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## When Public Acts like Private: the failure of Estonia's school choice mechanism

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**ABSTRACT** This article aims to show the segregating effect of the market-like matching of students and schools at the basic school level. The natural experiment case is Tallinn, the capital of Estonia. The current school choice mechanism applied in this case is based on entrance tests. There are increasingly over-subscribed intra-catchment area public schools, where high reputations are reinforced by publicly reported league tables. The current mechanism has resulted in parental strategies of prep-schooling and the manipulation of addresses. Logistic regression results based on survey data assure that, under competitive entrance, families' educational strategies and background characteristics determine the success of admission to schools with good reputations. Understanding this heterogeneous strategic behaviour is important for the effective design of school choice mechanisms.

### Introduction

Starting with Friedman (1955, 1962), school choice has been a widely discussed topic in education. It means giving parents the opportunity to choose a school for their children. The traditional problem handled under the heading of 'school choice' was related to private schools as educational providers and government funded voucher systems to support students with different backgrounds to be admitted into these schools. School choice is sometimes still reduced to the question of the magnitude and state financing of private schools in Europe (Schuetz et al, 2008) or the efficiency of voucher systems in the United States of America (USA) (Miron et al, 2008). More often, the policy research in education is triggered by the wave of decentralisation of education as part of the bigger movement in New Public Management (NPM) in the late 1980s and early 1990s. In this context, the school choice problem points to the reforms that gave parents the right to influence decisions concerning the allocation of pupils to public-sector schools. This development is driven in part by market-based ideology, which assumes that increased competition will generate the incentives to improve schools and students' achievements. Alongside the efficiency argument, it was also hoped that school choice policies would enable children from poor families to 'break the iron cage of zoning' (Gorard et al, 2003).

Many authors (e.g. Betts & Roemer 2007; Woessmann, 2008b; Woessmann et al, 2009) agree that the educational achievement of students should be independent of their family socio-economic background. In this understanding, educational inequality should be tolerated only if it results from differences in effort, not if it reflects circumstances that are beyond a person's control – including the socio-economic background of their parents, peer effects, or teacher effects. At the same time, education policy has shifted more towards choice policies in the European systems; by aiming for efficiency, it has unintentionally created more inequality. The effect of choice on equality is hotly debated in empirical and theoretical literature. It is shown in many cases, such as Germany (Riedel et al, 2009), various cities in the USA (Burgess & Briggs, 2006; Bifulco et al, 2009), England (Burgess

et al, 2011; West, 2006), and even increasingly in Finland (Seppänen, 2003; Poikolainen, 2012) that choice tends to gather students from better socioeconomic backgrounds into certain schools, creating not only positive peer effects, but also a negative externality for the rest of students. Uncontrolled choice has increased ethnic and social segregation, which can result in even more social costs than residential segregation (Bifulco et al, 2009). Furthermore, due to limited economic, cultural and social resources, school choice tends to constrain disadvantaged families from practising their choice. Thus, the distribution of students in schools is fundamental to concerns about the equality of educational opportunity.

In this article we look at school choice as an allocation problem, namely the effect of the school choice mechanism, which involves the process of how students and schools are matched to the social structure of 'good' and 'not-so-good' schools. We examine whether under liberal enrolment, based on entrance tests, schools select high socio-economic status (SES) families. Moreover, we test whether this reproduction of the elite is based on parental pre-training strategies and residential choice or rather on financial advantages like high-SES.

Our approach is related to admission models and selection criteria in general, but does not deal with the private share in educational governance, which in our case is the 'school market' appearing within the public system. The concept of 'market' is applied in our case by referring to local structures in the city where the supply of schools and the demand of families exist. Since families were given an opportunity to apply to a school other than the one allocated on the basis of their residence, and schools are able to take pupils from outside the catchment area, there is a market-like situation inside the publicly maintained school system.

As a member of the European Union (EU), it is not surprising that Estonian education policy is strongly influenced by the EU's policy on education, and that Lisbon objectives on education and training unquestionably occupy an important place in Estonian educational strategies. However, the Soviet past and the vicinity to Finland have influenced the policy learning process. First, during the period of pre-accession of the EU (1992-2004), the dominance of Finland as the source of policy learning was prevalent, and the dominant motive shared by all actors in the field was the willingness to gain the confidence that the chosen policy orientation fits with democratic principles. One of the most illustrative examples here is the process of curricula reform. Second, the post-accession period (starting from 2004) can be characterised by a progressive increase of influence of the EU. However, due to the variance of political preferences, policy transfer became more selective and contested (Toots, 2009). In terms of school choice, for instance, the traditions of central examinations and related league tables as one of the characteristics of neoliberal traditions are openly debated, but still uniformly accepted features of contemporary education practices. Also, the acceptance of the need for international standardised statistical indicators, the willingness to participate in these tests (Programme for International Student Assessment [PISA] and the International Association for the Evaluation of Educational Achievement [IEA], for instance), and related comparative turns in educational policy are considered as natural developments in education in Estonia (see Estonian Ministry of Education [EMER], 2007). At the same time, school choice as a problem of allocation and as the main feature of neoliberal, competition-supportive educational arrangements, is hardly mentioned in Estonian strategy documents. Thus, school choice has been a rather latent development within the system in which school choice has been a by-product, since families were given some opportunity to apply to a school other than the one assigned on the basis of their residence, enabling schools to admit students from outside their catchment areas, and thus contributing to the tradition of the elitist school system of Tallinn.

