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Tracking, schools' entrance requirements and the educational performance of migrant students

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Abstract

The aim of this paper is to investigate the relation between tracking and migrant students' performance (and parental background), taking into account school selection policies, and to compare the results across natives, first and second generation migrants. We combine two insights: the need to take into account school level variables when estimating the relation between education system and student performance and the need for including region of origin to correctly estimate models for migrant students. We use PISA 2009, selecting 31 countries with school features, of which 15 countries with information on the region of origin of the migrant students. We run separate analyses for native and first and second generation migrants, without and with origin dummies. We find that migrant students in education systems with many tracks which are themselves in schools in which the principal always considers prior performance in accepting students to the school have equal or higher scores than students in systems with only one track. However, in the full sample the influence of education systems for first generation students is absent: their performance is nearly only based on individual and school characteristics, while the performance of second generation migrant students is also influenced by tracks or prior performance. Still, the influence of the combination of tracks and entrance selection is weaker than that for native students.

Keywords: Cross-national comparison, migrant students, native students, education system, schools with and without entrance-selection based on prior achievement, PISA data, origin countries

JEL codes: I21, I24, J15

1. Introduction

The low educational achievement level of migrant students in most Western countries is a growing concern for policymakers. High educational achieving is a pre-requisite for successful integration into society and thus the best strategy to combat societal exclusion and discrimination of minority groups. Many studies have shown that the low educational achievement of migrant students is partly explained by their lower socioeconomic status (e.g. Kao and Thompson 2003; Marks, 2005, OECD, 2012; Portes and Rumbaut, 2001). But even controlling for this aspect, research still points toward a wide gap between native and migrant students in educational achievement. What is interesting from a policy perspective is that there is a substantial variation among migrant students themselves. This variation is linked to, for instance, individual characteristics such as the student's destination language, whether the student is a first- or second-generation migrant, age of migration, and having one or two non-native parents (Chiswick & Miller, 1996; 2002).

This study focuses on the effects of the most discussed characteristic of education systems on migrant students' performance: the number of tracks in lower secondary education. National education systems differ in the number of distinct educational programs or tracks at secondary education, and the existence of prior performance-based selection at the entrance of secondary education (Shavit and Blossfeld, 1993; Shavit and Müller, 1998). Although these different educational structures have been suggested to explain differences in the educational success of migrants across countries, there is little systematic evidence for this claim (Buchmann and Parrado, 2006; Heath and Birnbaum, 2007). Comprehensive education systems like those in Scandinavia do not have separate tracks in lower secondary education (but sometimes international differentiation of students within schools), while education systems in Germany and the Netherlands differentiate students from the start of secondary education in different tracks, located in different schools, each with their own curriculum, teacher qualifications, etc. (the so-called stratified education systems).

A study by the Organisation for Economic Co-operation and Development (OECD) (2007) showed that the more differentiated a country's education system, the more native students outperform migrant students, even after taking into account social background characteristics. Ammermüller (2005), who used a more restricted measurement of differentiation (number of school types available), reached a more nuanced conclusion: the more school types migrant students can choose from in secondary education, the better they perform on average. However, such a school system, with choice between different school types, enhances the negative effect of speaking the language of the origin country at home instead of the language of the destination country.

Although these studies examine education system effects on migrants, this is not the main focus of their analysis. Moreover, they lack an adequate design to study the effects of migrants' countries of origin and destination, while these are related to their educational achievement. The current paper builds on earlier work of Levels, Dronkers, and Kraaykamp (2008) and Dronkers, Levels and Heus (2013) who have focused on the influence of both societal and education system characteristics of migrants' countries of origin and destination on their educational achievement, using various waves of the Programme for International Student Assessment (PISA) data. These studies use the cross-classified multilevel design first introduced by Tubergen, Maas, and Flap (2004). Instead of relying on observations of multiple-origin groups in a single destination or a single-origin group in multiple

destinations, the authors proposed a combined method that allows a comparison of multiple origins in multiple destinations[1].

