The Unified State Examination and the Determinants of Academic Achievement: Does Investment in Pre-entry Coaching Matter?[1]

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This paper examines the effects of pre-entry coaching (both in terms of money and efforts) on achievement of Russian high school graduates expressed in the results of the Unified state examination (USE). Using the dataset of students from 16 biggest Russian cities which includes information on USE results, family background, school characteristics and patterns on pre-entry training, factors which determine final results are estimated. Parental education, family income, student's abilities, the fact of graduation of magnet school are significant predictors of USE results in Russian, Mathematics and the average USE score. Characteristics of pre-entry courses (duration of a program as well as total fee) have positive influence on USE scores, but the effect of this kind of pre-entry training is moderate. Attending classes with tutors has significant (but still moderate) effect only on USE score in Russian.

Keywords: the Unified State Examination, pre-entry coaching, educational strategies

JEL Codes: I21, I24, I28

I.   Introduction

The Russian system of admission to higher education is undergoing a major institutional transformation: from a 'dual examination' system (when universities had their own specific requirements concerning entry exams, so high school graduates were forced to pass exams at least twice: in school and in university) which existed during the Soviet period and the last 20 years, towards an external and unified mechanism of evaluation of student abilities. Since 2009 all Russian universities are to admit students on the basis of results of the Unified State Examination (USE), a system of standardized tests on different subjects. This examination is uniform and

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intended for all Russian school graduates. Every school graduate can pass the set of exams and apply to different universities (in 2010 the maximum number of applications that one person can complete was 5, but this limitation is formal as there are no legal authorities which monitor the application process).

Every high school graduate may pass the set of USE tests only once a year. If he (she) fails, he (she) can attempt to do this next year for free. Note, that only two subjects are obligatory: Russian (National language) and Mathematics. Other subjects are required by different universities according to their specific field of study. After collecting the requests, education institutions (universities) rank the applications on the basis of the sum of required exam scores and take a decision on matriculation. The process of admission to the university has two stages. First, the universities rank all the requests from prospective students and draw a line. After that those students who are admitted have to present to the university their certificates (scripts). Certainly, still there will be vacant positions after that, because one student can apply to several universities, so he (she) can be admitted to more than one institution as well. Having received the scripts, the universities rank students again and draw a line for the second time. Hence, there is a chance for those prospective students who were not admitted on the first stage to a university of their choice.

Before introduction of the USE every Russian university had its own admission procedure. The universities' autonomy in admission procedures often led to high selectivity, and school graduates were forced to adjust their strategies in regard to the specific institution in which they were interested. Graduates, who wanted to enter a university with specific entry requirements, were advised that they should be aware of the program of examinations of that university. In order to prepare for the examination properly and meet entry requirements (e.g, program and format of entry exams), prospective students were required either to attend special coaching courses provided by the university or to have additional classes with tutors, whom usually worked in the same institution. In other words, they chose the direction of specific investment (both financial and temporal) in the moment when they were hardly aware about what university to attend (up to 1 year before matriculation). This process was inefficient and imposed restrictions on college choice.

The main idea of introduction of the USE was to make admission procedures more transparent and to give more educational opportunities for students from disadvantaged backgrounds. Besides, prospective students can now prepare for the USE without specific investment concerning any particular university, and make the choice of where to apply at a later time. This simplifies the access to university as it decreases transaction costs of pre-entry coaching. Pre-entry coaching still exists however, but now it is done for the centralized test, rather than for and by each university separately. The goal of this paper is to find out to what extent such pre-test training pays off in terms of higher test scores on the centralized test.

This paper is devoted to the study and evaluation different factors that determine real USE scores, because higher achievement in terms of scores is positively associated with the probability of successful matriculation. Information about real scores can be interpreted as an output of educational production function. As the Unified State Examination and its unified scores can be considered as the 'output', so we can measure and evaluate factors which determine such 'output' and compare the results among students from different socio-economic backgrounds. There is a lot of research concerning empirical evaluation of educational production function (i.e. assessment of factors which determine academic achievement). The main findings are: (1) student abilities and his (her) socio-economic characteristics (such as parental education and level of income) have strong effects on achievement; (2) effects of school resources (e.g., type of school, size of class etc) are ambiguous. Relatively little is known however about the impact of preparation efforts on the actual scores on the exam, though there are some projects that study the influence of coaching on SAT scores (see below). In this work we will examine the significance of pre-entry efforts as factors of educational production function. In other words, the main question is "How can investment in pre-entry coaching improve the results of the USE?"

The process of institutional transformation concerning admission policy affects incentives of students (households), government, and universities. The USE is a new institution, hence it is crucial to analyze the consequences of its introduction (including the patterns of investment in pre-entry coaching).

This topic is timely for the households: on the one hand, for parents, who pay money for special coaching courses and classes with tutors (so they make monetary investment in coaching process); on the other hand for prospective students, who attend these classes (so they make non-monetary cognitive and temporary efforts). Before introduction of the USE, under the system of dual examinations, parents had to pay for training courses and classes with tutors, because such classes were 'attached' to certain (selective) universities. In other words, such payments represented a hidden form of guaranty of successful matriculation. Moreover, universities do not have permission to implement their own admission policy and they cannot influence real USE scores. In other words, there is a need for understanding if such kind of investment improves the results of the USE, such as why should parents pay money for courses if those do not affect final USE marks?

Second, this issue is policy-oriented for government. One of the ideas of introduction of the USE was to lower payments in pre-entry coaching, because they can also be considered as a bribe, and to move the process of pre-entry coaching into high schools. The first issue has been solved, but still there is evidence that parents use various methods of pre-entry coaching, and they are not free of charge. Besides, if such coaching mechanisms are effective, but cost too much, then there could be inequality in admission process and problems with accessibility of higher education for poorer

students, because some groups of students would have "unfair disadvantage over others" (Powers, 1993). After that, if coaching effects are great, then the USE results can be bad indicators of student performance (as there would be biases towards pre-entry coaching). Finally, if coaching takes a lot of time, students would spend less time on school subjects, which are obligatory.

In addition, studying the achievement is an important issue, as there is evidence that test scores are highly correlated with the average annual rate of growth (in percent) of real GDP per capita (Hanushek, Woessmann, 2009). Consequently, evaluation of factors which determine academic achievement will result in policy recommendations concerning education and growth.

As it was stated above, the main focus for this paper is the process of pre-entry coaching and its influence on achievement. In other words, is there an effect of investment in the pre-entry coaching process (money and time expenditures) on real USE scores? If there is a positive significant effect, then the increase in such investment will increase the final USE results.

The second hypothesis is concerned with family inputs. The set of factors (parental education, family income, and current academic achievement) positively affect students' actual USE scores. As a consequence, these factors can influence college choice via actual scores, so college choice can be determined by family factors (inputs) as well.

