SOCIAL ORIGIN, SCHOOL CHOICE, AND STUDENT PERFORMANCE

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Abstract

The paper intends to define educational markets based on the ground of major divisions existing in the school system like 1) public vs. private; 2) tracking either by academic vs. vocational curriculum or by ability; and 3) schools' practice regarding admittance of students. It is assumed that sector of schools, tracking practice as well as admittance rules create a 'market', put the schools into various positions in the educational 'field' and parents consider these options when deciding about school choice. In addition to this 'input-effect' leading most probably to differences in school composition regarding social background of the pupils, there is also an 'output-effect' of the educational market. School's position in the market in terms of sector, tracking or practice of admittance is assumed to have an impact on students' school performance.

The paper has two research aims. On the hand, it investigates the statistical relationship between parental background and type of school, the offspring attend. It is assumed that parents with higher status prefer to choose schools with stronger academic curriculum, using academic criteria to select students, belonging to private sector and applying some ability grouping. On the other hand, the paper estimates the impact of the school's market position on the performance of their students. It is expected that pupils will perform better in schools with stronger academic curriculum, in the private sector, applying some practice for selection based on previous qualification and grouping the students by ability.

The paper uses the data form the PISA 2006 survey and intends to provide a general picture based on selected European OECD countries. In the course of the analysis, the relationship between social origin and school characteristics as well as between school characteristics and performance is presented at descriptive level. In a next step, the odds of school choice are investigated using family background as main predictor. The analysis confirms the assumptions with the exception of ability tracking. The last part of the paper educational performance is the dependent variable and the impact of the various market-characteristics of the schools is studied. Most of the assumptions are verified but ability grouping does not improve achievement. A final model, applying interaction terms, shows that students from high status families benefit more from the education market with the exception of the religious schools.

Keywords: market competition, school choice, educational inequality, school quality, scholastic achievement

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Introduction

Market penetrates in every area of daily life. Education is not an exception from this rule. The emerging education market calls for new perspectives and approaches from researchers and policy-makers as well. The importance of institutional settings lays deeply in the sociological traditions and educational systems in the different countries produce structural conditions and segmentation which have an influence on the existence and functioning of education markets. The varying institutional structures e.g. the tracking system with regard to the academic vs. vocational focus of the educational programs or the public vs. private character of the schools serve as a basis for market creation.

Competition, selection, choice, quality – these are the key notions used most frequently in the discussions on education markets. In general, competition is the most important feature of markets, almost by definition. Quality is strongly connected to competition; if players in the market should compete for customers they will do it, among others, by providing higher quality. This is definitely the case for the education market where providers (schools) compete for the (best) students in terms of their abilities and cognitive skills as well as of their social background. Under the circumstances of the emerging education markets, schools intend to be selective and to pick up those pupils who can be expected to perform better either because they have good abilities or because they have favourable family background. Due to demographic reasons, the decline in fertility and in the number of students, the schools will not simply race for the better pupils but, to some extent, for the pupils at all. The selection process is mutual because parents also intend to choose such schools which can be assumed to provide better schooling and higher quality to their offspring. Apparently, one of the most essential policy issues is how freely this market process can go on in the society or how much the process should be regulated by governmental educational policies. Under a completely free market, parental choice and the selection procedures applied by the schools can easily lead to a high degree of segregation and to large inequalities in educational opportunities for offspring of families with different social background. This is why school choice is not fully free and selection process by schools is controlled to varying extent in most of the societies.

In this analysis I investigate two relationships connected to education markets. Firstly, I am interested in describing these markets by various dimensions like public and private segmentation, tracking by school programs or ability, and selectivity of the schools. I am curious how these characteristics of the education

market relate to the social origin of the pupils. Secondly, I want to investigate the impact of the market on school quality, i.e. on the performance of the students. This will be controlled for pupils' social background as well as some school characteristics. The next section of the paper deals with theoretical implications of the topic and the existing knowledge on the various issues. Then I present my data and variables. This part is followed by the empirical analysis. Finally, I discuss the results.

Posing the problem in the light of evidence

The chief dilemma researchers and policy makers face is the efficiency of education and the equality of educational opportunities. The ideal solution would be to raise both the effectiveness and the equality in schooling but the reality and most of the empirical evidence show that this is an illusion. In fact, there are advocates of the free education markets who argue for larger school choice and underline its positive impact on school quality and try to minimize the social consequences of this policy for educational inequalities. The critics of the free education market, however, emphasise the social and political significance of equality in educational opportunities for youngsters with different ethnic or class background and question the efficiency of the education market for school quality.

The two most important dimensions of this debate relates to the public and private sector of schooling and to the tracking or selecting procedures schools apply. Liberal economists declare that market and private sector is always more efficient than public sector and this holds for education as well, private schools outperform public schools (e.g. Friedman 1997). An empirical test of this claim should, however, take into account the school composition in the public and private sector of education. Moreover, when speaking about private sector, it is crucial to make a distinction between government-dependent (mostly religious) and government independent schools. The empirical evidence shows that, if controlling for school composition in terms of students' characteristics (like e.g. social origin) and of school's attributes (like e.g. human resources and technical facilities), religious schools perform better than public schools but public schools have better quality in comparison to the other type of private schools (Dronkers and Robert 2008a. 2008b). This result is in accordance with the previous findings on the better achievement of pupils from Catholic schools in the US (Coleman et al. 1982. 1987). But when interpreting this result, the high quality in religious schools is usually not connected to their role in the market but to the social environment and social capital around these schools. Nevertheless, education market still seems to have a positive impact on

educational performance due to market competition. Hoxby (2003) found that test scores in public schools improve if they face competition in the market.