Under most Soviet regimes, including Estonia, children were for a long time centrally enrolled in neighbourhood schools. The problems of the current Estonian education system, having its roots in both the elitist pre-World War II and the egalitarian Soviet post-World War II society, is related to the concentration of high-SES families into an oasis of a limited number of downtown schools. We see that an increasing number of families are investing more time and limited resources into pre-training processes for their children. Moreover, over-subscribed elite schools are increasingly selective in their admissions through the use of aptitude tests. Our empirical survey data collected from 840 parents about their background characteristics and preferences, indicate that parental educational strategies will not bring with them social mobility. Admittance can still be in a huge part explained by family background characteristics (e.g. mothers' education and high income), but educational pre-training prevails over the latter.

In the following section of the article, we introduce the particularities of our case, highlighting path-dependent legacies and institutional design that are omitted by our empirical approach. We then discuss why choice can create a segregation effect. Thereafter, in the next section, we characterise our data and present findings of logistic regression analyses to indicate the segregation effect related to the Estonian school choice model. Finally, we conclude and also provide a policy discussion.

*Case Specificities: school choice mechanism in Tallinn*

Traditionally (during the Soviet period), children were assigned to public schools according to where they lived. Even under this comprehensive system, which continued to exist into the early 1990s, some parents (e.g. the wealthiest or perceived elite) had some school choice. This kind of school choice meant the ability to move to areas with good schools, or 'buying' enrolment with gifts or money, by using acquaintances, or by finding some other loopholes in the system. There were also schools or specialised classes that conducted ability tests for their entrance, and that most probably sowed the seeds of the current elite school. Thus, although one of the most characteristic features of the Soviet education system was the independence from any private contribution via tuition or other fees, there were schools within the system that were perceived to have more reputational capital than others.

After the early 1990s, the 'inherited' system gradually became more diverse. Starting from 1993, there have simultaneously been inter- and intra-district school practices in place. In inter-district schools, parents received the right to apply to a school outside of the catchment area. However, choice had not only been initiated by parents, but also justified by some sort of special need – change of dwelling, parents' extraordinary job conditions, or some other special circumstance. Moreover, school principals had the authority to accept or reject these applications. Non-transparent admission criteria prolonged the practices inherited from the Soviet 'allocation system' – using acquaintances, gifts or similar.

The distinction of inter- and intra-district schools started to follow the pattern of over- and under-demanded schools. So, even though the main principle of the school system was to fill schools with students from a specific geographic catchment area, there were municipal policies that allowed some comprehensive schools to select their students. Although there is no official tracking or ability grouping in the Estonian school model – that is, it is a single structure model of schooling – the selection is usually justified by special studies (specialisation track) and could apply only to special classes or all classes within the school. These schools, namely the over-subscribed schools in the city centre, started to be known as 'elite schools' (elite schools hereinafter).

In total, 15% (8 out of 56) of schools in the capital city conducting ability tests and high selection at the entrance can be considered elite. Most of the elite school graduates continue in publicly financed places [1] in universities in Estonia or obtain scholarships to universities abroad. In total, 45% of publicly financed places are occupied by the students of elite schools [2] and it is five times more probable for an elite school graduate to obtain public education in a university compared to a 'regular' graduate. The image of the 'not so good' and 'good' school is reinforced by league tables. These are public listings of schools reporting their average national final examination results. Elite schools routinely occupy the top positions; however, the positions themselves are mainly the result of selective entrance and peer effects (Põder, 2012). The justification for the public league tables can be traced to the Organisation for Economic Cooperation and Development's (OECD) 'comparative turn', quantitative outcome indexes which allow the definitive comparison of member states (Martens, 2007). These performance measures are closely related to accountability mechanisms that are an integral part of steering in the governance of current educational systems. Although the key purposes of national assessments are to provide feedback to improve instruction and show the relative performance of students (OECD, 2011), and national examination results are only one out of many elements in such a system, it is not rare that in some countries, including Estonia, league tables are considered the primary indicator of quality. This is also one of the examples of selectivity intrinsic to the Estonian policy learning process as already mentioned, while the aspect of league tables and the autonomy of school principals are considered vital for the efficiency of the contemporary education system. However, the potential segregation

effect or the debate on the trade-offs between selective and comprehensive enrolment is ignored. The importance of inclusive education and equity is mentioned in strategy documents (EMER, 2007), but the focus of these publications is on children with special needs, not school choice-related segregation.

The admissions process for elite schools has no explicit procedures. All these schools run entrance tests. Admission requirements are unknown or school-specific, meaning that there is no governance over the admission rules; the only restriction in the case of some schools is residence in the city or within the catchment area (in the case of inter-district schools). This entirely centrally administered admission criterion (that the family must indicate a registered address within the catchment area) results in the manipulation of addresses. The folk narratives or casual empiricism about manipulation include stories about the dozen school-age children registered at a certain address, or children registered at the addresses of public utility providers, e.g. a sauna or other private company.