This paper is organized as follows. Section II describes advantages of the USE as an external mechanism for evaluating student achievement, as well as the educational production function approach towards estimation factors which determine academic success. Literature on effects of pre-entry coaching is analyzed. Data and methodology are described in Section III. Section IV describes preliminary results of regression analysis. It is shown that family inputs, such as parental education, family income matter in all models. Student's abilities (expressed in school achievement) and the fact of graduation of magnet school are significant predictors of USE results in Russian, Mathematics and the average USE score. Characteristics of pre-entry courses (duration of a program as well as total fee) have positive influence on USE scores, but the effect of this kind of pre-entry training is moderate. Attending classes with tutors has significant (but still moderate) effect only on USE score in Russian. Section V includes concluding remarks.

II.   Educational production function and effects of coaching

Unified state examination is a kind of external examination system (analogue of SAT system in the U.S. or matriculation exams in Finland). Theoretical literature (e.g. Juerges, Schneider, Buechel, 2005) unambiguously predicts positive effects on student and teacher effort and achievement as the results are more valuable signals on the labor market than those of non-unified exams (Bishop, 1995, 1997). Second, such systems provide a set of incentives both for teachers and students for cooperation «toward the goal of students' academic progress» and there is no incentive

to agree on low-achievement cartel in class (Schiller, Muller, 2000, p. 74). Third, standardized tests lower the costs of monitoring associated with school performance as they can serve as indicators of the quality of teaching as well. Hence, teaching quality can be monitored, compared across schools and (possibly) rewarded. Finally, standardized testing introduces a competitive element in school systems because outcomes are comparable and they allow making comparisons across schools and students due to the fact that it provides uniformity across exam programs and the grading system. Consequently, uniform requirements and scale of grading are powerful tools of analysis student achievement throughout the country, as uniform test score are comparable and avoid biases which existed before introduction of the USE.

Real test scores can be considered as values of the educational production function (Hanushek, 1971; Polachek, Kniesner, Harwood, 1978). Formally this function can be expressed as a single equation $Y = X'\beta$, where Y is a measure of output, and X is a vector (set) of factors, reflecting student's background (for example, SES, individual abilities), schooling and institutional resources. Usually this equation represents a linear model, so coefficients can be regarded as marginal effects ($\beta_i = \dfrac{\partial Y}{\partial X_i}$), reflecting the importance of one or another factor in determining academic achievement.

This issue is very intriguing as still there is no theory behind educational production function (why it should be a function?) and there is no clear opinion about what factors do really matter. First of all, any production function should reflect the productivity of any given input. But what should be a measure of output? At least two questions arise here. First, what is the best measure of productivity? Following Woessman (2003) and other authors, we will use exam scores as a proxy. Second, which level of aggregation should be chosen: city, school, class, or student? In this paper we will rely on micro-data on individual students, as we should capture direct links between student achievement and resources spent as investment in pre-entry coaching (Hanushek, Rivkin, Taylor, 1996).

Depending on the structure of sample and particular dataset, researchers drew different conclusions. Most of research is concentrated on impact of schooling resources on student achievement. Hanushek (1997) summarized the results on schooling resources and academic achievement and draw a conclusion that only 9 to 29 percent of articles reveal positive effects of schooling resources on student achievement. Fowler and Walberg (1991) examined this issue using data from 293 schools of New Jersey. As a result, such factors as percentage of students from low-income households, size of school, number of schools in a district, percentage of teachers with bachelor's degree, number of teachers per pupil, average teacher's salary, and socio-economic status of a district, were significant. In contrast, Ehrenberg and Brewer (1994), using panel data

from *High School and Beyond*, found no relationship between teachers-per-pupil ratio and achievement. Gamoran (1996) examined effects of different types of school on final scores. It was evident from *National Education Longitudinal Study of 1988* that students from private schools perform almost the same as students from public schools. Students from catholic schools scored higher than those of public schools only in Mathematics. Students from magnet schools got higher scores than other students. However, the relationship between schooling resources is still ambiguous.

One of the problems concerning evaluation of educational production function is endogeneity, as students' assignment to schools is not random, because parents can choose schooling institutions and corresponding resources. In order to avoid biases the method of instrumental variables is commonly accepted (Woessman, 2005; Häkkinen et al, 2003). One of attempts to get data without endogeneity effects was *Project STAR* (*the Tennessee Student/Teacher Achievement Ratio experiment*). During this natural experiment, cohorts of pupils were randomly assigned between classes of different sizes and teachers. As a result, students who studied in small classes performed better than those of bigger classes (Krueger, 1999).

Despite the ambiguity of results concerning schooling resources and student performance, there is evidence that achievement can be related to the family inputs, i.e. social background, income and level of parental education (Häkkinen et al, 2003; Woessmann, 2005), so final results and, consequently, college choice can be determined by family factors.

It is very important to mention cross-country comparative research on determinants of student achievement. For example, Hanushek and Woessmann (2010) argue that cross-country data can reveal significant institutional effects, which do not exist within country. Another comparative study devoted to differences in schooling quality in Eastern European Countries (Ammermueller et al, 2005). It draws significant differences in achievement between countries explained by different institutional settings. However, this study neglects the effects of pre-entry coaching. Cross-country analysis is a very interesting issue, but our project is mostly concentrated on Russian high school graduates' achievement. However, this could be a promising extension of current research.

There is not so much literature on effects of coaching, however there are some articles about significance of coaching process in achievement, where the measure of achievement is SAT score (as it was stated above, the USE in Russia has almost the same format as SAT in the U.S.). The most general conclusion is that coached students do perform better than their uncoached counterparts: on average, those students who attend special coaching programs get 15-25 SAT-points on the verbal and on the mathematical blocks more than other students (Powers, 1993). In review of results from a meta-analysis of a set of papers concerning effectiveness of coaching it is stated that in most cases effects of coaching are positive (although there are several studies which

show negative effects), but the effect is small (Bangert-Drowns et al, 1983). However, longer programs have greater effects compared to shorter ones. Drill and practice on such tests yield greater returns as well. Becker (1990) pays attention to variation in results of different studies concerning the SAT effectiveness. In her review, she compared even published and unpublished results. In general, effects of item practice and instruction (coaching content) are positive. The importance of program duration is ambiguous, and coaching effects are stronger for Math test than to Verbal one. The study of the data of A College Board-sponsored survey reveals moderate effects of coaching, far less than promised by coaching entrepreneurs (Powers, Rock, 1999). The authors applied different models, but the result was almost the same. Hence, most of the researchers conclude that the effects of coaching are positive, but the importance of coaching (and its real influence) varies from study to study and depends on the concrete dataset. Hence, the importance of doing a study on USE data is to find out the impact of pre-test training in Russia.

III. Methodology and data description

The empirical data was obtained through the inquiry of school graduates (who are going to enter the university) and their parents in the fall 2010, i.e. at the moment when school graduates have passed all the exams and were admitted to the universities. During the inquiry 1600 households were interviewed[2].

