Reform of Higher Education Finance and Access to College in Russia[1]

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The combination of high achievement in all measures of educational attainment with laggard levels of labor productivity is a peculiar legacy of post-Soviet Russia, which has driven the reform of its higher education system. The unique feature of this education system is the strong presence of private funding options within the *public* college-prep and tertiary institutions. This phenomenon is consistent with the evolution of many social services in Russia, which feature a striking combination of preserved centralized budgeting and control with a complete departure from the principles of social guarantees. This article examines the implications of the mixed (two-track) higher education admission and financing system for the distribution of educational attainment in Russia. Furthermore, it discusses alternative policies of allocating higher education subsidies from the standpoints of accessibility and efficiency.

A unique feature of the transition economies setting them apart in the menu of growth scenarios is that their indicators in education categories were out of proportion to their per capita GDPs. Namely, standard measures of educational attainment in most transition economies were, at least initially, as high as in the world's wealthiest countries; yet in terms of per capita GDP a typical transition economy belonged in the category of middle income developing countries. A snapshot of such comparisons is given by Table 1, which, in addition to measures of educational attainment, also contains the indicators of public funding of education and income inequality. It is therefore clear that government policies affecting human capital accumulation are among the most significant (albeit less attention-grabbing) aspects of transition from a centralized command system toward markets.

It is worth noting that income inequality characteristics along with measures of public funding of education are essential determinants of the distribution of access to education of the current younger generation (Carneiro and Heckman 2002). The data in Table 1 confirms the general fact that many transition economies are characterized by a stronger degree of inequality, especially when it comes to poverty measures, than developed countries (with the exception of the US).

One of the most striking changes in the provision of education in Russia is the development of a peculiar mixed system of access to higher education.[2] It is characterized by an unusually strong presence of private funding options within *public* secondary and tertiary institutions. This system features a two-track admission: one form of admission is tuition-free and based solely on merit, while the other track has lower academic requirements for admission, but charges students the full amount of tuition. While tuition differentials are not uncommon in many higher education systems (for example, in-state vs. out-of-state, as well as merit and need-based differentials in the US and the substantially higher tuition fee paid by foreign students in some European countries), the stark features of the Russian system are its extreme level of price discrimination (full sticker price vs. a free ride) and its exclusive merit basis, which as I will argue is quite distinct from favoring ability and is heavily biased against low income students. One should add that this regressive feature of the Russian college financing system is exacerbated by the undeveloped educational credit market, as well as by the corruption of college staff as far as the

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[2] Remarkably, similar mixed access systems have developed, with no apparent coordination, in some other Soviet successor states. Elements of such a system were also present in the 1990s in some transition economies of Eastern Europe.

Table 1

International comparisons for 2002

	Russia	Turkey	Malaysia	Estonia	Poland	Germany	Japan	USA
GDP per capita (USD)	2,405	2,638	3,905	4,792	4,894	24,051	31,407	36,006
Gini index of income distribution	45.6	40.0 [a)]	49.2	37.2	31.6 [b)]	28.3	24.9 [c)]	40.8
Income share (%) of population's poorest 10%	1.8	2.3 [a)]	1.7	1.9	2.9 [b)]	3.2	4.8 [c)]	1.9
Ratio of income shares: richest 20% to poorest 20%	10.5	7.7 [a)]	12.4	7.2	5.8 [b)]	4.3	3.4 [c)]	8.4
Public expenditure on education as % of GDP	3.1	3.7	7.9	7.4	5.4	4.6	3.6	5.6
UNDP education index	0.95	0.80	0.83	0.98	0.96	0.95	0.94	0.97
Adult literacy rate (%)	99.6	86.5	88.7	99.8	99.7	99.0	85.0	94.0
Secondary net enrollment ratio (%)	92 [d)]	76 [d)]	69	87	91 [e)]	88	100	85
Tertiary gross enrollment ratio (%)	70	25	27	64	60	48 [f)]	49	81

Note: all measurements of income inequality in this table are for the year 2000, unless stated otherwise:
[a)]1997 figure, [b)]1999 figure, [c)]1993 figure, [d)]gross ratio, [e)] 2001 figure, [f)]1998/99 estimate.