Freedom of school choice is another crucial point for operating the education market and it fits into the general liberal theory of public choice (Chubb and Moe 1988). This means that parents are free to choose the school what they think to be the best for their offspring. Advocates of education market claim that this freedom makes possible for disadvantaged families to find and enrol better schools with higher quality. Though this assumption is in accordance with a liberal way of thinking, critics of free school choice argue that parents from different class with different network capital, financial standing, knowledge about schools, attitudes toward the importance of education can take an advantage of the freedom of school choice to dissimilar extent. In reality, free choice creates social closure, helps to maintain social inequalities in favour of the middle classes (Ball 2003). As Gerwitz et al (1995: 55) puts it: school choice is a 'factor in maintaining and reinforcing social class divisions and inequalities'. Other research, at the same time, did not find any increase in educational segregation caused by free school choice, but if certain regulations forced to schools to take pupils from the neighbourhood where they operated (Goldhaber 1999). Segregation, however, is not in issue for itself. The point is how much school segregation or integration due to more or less freedom in school choice leads to better or worse performance in the different schools as measured by test scores of the pupils. My own previous research in this regard found that integration does not decrease the achievement of middle class pupils but does not help much the offspring of disadvantaged families either (Robert 2007). The peer effects assumed to be present behind segregation and integration in the schools do not necessary operate in the way as policy makers tend to believe (Jakubowski and Robert 2008).

Turning to tracking, the curricular differentiation is a structural feature of the school system that makes parents to choose between schools. Curriculum tracking and its most common form, the academic vs. vocational training in the secondary schools has deep roots in the school system of certain European nations, chiefly in Germany (Maurice, Sellier and Silvestre 1986) and in some countries in Middle Europe where school system followed the German model. The academic vs. vocational focus in training contributes to creating an education market because this curricular difference has a consequence for the odds of school progression to tertiary level of education and to labour market possibilities (Allmendinger 1989). Parents who have intentions to send their offspring to university tend to choose grammar schools with academic curriculum, while less ambitious parents prefer to choose

labour market oriented vocational schools for their offspring. This choice is usually not independent from the social status of the parents. Since parents with lower social status tend to underestimate the possibilities of their offspring and overestimate the difficulties for them to continue their studies at higher level (Boudon 1974. Goldthorpe 1996), they choose vocational schools for them. High status parents, however, prefer to choose grammar schools for their children because they have strong confidence that children will continue their studies at tertiary level. Achievement of the students in terms of test scores is usually higher in the grammar schools or in academic track than in the vocational schools or in vocational track (Natriello, Pallas and Alexander 1989). Generally, curriculum tracking, and particularly if the selection occurs at younger age, contributes strongly to inequality of educational attainment by social origin. Based on test scores from PISA 2000 and 2003, Jenkins et. al. (2006) show that segregation is the highest for those countries where academic vs. vocational tracking operates at strongest. In a recent study, Pfeffer (2008) examines the relationship between educational mobility and stratification of the educational systems and finds much less mobility in those countries where the system is more rigid, educational pathways are diverging, and sorting of pupils occurs in the beginning of the educational career. (See also Hanushek and Wössman, 2005, in this respect.)

Another form of tracking is based on pupils' characteristics like prior achievement or test-based ability and knowledge in a given subject investigated in the beginning of a course. This type of tracking is expected to improve educational productivity based on the assumption that homogeneous groups can be trained more efficiently, i.e. teachers can meet students' needs better if they are at more similar level in terms of prior knowledge or qualification. At the same time, much research suggests that tracking or grouping increase inequality and widen the gap between students with respect to their final achievement to various extent (e.g. Heyns 1974. Gamoran 1986. 1987. Kerckhoff 1986). Whether or not a school offers any kind of tracking can be regarded as part of making an education market because parents can consider this opportunity when they choose between schools. Most probably parental social status has an impact on this consideration and high status parents may favour schools with ability tracking.

The next way how schools can differ from each other is selectivity of admittance. Most schools are required to inform parents about the criteria they take pupils. Part of these criteria is usually legally regulated like e.g. how place of residence of the applicant should be considered. Private schools can require tuition or endorsement from parents. Some schools give advantage to those pupils whose

sibling attends already the same school. From the viewpoint of achievement, student's prior academic records, some form of entrance examination or screening, and recommendation of the former school where the pupil studied can serve as selection criteria for admittance. The various degree and from of selectivity of admittance can attract parents with different social standing in dissimilar way. It can influence their school choice and this fact also creates a market for the schools. The expected mechanism is that high status parents will prefer to choose those schools where selectivity is higher, while low status parents will send their offspring to those schools where they are less screened. At the same time, it may hold that high status parents are more informed about selection criteria schools apply in comparison with low status parents. It is a similarly important research question whether stronger academic selectivity in schools leads to higher level of performance of the students, (taken school composition into account).