The inquiry took place in 16 big Russian cities (with population more than 800 000 people): Moscow, St. Petersburg, Volgograd, Voronezh, Yekaterinburg, Kazan, Krasnoyarsk, Nizhny Novgorod, Novosibirsk, Omsk, Perm, Rostov-on-Don, Samara, Saratov, Ufa and Chelyabinsk. The number of households interviewed in every city was 100. After removing profiles with missing answers, the size of the sample diminished to 1165 households. Then the sample was weighted proportionally to the number of school graduates in the above cities in 2005. The structure of the sample is presented in the Table 1.

Table 1.

The structure of sample (weighted)

City	Percentage
Volgograd	3,7%
Voronezh	3,1%
Yekaterinburg	4,2%

Kazan	4,2%
Krasnoyarsk	3,8%
Moscow	30,9%
Nizhny Novgorod	4,5%
Novosibirsk	4,9%
Omsk	4,2%
Perm	3,6%
Rostov-on-Don	3,5%
Samara	4,0%
St. Petersburg	14,5%
Saratov	3,0%
Ufa	4,0%
Chelyabinsk	3,9%
Total	**100,0%**

There were two different questionnaires for children (school graduates) and their parents. One prospective student and one parent in each household were interviewed. They answered proposed questions separately from each other in order to avoid biases in their answers. The list of variables is presented below (Table 2):

Table 2.

Key variables used in the project

Sociodemographic characteristics of the respondents and their families:
Gender
Parental education
Number of members in household
Household income
Complete/incomplete family
Age of mother
What level of education parents think is appropriate for their children (BA, MA…)
Schooling characteristics:
Type of school
Specialization of class
Level of pupil's school achievement (school scores)
USE results (Russian, Maths)

Number of USE exams taken
Overall result
Strategies of pre-entry coaching:
The main type of pre-entry coaching (pre-entry classes, classes with tutors, school training, self-coaching)
Intensity (frequency) of pre-entry training
Expenditures on different types of pre-entry coaching
Participation in Olympiads for pupils
Specific characteristics of coaching program
Certainty about the university and specialization at the beginning of pre-entry coaching
Time period when college choice is made
Moment when choice of specialization is made
Moment of beginning of pre-entry coaching
Strategies of college choice:
Specialization of chosen university
Field of study
Amount of tuition fee
Expected returns from higher education
Characteristics of the university they were admitted
Information used in decision making process
Where do they apply? (list of the universities)
Was the initial application (to the university of first choice) successful?
The university (title)
Stage of admission
Evaluation of availability of information necessary for application process and making decision about university
Place subsidized by state or not
Type of university (public/private)
Admission criteria (minimum admission score)
Number of applications sent to the universities

The process of estimation is divided into 2 parts. The first part is formal and comprises brief estimation of preliminary results: studying descriptive statistics and frequencies. However, this is an important part of estimation process, because it provides a glimpse of the main characteristics of sample. Before running econometric models (regression analysis, see below for specification of the

model) we will evaluate differences between groups of respondents (cross-tabulation analysis) and test the hypothesis of statistically significant relationship between variables (chi-square statistics) and multicollinearity. Afterwards, we run econometric models. The process of analysis is based on the following scheme (Fig. 1):
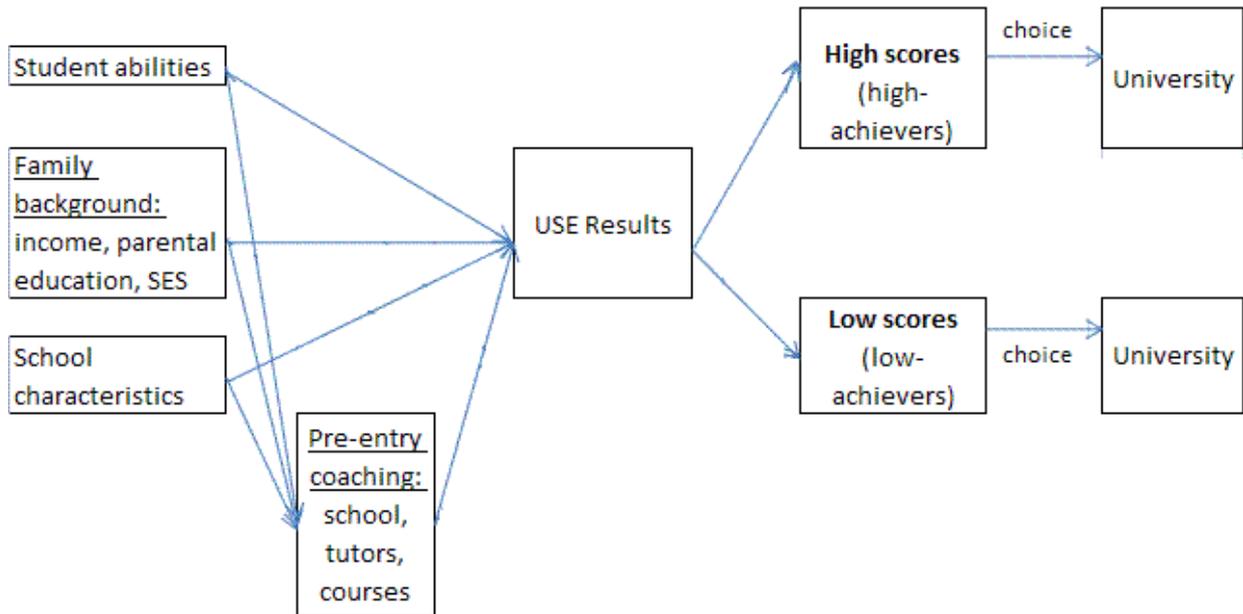
Figure 1. The model of formation of USE results

According to empirical findings (Chapman, 1981; Litten, 1982), there are different groups of factors which determine college choice. The proxy for college choice in our model is an output measured in USE scores in Russian and Mathematics. Hence, these scores can be affected by the following determinants:

(1)   Student abilities,

(2)   Family characteristics,

(3)   School characteristics.

Moreover, as it was stated before, features of pre-entry coaching can make a figure in the process of college choice and affect it (via actual USE score). Therefore, it is very important to analyze the impact of investment in pre-entry coaching on academic achievement. We propose linear model, the analogue of educational production function, which includes patterns of the process of pre-entry training. The main idea of the model is to analyze and evaluate factors which determine actual student achievement (in terms of USE scores), i.e. to evaluate educational production function:

$$T_i = \alpha + \beta A_i + \gamma F_i + \lambda S_i + \mu I_i + \varepsilon, \text{ where}$$

**Dependent variables:** T_i - USE scores of student i in Russian, Mathematics, and the average USE score.

**Independent variables:**

A_i – academic achievement before pre-entry training (measure of abilities);

F_i – vector of SES (family) characteristics: level of income, parental education, family composition, gender;

S_i – vector of school characteristics: type of school;

I_i – vector of characteristics of pre-entry training: characteristics of school learning (extra-classes) and pre-entry coaching (ex.: both temporary and financial investment),

ε – error term.

