49.6	49.0	54.0	87.4

Table V.
Euro and pound sterling (GBP) exchange rates

Similar processes can be observed in the new member states of the European Union, where the implications of controlling total expenditure, together with the Stability and Growth Pact rules, may result in damaging investment in human capital while fixed capital investment remains untouched (Bacchiocchi *et al.*, 2011).

In the cost structure of the CFD, the share of the universities in Moscow is 75 percent, taking account of all funding sources, the share of the other universities is 25 percent. In 2014–2015, the basic budget spending policy of the Moscow universities (particularly the subsidies for public contract implementation) was focused on the development of fixed assets and material inventory, up to 35 percent in 2015 compared to 15 percent in 2014, and on increasing funds to maintain higher education property – up to 49 percent in 2015 as compared to 23 percent in 2014.

At the same time, the share of budget funds covering labor costs remained unchanged; but the universities made active use of funds from income-generating activities: contributing 47 percent for salaries, 73 percent for research and development projects and 9 percent for research grants and state scientific awards (see other expenses). Moscow universities' budget and non-budget revenue management is different, to a large extent, from that of the NRUs and 5 top 100 participating universities which mainly rely on the state support program. In 2015, the labor costs covered by the funds from income-generating activities in NRUs were 36 percent, research and development projects—63 percent, and research grants and state scientific awards—8 percent. According to the 5 top 100 state support program, an important condition for providing subsidies to leading Russian universities is their increasing competitiveness and implementation of the road maps, including entry into the world university rankings. In 2015, labor costs covered by the non-budget funds (from income-generating activities) in the 5 top 100 participating universities was 33 percent, research and development projects – 45 percent, and research grants and state scientific awards – 7 percent.

Thus, high quality financial management and use of modern tools and technologies to manage revenues from income-generating activities distinguish the universities of Moscow from other CFD universities. In 2015 Moscow universities maintained the share of the wage fund (for teaching and other staff) in their institutions at the level of 61 percent, which is significantly higher than for other CFD universities (56 percent of total costs in 2015), NRUs (55 percent), and the 5 top 100 program universities (48 percent).

These data are further evidence of state support provided for the leading universities which have long-term development strategies for their educational and research activities, and are able to use modern management technologies to maximize their competitive position in the education market.

Conclusions

In the course of studying the transformation of the economics of education, we found that education, including higher education, is the only type of economic activity for which the indexes of physical volume of gross value added did not recover after the crisis of 2008–2010. Moreover, the share of people with a higher education within the education sector itself (general and higher) has declined in 2010–2014, unlike in other economic sectors.

New sources of financial support for higher education institutions have not yet had a significant effect: student loans are still not very popular, and the current exchange rate volatility has also made income from endowment funds insufficient to improve the economic situation of universities. In these circumstances, public funds remain the most stable revenue source, and the processes of restructuring and optimization of all types of resources in higher education since 2011 has entailed a diversification of funding sources, consolidating educational institutions of different levels and changing their management systems.

The results of this research on universities in the CFD point to inertia in the development of universities in the regions, and problems in transitioning to new business models. Groups of

universities in the region often lobby for the “previous rules of the game.” But the rules have changed. Universities are not always able to develop in the regions. Previously, a strong region produced a strong university, but now this logic does not always work. Many regions need a kind of “reset.”

