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ONE OR MANY? USING THE NEW OPPORTUNITIES OF THE UNIFIED STATE EXAM IN RUSSIAN UNIVERSITY ADMISSIONS

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ONE OR MANY? USING THE NEW OPPORTUNITIES OF THE UNIFIED STATE EXAM IN RUSSIAN UNIVERSITY ADMISSIONS[4]

The introduction of the Unified State Exam (USE) has simplified the process of university entry by decreasing transaction costs associated with the application process. The new system allows applicants to apply to several higher education institutions at the same time. However, many students do not take advantage of this opportunity and apply only to a single university. In this study we analyze the factors that influence application strategies, whether to apply to only one institution or to apply to several. We argue that higher USE scores predict a higher probability of multiple applications. Additionally, graduating from a high school that offers advanced training in a particular discipline positively influences this probability. The variables of family income and social capital, a parent's level of education, and their age, as well as attending additional programs of pre-entry training are statistically insignificant.

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Introduction

The introduction of the Unified State Exam (USE) in 2009, a college admissions exam that is obligatory for all high school graduates, should have led to a decrease in transaction costs connected with the application process. Moreover, the new examination system was expected to increase access to higher education for students from disadvantaged socio-economic backgrounds.

Before the USE appeared, pre-entry coaching and applying (especially to several institutions simultaneously) were concerned with very high transaction costs. Even if the subjects to be tested for entry remained the same, the requirements for students and the format of examinations could differ from one university to another. This was because universities had a certain amount of freedom in making a decision about the format of entry exams, despite the fact that all the entrance tests formally corresponded to the official program approved by the Ministry of Education. Often, in order to have a better chance for successful admission, high school students selected a target university far in advance in order to attend pre-entry classes within that chosen university and get information about certain exam requirements (Prakhov, Yudkevich, 2012). Pre-entry coaching was associated with considerable costs, especially when high school graduates chose selective universities with a high level of competition for state-subsidized places among university entrants. Thus, before USE, matching students with universities occurred at a very early stage (Prakhov, 2012). Additionally, entry exams were held on site within the university, which made the application process very expensive for those students who lived far away. Moreover, in some cases applying to several universities was physically impossible, as entry exams in different universities could be carried out at the same time.

With the transformation of the admission system in Russia and introduction of USE, which now serves as the basis for selecting students, transaction costs relating to university applications changed: Under the new system the need for extra coaching is not noticeable and each additional application has almost no costs because students prepare for the USE and do not concentrate on the specific requirements of individual universities. In addition, the process of applying was simplified: university entrants can send their USE Certificates (with USE results) via Internet or post. In this case, one could expect an increase in the number of applications from each student.[5] However, according to our data, not all applicants take this approach, limiting their efforts to a single university. In this paper we analyze the factors that determine a student's choice between applying to only university or to several.

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[5] The maximum number of universities that a student can send his or her results to is 5, but this limitation is rather formal, as there is no central agency that collects the requests from the applicants and then sends them to the institutes of higher education. Hence, real monitoring of the number of applications from each student is difficult.

What drives high school graduates away from using the new opportunities of the USE? The unified system of admission was launched quite recently, and it is probable that some students have not yet adapted their application strategies to the new system. We assume that there is a set of factors that influence the probability that a student will apply to one university or to several, including the socio-demographic characteristics of family, school achievement (USE results), and school characteristics. For instance, high-achievers might be more motivated towards a good quality higher education and are expected to apply to several institutes of higher education. Likewise, high school graduates who used to study in schools with special programs will be more informed about universities where they can continue their studies, which in turn can also lead to an increase in the number of applications.

This research is based on data collected during an Internet-survey of first-year students at Russian universities that was commissioned by the HSE in November-December 2011.

The rest of the paper is organized as follows. In Section I we discuss the results of previous research concerning the number of applications. Section II is devoted to describing data and methodology, and presenting the regression model. Based on the literature review, we present the factors that can influence the probability of applying to several universities. Section III contains the main findings and their interpretation.