Variables description.

Dependent variables. _USE score in Russian_ (USE_Rus) – USE result of student in Russian (1 – 100 points). More than a half of students (58,7%) achieved good results in Russian, getting from 61 to 80 points (see Table 3). The proportion of those who have lowest results (40 points and less) is very small (2,0%). More than 10% of interviewed high school graduates have excellent results (more than 80 points).

USE score in Mathematics (USE_Math) – USE result of student in Mathematics (1 – 100 points). Results for Mathematics are lower than those for Russian. Only 43% of school graduates scored more than 60 points. More than 10% of students have very low result (40 points and less).

Average USE score (USE_Average) – the sum of USE scores divided by number of exams taken (1 – 100 points). More than a half of students (52,7%) have «fair» marks (from 41 to 60 points). There are only 4,3% of students whose average USE score is higher than 80 points.

Table 3.

Distribution of dependent variables

Score	Subject, %		
	Russian	**Maths**	**Average score**
1 - 40 points	2,0	11,2	3,9
41 - 60 points	29,0	45,9	52,7
61 - 80 points	58,7	34,8	39,1
81 - 100 points	10,3	8,1	4,3
Total	**100,0**	**100,0**	**100,0**
Number of observations	**1165**	**1165**	**931**

Independent variables. Family characteristics are parental education, type of family and the level of income. Parental education was coded as dummy variable which equals 1 if at least one of the parents (father or mother) has higher education or incomplete higher education. Otherwise this variable equals zero. There are 66,0% of households with higher education and 34,0% – with secondary education in the sample (see Table 4).

Type of family. There are 80,6% complete families (where both parents live with their child) and 19,4% incomplete families (where at least one parent lives separately). This variable was coded as dummy, which equals 1 in the case of incomplete family.

Level of income. Level of income means the sum of money (in rubles) per person per month. The largest group are households with income 10000 – 14999 per person per month. For the regression analysis this variable was taken in logarithms.

Student abilities (before attending programs of pre-entry coaching), or *academic achievement* is expressed in the average scores in the Certificate of Education in 9th grade. About 53% of high school graduates have only «good» and «excellent» marks in their Certificates (such GPA was coded as 4,5 out of 5 points). More than 34% of students have mostly «good» marks (GPA is 4 out of 5). More than 8% of students have only «excellent» marks (GPA is 5 out of 5), and less than 4% of children have mostly «fair» marks (GPA is 3 out of 5)

Gender. There are 41,7% of boys and 58,3% of girls in the sample. This variable equals zero for girls, and one for boys.

Type of school. Most of high school graduates attended comprehensive schools (61,7%). More than 17% of students graduated from gymnasiums, colleges of lyceums. More than 11% have Certificates from comprehensive schools with special classes, rest of students attended magnet schools.

Characteristics of pre-entry coaching. Most of the students used various methods of pre-entry coaching: the majority (46,0%) attended classes with tutors, 33,7% of school graduates visited special courses, 40,0% used other methods of coaching (for example, extra-classes in high school). More than 8% of enrollees coached by themselves, and 18,3% of students stated that they didn't use any type of pre-entry coaching. Average duration of coaching was 7,5 months, average frequency of classes was from 2 to 2,3 times a week. Average fee for pre-entry coaching was 5851 rubles per month, and pay for the tutors was 5647 rubles per month.

Table 4.

Distribution of independent variables

Variable	Answers	Percentage
Level of achievement	3	3,5

(average score out of 5)	4	34,6
	4,5	53,4
	5	8,5
Gender	Boys	41,7
	Girls	58,3
Parental education	No higher education	34,0
	Higher education and incomplete higher education	66,0
Complete/Incomplete family	Complete family	80,6
	Incomplete family	19,4
Income (rubles per person per month)	Less than 4000 rub.	3,1
	4000 – 4999 rub.	4,8
	5000 – 6999 rub.	9,1
	7000 – 9999 rub.	17,8
	10000 – 14999 rub.	27,0
	15000 – 20000 rub.	20,6
	More than 20000 rub.	17,6
Type of school	Comprehensive school	61,7
	Comprehensive school with special classes	11,1
	College, gymnasium, lyceum	17,5
	Magnet school	9,6
Type of pre-entry coaching	Self-coaching	8,2
	Pre-entry courses	33,7
	Classes with tutors	46,0
	Other types of coaching	40,0
	No coaching	18,3
Average duration of coaching		7,5 months
Average frequency of pre-entry courses		2 times a week
Average frequency of classes with tutors		2,1 times a week
Average frequency of other classes		2,3 times a week
Average fee for pre-entry courses		5851 rub. per month
Average fee for classes with tutors		5647 rub. per month

In the models of educational production function there can a problem of endogeneity when using OLS regression, as coaching effects are not random. One way to solve this problem is to find the instruments for characteristics of pre-entry coaching. However, it is rather difficult to find appropriate substitutes for temporary and monetary investment in classes with tutors and preparatory courses.

At the same time, if we compare mean scores for different groups of students (depending on which method of coaching they used), we can see that the different in scores is rather low (see Table 1). For example, the maximum gap for the score in Russian is 5,43 points, for Mathematics – 6,16 points, and 5,38 points for the average USE score. This difference is small, and OLS regression will show even less effect of pre-entry coaching. Hence, it is possible to use OLS method without instrumental variables.

Table 5.

Mean USE scores for different method of pre-entry coaching

Type of pre-entry coaching	USE scores (means)		
	Russian	**Mathematics**	**Average score**
Courses	68,89	64,58	65,16
Tutors	69,27	61,87	63,71
Other types of coaching	66,75	60,30	61,01
Self-coaching	63,84	58,42	61,10
No coaching	64,63	60,85	59,78

IV. Results

Before estimation the effects of different factors on USE results, have a look at the distributions of dependent variables (USE scores in Russian, Mathematics and the average score on all the subjects passed) depending on student's socio-economic background, his (her) abilities, type of high school and characteristics of pre-entry coaching.

First of all, before controlling for other factors, the USE results vary between different cities (see Table A1 in the Appendix). If we compare mean scores in Russian, Mathematics and the average exam score, we may see that lowest achievement in the terms of the USE in Russian is in Yekaterinburg (mean score is 59,04 points), in Mathematics – in Saratov (mean score equals 50,06 points). Lowest mean of average score is in Yekaterinburg as well (52,14 points). Graduates from Samara have got highest scores (corresponding means are 73,33 points in Russian, 71,80 points in Mathematics, and average score is 70,26 points).