In addition, parents' complaints about the asymmetric division of information about test requirements have created a new demand-driven phenomenon – elite preparatory pre-schools (elite prep-schools hereinafter). These prep-schools are nigh-on year-long paid courses, where student candidates are drilled for the entrance tests. A preschool in the education studies literature (Károly et al, 1998; Reynolds, 1998; Currie, 2000, 2001; Garces et al, 2002; Deming, 2009) is perceived as the most important political and institutional tool to adjust long-term inequalities created by the socio-economic status of the parents. In the current case, prep-school is a totally different phenomenon – it is preparation for admission to the competitive elite schools. We conceptualise two types of prep schools: elite prep-schools and discretionary prep-schools. The first type is meant for asset-specific training for entrance exams; the second type for introduction to the school system and school premises in general. The study undertaken by Kukk and Talts (2009) showed that the ideology, which may be termed 'the cult of success', is shared among parents, and thus families, who are more than willing to participate in elite prep-schools, in addition to public preparatory courses in the preschools. In some cases it goes to extremes as some parents enrol their children in more than one prep-school or employ private tutors from elite schools.[3] Children are thus pre-trained in 'measurable skills' (mathematics, reading and writing), with less or no attention paid to social skills (Koop, 2006) in order to guarantee their success in entrance tests into elite schools. Our survey showed that approximately 70% of the children who have started their schooling in one of the schools in Tallinn during 2008-2011 participated in at least one of the prep-schools. The latter is noteworthy due to the fact that the attendance rate of public preschools (generally known as kindergartens in Estonia) is above 90%. Furthermore, the places in elite prep-schools are limited, distributed by competition on a first-come-first-served basis. Our study reveals that elite prep-school attenders account for almost 50% of all prep-school attenders. Thus, it can be hypothesised that these prep-schools are perceived as a compulsory investment for elite school admission.

The new Basic Schools and Upper Secondary Schools Act (2010) was enacted to regulate the school choice mechanism and to apply centrally designed entrance criteria where proximity, siblings, and parental preferences were highlighted. However, the current formulation gives ground to multiple interpretations of the priority list for the aforementioned criteria. In Tallinn, emphasis was placed on parental preferences over the alternative criteria in 2011. The result was the creation of an unregulated school market for public schools, with the abolishment of all catchment zones. This caused an overwhelming panic among parents and massive discrepancies in terms of distance between home and school and in terms of parental preferences.

In conclusion, although the latest legal amendments have tried to increase the importance of proximity and siblings in school assignment, the current Estonian education system can be characterised by an unregulated choice model in terms of matching students and schools. Additional case-specific features of the system are the remarkable autonomy of schools concerning the design of entrance criteria, and a marginal share of privately operated schools. The latter indicates that choices must be made within a comprehensive system (in a single-track system there are no substantial differences among schools in terms of curricula, leadership, or teaching methodology). Information on schools is based on public test scores, which are reported in league tables. Most specifically, entrance to primary schools is based on independent aptitude tests

conducted by elite schools. Institutional 'evolution' has created massive prep-schooling and manipulation of addresses as parental strategies for coping with the selection effect.

Thus, although it is quite common to distinguish between two opposing models of school choice – (1) the catchment area-based, more equity-oriented comprehensive system, and (2) the liberal, efficiency-seeking choice-based model – the opposition of these is not so dichotomised. Rather, most countries allow parents and students to select their school from a diverse array of options, even though the majority of countries rely mostly on public schools to provide education at the primary and lower secondary levels (Eurydice, 2012). Nowadays, initial geographical assignment to a primary school is frequently accompanied by more flexible choice options, as has been the case with Tallinn. As will be showed, even in countries which have tried to resist choice-supportive policy initiatives, even without any formal choice mechanisms, some parents still find ways to exercise choice and choose a school for their children, finding ways to go around official policies (by declaring an address other than their actual residence, for example), buying into a neighbourhood to gain access to a particular school, and even becoming involved in the determination of catchment boundaries. As this capacity is strongly linked to their social, cultural and economic resources, it is found to be inequitable, and is considered to be one of the reasons that lead countries to the introduction of more straightforward choice models instead of latent self-regulated choice strategies. Taking the last argument into account, and developing it with the expanding literature on active citizenship (e.g. Newman & Clarke, 2009), we claim that the importance of choice policy is growing, and instead of the nostalgic dream of catchment-based assignment, the contemporary solution for school choice presumes an understanding of choice mechanisms to be better prepared for dealing with choice-based segregation.

#### *Why Choice has a Segregation Effect: theoretical and empirical insights*

Looking at the theoretical literature, generally speaking, there are two groups of theories: Bourdieu's cultural capital theory, and the rational choice approach to explain the segregation effects. In the rational choice framework, the mechanism of education decision-making, which has some roots in human capital theory (Harmon et al, 2003; Cunha & Heckman, 2007), contains the maximisation of expected (educational) returns. An exercise in maximisation is performed subject to constraints such as those deriving from income and/or ability. The emphasis here is on the variation of constraints, not preferences. In this view, education is an investment. For example, in the context of rational choice, parents decide whether or not to invest in prep-schooling after weighing up the expected costs and benefits of that decision. They choose an academically high-performing school based on the expectation of the higher number of positive qualifications that a student could achieve there. Such qualifications would be the measure of human capital, which in turn would be expected to provide a higher economic return. This return can also be related to peers (the peer effect) as a future social network (Ammermueller & Pischke, 2009). Also, following the latter line of argument that puts the emphasis on constraints rather than preferences, it can be disputed that, under choice mechanisms, low-SES families have higher costs of opportunity in finding information on various service providers. In addition, relative risk aversion by Breen and Goldthorpe (1997) can be used as a 'rational explanation'. Instead of different values towards education, low- and high-SES parents have a different utility function concerning attitudes toward risks related to educational investments. The different starting points of children from different SES backgrounds have an impact on their perceptions of the relative expected returns from alternative educational decisions and the expected costs of achieving them. Thus, according to the relative risk aversion assumption (the more advantaged have a higher risk of downward mobility), the families from higher socio-economic status make more ambitious educational decisions. Similar argumentation in modern economics literature is known as position good (e.g. Adnett & Davies, 2002; Solnick et al, 2007), i.e. the value of education is dependent on the ranking it guarantees in the social 'hierarchy'. This approach makes preferences partly endogenous, indicating that parental or student strategies can be different, whether they maximise expected utility or minimise potential loss of so-called social demotion.