Source: United Nations Development Programme (2004) and UNESCO Institute of Statistics (2004).

evaluation of college entrance examinations is concerned.

To gain an understanding of the full effect of a system of funding of tertiary education on the distribution of access to it, one must consider it along with the preceding basic stages of education, primary and secondary, where a student's pre-college human capital attainment is determined by his/her ability, as well as parental and school inputs, whether they be public or private. The main focus of my argument is on the problems of access to higher education stemming from the interaction of public and private funding at both the tertiary and the pre-college stage, where parental resources are even more essential than for financing college. Indeed, even when access to college is provided on a "need-blind" basis (for example, in many US universities admission is merit-based, while tuition is subsidized based on need) a young individual's overall opportunity to acquire higher education will depend on the availability of resources at earlier stages. I will therefore examine the trade-off between a student's innate ability and the availability of private resources for pre-college and college stages of education, given the fact that the interaction of public and private funding is omnipresent in Russia's current education system. At the college level, this is manifested by the aforementioned two-track admission system in public colleges. At the primary and secondary levels it is given by the widespread practice of providing optional additional education services to students in public schools for extra private fees, and also by the highly differentiated quality of public schools whereby the access to higher quality is strongly correlated with families' economic and social status. The problem of access to higher education arising in such a mixed system is the main subject of this article.

I will argue that Russia's two-track admission system to higher education leads to a polarization in the distribution of human capital. Its positive effect, which results from the crowd-in of private inputs, is an increased funding base for colleges and therefore sustained high rate of tertiary attainment, albeit at the expense of the quality of higher education outside a small subset of elite colleges. However, the same factors lead to deterioration of human capital levels and social mobility for the rest, for whom the opportunity to go beyond secondary education is substantially curtailed. Furthermore, the educational opportunity in such a system is much more heavily biased toward higher income families than is the case in developed countries in the West, where full or partial tuition subsidies are widespread.

Russia's education landscape: some facts and figures

Developments in education finance and access to education in post-Soviet Russia represent a striking combination of preserving the elements of the inherited centralized structure of management and budgeting with the total departure from the principles of basic social guarantees. A surprising continued near-complete dominance of public institutions at all levels of education is combined with unfettered availability of private opportunities within this system (other social services, such as healthcare are characterized by a similar mix). While private services offered by these institutions respond to demand, their public counterparts still feature centralized planning methods.

The analysis in this article is based on the following set of facts characterizing Russia's education system and its socio-economic indicators in the early 2000s.

Incomes

The following are 2001 figures from a study by Aleksandrova, Ovcharova and Shishkin (2003):

- Average monthly per capita income: 3,000 rubles, or around USD 120 at the contemporary exchange rate. This is twice the official contemporary poverty level.
- Share of population below poverty line: about 1/3, including ten percent lacking sufficient nutrition.
- Share of aggregate personal income spent on food items: over 50 percent. For the bottom two quintiles of the population by income such share exceeded 60 percent.
- Gini coefficient for incomes in 2001: 39.6 percent, rising from 28.9 percent in 1992. Share of aggregate personal income in 2000 received by the top income quintile: 47.6 percent (rising from 30.7 percent in 1991); the share received by the next two quintiles: 36 percent; the share received by the bottom income quintile: six percent (falling from 11.9 percent in 1991).