I. Unified exams and the number of applications: some empirical evidence

Studies on how university entrants with different backgrounds choose the number of universities to apply to are mostly based on data from the US. Researchers pay attention to socio-demographic characteristics (such as gender, family income, parental education), previous education (school achievement), and preferences during the process of college choice.

Results of the National Educational Longitudinal Study (NELS, 1992) show that university entrants from wealthier households and with higher SAT scores (the American analogue of the USE) are more likely to apply to several universities (Briggs et al, 1997). The probability of several applications was higher if a student's father had a degree of higher education.

At the same time, based on the same data, Turley (2005) showed that if parents did not care about the distance between home and university, their child would more likely apply to several higher education institutions. Having a parent with a higher education as well as good SAT results were associated with the probability of applying to several universities.

Another study stated that university entrants with a high SES applied to more universities (10, on the average) than those with a lower SES (only a few applications only) (McDonough,

1994). The author assumes that such a difference is caused by an inequality in access to additional coaching for students with different backgrounds.

The number of books at home is positively correlated with student achievement (Evans et al, 2010) as well as with the decision on whether to go to the college (Davies and Noble, 2009). Although the authors do not consider this relationship with regard to the *number* of applications, the number of books at home is still an indicator of a student's cultural capital, which in turn can influence the number of applications.

In a study of 4,000 students in Israel, Ayalon (2007) revealed a positive relationship between the level of parental education and the number of university applications: Students whose parents have a higher education are more likely to apply to several universities.

Data from national surveys are available that reflect the average number of applications to universities in different countries (see Table 1).

Table 1. The average number of applications per student in different countries

#	Country	Research organization	Year	Sample	Average number of applications per student	Maximum number of applications
1	USA	NCES	2009	2401 four-year colleges†	5.02	No restrictions
2	USA (NCES, 2010)	DEEWR	2011	202303 students†*	5	9 courses
3	Australia (DEEWR, 2011)	UCAS	2011	700161 students†	4.1	5 universities (the same specialization)
4	UK (UCAS, 2012)	UCAS	2010	697351 students†	3.9	5 universities
5	Russia (Glebova, 2010)	The Federal Service for Supervision in Education and Science	2010	957492 students†*	2.08	5 universities

† general population
* with age correction (17-19 years old)

Russian students rarely apply to different universities when compared to American, Australian, and British students. For example, in Australia only 15% of students apply to one university, while 85% apply to more than 2 different universities (DEEWR, 2011). In Fall 2010 the majority of potential US students (77%) applied to more than two universities, and ¼ of applicants submitted their documents to more than 7 universities (NACAC, 2011). Those who had high SAT scores applied to 3.9 universities on average, while low achievers applied to 3.2 universities (College Board Advocacy & Policy Center, 2011).

What is the distribution of applications in Russia? Data on applications obtained from Internet-polls made by independent organizations show that the new opportunities offered by the USE are not used widely: Not all high school graduates apply to multiple universities. Certainly, these data are not official and may raise doubts, but they do shed light on the process of applying to Russian universities in general (see Table 2).

Table 2. Quantity of applications to universities in Russia

#	Web resource	Number of applications					N	Time of the survey
		1	2	3	4	5 (or more)		
1	www.osu.ru (Orenburg State University)	49%	42%			9%	1237	2009, 17 Aug. – 10 Sept.
2	www.career.ru (Jobs for students and graduates)	33%[6]	17%		50%		~5000	2011, 1–10 Apr.
		76%[7]	12%		12%			
3	www.examen.ru (Russian educational web resource; expected number of applications)	25%	13%	15%	6%	38%	3080	2011, 15 Jun. – 14 Aug.
4	http://vk.com/gia_ege (Group in the Russian social network Vkontakte.ru, devoted to the USE; expected number of applications)	11%	11%	18%	7%	38%	14395	2012, 29 Apr.