Cultural capital theory, most often applied in sociologically driven educational research, defines endowments of cultural capital as an explanatory source for differences between the

choices of high- and low-SES families. The former, as having more of all forms of cultural capital (objective, institutionalised, and embodied), have a comparative advantage upon entering the education system. Similar to the rational choice approach, according to the explanation given by cultural capital reproduction, the difference of values towards education is not assumed. Rather, there is a closeness or synergy between bourgeois values and the values inculcated in the education system, including pedagogy and styles of learning and testing. These values favour the children of high-SES families, whose conduct, styles of expression, and prior cultural learning from the family background match the values of the school. Thus, in cultural reproduction theory it is argued that high-SES families have so-called legitimate 'good taste', which is strongly interconnected with institutionalised forms of educational provisions in societies (Bourdieu, 1984). Cultural capital takes time to acquire (predominantly via transmission within families), is not easily lost, nor is it easily bought by economic capital, although it is mostly derived therefrom. In other words, the idea of Bourdieuan cultural capital is the concept of 'well-connectedness' – some relationships are much more valuable than others, and the value of networks depends not just on their extent, but on the extent of various forms of capital held by other people in the network. Its acquisition and duration make it a strong element in class reproduction and class distinction. It is also the element that is most strongly interconnected with institutionalised forms of educational provision in societies. It stresses the role of the family in relation to education, i.e. instead of treating families as a 'black box', the conceptions of families as strategists and families as mentors come into play (Croll, 2004).

As highlighted in the context of school choice, the generally observed empirical outcome, across different disciplinary literatures, and a range of methodological approaches, it is evident that there are differences in outcomes across the social status of the parents: low-SES children go to 'less good' schools (Burgess et al, 2009, 2011). Why? To what extent can that outcome be explained by the different choices made by parents from different backgrounds? As Burgess et al (2009) show, the answer may mostly lie in the constraints faced by low-SES families that prevent them from realising what are in actuality similar preferences for the school(s) they would like their child to attend.

Family inputs have long been viewed as a leading input in variations of human capital. The association between the family-background measure and student achievement is statistically significant and positive in most of the studies (Hanushek & Woessmann, 2010). There are several dimensions to the background vector: social background, ethnicity, immigrant status, gender, home educational resources, single parenting, occupational status of the parents, language at home, and so on. Estimates on how strongly student achievement depends on family background provide an indication of the intergenerational mobility of society. In many cases, differently from ours, detailed information about student background characteristics is inaccessible, so proxies such as the number of books in the homes of students are used as an instrument (e.g. Woessmann, 2003, 2008a; Schuetz et al, 2008). This instrument embraces the impact of educational and cultural resources at home, as well as SES indicators.

Most of the research from Bourdieu's theoretical perspective (Bourdieu & Passeron, 1977; Bourdieu, 1984, 1990) has dominated the sociology of empirical education literature on school choice. The literature from this perspective has struggled to find ways to operationalise the idea of cultural capital and to measure the degree to which it can account for differentials in educational attainment (De Graaf et al, 2000; Jaeger & Holm, 2007; Sullivan, 2007; Crozier et al, 2008). Some of these studies are concerned with micro-measurements of family cultural capital and evaluations of which elements have the biggest impact on educational outcomes (reading to your children seems to be the most significant) (Sullivan, 2007), although the impacts and significance of cultural capital in these contexts is contested (see Goldthorpe, 2007). These studies suggest a strong correlation between parents' cultural capital and children's cultural activities, and also that cultural resources are strongly transmitted from parents to children. What these studies suggest is that cultural capital does have a significant impact on educational outcomes; however, it can be operationalised by the various socio-economic indicators of families. These we have discussed previously as constraints in the rational choice context.

Besides the abovementioned evidence for the significance of the effect of family background in determining children's educational outcome, there is empirical evidence to support rational choice based arguments. For example, Burgess et al (2009, 2011), find that parents distributed across the socio-economic spectrum in England have similarly strong preferences for academic

quality, the type of peer group, and proximity, but differ in their ability to realise those preferences. However, what parents say sometimes differs from what they choose (Betts & Loveless, 2005), i.e. factors that make schools serving high-SES families 'better' are not the reasons parents gave for choosing a particular school or school district. According to Holme (2002), it is more often the struggle for status and distinction that urges parents towards complicated strategies to gain admission to schools they consider good. And 'good' in this context is the social construction of schools, rather than the factual information about schools. The social networks of these high-SES parents are not conduits of factual information about schools as often argued in school choice literature; rather, they pass along information on whether or not a school is considered good by a number of similar parents. Based on evidence, Holme argues that there exist the so-called unofficial school markets, where high-SES parents, among other strategies, buy a home that gives them access to a desired school.