A major problem with the above-mentioned studies (both for natives and migrants) is that they use a two-level model with a distinction between countries (origin and destination with societal and education system characteristics) and students (with individual and family characteristics). Thus, they ignore the fact that there are more levels that affect student achievement: students are nested in schools and within schools along different tracks, and all of these levels produce sources of variation in achievement levels.

Recently Dunne (2010) introduced a three-level model: countries, schools, and students. She showed that school characteristics like socioeconomic composition and ethnic diversity have substantial effects on achievement levels and also affect the relation between parental background and achievement. Moreover, these school characteristics seem to mediate some of the effects of education system characteristics found earlier. She also showed that one of the reasons the relation between parental background and achievement is stronger in stratified education systems, is that in these systems the particular school a student attends has stronger effects.

Dronkers, van der Velden, and Dunne (2012) applied this three-level model to migrants' children and their educational performance, also using PISA data. Their analysis confirmed the results of Dunne (2010) concerning the differential effects of parental background in education systems with more or less tracks in secondary education. The direct effect of parental background is strongest in comprehensive systems, and weakest in stratified education systems.. This still holds after inclusion of the track level within the schools, the origin countries of migrant students, and the ethnic school diversity. However, the influence of parental background on the entrance selection of students (either based on earlier ability or parental background) into different tracks and schools, is higher in stratified systems. Possibly in these systems parents are more concerned about school and track choice due to the long-term consequences of these early choices. When schools and tracks do not select students, the influence of parental background is greater in comprehensive systems, because the social background effect has not yet been transformed into different tracking or ability grouping.

Korthals (2012) also explicitly takes into account the school level to show that the relation between tracking and student performance is dependent on whether school principals use prior performance to select students, using the native students from the PISA 2009 wave. Selection by the secondary school could be based on prior performance (a proxy for ability) or some other criterion (for instance parental preferences). Her analyses showed that tracking in general does not have a direct relation with performance. On the other hand, students in highly differentiated systems perform best when schools always take into account prior performance to decide on student acceptance. In systems with a low number of tracks, whether principals consider prior performance has less of an impact. She also showed that in these schools and systems, students with high parental background, gain less from their high parental background, whereas low parental background students are less harmed by their lower background.

[1] It is important to distinguish both countries of destination and countries of origin. Omitting the latter from the analysis would give misleading results: Swedish and Russian migrants in Finland (with a comprehensive system) and Turkish and Yugoslav migrants in Germany (with a strongly differentiated system) cannot be treated as similar migrants, even when controlling for background characteristics.

The main aim of this paper is to investigate for migrant students the relation between tracking and student performance, taking into account the school level and region of origin. In our analyses we make use of the PISA 2009 wave and compare two samples: a sample of 31 western countries, which is the same sample of Korthals (2012), and a restricted sample of 15 countries for which the region of origin of the migrant students is available, a sample similar to Dronkers et al. (2012).

2. Debates about migrants and education

The educational position of migrant children with different origins has been well documented. Research conducted in the United States has shown that major variation exists in educational outcomes of different ethnic groups: Mexican Americans and African-Americans obtain lower average grades than Asians and native Americans, they are more likely to drop out of high school, and less likely to earn a college degree. Similar gaps in educational success between different migrant groups have been observed in other Western countries such as the Netherlands, Belgium, and Germany. In order to understand these migrant group differences, research has often relied on classic individual-level determinants (Kao and Thompson, 2003). Overall, these individual-level explanations have focused on the cultural position (e.g. their motivation to perform) and the structural characteristics (e.g. parental social capital and the time of arrival) of different migrant groups.