Maximum number of applications: in 2009 there was no limit, in 2010 the limit was 6 applications, in 2011 – 5, in 2012 – 5.

Table 2 contains the results of several internet polls. Even though the distribution of applications differ from poll to poll, they show that the share of students who applied to 5 universities hardly exceeds 40% (in the first case it is only 5%), and the share of students who applied to only one university reached 76%. Thus, according to various estimations, not all Russian students take advantage of the opportunity to apply to multiple universities. What factors drive students away from applying to more than one university? In the next section we state several hypotheses about factors that influence the probability of applying to multiple universities.

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[6] This line is for students who study on state-subsidized scholarships and do not pay tuition fees.
[7] This line is for students who pay tuition.

II.   Data and methodology of the study

In this paper, we use the results of the Internet-survey that was conducted in November-December 2011 in 80 regions throughout Russia. The age of respondents ranged from 16 to 21 years old. The questionnaires were sent to respondents in proportion to the total number of youth from 16 to 21 years old in a federal district. The total sample includes 4004 observations. The sample includes three categories of respondents: first-year students (36%), high school students and last-year students of technical schools (48%), and those who have a secondary education but do not study in university (16%). From the first group we selected full-time students who were admitted to universities on the basis of USE results (without results of Olympiads, internal university exams, or additional forms of evaluation). Thus, for the sake of our analysis we use a subsample that consists of 724 first-year university students in order to analyze the use of USE opportunities in the process of admission.

We have excluded those respondents who applied to university, but were not admitted (176 respondents, 4% of the sample). As they did not indicate the year of the attempt, we cannot take into consideration the institutional changes in admission policy.

About 73% of respondents applied to 2 or more universities, and more than ¼ of students applied only to a single university (see Fig. 1). In our sample, more than a half of the students have high USE scores in Russian and Mathematics (56% and 61% of students, respectively). About 1/3 of respondents have studied in high school programs with a specialization in natural sciences or physics and mathematics (35%) and roughly the same percentage of students did not have any specialization in high school. Almost ¼ of students graduated from humanities classes, while the rest graduated in classes with in-depth studies of social sciences or other subjects.

The distribution of the level of income among students is as follows: 44% have an above-average income level, 34% fall just below the average, 9% of students have a low income, and 13% have a high income. About 27% of students live in big cities (where the population supersedes 1 million inhabitants), while 58% live in smaller cities, and 15% live in rural areas.
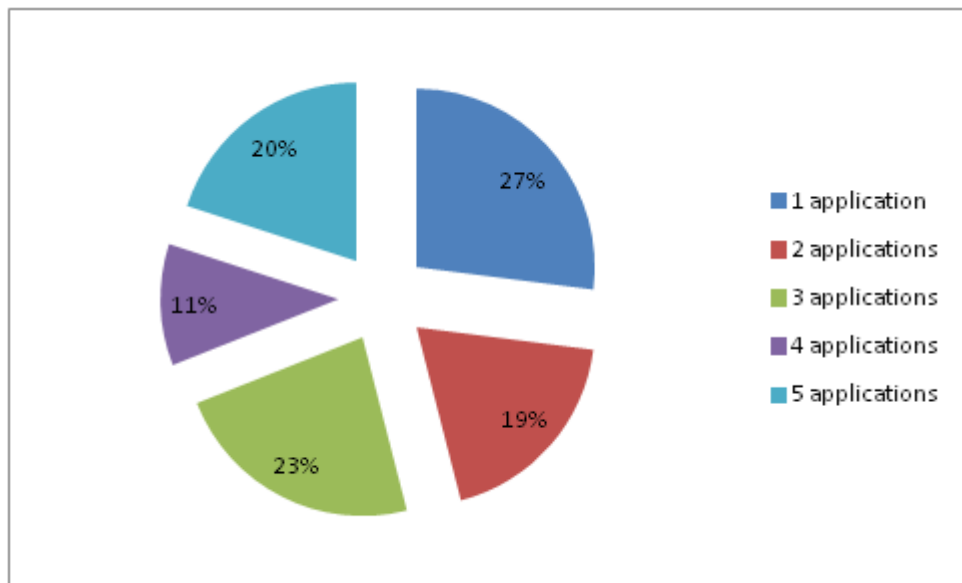
Figure 1. The distribution of the number of applications in 2011 (N = 724)