Primary and secondary education

The system is structured as in the Soviet past and resembles a classic German model. Education is provided uniformly in primary through an equivalent of junior high school (currently grades 1 through 9). The number of students exiting the junior high system in 2001 was about 2,180 thousand (Russia in Figures 2005, 2011). After this stage the pool splits in two directions: pre-college high schools, and the technical education track, which also provides secondary education. About 1,346 thousand students graduated from high schools in 2000. The technical track is represented firstly by secondary technical schools (PTU, in Russian abbreviation), from which about 763,000 students graduated in 2000, and also by "secondary-special" technical schools that provide junior college degrees and can be accessed either right after completing the junior high stage or upon obtaining a secondary school diploma. A total of 579,000 students graduated from technical schools of the latter type in 2000. About 1,292,000 students were admitted to colleges in 2001 (throughout this article the term 'college' is used to label institutions providing bachelor/master level degrees; as these are the only institutions classified as higher education institutions in Russia). The number of students admitted to colleges steadily and rapidly grew since its 1992 level of 521,000 to reach a peak of 1,682,000 in 2007. Its subsequent descent has been due to the demographic trend.

The state and municipal funding of the public education system as a whole shrank steadily throughout the 1990s. As a share of GDP it fell from 3.6 percent in 1991–92 to 3.1 percent in 2000. Moreover, funding in 1999 equaled around 49 percent of its 1991 level in consistent prices (Aleksandrova et al. 2003). Furthermore, the public funding of primary through secondary education is characterized by strong inter-regional and urban-rural inequities and social stratification of general public education. According to Jacobson (2002), budgetary funding per student in 2000 (even after purchasing power parity adjustment for education services) for the Moscow region ('oblast') without Moscow was less than half of that for Moscow metropolis proper; the figures for neighboring regions ranged from a half to less than a third of the metropolitan Moscow level. There was a similar degree of budgetary inequity within other metropolitan areas, where a subset of elite "special" schools was funded directly and preferentially by the city budget, while the rest were funded by lower level municipalities.

All of this has resulted in increasing polarization between the elite high quality segment of public schools and the severely under-funded regular public schools and has led to the development of the widespread system using an increasing share of sup-

plementary private parental resources in primary and secondary public schools. Aleksandrova et al. (2003) report the share of such private expenditure in budgets of primary and secondary *public* schools in 1998 at 21 percent. They estimate such private funding in 2001 at 0.6 percent of GDP, i.e., about 20 percent of government funding of education *at all levels* (which was 3.1 percent of GDP in 2001). The ability of families to provide supplemental funding is obviously unevenly distributed across income groups. The degree of disparity, however, is striking. In 2000, the share of the first and second top income quintiles of the population in aggregate private family expenditure at all levels of education, including kindergarten, was 48.5 and 25.7 percent respectively. The respective shares for the fourth and fifth quintiles were 7.6 and 3.7 percent.

In addition to private spending within public schools, many families spent substantial amounts on private preparation to college entrance exams, such as preparatory courses and private tutoring. According to Roshchina and Drugov (2003), such monthly per student expenditure in Moscow region in 2001 was almost uniformly distributed between 500 and 2,000 rubles among over half of all students applying to colleges. In other regions the figure was concentrated at around 500 rubles. The figures are substantial when compared to per capita income.

Higher Education: Admission and Funding

Russian higher education is still predominantly public. Although the number of private colleges has skyrocketed, their share in the total college student population had not exceeded 15 percent and they (colleges, as well as, logically, the students) were for the most part of inferior quality. However, as discussed above, the public higher education system has developed a two-track admission system where some students, best scoring on secondary school graduation and college admission tests, get a tuition-free ride, while others are admitted on a commercial basis: with lower academic requirements for admission, but full payment of tuition. Table 2 presents the dynamics of the breakdown between the tracks, where students in public colleges who are not marked as paying full tuition cost, pay none at all.

The trend in the share of students paying tuition (in full, there is no middle ground) increased steadily, but based on estimates of the ability to pay, it is expected to stabilize below 50 percent of all college students. Unsurprisingly, this share is unevenly distributed across the fields of study: according to a 1998–2000 study it approached 50 percent in economic, managerial and legal studies, while staying below ten percent in engineering and natural sciences (Roshchina 2003).