Next to the study of the educational performance of different migrant groups in a single country, cross-national research has been conducted. Cross-national data collections such as TIMMS, PISA, and PIRLS that focus on children's performances in numerous subjects have allowed comparing the educational performance of migrant and non-migrant students in different destination countries. Individual- and school-level characteristics have been taken into account to explain differences in educational performance between first- and second- generation migrant students and natives with the PISA 2000 (Marks, 2005; Schnepf, 2006). Interestingly, these effects vary substantially between countries. Although not tested, they suggest that these differential effects stem from differences in destination countries' education systems or immigration policies.

However, since immigration is intrinsically a transnational phenomenon, it should be studied accordingly (Portes, 1999). Migrant parents and children from various origin countries move to various destination countries. In order to fully capture the complexity of the migration process, the use of a so called cross-classified multi-level design (or, double comparative design) has been proposed (van Tubergen et al., 2004). Instead of relying on observation of multiple-origin groups in a single destination or a single-origin group in multiple destinations, the cross-classified design allows a comparison of multiple origins in multiple destinations simultaneously. Since this design disentangles effects of characteristics of origin countries migrants come from ('origin effects'), characteristics of the countries to which they migrate ('destination effects'), and characteristics of their specific community (the origin-destination combination), it is extremely useful for attempts to gain insights into migrants' outcomes such as educational performance. Analyzing migrants' integration in host societies without properly taking into account these origin effects will lead to flawed results: depending on the composition of the migrant population in a certain society, results may be too optimistic or too pessimistic.

3. Data

We make use of the 2009 wave of the PISA as organized by the OECD. PISA is conducted every three years since 2000 and its main purpose is to facilitate international comparisons of student achievement. The PISA data contains a large array of students and school level data for all participating countries, obtained by student and school surveys. PISA also contains individual test scores on reading, science and mathematics. We supplement this data by country level data, primarily on tracking.

PISA contains a representative sample from each participating country. It does so by selecting a sample of schools and including all 15 year old students in that school[2]. Due to the two-tiered selection procedure and to obtain enough information on small subgroups, the samples might not be fully representative. For this reason the OECD provides individual sample weights which we use to ensure sample representation.

3.1 Full sample

In 2009 75 OECD and partner countries participated in PISA. To ensure comparability with Korthals (2012) we employ only a selection of countries, namely the 31 countries which have a gross domestic product (GDP) per capita above the minimum of the OECD and available data on national tracking policies[3]. These limitations on the sample are imposed to exclude country heterogeneity as a driver of the results.

Table 1 shows the 31 countries and the samples sizes of both native student (both parents born in destination country) and students with a migration background. First generation migrants are born outside the destination country, with at least one parent born outside destination country. Second generation migrants are born inside the destination country with at least one parent born outside destination country. This distinction between first- and second-generation migrants deviates from that of Portes and Rumbaut (2001), who classify migrant generation status based on age upon arrival in the destination country. However, we believe that the distinction used in this paper is more clear in a cross-nationally usage and is less likely to underestimate the importance of pre-school socialization. Because of the early age of arrival the majority of the first generation in the PISA data had the major part of their formal schooling only in the destination country.

[2] PISA officially samples students between the ages of 15 years and three months to 16 years and two months OECD (2010).

[3] Australia, Canada, France, and the United Kingdom, are excluded from the full and restricted sample since these countries have missing data on the available number of tracks or on schools. Mexico is excluded since Mexican students and school behave very differently from other included countries on a large number of characteristics.

Table 1: Analyzed countries, number of native and migrant students, and education system characteristics per destination country.