The analysis of distributions of USE scores sheds light on a number of important relationships. Family factors, such as parental education, parental income, complete/incomplete family, as well as gender, matter. The first factor of significance is the level of parental education. In the households where parents have higher education, children get higher USE scores than in households where parents do not have higher education, i.e. they have only secondary education (see Table A2 in the Appendix). Furthermore, the proportion of school graduates who get only «good» (61-80 points) and «excellent» (81-100 points) scores is higher in well-educated households and lower in other households.

The next significant factor of distinction between different groups of enrollees is family structure (complete or incomplete family). In households where both parents live with their children, high school graduates are more successful in terms of the USE results than those who live only with one parent (see Table A3 in the Appendix). Indeed, the proportion of students who got «good» and «excellent» scores is higher in complete families (for example, more than 74% of children from complete families get more than 61 points in Russian, while only 63,4% of children from incomplete families reach the same result).

The USE results positively depend on parental income: the higher is the income of the household – the higher are the scores. If the majority of school graduates from low-income households expect received «poor» (1-40 points) and «fair» (41-60 points) marks as the average USE score, approximately a half of the students from high-income families expect «good» marks (see Table A4 in the Appendix). The same relationship is true for test results in Russian and Mathematics. Moreover, the proportion of school graduates who get only «good» and «excellent» marks is very high in «wealthy» households and substantially lower in «poor» ones. Hence, as higher USE scores represent better chances to enter the university, prospective students from high-income households have more chances for successful admission to the universities of high quality.

Gender is another factor of significance (see Table A5 in the Appendix). Girls are more successful in Russian, and boys get higher scores in Mathematics. For example, more than 75% of girls get 61-100 points in Russian, while only 67,4% of boys achieve the same result. And vice versa, 58,2% of boys and only 45,1% of girls get «good» and «excellent» USE marks in Mathematics. However, difference between boys and girls becomes insignificant in terms of average results.

Student abilities (expressed as the level of school achievement in 9th grade, i.e. 2 years before admission to the university) as well as type of school can determine final USE results. It is not surprisingly that there is a very strong positive relationship between USE scores and the level of school achievement (see table A6 in the Appendix). More than a half of those pupils who mostly had «fair» (GPA is 3 out of 5) marks in their Certificates of Education in 9th grade, get the same

marks (scores from 41 to 60 points) as the result of the Unified State Examination (57,5% and 58,5% in Russian and Mathematics respectively). The absolute majority of those who had mostly «good» and «excellent» marks (GPA is 4 or 4,5 out of 5) in their Certificates achieved the same results during the USE. More than ¾ of high-achievers in 9th grade got «good» and «excellent» marks (i.e. more than 61 points) again.

The type of high school which students attend influences their final results of the Unified State Examination (see Table A7 in the Appendix). Pupils who attend magnet schools usually receive higher scores than those who attend other types of high schools. Studying in (ordinary) comprehensive school without any specialization is concerned with lowest USE scores.

Finally, the type of pre-entry coaching determines the distribution of the USE results. Table A8 in the Appendix represents the distribution of final USE scores depending on the coaching program: pre-entry courses, classes with tutors, other types of coaching, self-coaching, as well as no coaching at all. We can see that enrollees, who attended pre-entry courses and classes with tutors, gain more than other high school graduates. Lowest results are for those respondents, who stated that there was no coaching for the USE at all (even no self-coaching).

Hence, USE results of high school graduates can be determined family inputs (parental education, structure of family, family income), ability (school achievement) and school inputs (type of school), methods of pre-entry coaching, as well as gender and city. Having specified the main factors, we should evaluate the effect of different inputs on the USE results, with the special emphasis on characteristics of pre-entry coaching. To do that we propose different linear models, where we will use the USE scores in Russian, Mathematics and the average USE score as dependent variables. Following characteristics of pre-entry programs will be included in corresponding models:

(1)   Dummy variables, whether or not high school graduate attended pre-entry courses (Courses = 1 if «yes», = 0 if «no»), classes with tutors (Tutors = 1 if «yes», = 0 if «no»), other types of pre-entry coaching (Other = 1 if «yes», = 0 if «no»), self-coaching (Self-coaching = 1 if «yes», = 0 if «no»); length of coaching (in months). These variables are included in the models 1 to 3 (see Table 5).

(2)   Total length of pre-entry courses and classes with tutors (expressed in total number of classes, i.e. frequency per week · 4 weeks in a month · length of coaching in months; taken both in linear and quadratic forms) are included in the models 4 to 6 instead dummy variables Courses and Tutors, and length of coaching. Total length of pre-entry coaching reflects temporary investment in the process of preparation for the university.

(3)   Total amounts of tuition on courses and by tutors (expressed in the amount of tuition fee per month multiplied by the length of pre-entry coaching in months) are included in the models 7 to 9 instead of total length of pre-entry courses and classes with tutors to avoid multicollinearity. These new independent variables reflect both temporary and monetary investment in pre-entry process. Moreover, price of courses and classes with tutors can be used as a proxy of «quality» of corresponding lessons.

Results of regression analysis. Family inputs. The results of regression analysis are represented in Table 6. First, note that characteristics of socio-economic background, such as parental education and family income are statistically significant and have positive effects on USE scores. Largest effects are for the USE score in Mathematics: *ceteris paribus*, children from families where parents have a diploma of higher education gain up to 5 points more than children whose parents do not have higher education. Increase of income (per month per person) also leads to improvement of USE results: children from more wealthy families have more chances to get higher USE scores. Gender is important for results in Russian (girls get 1,4 points more than boys) and Mathematics (boys score 2,5-2,7 points more than girls), however this factor loses its significance in the models where dependent variable is the average USE score. Type of family has significant effect only on average USE score: children from complete families are more successful in the terms of average score and get 2,6 points more than children who live either only with mother or with father.

Student's abilities and school inputs. Student's abilities (expressed as the achievement in 9th grade) have strong significant influence on USE results in all regression models. One-point increase in GPA in the Certificate of Education in 9th grade leads to 11,3-11,4 points increase in USE results in Russian, 12,9-13,0 points increase in USE results in Mathematics, and 8,8-8,9 points increase in average USE score.

Studying in comprehensive schools with special classes insignificantly differ from studying in ordinary comprehensive schools. Attending gymnasiums has significant positive effects on USE results in Russian (the effect is 1,8-1,9 points) and on average USE result (the effect is 2,7-2,8 points). Enrollees who graduated from magnet schools have a gain of 2,1-2,9 points in Russian, 3,4-5,2 points in Mathematics, 5,5-6,0 points on average (compared to those students who attended ordinary comprehensive schools).