It can be argued that parents are ready to play complicated admission games wherever needed. Furthermore, similarly to the idea of relative risk aversion, social demotion is a statistical reality stressed by sociological literature (Chauvel, 2006). For individuals, social demotion means that they end up with a lower social status than their parents and this threat of the downward social mobility of their children makes parents act strategically – including residential choice and beyond. Besides the examples of residential choice, literature from more interdisciplinary perspectives highlights differences in SES-based choice mechanisms of the families. Based largely on evidence from England, but also France, the USA, Canada, the Netherlands, Sweden and Denmark, research reveals a range of middle-SES strategies that include moving to catchment areas for better schools, getting involved in local churches to ensure entry to reputable faith schools, gaming entrance exams, and pursuing appeals if their child is not admitted to their first-choice school (De Graaf et al, 2000; Holme, 2002; Lund, 2008). Advantaged families are more strategic in their choice behaviour and therefore get admitted to better schools. But what accounts for these observed family background-based differences in school choice strategies? We create an empirical case to shed light on this question; focusing on the background, residential and strategic behaviour characteristics of parents in Tallinn.

### **Segregation Effect of School Choice: data and empirics**

Our data originates from survey data gathered by the authors on background characteristics, choice strategies and location of 840 enrolled students. Data was collected under the Estonian School Choice Mechanism (ESCM) [4] project in spring 2012. This dataset allows us to concentrate on the relationship between final allocation and background, school entrance strategies, and other family characteristics. Our survey includes school starters from the period 2008 to 2011, i.e. the year of 'panic' after the free market experiment and the years before that. Approximately half of the dataset covers information about children who entered the school market in the 'panic year' of 2011.

The survey was targeted at the families of all primary school children in Tallinn. The main sampling unit was primary school, followed by class, and the primary unit was a child. However, the survey was answered by a parent. In total, 31 schools participated, which is approximately 55% of all schools in Tallinn. Out of this sample, six were elite schools and the others regular intra-district schools. After removing missing values, the final number of respondents (parents) was 840, constituting 5.25% of the total sampling population. Approximately 70% of all respondents attended prep-schools, out of which 31% attended elite prep-schools. A total of 48% of all respondents were tested for admission to the elite schools (Table I).

Descriptive statistics indicates that 35% out of the 840 respondents are elite-school students, and the remainder of the students attend local intra-district schools. A relatively large proportion of responding parents indicated high education levels, which could be inherent to our internet-based survey design, and thus for robustness, check weighting for the whole sample would be recommendable. In general, parents with some higher education amount to 33% of the sample (in the case of both parents), whereas this indicator increases to 57% in the subsample of successful elite school applicants. A similar trend is inherent to the indicators of most family background characteristics, such as income categories and cultural consumption indicators, but not for the number of children in the family, nor for single-parent families. As discussed earlier, families use

school choice strategies intensively to manipulate or take advantage of the existing choice mechanism. We are able to operationalise these strategies by measuring the attendance of a prep-school and in the elite prep-schools specifically.

Variable	Observations	Mean	Std. dev.	Min.	Max.
<i>Dependent variable: elite-school (yes = 1, no = 0)</i>	840	0.346	0.176	0	1
<i>Family background characteristics: (yes = 1, no = 0)</i>					
Mother's education (ISCED 5* or higher)	840	0.519	0.500	0	1
Father's education (ISCED 5* or higher)	840	0.426	0.495	0	1
Net income per family member:					
... -300 eur	176	0.207	0.357	0	1
300-500 eur	249	0.296	0.457	0	1
500-800 eur	217	0.258	0.438	0	1
800-1300 eur	135	0.161	0.368	0	1
1300- ... eur	66	0.079	0.269	0	1
Reading cultural journals	840	0.398	0.490	0	1
Visiting cultural events with children	840	0.923	0.267	0	1
Average number of children (per family)	840	1.959	0.860	0	10
3 or more children in the family	840	0.186	0.389	0	1
Average number of children going to school (per family)	840	1.244	0.464	1	3
Single parenthood	840	0.137	0.344	0	1
<i>Family strategy (preferences): (yes=1, no=0)</i>					
Attending prep-school	840	0.685	0.465	0	1
Attending elite prep-school	840	0.311	0.463	0	1
Attending entrance tests	840	0.475	0.450	0	1
Attending 3 or more tests	840	0.189	0.398	0	1
<i>Location: (yes = 1, no = 0)</i>					
Central location	840	0.170	0.376	0	1
Driving children to the school	840	0.507	0.5	0	1

Notes: \*ISCED 5 is a education category indicating bachelor degree, higher than ISCED 5 indicates various scientific degrees (i.e. master, doctoral).

Table I. Characteristics of the dataset.

In addition, we can separate our sample into two subsamples by response on whether entrance tests were sat or not. The first group we indicate as high achievers, who have specific types of homogeneous preferences. In the whole sample, we are able to control for cultural capital and other family-based constraints, but are not sure about the independence of their preferences from the latter. In addition, we are aware of family strategic aspects related to the 'intensity of attendance of tests' (attending three or more schools' tests). Almost half of our sample applied to an elite school, of which 40% participated in a minimum of three tests. Prep-school attendance is intensive: 69% of the sample used that strategy, whereas slightly less than half of prep-school children go to elite prep-schools. In addition, we control for location. We consider location important for two reasons: it can partially grasp the effect of family wealth (stock instead of income as a flow variable); and it indicates the cost of the elite school in comparison with the dimension of time (how long it takes to transport children to the school). For similar reasons, we also included parents' willingness to drive children to school. In addition, it may be useful to note that 17% of the sample live within walking distance of the elite school; at the same time, 42% of the subsample comprising accepted students has a dwelling in the city centre (however, the central location can be over-reported due to the internet-based format of the survey, with no verification of address).