destination country	origin of migrants available	number of tracks (0=1 track)	Proportion of students in schools that consider prior performance for student acceptance			number of observations			
			Never	Sometimes	Always	natives	2nd gen.	1st gen.	all
ISL	No	0	0,68	0,29	0,03	3.454	14	67	3.535
SWE	No	0	0,78	0,19	0,03	3.976	339	163	4.478
NZL	Yes	0	0,36	0,38	0,26	3.418	363	790	4.571
NOR	Yes	0	0,75	0,19	0,06	4.293	165	146	4.604
EST	No	0	0,12	0,58	0,30	4.277	337	32	4.646
POL	No	0	0,34	0,48	0,18	4.821	0	1	4.822
USA	No	0	0,47	0,27	0,26	4.116	658	325	5.099
FIN	Yes	0	0,69	0,26	0,05	5.603	59	71	5.733
DNK	Yes	0	0,49	0,47	0,05	4.474	931	358	5.763
ESP	No	0	0,76	0,20	0,04	23.179	310	1.915	25.404
GRC	Yes	1	0,55	0,38	0,07	4.499	141	242	4.882
CHL	No	1	0,17	0,42	0,40	5.424	5	23	5.452
ISR	Yes	1	0,12	0,35	0,53	4.459	679	391	5.529
LTU	No	2	0,38	0,49	0,12	4.142	68	7	4.217
LVA	No	2	0,37	0,34	0,29	4.239	191	21	4.451
HUN	No	2	0,03	0,05	0,92	4.416	44	51	4.511
ARG	Yes	2	0,46	0,35	0,18	4.455	103	62	4.620
HRV	No	2	0,00	0,07	0,93	4.408	358	175	4.941
RUS	No	2	0,33	0,43	0,24	4.545	349	249	5.143
SVN	No	2	0,32	0,47	0,21	5.454	391	92	5.937
PRT	Yes	2	0,71	0,27	0,02	5.858	151	182	6.191
ITA	No	2	0,30	0,29	0,41	28.954	365	1.178	30.497
IRL	No	3	0,43	0,37	0,21	3.448	53	256	3.757
LUX	Yes	3	0,02	0,55	0,43	2.671	994	625	4.290
DEU	Yes	3	0,11	0,15	0,74	3.713	525	272	4.510
NLD	Yes	3	0,01	0,11	0,89	4.129	405	142	4.676
AUT	Yes	3	0,24	0,16	0,59	5.493	617	247	6.357
BEL	Yes	3	0,38	0,43	0,19	7.059	585	638	8.282
CHE	Yes	3	0,29	0,17	0,54	8.850	1.708	991	11.549
SVK	No	4	0,18	0,19	0,63	4.482	15	10	4.507
CZE	Yes	4	0,19	0,26	0,55	5.830	95	64	5.989
all		1,61	0,36	0,31	0,33	188.139	11.018	9.786	208.943

The final sample consists of 188,138 native, 9,786 first generation and 11,018 second generation migrant students in (pre-) vocational or general education who were in schools where more than five students participated in PISA 2009. This amounts to a total of 208,943 students in 7,489 schools in 31 countries.

3.2 Restricted sample

To determine the student' region of origin, which is necessary for our analyses, we need to have specific information on the country of birth of both the students and their parents. However, countries which allowed the country of birth questions in the PISA student surveys had the possibility of determining the set of allowed answers. This gave countries the option to include only their most important groups of migrants, limiting the options students could use. We omit in the restricted sample destination countries that did not allow for enough options in country of birth. Among some destination countries that did provide enough country of birth options, the question was not

consistently asked. Therefore, data from only 15 of the 31 countries of the full sample were useful for the analysis where region of birth is included. The restricted sample consists of 74,588 native, 7,609 first generation and 5,180 second generation migrant students. Which countries included information on the countries of birth of the students and the parents can be found in Table 1.

3.3 Tracking and whether school principals consider prior performance

Tracking means that secondary education is differentiated into a hierarchy of tracks, in which students across tracks are located in different schools, and each track has its own curriculum, teachers' qualifications, etc. The defining characteristic of tracking in this papers is the number of tracks a country has available for fifteen year old students, obtained from OECD (2007, Table 5.2).