Summing up, four dimensions of the education market will be investigated in this paper: public-private difference, curriculum tracking, ability tracking, and selectivity of admittance. The first aim of the study is to describe the educational market on the ground of these divisions. Then the segments of the educational market are analyzed from the viewpoint of school characteristics and compositional differences. Indirectly school composition in terms of the level of education or the socio-economic status of the parents reflects to school choice. These choices are based on parental strategies regarding investment into offspring's human capital and expected to be related to the social standing of the families. Basically, the (unequal) access to educational goods is studied from the viewpoint of status differences of the families. The second aim of the paper is to investigate the effectiveness of the schools, in terms of test results of students, for the various segments of the educational market. This intends to lead to some verdict on the quality of the schools taking different positions in the education market in terms of sectors, tracking or selection practices. As a last step, interaction terms are used to find out how high status and low status students are able to benefit from the education market.

Data and measures

The paper uses the PISA 2006 dataset. This research aimed to provide internationally comparable evidence on the performance of 15-year-old students chiefly in the OECD countries. I do not intend to include all countries involved PISA 2006 because they represent very different cases in terms of institutional context. In order to decrease the large variation, I have selected first only the OECD countries and then I made a further selection of a set of European OECD countries: Austria,

Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom (N of countries = 23; N of cases = 113 thousands).

Measuring education market

The analysis approaches education market in four dimensions. All of them are taken directly from the PISA data used in the paper.

1. Public vs. private segmentation distinguishes three types of schools. Firstly, public and private sector is separated on the ground weather the institution is controlled and managed by governmental or non-governmental agency or body. Then, government-dependent and government-independent schools are distinguished based on the form how these schools are financed. For the first type 'core funding' (= more than 50 percent of the budget) comes from government sources, while schools in the second type get chiefly financed from non-government sources. In practice, the government-dependent private institutions are usually religious schools.

2. The separation of the academic vs. vocational tracks in a dichotomous variable is based on the program the pupil attends. Both designation and orientation of the program is available in the data at ISCED level and this allows to making a first and draft distinction. Then, the national study program codes can be used to refine the measure in each country.

3. In the PISA school questionnaire, the school principals reported about the practice of the school with respect to ability grouping. A three-category variable is available indicating whether the school applies ability grouping for all subjects, some subjects or no grouping occurs at all.

4. The principals also reported about the practice of school admittance. In this regard, the PISA data contain a variable based on consideration of pupils' prior academic record and recommendation of their previous school. This variable has four categories: no consideration; at least one considered; at least one has priority; at least one is a prerequisite.

Students' characteristics

The paper takes into account gender, age (measured in months), highest parental education (measured in years completed), parental socio-economic status (measured by ISEI, see Ganzeboom et al. 1992).

Schools' characteristics

There is plenty of information on schools in the PISA data. For the school choice models I control for only two of them and these are the place of school and the availability of schools. For the previous one the categories are: city, large town, small town, and village; for the latter one the categories are: two or more schools, one more school, and no more school in the settlement. Few further controls are used in the models predicting the impact of educational market on scholastic achievement. I take into account the teachers' quality measured by the proportion of the certified staff in the school; the school's infrastructure measured by the proportion of computers connected to the WEB; and finally a question which related to the parental pressure regarding high academic standards in the school. This question had three categories in the PISA school questionnaire: constant pressure from many parents, pressure from a minority of the parents, and parental pressure on high academic standards is largely absent.

Students' academic performance

Like in all PISA surveys, pupils' achievement is measured by their scores in reading, math and science. (In 2006, the focus of the survey was science.) The dataset includes five-five plausible values for each of these three subjects, constructed by applying weighted maximum likelihood estimates (Warm 1985) and standardized into a score with a mean of 500 and a standard deviation of 100. The paper uses the first plausible value of the three measures as dependent variables.

For any further details on PISA 2006 survey, see OECD (2007b).

Descriptive results: Segmentation of the education market

Public vs. private division

Despite of emerging market in education, the target group of the PISA 2006 survey, the secondary school students aged 15, study chiefly (86 percent) in public schools (OECD 2007a: 229-230). On OECD average, only 4 percent of them study in schools being privately managed and financed, i.e. in government independent schools. This proportion is higher in societies outside of Europe but Spain can also be described by a relatively large share of such pupils (10 percent). On average, 10 percent of the pupils can be found in private government-dependent schools with a strong over-representation for the Netherlands and Belgium (two-third of the students), Ireland (half of the students), Spain and Denmark (one-fourth of the students). Out of the

formerly communist countries where religious education was apparently depressed, Hungary stands out with 13 percent of students attending private government-dependent schools. (For the phenomenon see Dronkers and Robert, 2004.)

For school choice, parental education and parental socio-economic status are presented by type of the schools. This can be regarded as a 'reconstruction' of parental choice with respect to the public and private segments of the education market. Figures in Table 1 indicate that the composition of the schools differs significantly in the selected 23 European societies: Pupils in public schools have parents with the lowest level of schooling and status, while parents have the highest education and status in the government independent schools.

Table 1 also displays those selected countries where education market is segmented by the public and private sector to a stronger extent. With the exception of the Netherlands (where, in fact, there are no government independent private schools), the same tendency of school choice seems to be present.

Table 1.