Due to the binary nature of almost all the variables, including the dependent variable – acceptance or not to the elite school – the logit method is used for regression. In Table II, marginal effects obtained after logit are reported. Marginal effects indicate that a change in an explanatory variable alters the average probability of getting accepted to the elite-school by the amount reported in the regression table. This change is measured in percentage points. However, it must be borne in mind that due to continuous explanatory variables (because density function is used), marginal effects are not constant, and in the regression table averages are reported.

Explanatory variables	Dependent variable: Acceptance to the elite school (yes=1), average marginal effects										
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	
<i>Interaction variable</i>											
Central location and elite prep-school				-0.181*** (0.063)	-0.177*** (0.061)				-0.350*	-0.342*	
<i>Family background effect</i>											
Education mother (min ISCED 5 = 1)	0.233*** (0.036)	0.120** (0.049)	0.104** (0.052)	0.103** (0.050)	0.110** (0.050)	0.208*** (0.049)	0.128** (0.057)	0.106* (0.055)	0.113** (0.057)	0.119** (0.057)	
Education father (min ISCED 5 = 1)	0.151*** (0.038)	0.111** (0.050)	0.109** (0.053)	0.097* (0.052)	0.102** (0.052)	-0.004	0.000	0.014	0.007	0.007	
<i>Income (net per family member):</i>											
500-800 eur	0.165*** (0.046)	0.161*** (0.060)	0.179*** (0.065)	0.174*** (0.064)	0.161** (0.063)	0.092* (0.048)	0.098** (0.046)	0.100** (0.041)	0.106** (0.043)	0.103** (0.043)	
800-1300 eur	0.223*** (0.056)	0.243*** (0.071)	0.213*** (0.080)	0.208*** (0.079)	0.210*** (0.080)	0.190*** (0.045)	0.174*** (0.042)	0.153*** (0.039)	0.161*** (0.039)	0.164*** (0.039)	
more than 1300 eur	0.315*** (0.074)	0.227** (0.106)	0.247** (0.118)	0.239** (0.119)	0.233** (0.119)	0.228*** (0.046)	0.173*** (0.050)	0.140*** (0.045)	0.140*** (0.047)	0.144*** (0.046)	
<i>Family educational strategy effect</i>											
Attending prep-school		-0.148** (0.062)	-0.155** (0.067)	-0.148** (0.067)	-0.139** (0.066)		-0.128*** (0.049)	-0.104** (0.046)	-0.102** (0.050)	-0.101** (0.050)	
Attending elite prep-school		0.579*** (0.047)	0.548*** (0.054)	0.578*** (0.055)	0.556*** (0.057)		0.245*** (0.067)	0.201*** (0.067)	0.243*** (0.075)	0.238*** (0.076)	
Attending 3 or more entrance tests		0.579*** (0.082)	0.542*** (0.083)	0.524*** (0.082)	0.498*** (0.080)		0.311*** (0.051)	0.260*** (0.048)	0.269*** (0.050)	0.264*** (0.050)	
<i>Location effect</i>											
Dwelling (central location = 1)			0.608*** (0.054)	0.673*** (0.056)	0.663*** (0.058)			0.292*** (0.039)	0.405*** (0.073)	0.397*** (0.073)	
Car (Driving children to the school = 1)			0.137*** (0.051)	0.135*** (0.050)	0.126** (0.050)			0.101* (0.053)	0.116** (0.056)	0.110* (0.055)	
<i>Controls</i>											
Reading cultural journals	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Cultural consumption (visiting cultural events with children)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Family structure (single parent = 1)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Number of children in the family	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Number of children in school	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Year or panic (2011 = 1)	no	no	no	no	yes	no	no	no	no	yes	
n			all sample (840)					only those who applied to elite (399)			
Log likelihood	-440.55	-285.95	-242.14	-241.95	-235.59	-214.06	-185.02	-160.71	-158.60	-157.75	
pseudo R square	0.187	0.472	0.553	0.554	0.565	0.107	0.228	0.329	0.338	0.342	

Notes: Data from internet survey, obtainable by e-mail from authors. Results obtained by using STATA 11.1. Significant levels: \* 10%, \*\* 5%, \*\*\* 1%, average marginal effects reported, only statistically significant standard errors in parentheses.

Table II. Logit regression results.

The empirical model that we estimate is as follows:

$$\pi(Y) = \beta_0 + \beta_1 F + \beta_2 S + \beta_3 L + \varepsilon. \tag{1}$$

Here,  $Y$  is the binary outcome capturing the acceptance or non-acceptance to the elite school and function  $\pi$  indicates probability. Vector  $F$  captures student family background characteristics

(background effect); vector  $S$  measures the effect of parental strategies (educational strategy effect); vector  $L$  indicates location effect; and  $\varepsilon$  indicates error term.

We conducted analyses in two separate subsamples. Models 1 to 5 assess Equation (1) using the total dataset – data from all 840 respondents. Models 6 to 10 are based on the subsample of those who were attending entrance tests, i.e. the so-called high achievers, who constituted 399 respondents.

All of the explanatory variables excluding father's education in Models 6 to 10 are statistically significant. Extensive controls are used for minimising omitted variable bias. For all models pseudo- $R^2$  is relatively high for a micro-econometric study, especially in the case of the whole sample, reaching almost 57%. Due to the nonlinear logit model, we pay more attention to the signs of the marginal effects rather than sizes. However, because of the binary nature of all explanatory variables, we can also interpret the relative sizes of the coefficients (as average probabilities).