A school level variable relating to tracking is how schools allocate students across tracks. Schools can decide based on prior performance (an imperfect proxy of ability), parental background, or a number of other criteria, while in some countries parents have the last word. As in Korthals (2012) school policies on track placement are obtained from the school survey in PISA 2009. School principals were asked how often consideration was given to a student's record of academic performance (including placements tests) and to feeder school recommendations in admitting the student to the school. There are schools where neither of the two factors is considered, schools where at least one of these factors is sometimes used to decide acceptance, and schools where at least one of the two factors is always considered. Table 1 provides some descriptive statistics on school selection policies at the country level. Table 1 shows that there is large country variation in the percentage of school principals who never, sometimes or always consider prior performance. In countries with 4 or 5 tracks over fifty percent of schools answer that they consider prior performance, while in comprehensive systems still 45 per cent of schools indicate they consider prior performance in accepting the student to the school. We control for the track level of the students to limit the possibility that school principals only consider prior performance to accept the better students to the school. More attention to this possible bias is given in Korthals (2012).

3.4 Regions of origin

The OECD allows participating countries to propose their own country of birth categories, and some countries allow more detail than others. As a result, the origin countries of the different destination countries are partly dependent on the quality of the available categories. To account for this possible bias, we compared, as much as possible, the origin countries in PISA with national statistics. In most cases the largest immigrant groups identified by the statistical offices are also represented in our PISA data. Since the PISA data do not oversample immigrant students, smaller immigrant groups (if the option was given) are understandably not always present in our data. There are no indications that this selectivity (only the largest migrant categories of destination countries) has produced a bias, because small migrant groups in destination countries hardly influence the results (see Dronkers & Kornder, 2014, for the distribution of migrants in all countries and areas of origin). The students who had a country of birth other than the country of birth options given are classified as having an unknown country of birth.

To simplify the presentation of the analysis, we combined the countries of origin into 14 regions of origin based upon a slightly adjusted version of the United Nations Statistics Division's composition of macro geographical regions.

3.5 Control variables

Besides the 2008 GDP per capita from the World Bank (2012), all controls variables are obtained from the PISA student and school surveys. The control variables at the student level are gender, age, parental background, whether the student is in (pre-)vocational education as opposed to general education and whether the students is in upper secondary school as opposed to lower secondary school. Parental background is measured by an index that describes the student's economic, social, and cultural status. An internationally comparable version of education levels (lower versus upper secondary education) is based on the International Standard Classification of Education (ISCED) level. We did not include variables available in PISA regarding student's studying efforts, because they might be both intermediary and control variables at the same time. Moreover student's studying effort indicators of 15-years-old students have a weak validity.

The control variables at the school level are school composition, a number of school input variables, and a range of other school characteristics. The school average and variation in parental background and the percentage of students in a school who speak a language other than the test language at home measure different school composition aspects. School inputs are the student-teacher ratio, teacher shortages, shortage in instruction material, and whether the school is responsible for the curriculum and assessment. Other school characteristics are the school type (public, private government-dependent, or private government-independent school), whether school achievement is tracked by an education authority; school competition in the area, school location, school size, and the use of ability grouping.

4. Estimation Method

We use random effect models, which are estimated using maximum likelihood, to take into account error terms for countries, schools, and individuals. Equation (1) below shows the model where we look at the relation between tracking ($\#ofTracks_c$) and migrant students' performance ($Test_{isc}$), taking into account school selection policies (vector $EntrReq_{sc}$, which contains two dummies for school policies regarding prior performance), for student *i* in school *s* in country *c*. Our main interest lies with the interaction $EntrReq_{sc} * \#ofTracks'_c$. We control for a vector of individual characteristics, including parental background ($Student_{isc}\beta_1$), a vector of school characteristics ($School_{sc}$) and GDP per capita ($GDPpc_c$). Equation (2) looks at whether the relation between parental background (PB_{isc}) and number of tracks differs when school policies are taken into account. To look at these differential effects our main interest lies with the interaction $PB_{isc} * \#ofTracks'_c$. Separate error terms for countries (u_c and v_c), schools (u_{sc} and v_{sc}), and individuals (ϵ_{isc} and ε_{isc}) are necessary, since students are nested within schools within countries. If we would ignore the nested data structure, we would implicitly assume that all observations are independent from each other. This would lead to a downwards bias of the standard errors. More attention to a

possible selection bias due to strategic behaviour of schools with regard to their selection policies is given in Korthals (2012).