Table 2

Numbers of students in Russia's higher education system (at the start of school year, in thousands)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total number of college students	2,791	2,965	3,248	3,598	4,073	4,742	5,427	5,947	6,456	6,884	7,065	7,310	7,461	7,513	7,419
Students in public colleges, total	2,655	2,802	3,046	3,347	3,728	4,271	4,797	5,229	5,596	5,860	5,985	6,133	6,208	6,215	6,136
Students in public colleges paying full tuition	229	326	474	729	1,021	1,469	1,955	2,309	2,622	2,858	2,983	3,144	3,277	3,356	3,372
As a % of all college students	8.2	11	14.6	20.2	25.1	31	36	39	40.6	41.5	42	43	44	44.7	45.5
Students in private colleges	136	163	202	251	345	471	630	719	860	1,024	1,079	1,177	1,253	1,298	1,283
As a % of all college students	4.9	5.5	6.2	7	8.5	9.9	11.6	12.1	13.3	14.9	15.3	16.1	16.8	17.3	17.3

Source: Russia in Figures (2005, 2011).

The ratio between the aggregate amounts of funding from public and private sources is also telling: according to Aleksandrova et al. (2003), the aggregate tuition paid to colleges by students in 2000 was estimated at 24.7 billion rubles while the total state funding was 19.5 billion rubles. This is consistent with the estimates in Klyachko (2002) that while state funding per student admitted on the tuition-free track was USD 300 to USD 350 in 2000/01, the average tuition on the commercial track was about USD 600, or nearly a half of per capita income in 2001.

Like the situation in primary and secondary public education, budgetary funding of higher education has been characterized by significant regional inequality. This is illustrated by Jacobson (2002) who compares the numbers of college students whose tuition was funded by federal budget per 1,000 residents by geographic regions of Russia in 1999/2000. In Moscow this ratio was 51.6 and in St. Petersburg it was 44.2, while the figures in all areas outside the Central and North-Western regions (containing the respective cities) ranged from 9.7 to 17.5, and the ratio for Russia overall was 18.3. These figures *per se* do not prove a geographical inequality of access since the two largest "university" cities with their 135 public colleges (out of Russia's 590) have historically attracted students from all over the country. However, studies reveal a significant decline in the shares of "out of town" students in Moscow and St. Petersburg colleges, partly due to the increased cost of transportation and living. Roshchina (2003) indicates that Moscow, the pre-eminent college city, is also the most closed to out-of-town students. Given that the Moscow metropolitan area is also characterized by the highest level of per capita income and, as mentioned earlier, the highest funding level of pre-college public education (by very wide margins in both cases), these facts alone provide significant evidence of inequities in access to college. Moreover, this suggests that the higher-income segments of the country's population tend to have disproportionately greater access to publicly subsidized higher education.

The implications of the two-track system for college access

The discussion below is based on the theoretical analysis of higher education provision in a model of college admission decisions, as well as educational decisions by students and their families by Kaganovich (in press) whose assumptions are informed by the realities of Russia's education system, as well as the income distribution outlined above.

A fundamental feature of the higher education system at hand is that, while the colleges face limited government funding in the form of a specified supply of budgeted seats that come with a fixed tuition rate paid by the government, the colleges are allowed to admit additional students via their "commercial" track whereby the latter can be charged full tuition fees.[3] The colleges have an incentive to make such admissions even when their decisions are driven solely by the goal of maximizing the quality of the education that they provide, since commercial admission allows them to increase per student educational expenditure. In this case, the limit on commercial admission is imposed by the need to maintain adequate educational standards. The colleges must then set admission standards on each of the tracks to optimize the quality of their student body, as well as the tuition revenues needed to ensure adequate quality of instruction.