According to previous studies, researchers notice three main groups of factors that can influence the number of applications a potential student submits, as well of the probability of applying to multiple universities. These include socio-economic status (parental education, income, and social and cultural capital), school characteristics and a student's achievement (school/current achievement, results of a national exam), and moving costs (willingness to live and study in another city). Additionally, we add a characteristic for timing, which concerns the decision-making process while preparing for university. We discussed earlier that before the introduction of USE matching a student with a university took place long before the start of application procedures. Then it was very crucial to choose a university in advance in order to have enough time to prepare for the specific requirements of a given university. Under the USE, students can choose the university at a latter stage, and there is no need for early matching. Hence, timing can be an important feature that influences the probability of multiple applications under the new institutional conditions of student admissions.

With respect to this classification of factors, we test the following hypotheses in this study.

Socio-economic status

Hypothesis 1. Social status (parental education, income, cultural capital) is positively associated with the probability of applying to multiple universities.

We hypothesize that students from families with a high level of social and cultural capital (education, income, books at home, and so on) have adapted to the new institution of the USE faster than other families, and that they use new opportunities more frequently.

School characteristics and student's achievement

Hypothesis 2. Graduates from specialized high school classes are more likely to apply to multiple universities.

Potential university students, who studied in special classes, usually have more information about universities, as well as about possibilities offered by the USE. That is why they will seek to apply to several universities.

Hypothesis 3. USE scores positively influence the probability of applying to several universities.

We suppose that, while students with higher USE scores have more chances for successful admission than low achievers, they have a wider choice of universities, so they will apply to more (several) universities.

Moving costs

Hypothesis 4. Willingness to move to another city for studies positively correlates with the probability of applying to multiple universities.

Potential university students who are ready to move to another city (usually from a smaller city to a larger one) are more likely to apply to several universities, because there is a higher concentration of institutions of higher education in big cities. Hence, the selection in these cities is wider than in smaller ones.

Timing

Hypothesis 5. The later an applicant makes a final decision of where to apply, the higher the probability that he or she will apply to multiple universities.

Applicants who have made a later decision about which university to study at, or a set of universities, will send several applications because they did not know where to apply until the last moment. That is why their final choice will be less calculated than the choice of the students who decided where to apply earlier.

As the method of analysis, we use the logistic regression:

$$\Pr[Y_i = 1 | X_i] = F(X_i'\beta)$$, where

$\Pr[\cdot]$ is a binary variable that represents the probability of applying to one university or to many universities and that equals 0 if applicant *i* has applied only to one university, and 1 if applicant *i* has applied to several universities;

X_i is a vector of independent variables (see above);

β is a vector of coefficients;

$F(\cdot) = \dfrac{1}{1 + e^{-(X_i'\beta)}}$ is the distribution function of logistic regression.[8]

III. Results

According to our analysis, some family characteristics, as well as the type of school, USE scores, one's readiness to move, and the timing of university choice are highly correlated with the likelihood of applying to multiple universities. Table 3 shows the results of regression analysis on the probability of applying to multiple universities (estimates are in terms of marginal effects). Only significant variables were included in the final specification.