'Reconstructed' parental choice by school type in selected countries

	Parental education			Parental status		
	Government independent private	Government-dependent private	Public	Government independent private	Government-dependent private	Public
Belgium	15.1	14.1	13.3	59.4	50.9	46.2
Netherlands	-	13.7	13.8	-	51.1	52.2
Ireland	14.9	13.1	12.6	66.5	50.5	40.9
Spain	14.1	11.9	10.3	60.1	47.8	41.1
Denmark	14.7	14.4	13.9	60.4	51.5	48.1
Hungary	14.9	13.5	12.5	59.3	53.0	46.7
OECD countries	14.4	13.4	12.3	60.2	50.8	46.0

Source: PISA 2006, own calculations

Academic vs. vocational tracking

As mentioned above, the curriculum tracking is a form of market segmentation that is deeply rooted in the traditions of the schooling system in certain nations. This type of tracking is much less present in the Anglo-Saxon countries; the proportion of pupils studying in vocational programs is negligible in the UK or Ireland. The same holds for the Scandinavian countries, Denmark, Finland, Norway or Sweden. The Southern European countries are mixed; there seem to be no students in vocational programs in Spain, a low proportion appears in Greece, but Italy and Turkey have a large percentage of pupils in vocational programs. The countries with more marked

vocational specificity are those with a German-type schooling system, i.e. Germany, Austria and some of the former communist societies like Czech Republic or Hungary, where the proportion of pupils attending vocational programs varies between 40 and 70 percent. Belgium is also part of this group with a large share of vocational training. A third group of the countries (e.g. France, Switzerland, the Netherlands or Slovakia) has a moderate (10-30 percent) fraction of students studying in vocational programs.

When looking at students' social origin by the two tracks, results seems to support the assumption that parental background is strongly related to the secondary school track choice. As Table 2 displays, the pattern is the same for the selected OECD countries as well as for those societies where this type of curriculum tracking is markedly present. Pupils who attend vocational programs come from families where parents are less educated and have lower level of social status. Those students, however, who study in academic programs and, consequently, will have better odds for continuing their studies at tertiary level, seem to come from families with higher education and social status.

Table 2.
'Reconstructed' parental choice by curriculum tracking in selected countries

	Parental education		Parental status	
	Vocational	Academic	Vocational	Academic
Germany	13.6	14.9	45.1	53.9
Austria	13.4	14.5	44.9	56.5
Czech Republic	13.1	13.8	45.8	50.1
Hungary	12.1	13.5	44.5	52.2
Belgium	13.1	14.6	43.7	55.1
Italy	11.7	13.3	41.7	52.3
Turkey	7.8	9.1	36.4	41.7
OECD countries	11.8	12.7	42.4	48.8

Source: PISA 2006, own calculations

Ability grouping
According to the reports of the school principals, on average 14 percent of the students study in schools where ability grouping is present for all subjects. The majority of 54 percent can experience ability grouping for some subjects, while about one-third of the students attend schools where no ability grouping takes place (OECD 2007a: 223).

It seems to be difficult to find a pattern for the countries on the ground whether schools favour or do not favour ability grouping. Apparently, this is the UK and Ireland, the two Anglo-Saxon nations where ability grouping appears in about 90 percent of schools, though not for all subjects. Of the Scandinavian countries, ability

grouping is more present in Denmark or Sweden and less present in Finland or Norway. In Southern Europe, ability grouping seems to be rare in schools, particularly in Greece, Turkey or Italy. There seems to be no strong relationship between curriculum tracking and ability grouping. Schools in Germany, Austria or Belgium, countries with a large share of students attending vocational programs, do not apply ability grouping. Netherlands and Switzerland, on the other hand, have a moderate curriculum tracking and the proportion of students who study in schools where ability tracking occurs for all subjects is over 40 percent. Of the former communist countries, in Hungary more than two-third of pupils study in schools where ability tracking appears at least for some subjects. This percentage is lower in the Czech Republic and Slovakia, while more than half of the students do not experience any ability grouping in Poland.

In terms of 'reconstructed' parental choice, the picture is less clear cut for ability tracking as it was for school type or curriculum tracking. Regarding parental education, the means for the categories of 'no grouping', 'for some subjects' and 'for all subjects' look like 12.3, 12.8 and 12.1. The mean parental social status (SES) is 46.7, 47.4 and 45.8 for these categories, respectively. The differences in the means are much smaller and do not indicate that high status parents would strongly support ability tracking. The differences are not large at the level of the single countries either. In fact, there are only few countries (Czech Republic, Finland, Greece, Hungary, Poland, Slovakia, Spain, Sweden, Switzerland), where parents, who seemed to select schools with some or full ability tracking, have slightly higher levels of schooling and social status.

Selectivity of school admittance

According to the PISA 2006 data, about 43 percent of the students study in those schools where neither previous academic record nor school recommendation is used for selecting applicants. Another 29 percent of pupils attend schools where at least one of these aspects is considered. Either academic record or recommendation gets high priority in schools where 12 percent of the students study and one of them is prerequisite in schools attended by another 16 percent of the pupils. Thus, a bit more than one-fourth of the students study in schools where stronger selectivity is applied for admittance.