When students differ in their innate abilities, their access to college is determined by the interplay of the ability factor and parental private resources.[4] Students endowed with high abilities can gain admission without supplemental (privately financed) pre-college preparation. Their moderately capable counterparts, however, will require such funds to get into college, the more so the lower the student's ability. Thus under the two-track admission system, college is inaccessible to all but the most able students from low income families. The families of moderately able students who can afford some supplemental education funding have two potential options: they can either devote sufficient resources to prepare a student enough to gain the "budgeted" admission and then enjoy a free ride in college, or prepare him/her to qualify for the commercial track and incur subse-

[3] This situation whereby all commercially admitted students are indiscriminately charged the maximum tuition fee (while others are charged no fee at all) highlights the crucial distinction between the US college financial aid system, which results in close to perfect differentiation of students by their ability to pay, and the Russian system analyzed here.

[4] While the understanding that educational attainment depends on both students' abilities and parental characteristics is standard in the literature on the economics of education, until recently it overlooked the role of endogenous interactions between decisions made at the different stages of education, as they are affected by these heterogeneous endowments. Such analysis involves modeling education as a multi-stage process, which is the subject matter of a growing body of recent literature (Su 2004; Cuhna and Heckman 2007; Gilpin and Kaganovich 2012).

quent additional expenditure on tuition. It is clear that, controlling for family income, the first of these options is more cost-effective for adequately able students, therefore the second option defines the ability-income trade-off for access to college for middle-class families.

Thus the pool of students gaining college access can be partitioned into three subsets: highly able students whose access to college does not require financial support from their families, the next ability tier of students whose families can provide funding for pre-college preparation sufficient for them to gain a tuition-free college education (this implies a trade-off whereby the families of relatively modest means are only able to provide college access to children of relatively high ability), and the lowest ability tier whose college admission will require more resources, both for pre-college preparation and college tuition.

The above analysis of the composition of the admission pools in the two tracks shows that the two-track college admission system under investigation allocates public educational resources both inefficiently and unequally. Indeed, it features the most limited access to college for students from low income families. Thus public education funds are underprovided to a group with a relatively higher human capital potential where those funds would be the most productive. Another inefficient characteristic of the two-track admission system exhibited at the other end of income distribution is the crowding out of private educational resources available to middle and upper income students by the public funds to which they have disproportionate access. This is discussed in greater detail in the next section.

Comparison of public subsidy policies and their effects on access to college

The observations above raise questions about the appropriate direction of policy change in the system of the admission to and funding of higher education that would lead to improvements in allocative efficiency, as well as greater overall access to college education. It is worth noting that superior aggregate efficiency, and especially the provision of equal access, are the characteristics that are typically referred to as justifications for the public funding of education in the first place. One policy direction that is often believed beneficial (and is in line with the mainstream practice in Western Europe) is the expansion of tuition-free admission via increased government funding, which in this model would be expressed by increasing the size of the budgeted college track. This can be referred to as "policy *E*". An alternative approach that distinguishes the form of public subsidy of higher education prevalent in the US, henceforth labeled here as "policy *A*", is based on the principle of means-tested federal or state financial aid, whereby government funded or sponsored tuition subsidy is allocated to academically qualified students (at least in theory), but only if they meet a financial need criterion, rather than being purely based on academic merit.[5]

The actual approaches to reforming higher education funding on the agenda in Russia include elements of both types of policy. A government voucher policy experiment that was run in several universities between 2002 and 2005 was supposed to allow full or partial funding by the government of a student's tuition by means of an education voucher whose value would depend on his/her performance on a newly instituted system of standardized state exams for college admission and field of study (Klyachko 2002; Shishkin 2004). The expectation, however, was that the number of fully-funded students would increase. Indeed, the recent "*Law on Higher and Postgraduate Education*" in Russia specifically stipulated that the number of students studying at the expense of the federal budget should not decrease as a result of the proposed new policies. Although this approach assumed that a standardized examination system would improve access to education for the socially disadvantaged, no specific mechanism connecting the fact or extent of state funding to student's ability to pay was articulated. Indeed, as discussed above, family income is a major factor in students' preparation to college admission exams in most countries. An understanding that this factor can be a substitute for a student's innate ability appears to be behind a recent tendency in top undergraduate programs in the US to de-emphasize the role of standardized test scores (such as SAT or ACT) in their admission decisions.