Table 1. Factors that influence the probability of multiple applications (marginal effects)

	$\overline{ME}$	St. dev
Family characteristics		
Level of father's knowledge of a foreign language	-0.03*	0.01
Books at home		
(0 – 25)	—	—
26 – 100	0.08	0.06
101 – 200	0.12*	0.06
201 +	0.008	0.06
Academic abilities and school characteristics		
Class specialization		
Natural sciences, physics, mathematics	0.09*	0.04
Humanities	0.12**	0.04
Social science	0.13	0.08
(No specialization)	—	—
USE result in Russian language		
low [36 – 51 points]	-0.24*	0.1
(medium [52 – 69 points])	—	—
high [70 – 100] points	0.10**	0.04

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[8] The properties of logistic regression make it difficult to interpret the vectors of coefficients β_1, β_2, unlike in linear models, where the coefficients can be regarded as marginal effects. Looking at the coefficients, we can here only judge the significance and direction of the relationship between independent and dependent variables: if β is positive, then this means an increase in the probability of applying to multiple universities, and vice-versa. In order to evaluate the magnitude of such an influence, we have calculated average marginal effects ($\overline{ME}$), which reflect the change of the probability (in percentage points) when an independent variable changes by one percent, assuming that all other variables remain constant.

The USE result in Mathematics		
low [24 – 38 points]	-0.06	0.09
(medium [39 – 57 points])	—	—
high [58 – 100] points	0.09*	0.04
Timing of choice		
Missed one year before applying to university	-0.20***	0.05
Moment of the decision about applying to a concrete university (universities)		
Summer 2011	0.12***	0.04
Spring 2011	0.07	0.05
(Winter 2011 and earlier)	—	—
Regional characteristics		
University is in Moscow or St. Petersburg	0.16***	0.04
Willingness to move to another city	0.09**	0.03

Base groups in parentheses

*p < 0,05; **p <0,01; ***p < 0,001

$N = 565$; LR $\chi^2 = 109.91$***; df = 16; Pseudo $R^2 = 0.175$

The results of the regression analysis show that a father's foreign language ability negatively influences the probability that his child will apply to multiple universities. Note that knowing a foreign language is positively correlated with a father's education (the coefficient of correlation is 0.28 and significant at the 1%-level), but parental education (both of the mother and the father) is insignificant. Hence we observe an opposite effect to that of the previous research. We can explain it in the following way: Parents who know a foreign language (and, indirectly, who have higher level of education) can be more involved in the life of their child and force him or her to apply to a smaller number of universities, as they have enough social capital to make a more precise decision.

On the other hand, the level of cultural capital (expressed in the number of books at home) leads to an increased probability of applying to multiple universities. Parents with a high level of cultural capital tend to ensure that their children will get a good education because they know that in the future a higher level of education will pay off in terms of employment and a higher salary, as well as a higher social status. That is why students from families with a higher

level of cultural capital are more likely to send several applications. Hence, in this part, hypothesis 1 is confirmed.

Family income is insignificant. We can explain this fact by the multidirectional influence of income on application strategies. On the one hand, applicants from wealthier families are more aware of the application process and of the characteristics of universities. Such awareness can increase the number of applications from each student. On the other hand, entrants from families with a high level of income can initially prepare for a certain university and select it in advance, being indifferent to the risks connected with failing to be granted a state-subsidized scholarship. In this case, wealthier students have the option of paying tuition fees at the same university. Gender is insignificant as well.

Graduating from high school with a certain specialization (such as in natural sciences, physics, mathematics, or humanities) increases the probability of applying to multiple universities. Hence, hypothesis 2 is true for such types of programs: These programs often have agreements or other relations with universities. Hence, teachers from those classes can help students in select a university. Consequently, high school students can widen their selection of universities to apply to.

Students with higher USE results in Russian language and Mathematics are more likely to apply to several institutes of higher education. This can be explained by the fact that high school graduates with good USE scores have a better chance of being admitted to a good university. They will therefore apply to several institutions in order to increase the probability of being accepted to a selective university. Thus, the third hypothesis is confirmed.