The country pattern for schools' admittance practice is quite clear in this case. There is no market in this respect in the Scandinavian school system: more than 80 percent of the students attend schools where the criteria are not considered. The situation is similar in most of the Southern European countries like Greece, Portugal

or Spain. But schools in Italy or Turkey seem to be a bit more selective. Low level of academic selectivity characterizes the Irish or the British schools as well. Educational selectivity at admittance seems to be the strongest in the Netherlands where 90 percent of the students study in schools where prior academic record or school recommendation either have high priority or are prerequisite. Two countries with very similar traditions for the school system, Austria and Hungary have about two-third of the students in their sample attending similarly selective schools. Further countries where half or nearly half of the pupils study in selective schools are Switzerland, Germany, Slovakia and the Czech Republic.

As Table 3 displays, students of those schools where academic selection criteria play stronger role in admittance, come from families where parents are better educated and have higher social status. On average there is 1 year difference in schooling and nearly 5 points difference in SES for those cases where academic selection is not considered in the school or where there are prerequisite criteria for the admittance. The SES differences between the extremes are slightly higher in Switzerland, Czech Republic or Slovakia and much higher (over 10 points) in the Netherlands and Austria.

Table 3.

'Reconstructed' parental choice by selectivity of admittance* in some countries

	Parental education				Parental status			
	1	2	3	4	1	2	3	4
Netherlands	13.0	13.6	13.6	13.7	40.6	48.9	51.5	52.0
Austria	13.2	13.6	13.6	14.1	41.6	46.1	48.6	52.1
Hungary	11.1	12.2	12.7	12.4	38.5	45.1	47.1	52.5
Switzerland	13.0	13.7	12.7	13.7	46.4	50.3	46.2	51.5
Germany	13.8	13.8	14.6	14.7	46.5	46.8	52.1	50.6
Slovakia	12.8	13.1	13.1	13.6	43.7	46.7	45.8	49.6
Czech Republic	13.3	13.5	13.0	13.6	45.3	47.7	45.0	51.1
OECD countries	12.3	12.1	13.1	13.3	45.8	45.6	49.3	50.6

Source: PISA 2006, own calculations
*Codes: 1=academic record / school recommendation are not considered; 2=one of them is considered; 3=one of them has high priority; 4=one of them is prerequisite

Reconstruction of school choice in the education market: a multivariate perspective

This part of the analysis aims to investigate the statistical relationship between the education market and the school choice. School choice is assumed to be reflected by the parental characteristics of the students who attend the different schools that belong to the various segments of the education market. The statistical model

controls for the student's gender and age as well the place of school and the availability of school at the given location.

Table 4.

Predicting the various segments of the education market[§]

	Type of school		Tracking	Selectivity of school admittance		
	Government		Academic	Prerequisite	Priority	Considered
	Independent	Dependent				
Parental						
-status	.040***	.009***	.023****	.007***	.003***	-.002
-education	.063***	.050***	.017***	.066***	.062***	-.009
Student						
-male	.068	-.091***	-.288***	.060**	.064**	.030
-age	-.255***	.002	-.778***	.731***	.497***	.289***
Region						
-village	-.308***	.163**	.683***	-.971***	-1.129***	-.213***
-small town	-1.367***	.013	-.324***	-.251***	-.466***	-.298***
-town	-.901***	.112***	-.351***	.281***	.011	.151***
School						
-more	.424***	1.470***	.060***	.954***	.764***	.368***
-two	-.744***	.970***	.034	.696***	.661***	.112***
Intercept	-2.223	-4.571	11.983	-14.437	-10.541	-4.946
Nagelkerke R Square	.092		.082	.078		

Source: PISA 2006, selected countries, own calculations
Notes: The table contains unstandardized OLS regression estimates Type of school is predicted by using multinomial logistic regression; public school is the reference. Tracking is predicted by using binary logistic regression; academic=1 and vocational=0. Selectivity is predicted by using multinomial logistic regression; not considered is the reference. For region city is the reference and for the availability of the school 'no other school' is the reference. Significance: *** p<.001, ** p<.01, *p<.05

§ Segmentation by ability grouping is skipped.

The estimates in Table 4 reveal significant statistical relationship between students' parental background and various segments of the education market. It seems that parents with higher level of education and SES, indeed, prefer to choose private schools over public ones, schools with academic curriculum that prepares pupils better for successful entry to tertiary education, and schools where stronger criteria are applied for admittance and which can, thus, be expected to be more selective in terms of the quality of the composition of students. These results are

controlled for the pupils' gender, age, place of the school and the availability of the school.

In addition to serving as control variables, differences by region and availability of the school are interesting on their own right. For public and private division, government independent private schools are less chosen in smaller settlements than cities and are chosen with higher probability if more schools are available and with less probability if only two schools are present to choose from. On the contrary, private government dependent (mostly religious) schools are chosen in villages and towns and are chosen with higher probability if parents have more than one school available. Schools with academic curriculum track seem to be more popular in villages and cities and are preferred to choose if there are more schools available. But this is not the case if only two schools are present. The pattern is very clear for the selection at school admittance. Stronger academic selectivity is less preferred in smaller settlements and most preferred in towns in contrast to cities. Taken this into account, if two or more schools are available, the preferred choice seems to be those that are more selective when deciding which students are admitted. It is important to note that both region and availability are included in the models as they are related: more schools are available in larger settlements. Moreover, these results are, again, controlled for parents' education and status.

Scholastic achievement and education market

The second part of the analysis focuses on the variation of students' performance in the different segments of the education market. Firstly, the descriptive picture is presented, the mean values of the math, reading and science score by school type, curriculum tracking, ability tracking and selectivity of admittance. Then, students' performance is predicted by their 'position' in the education market, taking into account the various forms of segmentation simultaneously. Models also control for students' and schools' characteristics.