[5] This government education policy should obviously be distinguished from the price discrimination by colleges based on ability to pay along with other factors. The latter important phenomenon in the industrial organization of education has received attention following Rothschild and White (1995) and Winston (1999). Unlike the tuition policies of colleges motivated by their own objectives, the government sponsored financial aid programs have a declared aim to provide more equitable access to education. The actual implications of such policies are a matter of controversy; this analysis aims to contribute to this discourse.

The aforementioned policy alternatives *A* and *E* can be defined in terms of an allocation rule for a marginal increment of the government's aggregate higher education funding.

Policy *E:* an increment of government funding of higher education is spent on the expansion of the tuition-free admission of top performing students.

Policy *A:* the government funding increment is allocated based on the combination of financial need and academic merit. In other words, only students from low-income families whose pre-college test results fall just short of the tuition-free admission standard, in addition to those meeting this threshold, receive the funding. The admission threshold remains unchanged for students whose families cannot demonstrate financial need, i.e., those deemed unable to afford tuition on the commercial track.

Analysis of the above policy alternatives in Kaganovich (in press) leads to the following results. A marginal increase in tuition-free admission according to policy *E* will lead to increased commercial admission (consistent with the factual co-movement of the two variables provided in Table 2) because the addition of tuition-free seats reduces competition on this track and hence lowers preparation requirements for it. This can be shown to reduce the marginal drop in the average quality of students associated with expanding commercial admission, and thereby to raise colleges' incentives to increase commercial admissions. This also implies that the additional public funding provided by the policy will crowd out private resources devoted by families to college preparation.

The incremental government funding dedicated to admitting additional, deserving low-income students according to policy *A* can be shown to shrink the number of middle class students admitted to the tuition-free track and to expand the admission of low-income students to a greater degree. Thus this policy, as opposed to policy *E*, redistributes the public funding of college tuition, as well as that of education access progressively, i.e., in favor of low-income students. Such redistribution also contributes to allocative efficiency because the ability cut-off for tuition-free admission is higher for students from low income families, who can only succeed by relying on their innate abilities and publicly funded pre-tertiary education.

The above also suggests that a policy change that keeps the aggregate tuition subsidy unchanged, but reallocates a part of it to be distributed based on the combination of merit and need (rather than purely on merit as defined in terms of performance in pre-college tests) will not only expand college access for able low-income students, but will also increase the efficiency of education funding: it will raise overall student preparation and "crowd in" private investment in education, while leaving the level of public funding unchanged.

Concluding comments

This analysis highlights two features of the higher education system in transition in Russia: (i) the higher education attainment has undergone an impressive expansion, although at the expense of an overall decline in quality; (ii) the two-track admission system strongly favors students from well-off families who have better access to quality pre-college education; namely, the incidence of public subsidy of higher education critically depends on the distribution of the available quality of education at earlier levels across income groups.

In reality, the fall in quality is naturally not uniform across Russia's colleges; instead, there is an expanding differentiation of standards between the small elite subset of programs and the rest. While quality differentiation seems like a natural price to pay for the expansion, and the increase in the number of students going to college can in itself be viewed as a welcome phenomenon, the points made above indicate important problems. Namely, the analysis demonstrates that the two-track system exacerbates the trade-off between the expansion of the higher education system and its quality by inefficiently channeling public resources, shutting out able low-income students who lack the resources to prepare adequately, while crowding out the private education expenditure of families who can afford it. The increasingly preferential treatment of an elite subset of colleges with "more than equal" public funding adds an important dimension to the above analysis of the distribution of student access to public education.

The main flaw in the evolution of Russia's education system, according to this article's analysis, is the expanding quality gap in pre-tertiary education,

which is due to insufficient and unequal public funding, and is exacerbated by the explicit advantages for students who are able to complement public funding with private resources in pre-college education. Indeed, such students are winning twice: thanks to their access to higher-quality pre-college education they are more likely to be admitted to better colleges and will be better prepared to study there; furthermore, they are more likely to get on the tuition-free track where their studies will be subsidized by the government. It is apparent that reallocation of some government funding from non-need based college subsidy toward a more equitable provision of public primary and secondary education would not only mitigate a rapidly growing polarization of society, but would also result in a net gain in terms of the quality of education of the labor force.