If territorial conditions where universities operate are not taken into account, universities located in Russia’s remote north and far east receive larger amounts of support, but this only serves to balance the higher costs of education programs in these regions. Indeed, the policy of supporting leaders and concentrating resources on breakthrough areas is only implemented by the Russian Ministry of Education and Science in homogeneous regions. Through the example of the CFD, we have proved that concentration of resources in universities with high indices advances their position, including in international ratings. Therefore, to create equal opportunities, it is necessary to introduce territorial coefficients in the process of state support allocation, offsetting the difference in costs of education programs. Based on this analysis, we recommend the Russian Ministry of Education and Science begin setting alignment coefficients to make the cost of education programs consistent throughout the different regions, and only then apply results-oriented mechanisms to distribute government subsidies among the universities. Without using these alignment territorial coefficients, the results of the analysis should be applied to distribution of state subsidies with discretion. The results are applicable to regions with homogeneous conditions and established leading universities. In Siberia, for example, such leaders are Tomsk’s universities, and in the Urals – those of Yekaterinburg, but in order to determine the scale of support for leading universities in these regions it is required to start with the calculation of alignment coefficients for the whole region. After that, it would be possible to utilize the findings of this research made for the CFD in these macro regions. If leading universities are only just emerging in a macro region, as in the far east or in the Southern Federal District of the Russian Federation, it is premature to rely on the findings of an analysis obtained for the CFD. A policy based on a special investment project to foster a new leading university, like the one on Russky Island in Vladivostok, seems more appropriate. We also believe that another suitable policy, taking into account specific conditions, would be the merger of several universities into one mega-university in Rostov-on-Don in the Southern Federal District, with the aim of supporting a new leading university there. It is sensible to rely on the research findings for the CFD when considering the southern and far eastern regions of Russia, as they are applicable to relatively homogeneous regions with established leading universities.

Today, while introducing the principles of performance-based employment contracts, the government is focusing on stimulating innovations through the commitment of educational institutions to secure and continuously improve their quality and competitiveness, expanding students’ educational choice through increased institutional autonomy and the optimization of budgets. Optimization of budget management implies a transition from budgetary allocations for the universities’ general operations to financing their activities, educational programs and research and development projects on the basis of a state assignment. The assignment links performance indicators and the volume and quality of the services provided to the amount of budget funds allocated for these purposes.

However, optimization of costs in favor of the given priorities, such as increasing faculty salaries, has resulted in less development and maintenance of their property. This policy has led to a polarization of universities and reduced development opportunities for a significant proportion of regional universities. In order to maintain their property, these have to actively seek out non-budget funding sources against a background of decreasing effective demand from the population.

The financial position of Moscow households is more stable than the national average, so universities in Moscow, unlike the other CFD universities, have more funds from income-generating activities to cover their labor costs and research and development.

Analysis of universities' non-budget revenues showed that they generate more than 85 percent of their revenue from individuals, largely from the provision of educational activities. Research activities only bring in revenue for technical and technological universities. This research highlights the problem with commercializing the results of universities' research projects – difficulties that are largely linked to an undeveloped legal environment for intellectual property.

We recommend the Russian Ministry of Education and Science initiate the process of removing legislative barriers and restrictions hampering commercialization of scientific efforts based on intellectual property by means of franchise tools. This study has shown that universities may be much more active in setting up small innovative enterprises or start-ups to commercialize their research projects, but they face compliance risks when doing so. Therefore, if legislation is amended in order to grant more freedom to universities in using the products of their academic efforts, their potential would be leveraged more efficiently.

It is becoming increasingly important for higher education institutions to develop a strategy for expanding revenue sources. This expansion is a recognized priority in systems for the funding of national higher education in many countries (Hübner, 2012; Bruckmeier and Wigger, 2014). It could be beneficial to use such practices, common in the commercial sector, as risk management or research and portfolio management (Neale, 2009). Here, the adaptation of these practices to the specific activities and academic values of educational institutions should be considered (Subrahmanyam and Shekhar, 2017).

The expansion of university funding sources should take into account those changes in the structural dynamics of higher education which are related to demographic decline, changing university admission rules (the introduction of a single nationwide compulsory university entrance exam), trends in the effective demand of the population, and strengthening the competition between universities, including competition for financial resources in the context of budget optimization.

Notes

1. The authors' calculations are based on data on the distribution of employment by economic activity and education level for 2010–2014 (*Russian Statistical Yearbook*, 2015, table 5.5, table 5.12).
2. Gross value added in a particular sector is estimated as the difference between the implementation of services and intermediate consumption. The value added indicator is used for calculating gross domestic product. It is defined as the cost of implementation of works and services in the industry minus the cost of materials used. The increase in value added evidences, as a rule, the growth of gross domestic product.
3. Authors' own calculations. Main data processing center of the Education and Science Ministry of the Russian Federation (www.miccedu.ru).
4. Integrated information system of the Education and Science Ministry of the Russian Federation (<http://eis.mon.gov.ru>).
5. Central Bank of the Russian Federation (www.cbr.ru/currency_base/dynamics.aspx).

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