Pre-entry coaching. Let's turn to concrete model specifications including factors of pre-entry training. Models 1 to 3 reflect the importance of separate types of pre-entry coaching, neglecting the fact that those programs differ by time and by price. However, this specification allows for understanding the overall effect of pre-entry coaching. Effect of pre-entry courses is significant and

positive for USE scores in Russian and Mathematics, as well as for the average USE score. However, this effect is very moderate: the fact of attending such courses improves USE result in Russian by 1,5 points, in Mathematics – by 3,4 points, and the average USE result by 2,8 points. Classes with tutors are effective only for Russian language: students who attend individual lessons, get 2,1 USE points more than those who do not. Other types of coaching decrease average USE result by 1,5 points, and self-coaching as the main form of pre-entry training increase average score by 2,5 points. Overall effect of pre-entry coaching is relatively small.

Models 4 to 6 deal with temporary investment in pre-entry courses and classes with tutors. Again, duration of pre-entry courses (expressed as total number of classes) has significant and positive impact on USE scores in Russian, Mathematics, and average score. Imagine that enrollee has attended courses for 8 months, with 2 classes per week. Then, total number of classes is 8 months · 2 times per week · 4 weeks in a month = 64 classes. This temporary investment adds to the final USE score in Russian only 2,8 points, to the USE score in Mathematics – 3,6 points, and to the average USE score – 3,3 points. Note, that the coefficients are significant both in linear (positive) and squared (negative) forms. It means that too long or intensive coaching can diminish the return. We may conclude that investment in pre-entry training in terms of time has positive, but modest effect on USE score. Duration of classes with tutors, like in the previous specification, has significant effect only on the USE score in Russian.

Models 7 to 9 represent the results of estimation of both temporary and monetary investment in pre-entry training. The main variable here is natural logarithm of total fee paid by parents for pre-entry courses and classes with tutors. This value was calculated as length of coaching (in months) multiplied by fee per month. Again, only investment in pre-entry courses has significant and positive effect for all examined USE marks. Imagine a student who pays 6000 rubles per month for pre-entry courses during 8 months. This strategy will add 1,6 points to the USE score in Russian, 2,8 points to the USE score in Mathematics and 2,8 points to the average USE score. The amount of tuition fee for classes with tutors is positive, but significant only for USE results in Russian.

Hence, the effects of pre-entry coaching are small. The main type of coaching that can slightly improve USE results is pre-entry courses.

Table 6.

Estimates of coefficients of educational production function with factors of pre-entry coaching (results of regression analysis)

	Coefficients								
Model →	1	2	3	4	5	6	7	8	9
Dependent variables → Independent variables ↓	USE_Rus	USE_Math	USE_ Average	USE_Rus	USE_Math	USE_ Average	USE_Rus	USE_Math	USE_ Average

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	1,150 (8,275)	**-33,605***** **(10,030)**	-7,140 (8,855)	1,016 (8,113)	**-36,311***** **(9,919)**	-8,603 (8,822)	1,560 (8,194)	**-36,389***** **(9,966)**	-7,559 (8,803)
Parental Education (=1 if higher education)	**2,918***** **(0,731)**	**5,014***** **(0,886)**	**2,734***** **(0,771)**	**2,685***** **(0,722)**	**4,767***** **(0,883)**	**2,609***** **(0,776)**	**2,903***** **(0,730)**	**5,028***** **(0,887)**	**2,762***** **(0,771)**
Ln (Income)	**1,611**** **(0,783)**	**3,707***** **(0,949)**	**3,257***** **(0,840)**	**1,625**** **(0,768)**	**3,930***** **(0,938)**	**3,415***** **(0,835)**	**1,572**** **(0,777)**	**3,911***** **(0,945)**	**3,283***** **(0,835)**
Incomplete family	-0,713 (0,827)	-1,267 (1,002)	**-2,555***** **(0,883)**	-0,688 (0,815)	-1,326 (0,996)	**-2,645***** **(0,881)**	-0,705 (0,825)	-1,320 (1,004)	**-2,602***** **(0,881)**
Gender (=1 if boy)	**-1,356**** **(0,668)**	**2,659***** **(0,810)**	0,437 (0,715)	**-1,494**** **(0,659)**	**2,546***** **(0,806)**	0,334 (0,718)	**-1,414**** **(0,667)**	**2,668***** **(0,812)**	0,416 (0,717)
Achievement	**11,304***** **(0,850)**	**12,865***** **(1,030)**	**8,807***** **(0,946)**	**11,434***** **(0,843)**	**12,988***** **(1,030)**	**8,850***** **(0,952)**	**11,314***** **(0,848)**	**12,930***** **(1,032)**	**8,830***** **(0,945)**
Comprehensive school with special classes	0,840 (1,073)	1,694 (1,301)	-0,195 (1,243)	0,675 (1,050)	1,461 (1,283)	-0,341 (1,230)	0,843 (1,061)	1,308 (1,291)	-0,328 (1,225)
Gymnasium	**1,822*** **(0,959)**	1,004 (1,163)	**2,768***** **(1,053)**	**1,874**** **(0,943)**	0,972 (1,153)	**2,701***** **(1,045)**	**1,819*** **(0,951)**	0,715 (1,157)	**2,651***** **(1,037)**
Magnet school	**2,163*** **(1,278)**	**4,622***** **(1,550)**	**5,937***** **(1,298)**	**2,945**** **(1,282)**	**5,219***** **(1,568)**	**5,971***** **(1,308)**	**2,085*** **(1,206)**	**3,381**** **(1,466)**	**5,542***** **(1,221)**
Courses	**1,480**** **(0,749)**	**3,356***** **(0,908)**	**2,827***** **(0,794)**	-	-	-	-	-	-
Tutors	**2,064***** **(0,735)**	0,498 (0,891)	0,836 (0,784)	-	-	-	-	-	-
Total duration of pre-entry courses	-	-	-	**0,096***** **(0,022)**	**0,115***** **(0,027)**	**0,092***** **(0,026)**	-	-	-
Total duration of pre-entry courses squared	-	-	-	**-0,0008***** **(0,000)**	**-0,0009***** **(0,000)**	**-0,0006***** **(0,003)**	-	-	-
Total duration of classes with tutors	-	-	-	**0,024*** **(0,015)**	-0,027 (0,018)	0,010 (0,015)	-	-	-
Total duration of classes with tutors squared	-	-	-	0,000 (0,000)	**0,000***** **(0,000)**	0,000 (0,000)	-	-	-
Ln (Total fee for pre-entry courses)	-	-	-	-	-	-	**0,148**** **(0,037)**	**0,264***** **(0,086)**	**0,263***** **(0,076)**
Ln (Total fee for classes with tutors)	-	-	-	-	-	-	**0,234***** **(0,069)**	0,007 (0,084)	0,072 (0,073)
Other	-0,857 (0,719)	-0,533 (0,871)	**-1,536**** **(0,758)**	-0,766 (0,699)	-0,714 (0,854)	**-1,606**** **(0,753)**	-0,848 (0,711)	-0,758 (0,865)	**-1,553**** **(0,752)**
Selfcoaching	0,210 (1,318)	0,603 (1,598)	**2,497*** **(1,464)**	0,192 (1,274)	0,664 (1,558)	**2,420*** **(1,441)**	0,186 (1,300)	0,956 (1,581)	**2,535*** **(1,445)**
Length of coaching	0,036 (0,081)	**-0,194**** **(0,098)**	-,031 (0,088)	-	-	-	-	-	-
Volgograd	-2,524 (1,899)	**-5,625**** **(2,302)**	**-5,040***** **(1,946)**	**-3,263*** **(1,879)**	**-5,921***** **(2,297)**	**-5,055***** **(1,943)**	-2,584 (1,896)	**-5,448**** **(2,306)**	**-4,945***** **(1,942)**
Voronezh	2,415 (2,054)	2,245 (2,489)	-0,369 (2,120)	1,180 (2,041)	1,396 (2,496)	-0,618 (2,128)	2,327 (2,052)	2,265 (2,496)	-0,303 (2,120)
Yekaterinburg	**-8,939***** **(1,744)**	-3,344 (2,114)	**-12,802***** **(1,826)**	**-9,225***** **(1,716)**	**-3,483*** **(2,099)**	**-12,906***** **(1,829)**	**-8,844***** **(1,739)**	-3,189 (2,115)	**-12,699***** **(1,825)**
Kazan	**-4,723***** **(1,835)**	**-8,857***** **(2,224)**	**-7,822***** **(1,949)**	**-5,625***** **(1,811)**	**-9,178***** **(2,215)**	**-7,988***** **(1,941)**	**-4,790***** **(1,828)**	**-8,472***** **(2,224)**	**-7,675***** **(1,940)**
Krasnoyarsk	-1,971 (1,824)	-2,198 (2,211)	**-5,292***** **(1,903)**	-2,754 (1,799)	-2,628 (2,199)	**-5,555***** **(1,903)**	-1,909 (1,819)	-2,126 (2,213)	**-5,209***** **(1,902)**
N.Novgorod	-1,870 (1,664)	-0,444 (2,018)	**-5,185***** **(1,625)**	-1,890 (1,639)	-0,045 (2,004)	**-4,826***** **(1,619)**	-1,816 (1,655)	-0,018 (2,013)	**-4,964***** **(1,615)**
Novosibirsk	**-4,552***** **(1,676)**	2,318 (2,031)	**-8,862***** **(1,706)**	**-4,788***** **(1,625)**	2,704 (1,986)	**-8,728***** **(1,675)**	**-4,595***** **(1,651)**	2,937 (2,008)	**-8,752***** **(1,678)**