In the family background effect, the mother's education is statistically significant and bigger than the father's education; however, this impact gap closes as more explanatory variables are added to the model. Surprisingly for us, parents' education (either mother's or father's) has a smaller impact than income on the probability of getting accepted to the elite school. In addition, income categories do not lose their significance or diminish in size, and stay relatively stable around 0.20, being marginally bigger in higher income categories (a reference category in income is 500 euros or less per family member). In Model 2, we added family 'educational resources', to control for the impact of strategic choices that parents make on the probability of successful elite school application. Here we see that attending a discretionary prep-school (not elite prep-schools) as an additional educational investment for their children is not a productive strategy (the sign of the coefficient is negative). The sign of the prep-school variable is negative throughout all models, and comparably the size of the coefficient is slightly above the size of coefficient for the mother's education. However, attending an elite prep-school has a totally different effect; it is positive and above 0.50 in all models. As discussed earlier, elite prep-schools are usually eight-month-long courses offered for money for six and seven year olds, and are delivered by elite-school teachers. Our model indicates that only elite prep-school attendance has a high positive effect on the probability of being accepted, and this does not apply to alternative educational investments. Thus, it can be argued whether elite prep-schools give higher quality courses compared to alternative prep-schools, or simply give asset-specific knowledge for the admission tests. A second argument is partially supported by the fact that, for the parents, the effective strategy is to attend three or more entrance tests, which can also be considered as learning-by-doing or asset-specific investment for obtaining knowledge for admission tests only.

In Models 3, 4 and 5, we add the location effect variables to the analysis. We control for a city-centre dwelling (where all elite schools are located), and for the ability and willingness of parents to transport their children to school (explanatory variable 'car'). In Model 5 we also control for the 'panic year of 2011'. We see that both have a positive impact. However, adjusting for the panic year does not amend the values of coefficients remarkably. At the same time, a central location is even more influential to the probability of getting accepted than attendance of an elite prep-school. It is argued that, similar to the social desirability bias in individual reports such as surveys, people tend to over-report some official (but not actual) information or socially acceptable values to hide their true reasons (Holme, 2002; Betts & Loveless, 2005), and thus, we may overestimate the impact of central location. In addition, in the last two Models (Models 4 and 5) we control for the interaction term that captures the effect of parental strategy 'to live (or register their address) in the centre of the city and to attend an elite prep-school'. We see that the sign of the coefficient is negative, indicating that there are two effective and influential strategies for getting accepted – either to report a central location (or to live in the centre) or to attend an elite prep-school, but simultaneous use of both will have a smaller overall positive effect.

In Models 6, 7, 8, 9 and 10, we concentrate on the subsample of respondents who partook in the entrance tests. We indicate these families and students as high achievers. It can be hypothesised that this subsampling allows us to control under the assumption of some families having different preferences (or attitudes toward risk), with the results of our models being robust. The overall result is that all signs of the coefficients stay the same, excluding the father's education. The coefficient of the father's education turns out insignificant and marginal in size. However, the sizes of the coefficients become smaller compared to the whole sample (Models 1 to 5). The mother's

education effect is not much changed, but the coefficient of income variables decreases, meaning that in the more ambitious high achievers group, income plays less importance. Also, belonging in the highest income category (more than 1300 euros per family member) has no effect as compared with the 800-1300 euro category. The negative impact of discretionary training (prep-school) turns out to be comparable in size, but the positive effect of the elite prep-school is approximately half as large as in the case of the whole sample. A similar result applies to the effect of location. Also, the effect of the 'car' is smaller. At the same time, the interaction variable has a much larger negative effect, indicating that, in the case of high achievers, the simultaneous strategy of 'location and elite prep-school' has a smaller positive effect. Our interpretation is that in the case of high achievers, the constraints (lower-SES, strategic location effect, or prep-schooling) matter less, because of their specific form of utility function (or attitude toward risks) that makes their background characteristics less important for being accepted to the elite school, even though segregation by SES and education strategy remains.

### **Conclusions and Policy Implications**

The selection of children according to ability or aptitude tests for primary schools is a rare practice in Europe. Usually, selection takes place before transferring to the secondary schools (at age eleven at the earliest), and, even then, plenty of balancing instruments for low-SES children are used, which is not the case in Estonia. In our case, the school choice mechanism permits testing children for admission to the over-subscribed (elite) primary schools. In addition, our case specificity is that all the aforementioned elite schools are public, meaning that the natural experiment of a 'free market' is conducted within equally financed schools that all rely on the same curriculum. 'Quality' differences indicated by league tables can thus mainly result from the segregation effect that can be reinforced by the peer effect.

The segregation effect – low-SES children going to 'less good' schools – is a generally admitted empirical outcome across literatures from different disciplines. In our case, a microeconomic study using logistic regression is applied. We test whether, and by how much, different components of the characteristics of family background, a family's educational strategy, and location affect the probability of being accepted to the elite school under the conditions of the natural market experiment. Intensive controls for family structure, cultural consumption and others are included. Theoretical arguments (e.g. Burgess et al, 2009) stress mostly that constraints (opportunity costs) faced by low-SES families prevent them from participating in choice programmes. However, it can also be argued that these constraints also alter their preferences and attitudes toward risks, or even that the constraints prevent them from realising their actual preferences for the school(s) they would like their child to attend. To control for the last argument we run regressions based on separate subsamples.