It is worth noting that while the current developments in Russia's education system may represent an extreme special case, this case is highly relevant for understanding the problems arising in the world's major "mainstream" education systems. Indeed, it highlights issues of the interaction between public and private resources that is present in all systems and plays an important role in their outcomes.

References

Aleksandrova, A., L. Ovcharova and S. Shishkin (2003), *Dohody Naselenia i Dostupnost' Sotsial'nyh Uslug (Population's Income and Accessibility of Social Services)*, Independent Institute for Social Policy, Urban Economics Foundation, Moscow.

Carneiro, P. and J. J. Heckman (2002), "The Evidence on Credit Constraints in Post-Secondary Education", *The Economic Journal* 112, 705–34.

Cunha, F. and J. J. Heckman (2007), "The Technology of Skill Formation", *American Economic Review* 97 (2), 31–47.

Gilpin, G. and M. Kaganovich (2012), "The Quantity and Quality of Teachers: Dynamics of the Trade-off", *Journal of Public Economics* 96, 417–29.

Jacobson, L. I., ed (2002), *Mezhbudzhetnye otnoshenia v rossiiskom obrazovanii (Budgetary Relations in Russian Education),* State University-Higher School of Economics, Moscow.

Kaganovich, M. (2013), "Higher Education Reform and Access to College in Russia", in: *The Oxford Handbook of the Russian Economy,* Oxford University Press, in press.

Klyachko, T. L., ed. (2002), *Modernizatsia Rossiiskogo Obrazovania (Modernization of Education in Russia),* State University-Higher School of Economics, Moscow.

Roshchina, J. M. (2003), "Neravenstvo dostupa k obrazovaniu: chto my znaem ob etom?" (Unequal Access to Education: What do We Know About It?), in S. Shishkin, ed., *Problemy Dostupnosti Vyshego Obrazovania (Accessibility of Higher Education)*, IISP Working Papers Series no. WP3/2003/01, Moscow.

Roshchina, J. M. and M. A. Drugov (2003), "Social'nye Determinanty Neravenstva Dostupa k Vysshemu Obrazovaniu v Sovremennoi Rossii" (Social Determinants of Unequal Access to Higher Education in Contemporary Russia), in S. Shishkin, ed., *Problemy Dostupnosti Vyshego Obrazovania (Accessibility of Higher Education), IISP Working Papers Serie*s no. WP3/2003/01, Moscow.

Russia in Figures (Rossiiskii Statisticheskii Iezegodnik) 2005, Rosstat (Russian Federation Federal State Statistics Service), http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/publishing/catalog/statisticCollections/doc_1135087342078.

Russia in Figures (Rossiiskii Statisticheskii Iezegodnik) 2011, Rosstat (Russian Federation Federal State Statistics Service), http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/publishing/catalog/statisticCollections/doc_1135087342078.

Rothschild, M. and L. J. White (1995), "The Analytics of Pricing in Higher Education and Other Services in Which Customers are Inputs", *Journal of Political Economy* 103, 573–86.

Shishkin, S. V. ed. (2004), *Vysshee Obrazovanie v Rossii: Pravila i Real'nost (Higher Education in Russia: Rules and Reality)*, Independent Institute for Social Policy, Moscow.

Su, X. (2004), "The Allocation of Public Funds in a Hierarchical Educational System", *Journal of Economic Dynamics and Control* 28, 2485–510.

UNESCO Institute of Statistics (2004), www.uis.unesco.org.

United Nations Development Programme (2004), *Human Development Report 2004,* New York.

Winston, G. C. (1999), "Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education," *Journal of Economic Perspectives* 13 (1), 13–36.