The fourth hypothesis is confirmed as well. If the applicant is ready to move to another city, this leads to an increased probability that he or she will apply to multiple universities. We should mention that there are many high achievers from small cities and rural areas in our sample. Besides this, the distribution of "good" and "best" Russian universities is not uniform: Universities of a high quality are often located in the biggest cities. That is why applicants from rural areas who have high USE results will tend to be admitted to a "good" university that is located in another city. This means a change in living conditions in the case of successful admission. In order to have a better chance for being admitted to such a university, it is necessary to send several applications. It is necessary to say that moving to another city is connected with costs of moving and living outside a student's native city, and not all the students can afford this.

Applicants who made their choice of university (or set of universities) relatively late (in Summer 2011) are more likely to apply to several institutions of higher education. This behavior can be explained in a following way: These potential university students have yet to

decide where to apply and, considering pressing deadline, apply to as many universities as possible to increase their chances of being accepting to at least one of these. Hence, hypothesis 5 is confirmed.

In addition to gender and income status, several other factors can be considered insignificant. Firstly, the location and type of a student's secondary education (high school, lyceum, and so on) was found to be insignificant in predicting whether a student applied to one university or to many. This insignificant relationship can be explained in that these variables are correlated with one's willingness to move to another city and his or her class specialization. Family type (complete or incomplete family) also does not influence the probability of multiple applications. A student's GPA in the 9th and 11th grades of high school is insignificant as well, but they are correlated with USE results, which are significant. Hence, there is an indirect relationship between academic achievement in school and the probability of multiple applications. Additional pre-entry coaching does not influence the target variable.

IV. Conclusion

The goal of this paper was to determine and study the factors that influence the probability that individuals will apply to multiple universities. The analysis of this problem is closely related to developing a new admissions system for higher education in Russia – the USE, in particular – and the reaction to its introduction. The new system of admissions allows for a decrease in transaction costs, and standardized exams help to diminish expenditures in pre-entry coaching. Consequently, in the new institutional framework, the marginal cost of each additional application from a student is quite low, which in turn should incentivize students to apply to multiple institutions. However, not all the applicants take advantage of this opportunity.

In this paper, we have created and evaluated a probability model for applying to several universities. Based on the data from an Internet-survey of young Russians, we have estimated the factors that influence the probability of applying to multiple universities. In other words, we analyzed the variables that determine the willingness of students to send applications to several institutes of higher education, as opposed to just one institute.

It was shown that cultural capital (the number of books at home), USE results, class specialization, as well as choosing universities in Moscow and St. Petersburg and being willing to move to another city for higher education, all positively influence the probability of applying to multiple universities. At the same time, income and parental education are not significant factors.

Our results are important for further studying the educational strategies of applicants under the USE. First, USE results (a measure of academic achievement) are one of the most important predictors of the probability that a student will apply to multiple universities. Class specialization and cultural capital are also important. This means that high school graduates who used to study in secondary and high schools, in programs without a certain specialization, and those who have parents with a lower level of cultural capital are more likely to send an application to only one university, and not use the opportunities of the USE. Hence, we can say that these freshmen are at a disadvantage compared to those who apply to several institutions. Consequently, it is crucial to increase awareness among applicants.

An applicant's mobility is another significant factor. Applicants who have moved to another region – who have made a decision about it in advance – took advantage of the opportunity to apply to multiple universities. This fact can serve as a basis for additional research of the factors of mobility under the USE.

Income status is not a significant factor. However, we cannot say that the level of income is neutral to the number of universities a student sends an application to. In other words, we cannot say that application strategies are not related to income. We cannot make any conclusion about the equality of access to higher education in this context. The influence of income requires a separate investigation, because more affluent applicants can apply to several institutions (by having more information about the admission procedures), or limit themselves to only one university (in case they fail to receive a state-subsidized scholarship, they have enough financial resources to cover tuition themselves).

The USE was introduced only a few years ago. This is why studying the adaptation of educational strategies to the new system is needed. In other words, we should pay attention to the question of how fast applicants and their parents react to the new rules for admission.

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