Omsk	**-2,954*** **(1,190)**	**-4,384**** **(2,169)**	**-3,870**** **(1,809)**	**-3,080*** **(1,759)**	**-4,272**** **(2,151)**	**-3,677**** **(1,806)**	-2,875 (1,785)	**-4,232*** **(2,171)**	**-3,775**** **(1,807)**
Perm	0,877 (1,891)	-3,207 (2,293)	**-3,593*** **(1,888)**	0,664 (1,863)	-3,256 (2,278)	**-3,437*** **(1,887)**	0,935 (1,888)	-3,039 (2,296)	**-3,476*** **(1,887)**
Postov-on-Don	1,818 (1,906)	-0,257 (2,311)	-1,209 (2,007)	1,436 (1,879)	-0,253 (2,297)	-1,101 (2,006)	1,848 (1,902)	-0,195 (2,313)	-1,148 (2,005)
Samara	**5,754**** **(1,762)**	**10,698**** **(2,136)**	**5,961**** **(1,948)**	**5,440**** **(1,736)**	**11,119**** **(2,123)**	**6,135**** **(1,945)**	**5,790**** **(1,753)**	**11,144**** **(2,132)**	**6,161**** **(1,940)**
St. Petersburg	**-2,377**** **(1,068)**	-0,421 (1,295)	**-2,039*** **(1,257)**	**-2,757**** **(1,055)**	-0,440 (1,289)	**-2,070*** **(1,253)**	**-2,396**** **(1,064)**	-0,212 (1,294)	-2,010 (1,252)
Saratov	**-5,862**** **(1,988)**	**-8,737**** **(2,410)**	**-8,985**** **(1,980)**	**-6,303**** **(1,968)**	**-9,009**** **(2,406)**	**-9,179**** **(1,987)**	**-5,761**** **(1,985)**	**-8,681**** **(2,414)**	**-8,883**** **(1,979)**
Ufa	**4,145**** **(1,827)**	**6,018**** **(2,214)**	4,780 (3,428)	**4,012**** **(1,797)**	**6,205**** **(2,197)**	4,859 (3,429)	**4,173**** **(1,814)**	**6,541**** **(2,206)**	4,921 (3,423)
Chelyabinsk	-0,728 (1,796)	0,168 (2,177)	-1,967 (1,806)	-0,790 (1,766)	0,031 (2,159)	-1,917 (1,805)	-0,687 (1,791)	0,038 (2,178)	-1,964 (1,805)
R^2	**0,266**	**0,290**	**0,353**	**0,287**	**0,298**	**0,354**	**0,267**	**0,287**	**0,353**
Observations	**1165**	**1165**	**900**	**1165**	**1165**	**900**	**1165**	**1165**	**900**

Standard errors in parentheses

*** $p < 0,01$, ** $p < 0,05$, * $p < 0,1$.

V.   Conclusion

The Unified State Examination is a new institution of admission to higher education. In this paper we have identified and evaluated the set of factors which affect actual USE scores, with special emphasis on characteristics of pre-entry coaching. USE scores can be determined by family inputs, as well as by achievement (student abilities) and type of school. Gender matters for USE results in Russian in Mathematics.

Pre-entry coaching matter, but only investment in pre-entry courses can improve USE results in Russian, Mathematics and the average score. However, the effect of courses is rather small and varies (on average) from 1,5 to 3,6 points.

As a consequence, these factors can influence college choice via scores, so college choice can be determined not only by student abilities. However, we cannot say that those who invest more in pre-entry coaching have far more chances for successful matriculation.

Preliminary findings point up the necessity for extended research and further comparisons of educational pathways of students from different backgrounds with the emphasis on the relationship between investment in pre-entry coaching and actual USE scores.