Results in Table 5 reveal that scholastic achievement is higher in the private government independent schools, followed by the private government dependent schools and students in public schools perform below the average. As shown by other studies, students in academic oriented schools achieve better than their counterparts in vocational oriented ones. But ability tracking do not seem to work in a way as assumed. The best performing students attend in schools that do not apply ability tracking and those schools where ability tracking occurs for all subjects function below the average. Selectivity in school admittance, however, seems to be connected to higher level of scholastic achievement. In particular those cases, when

prior performance of the pupils or recommendation by school is prerequisites or priority in the selection procedure, students' test results score higher. But it is important to note that these results do not take into account the variation in school composition and other school characteristics. This happens in the next step.

Table 5.
Scholastic achievement in the various segments of the education market

	Math score	Reading score	Science score
School type			
- government independent	533.8	529.9	547.9
- government dependent	520.3	506.8	520.5
- public	480.5	481.2	488.3
Curriculum tracking			
- academic	500.2	498.5	506.4
- vocational	448.6	445.1	454.7
Ability tracking			
- for all subjects	469.5	467.4	475.6
- for some subjects	485.4	482.7	494.8
- no tracking	491.6	492.9	497.0
Selectivity of admittance			
- prerequisite	530.9	523.0	534.3
- priority	502.4	496.9	509.1
- considered	470.5	476.4	477.6
- not considered	475.2	474.1	483.9
Total	486.8	484.7	493.1

Source: PISA 2006, selected countries, own calculations

The estimates from the multivariate analysis are presented in Table 6a, 6b and 6c for pupils' test scores in math, reading and science, respectively. Three models were fitted on the data and the upper panel of the tables is the most important for the study because these figures indicate the impact of the education market on the quality of the school in terms of the test result. The appropriate estimates in Model 2 and 3 are getting somewhat smaller because Model 2 controls for the school composition and Model 3 controls for further school characteristics. But it is crucial that already Model 1 takes into account the various forms of market segmentation simultaneously, this paper considers.

Table 6a.

Predicting students' performance in math

	Model 1	Model 2	Model 3
Education market			
- government independent	25.001***	6.500**	6.199*
- government dependent	20.456***	16.789**	16.426**
- academic track	53.168***	45.398***	42.563***
- no ability grouping	11.353***	11.277***	13.325***
- ability grouping for all	-4.680***	-4.062***	-2.402***
- selection considered	5.539***	4.522***	4.460***
- selection is priority	38.478***	29.585***	29.187***
- selection is prerequisite	57.684***	46.705***	46.244***
Students' characteristics			
- gender (male)		16.685***	17.090***
- age		18.648***	19.018***
- parental SES		1.279***	1.243***
- parental education		3.621***	3.519***
Schools' characteristics			
- town			4.171***
- small town			7.518***
- village			1.162
- more schools available			4.730***
- two schools available			6.774***
- % of certified teachers			10.330***
- % of computers on WEB			24.958***
- large parental pressure			11.915***
- no parental pressure			.205
Intercept	440.794	54.566	11.505
Adjusted R square	.129	.223	.230

Source: PISA 2006, selected countries, own calculations
Notes: The table contains unstandardized OLS regression estimates. The metric coefficients tell precisely the gains on the test score in points. Reference categories: for type of school: public; for curriculum tracking: vocational; for ability tracking: grouping for some subjects; for selectivity: not considered; for place of school: city; for availability of other school: not available; for parental pressure: some pressure.
Significance: *** $p<.001$, ** $p<.01$, *$p<.05$

Regarding math, the government independent schools indicate 25 points, the government dependent schools 20 points gains in comparison to public schools. The advantage of the government independent schools is strongly reduced by taking into account the school composition. It turns out that students in government dependent schools perform better as found earlier by Dronkers and Robert (2008b). Studying in academic track has a 53 points advantage in contrast to the vocational track and this is reduced to 43 points in Model 3 but remains significant. It looks that the best

performing schools do not apply ability tracking. Grouping the pupils for all subjects has a small but significant negative impact on students' achievement. Selection of admittance improves the quality of the school, the maximum gain is 58 points and this is 46 points even if all controls are added to the last model.

Table 6b.

Predicting students' performance in reading

	Model 1	Model 2	Model 3
Education market			
- government independent	29.273***	13.908***	12.406***
- government dependent	11.716***	6.256***	5.663***
- academic track	62.170***	50.651***	46.285***
- no ability grouping	14.848***	13.686***	16.360***
- ability grouping for all	-8.145***	-6.982***	-5.487***
- selection considered	10.497***	8.790***	7.790***
- selection is priority	36.603***	26.399***	24.895***
- selection is prerequisite	48.996***	37.850***	36.850***
Students' characteristics			
- gender (male)		-35.369***	-34.788***
- age		19.462***	20.117***
- parental SES		1.290***	1.234***
- parental education		3.632***	3.484***
Schools' characteristics			
- town			2.362*
- small town			2.083
- village			.139
- more schools available			9.231***
- two schools available			13.350***
- % of certified teachers			15.580***
- % of computers on WEB			27.986***
- large parental pressure			13.648***
- no parental pressure			-2.286**
Intercept	432.851	10.795	-42.465
Adjusted R square	.112	.211	.219

Source: PISA 2006, selected countries, own calculations
Notes: The table contains unstandardized OLS regression estimates. The metric coefficients tell precisely the gains on the test score in points. Reference categories: for type of school: public; for curriculum tracking: vocational; for ability tracking: grouping for some subjects; for selectivity: not considered; for place of school: city; for availability of other school: not available; for parental pressure: some pressure.
Significance: *** $p<.001$, ** $p<.01$, *$p<.05$

Table 6c.