In the whole sample, we assume that there are no differences in preferences (no bias between low- and high-SES parents' preferences) among different socio-economic groups; in the smaller subsample we test whether parental strategies and background characteristics become more or less important in the case of homogeneous preferences (high achievers). In the last group of high achievers, only those children whose families somehow signal their preferences by attending admission tests are included. In the case of both samples, all the effects (background, parental strategies, and location effect) are statistically significant and positive. However, investment in discretionary prep-school is not productive. The location effect and the strategy of attending an elite prep-school dominate over all other effects. In the high achievers subsample, some effects are slightly smaller, indicating that high income, attending elite-prep, and a central location are less important for high achievers.

Results indicate that the Estonian school market experiment taking place within the public school system has segregating effects – this segregation will not only occur following the lines of parental background characteristics, but also the educational strategy of families. This strategy implies that investment in asset-specific knowledge about the admission test (i.e. by attending an elite prep-school) is as productive as relying on a central location (or falsely declaring a central address). However, relying on both strategic actions is a kind of overinvestment, and diminishes positive returns.

Notwithstanding the limitations of the study (internet survey design, missing weights for total population), we conclude that our results showing the heterogeneous strategic behaviour of families allow us to make some policy implications supported by theoretical arguments throughout the literature. In general, our case implies (as is also generally accepted in school choice literature) that lifting the market constraints through a free school market is not sufficient, as the differences in educational strategies as an outcome of rational decisions, maximising expected utility subject to opportunity costs (or as referred by sociological literature, in cultural capital), still exacerbate the outcome of educational choice.

Some authors (Betts & Loveless, 2005; Le Grand, 2007; Woessmann et al, 2009) have been optimistic about the possibility of designing a workable efficiency and equity-oriented choice policy. Le Grand (2007) argues that there are at least three such criteria in which the choice-based system functions better. Firstly, by increasing the ability of users to make choices, e.g. parents must be properly informed about the quality of the alternatives and supportive transportation. One solution from this stream is the reduction of the costs of education decision-making and the perceived risk of failure. Musset (2012) similarly argues for targeted and active information programmes to cater to all parents, not only the active ones. Such policy implications are at the level of the individual decision-maker, but still need intervention at the institutional level. However, it is not that easy to implement. As we see, one of the sources of performance information (namely the league tables) is used as a raw outcome measure of performance that dominates the headlines. This type of 'performance management' creates incentives for schools that exacerbate segregation, i.e. to choose better-prepared children (cream-skimming) as one way to boost a school's ranking. In our case, being better prepared becomes one of the strategies in an uncontrolled school market, where matching of children to schools is mitigated by the schools only. That leads to the second criteria highlighted by Le Grand (2007) – decreasing the ability of providers to make choices, e.g. to avoid cream-skimming, it is important to restrict the ability of the school to make its own admissions decisions and should be compelled to take pupils from a range of backgrounds by a banding or quota system instead, or by some sort of matching mechanism (e.g. lottery). The latter will also decrease the expected benefits of prep-schooling and other manipulating strategies. An additional suggestion is called the pupil premium (Chowdry et al, 2010), also known as the progressive voucher scheme (Musset, 2012), or alternatively quotas combined with lotteries (Betts & Loveless, 2005). Basically, all these measures suggest additional per-capita funding for schools accepting low-income students. This could create alternative incentives for the schools that give rewards on the basis of supporting ambitious educational choices by children from lower-SES families. The third institutional feature in Le Grand (2007) is the widening of the extent of competition, meaning that competition must be real. According to Le Grand, one of the criteria for improving the competition is the guarantee that money follows the children. There are plenty of OECD countries which have changed their funding formulas accordingly (OECD, 2010), although there are many examples, including Estonia, where in the case of an alternative provider, the public funding covers only partial costs and parents are forced to pay tuition fees (OECD, 2011). This is exactly what Musset (2012) warns against – that topped-off vouchers (combining choice and the availability to ask extra money) should be avoided, as it is not fruitful in terms of competition and creation of alternative providers, or in terms of segregation. Also, the practice of private but opaque contributions (e.g. donations or fees for extra-curricular activities) within public (especially elite) schools is common in Estonia. In addition, Le Grand (2007) argues that for a meaningful choice there should be an 'opportunity set' of alternatives. Currently, in Estonia's case there are no clear differences between schools based on curriculum, form of ownership, or other intrinsic features of the system. Due to the static nature of the school system, the path-dependent institutional arrangement is difficult to amend. However, countries do tend to adopt general trends in educational policymaking, fitting new features to the old context. Variability is difficult to implement through policy amendments. Nevertheless, it is generally admitted that choice and variability go hand in hand (Hirsch, 2002; Pöder et al, 2013). The latter is not based on league tables, but rather alternative dimensions based on pedagogical practices, curriculum, or even ownership. If variability is not there, do we need choice at all? At the same time, taking into account the paradigmatic shift in public governance, it is hard to see the strict rules of catchment zones becoming prevalent. Thus, we see the growing importance of research on educational choice regardless of a country's public policy design.

## Notes

- [1] The education financing in universities is based on publicly financed places (a limited number in each curricula) and private provision financed by tuition fees. The competition to the publicly financed seats is severe in all disciplines, being highest in law, medicine and economics.
- [2] Based on authors' analyses of admission information from 2011, gathered from various universities.
- [3] Information about elite school admission strategies is collected by the authors for the year 2011, available by e-mail request from the authors.
- [4] Eesti Teadusfond, ETF Grant 8997 on school choice mechanisms financed by the Estonian Research Foundation.

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