VI.   Bibliography

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VII. Appendix

Table A1. Distributions of USE scores depending on the city

City	Means		
	Russian	**Maths**	**Average score**
Volgograd	67,14	55,69	59,61
Voronezh	70,77	61,72	63,03
Yekaterinburg	**59,04**	58,37	**52,14**
Kazan	64,33	51,00	56,42
Krasnoyarsk	64,92	56,75	57,06
Moscow	69,68	64,15	67,30
Nizhny Novgorod	66,32	60,81	59,15
Novosibirsk	61,35	62,42	53,95
Omsk	64,76	56,29	59,71
Perm	67,81	55,39	58,49
Rostov-on-Don	69,33	59,44	62,00
Samara	**73,33**	**71,80**	**70,26**
St. Petersburg	65,91	62,48	64,42
Saratov	60,24	**50,06**	53,72
Ufa	70,84	67,05	65,00
Chelyabinsk	64,84	58,23	59,97
Total	**67,10**	**61,17**	**62,15**

Table A2. Distributions of USE scores depending on parental education

Score	Parental Education					
	Russian		Maths		Average score	
	No higher education	Higher education, incomplete higher education	No higher education	Higher education, incomplete higher education	No higher education	Higher education, incomplete higher education
1 - 40 points	1,8%	2,0%	18,2%	6,8%	2,3%	4,0%
41 - 60 points	34,8%	21,1%	48,0%	34,1%	58,2%	34,6%
61 - 80 points	55,1%	62,2%	29,0%	46,4%	35,8%	53,5%
81 - 100 points	8,3%	14,7%	4,8%	12,7%	3,7%	7,9%
Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Table A3. Distributions of USE scores depending on family structure (complete/incomplete family)

Score	Complete/Incomplete Family					
	Russian		Maths		Average score	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
1 - 40 points	1,9%	2,2%	9,9%	14,1%	2,8%	5,8%
41 - 60 points	23,6%	34,4%	37,4%	44,5%	40,3%	52,3%
61 - 80 points	60,9%	54,6%	41,7%	35,2%	49,2%	40,7%
81 - 100 points	13,5%	8,8%	11,0%	6,2%	7,8%	1,2%
Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Table A4. Distributions of USE scores depending on family income

Score	Level of income (in rub. per person per month)														
	Russian					Maths					Average score				
	Less than 7000 rub.	7000 - 9999 rub.	10000 - 14999 rub.	15000 - 20000 rub.	More than 20000 rub.	Less than 7000 rub.	7000 - 9999 rub.	10000 - 14999 rub.	15000 - 20000 rub.	More than 20000 rub.	Less than 7000 rub.	7000 - 9999 rub.	10000 - 14999 rub.	15000 - 20000 rub.	More than 20000 rub.
1 - 40 points	2,2%	0,9%	1,4%	3,2%	0,8%	22,8%	8,4%	10,1%	12,4%	5,0%	1,4%	2,4%	3,7%	5,5%	3,4%
41 - 60 points	36,6%	29,2%	29,0%	30,5%	25,0%	59,8%	45,8%	45,9%	39,8%	39,3%	68,6%	62,7%	54,9%	45,1%	31,0%
61 - 80 points	57,0%	61,3%	59,9%	52,7%	65,8%	15,2%	41,1%	37,2%	38,2%	46,4%	28,6%	34,9%	39,6%	42,6%	59,8%
81 - 100 points	4,3%	8,5%	9,7%	13,7%	8,3%	2,2%	4,7%	6,8%	9,6%	9,2%	1,4%		1,8%	6,8%	5,7%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table A5. Distributions of USE scores depending on gender

Score	Subject					
	Russian		Maths		Average score	
	Girls	Boys	Girls	Boys	Girls	Boys
1 - 40 points	1,9%	1,9%	11,0%	10,1%	3,5%	3,2%
41 - 60 points	22,2%	30,7%	43,9%	31,8%	42,9%	42,2%
61 - 80 points	64,4%	53,4%	36,4%	46,2%	47,4%	47,7%
81 - 100 points	11,5%	14,0%	8,7%	12,0%	6,2%	7,0%
Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Table A6. Distributions of USE scores depending on achievement

Score	Achievement											
	Russian				Maths				Average score			
	C (3)	B (4)	A-B (4,5)	A (5)	C (3)	B (4)	A-B (4,5)	A (5)	C (3)	B (4)	A-B (4,5)	A (5)
1 - 40 points	2,5%	4,7%	0,3%		12,2%	19,9%	6,1%		3,6%	8,2%	1,4%	
41 - 60 points	57,5%	42,4%	16,8%	2,0%	58,5%	49,4%	33,1%	23,2%	60,7%	62,8%	36,1%	9,0%
61 - 80 points	20,0%	48,9%	69,6%	57,6%	17,1%	27,8%	50,2%	41,4%	17,9%	27,9%	56,7%	65,4%
81 - 100 points	20,0%	4,0%	13,3%	40,4%	12,2%	3,0%	10,6%	35,4%	17,9%	1,1%	5,8%	25,6%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table A7. Distributions of USE scores depending on type of high school attended

Score	Type of high school											
	Russian				Maths				Average score			
	Comprehensive school	Comprehensive school (special class)	Gymnasium, lyceum	Magnet school	Comprehensive school	Comprehensive school (special class)	Gymnasium, lyceum	Magnet school	Comprehensive school	Comprehensive school (special class)	Gymnasium, lyceum	Magnet school
1 - 40 points	1,7%	3,9%	2,0%	0,9%	12,5%	10,9%	7,8%	3,6%	4,3%		4,1%	
41 - 60 points	31,1%	16,3%	20,6%	11,6%	39,9%	33,3%	46,1%	25,9%	49,1%	35,9%	41,5%	13,0%
61 - 80 points	55,0%	67,4%	62,7%	75,9%	38,1%	45,7%	36,8%	56,2%	41,5%	56,4%	48,3%	73,0%
81 - 100 points	12,2%	12,4%	14,7%	11,6%	9,6%	10,1%	9,3%	14,3%	5,1%	7,7%	6,1%	14,0%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table A8. Distributions of USE scores depending on type of pre-entry coaching

Score	Type of pre-entry coaching														
	Russian					Maths					Average score				
	Pre-entry courses	Classes with tutors	Other types of coaching	Self-coaching	No coaching	Pre-entry courses	Classes with tutors	Other types of coaching	Self-coaching	No coaching	Pre-entry courses	Classes with tutors	Other types of coaching	Self-coaching	No coaching
1 - 40 points	2,6%	0,2%	0,5%	2,1%	4,2%	6,6%	9,5%	11,6%	13,5%	11,2%	3,8%	1,9%	1,5%	3,0%	6,2%
41 - 60 points	20,9%	18,8%	27,8%	33,3%	34,1%	34,9%	36,9%	40,6%	52,1%	36,4%	33,6%	37,3%	48,9%	47,8%	46,9%
61 - 80 points	61,0%	67,5%	60,2%	55,2%	50,5%	44,3%	44,5%	39,0%	26,0%	41,6%	51,7%	54,2%	44,3%	44,8%	42,0%
81 - 100 points	15,6%	13,4%	11,6%	9,4%	11,2%	14,2%	9,1%	8,8%	8,3%	10,7%	11,0%	6,6%	5,2%	4,5%	4,9%
Total	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%