Predicting students' performance in science

	Model 1	Model 2	Model 3
Education market			
- government independent	33.453***	13.878***	13.281***
- government dependent	10.746***	6.374***	5.584***
- academic track	51.960***	42.594***	39.640***
- no ability grouping	9.117***	8.871***	11.348***
- ability grouping for all	-9.173***	-8.352***	-6.659***
- selection considered	4.626***	3.411***	2.906**
- selection is priority	39.125***	29.077***	27.826***
- selection is prerequisite	54.808***	42.699***	41.477***
Students' characteristics			
- gender (male)		7.361***	7.861***
- age		18.930***	19.296***
- parental SES		1.347***	1.297***
- parental education		4.400***	4.251***
Schools' characteristics			
- town			3.923***
- small town			7.184***
- village			-1.155
- more schools available			8.582***
- two schools available			7.824***
- % of certified teachers			13.276***
- % of computers on WEB			27.284***
- large parental pressure			12.452***
- no parental pressure			.868
Intercept	453.349	46.028	-2.557
Adjusted R square	.110	.207	.215

Source: PISA 2006, selected countries, own calculations
Notes: The table contains unstandardized OLS regression estimates. The metric coefficients tell precisely the gains on the test score in points. Reference categories: for type of school: public; for curriculum tracking: vocational; for ability tracking: grouping for some subjects; for selectivity: not considered; for place of school: city; for availability of other school: not available; for parental pressure: some pressure.
Significance: *** p<.001, ** p<.01, *p<.05

I summarize the results for reading and science on the ground of Table 6b and 6c and underline any differences that may appear. For type of school, students in the private government independent schools seem to perform better than their counterparts in the private government dependent schools in reading and science – even after the estimates are controlled for students' and school's characteristics. Previously, Dronkers and Robert (2008a) found that pupils in private government dependent schools perform better in reading (science test results for not

investigated). But the models here contain less control variables and take into account less characteristics of the students and the school.

Students in schools with academic track outperform students in schools with vocational curriculum and the difference is the biggest for reading: 62 points. This drops to 46 points when school composition and characteristics are taken into account but this is still quite large, one of the biggest difference in the data. The pattern for ability tracking is the same for reading and science: grouping for all subjects lead to lower achievement, while students in schools that apply no ability grouping perform the best.

Finally, the models reveal that the stronger the selectivity at school admittance, the better the students' performance in the school for reading and science as well. The gains seem to be smaller for reading, while stronger selection brings more improvement in scholastic achievement for the math and science tests.

Regarding the control variables, there is no surprise in the results. Male pupils are better in math and science but much worse in reading (-35 points). Older age, higher parental education and status increase pupils' achievement. It seems that students perform better in schools located in towns than in big cities or villages. Competition in terms of availability of more schools in the settlement increases scholastic achievement, even if controlled for region. This is an important result for those experts who claim for more market. Teacher quality and infrastructure also matter: a bigger proportion of certified teachers and a bigger proportion of computers connected to the Internet have positive impact on students' performance. Finally, if parents put larger pressure on school in order to provide higher academic standards, the students will also perform better. Again, these results are interesting and important on their own right, in addition to their control function in the analysis.

For our study, it is more important to make one more step further. The last models provided evidence that a) education market determined scholastic performance, and b) higher levels of parental education and SES increased students' performance. As a next step, the question can be raised how students with higher or lower level of family background benefit from attending schools in different segments of the education market. This question I try to answer by adding the interaction terms of the education market variables and the parental background variables to the previous regression models. In order to avoid a large multi-collinearity among the independent variables, only parental education is considered as a measure for social origin. The results are displayed in Table 7 for math, reading and science scores.

Table 7.

Predicting students' performance: who benefits more from education market?

	Math score	Reading score	Science score
Education market			
- government independent	-38.566*	-.793	-19.450
- government dependent	31.419***	25.403***	27.047***
- academic track	36.291***	35.454***	29.433***
- no ability grouping	-2.826	10.463**	-1.033
- ability grouping for all	-16.383**	-7.398	-12.066*
- selection considered	3.540	12.891**	4.373
- selection is priority	31.009***	25.704***	25.147***
- selection is prerequisite	21.339***	25.561***	24.516***
Students' characteristics			
- gender (male)	17.304***	-34.347***	8.251***
- age	18.525***	19.426***	18.576***
- parental SES	1.235***	1.228***	1.288***
- parental education	1.843***	2.007***	2.438***
Schools' characteristics			
- town	4.081***	2.165*	3.768***
- small town	6.794***	.765	5.984***
- village	.587	-1.005	-2.159
- more schools available	4.409***	8.543***	7.955***
- two schools available	6.579***	12.952***	7.453***
- % of certified teachers	9.674***	14.717***	12.418***
- % of computers on WEB	24.696***	27.272***	26.755***
- large parental pressure	12.268***	13.781***	12.716***
- no parental pressure	-.234	-2.992**	.179
Interaction terms:			
parental education with			
- government independent	3.098**	.959	2.288*
- government dependent	-1.006*	-1.280**	-1.414**
- academic track	.815***	1.452	1.357***
- no ability grouping	1.216***	.447	.931
- ability grouping for all	1.064**	.148	.413
- selection considered	.026	-.442	-.168
- selection is priority	-.183	-.136	.118
- selection is prerequisite	1.775***	.790*	1.200**
Intercept	38.937	17.145	28.104
Adjusted R square	.232	.222	.218

Source: PISA 2006, selected countries, own calculations
Notes: The table contains unstandardized OLS regression estimates. The metric coefficients tell precisely the advantage on the test score in points. Reference categories: for type of school: public; for curriculum tracking: vocational; for ability tracking: grouping for some subjects; for selectivity: not considered; for place of school: city; for availability of other school: not available; for parental pressure: some pressure.
Significance: *** $p<.001$, ** $p<.01$, *$p<.05$

According to the upper panel of Table 7, the first interesting finding is that students in private government dependent (mostly religious) schools score the highest on all of the three scales and have about 25-31 points advantage over their counterparts in public schools. At the same time, in consequence of the interactions with social origin, the gain of students in private government independent schools disappears. Thus, these models are, finally, in line with the previous results by Dronkers and Robert (2008a. 2008b). Attending a school with academic curriculum leads to a gain of 29-36 points in performance. The pattern for ability grouping is the same and stronger academic selection can also mean an improvement of 21-31 points in scholastic achievement for the students in the appropriate schools.

Moving to the lower panel of Table 7, to the interaction terms, the significant estimates are all positive except for one row in the table. The only negative estimates appear for the government dependent schools for all of the three PISA scores. This means that low status students (with parents who are less educated) perform better in religious schools. This is a very important result (though the coefficients indicate only small difference) and confirms the previous findings about the efficiency of the religious schools (Coleman et al. 1982. 1987. Gamoran 1992). In the other segment of the private schools (the government independent schools) offspring of parents with higher education perform better – at least for math and science. Similarly, these students have an advantage if they study in schools with academic curriculum. And these are the students who benefit from choosing those schools where academic selection is a prerequisite for admittance. The interactions for ability tracking are significant only for math and it seems that high status students are better off under any circumstances, even if there is no grouping at all or the school applies groping for all subjects.

The control variables on student and school characteristic display the pattern discussed above.

Conclusion and discussion

This study aimed to investigate education market from two aspects. On the one hand, 'reconstructed' school choice was analyzed and I labelled this as an 'input' functioning of the education market. The results show that parents with higher levels of schooling and social status use the 'tool' of school choice more efficiently. They successfully avoid public schools, tend to select schools with academic curriculum that ensure the successful transition to tertiary education to larger extent, and prefer schools that apply stronger academic criteria for admittance. Location of the school and availability of more schools do not change this picture. Only ability tracking

seems to be not much related to parental education and SES; high status parents do not select schools where ability tracking is more applied.

On the other hand, the outcomes give support to the advocates of education market and competition between schools. Indeed, students in private schools outperform their counterparts in public schools. Applying stronger academic criteria for school admittance leads to pupils' higher achievement in those schools. Nevertheless, results for ability tracking seem to verify the concept of integration as students have better test scores in schools where there is no ability grouping. All of these findings, which I labelled as an 'output' functioning of the education market, persist at least to some extent, even if differences in school composition as well as other school characteristics are taken into account.

The most important lesson about education market refers probably to the public – private division. The private government dependent schools provide the best quality in achievement in two respects. Firstly, students in these schools perform better than in other schools. The last model proved that the advantage of studying in other private schools is based on entirely the advantageous composition of those schools in terms of social origin. Secondly, students coming from families where parents are less educated perform better in these schools. Thus, religious schools seem to be able to combine the advantage of school choice and an increase of equality of educational opportunities. This does not hold for any other segment of the education market. High status families benefit from school choice and benefit from the better schools from the viewpoint of either curriculum tracking or selection at admittance. These segments of education market, indeed, contribute to maintaining educational and social inequalities from one generation to the next.

Ability tracking, however, does not seem to work in the same way. Unlike expected, high status parents do not select these schools and schools that apply ability grouping do not provide high quality in performance.

This paper cannot produce a final verdict on education market, even not for the religious schools. The favourable outcomes for these schools were registered but – as it was mentioned in the theoretical part – the mechanism behind their good scholastic quality is unclear. It is the market and the competition? Is it the social capital around these schools? But the relative failure of the private government independent schools, when the test results are controlled for the composition of these schools in the last model, can be interpreted, in fact, as an argument against the efficiency of the market and competition.

Regarding the other segments of the education market, the question for the policy makers holds. For curriculum tracking and academic selection, the analysis

shows that market and competition increase the efficiency of education but the inequality of educational opportunities also persists: high status families can benefit more from school choice. This dilemma remains unsolved, though no all possibilities have been used to get a more complete picture. The multivariate analyses have been carried out on the pooled file of the 23 selected European OECD countries. Fitting the models into the data of single countries could tell more about the particular country cases but it would make the paper too lengthy fro the moment. Nevertheless, this is a work to be done in the future.

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