$$Test_{isc} = \beta_0 + Student_{isc}\beta_1 + School_{sc}\beta_2 + EntrReq_{sc}\beta_3 + \#ofTracks_c\beta_4 + EntrReq_{sc} * \#ofTracks'_c\beta_5 + GDPpc_c\beta_6 + u_c + u_{sc} + \epsilon_{isc} \quad (1)$$

$$Test_{isc} = \gamma_0 + Student_{isc}\gamma_1 + School_{sc}\gamma_2 + EntrReq_{sc}\gamma_3 + \#ofTracks_c\gamma_4 + PB_{isc} * \#ofTracks'_c\gamma_5 + GDPpc_c\gamma_6 + v_c + v_{sc} + \varepsilon_{isc} \quad (2)$$

Missing values in the sample are replaced by group averages on the lowest aggregation level (schools or countries), a compromise between mean substitution and imputation. To control for possible bias introduced by the method for replacing missing values, the models include dummies for those observations for which missing values are replace and interactions between the replace values and the dummies just mentioned. With these additional variables we control for any systematic differences in the slope for the variables which contain missing values. Thus, by including these dummies and the interaction, the results are not impacted by the method to deal with missing values.

We use the provided student and school weights in PISA. We then reweighted the subsamples (native students, first generation migrant student, and second generation migrant students) so that each country within a subsample had the same size. Thus, for instance, in the models looking at first generation migrant students, all countries received the same weights no matter the size of their first generation migrant population in PISA. If we would not do this, countries with many first generation migrant students would dominate the results.

5. Results

In this section, first, we look at the relation between tracking and migrant students' performance, taking into account school selection policies. We run all models for the three indicators of student performance: reading, math and science, and separately for natives, first and second generation migrant students. The first model in the tables contain, next to all control variables (individual and school characteristics[4]), the entrance selection by the schools (the reference category is when principals never consider prior performance), and the number of track in the destination countries. In the second model, we add the interaction terms between number of tracks and entrance selection policies.

Second, we ask whether the relation of tracking and parental background is different when school selection policies are taken into account. Therefore, in the third model, we include the interaction between parental background and number of tracks.

Thirdly, we are interested in the size of the bias when omitting the region of origin from the analyses. We run the models separately for first and second generation migrant students, with and without region of origin included. We analyze the native students solely as a reference group. Since the

[4] See table 6 and 7 for the parameters of these variables.

region of origin is not available for all countries in our estimation sample, we also compare the results of the full sample to those of the restricted sample.

5.1. All 31 destination countries

Table 2 shows our results for first generation migrant, second generation migrant and native students of the 31 destination countries without the origin of migrants' students[5].

Table 2: The relation between the number of tracks, entrance requirements based on earlier performances and test scores in the full sample

model	(1)	(1)	(1)	(2)	(2)	(2)	(3)	(3)	(3)
dependent variable	read	math	science	read	math	science	read	math	science
First generation									
School considers prior performance:									
Sometimes	3.12	2.23	0.68	2.58	0.45	-4.59	3.12	2.23	0.67
Always	9.82	12.96	0.11	-1.57	3.29	-12.91	9.68	12.94	-0.39
Number Of tracks	-1.40	-1.62	-2.04	-2.90	-3.27	-5.09	-1.06	-1.57	-0.82
Sometimes *tracks				0.26	1.10	3.39			
Always *tracks				5.49	4.81	6.81			
Parental Background *tracks							1.65	0.25	5.96
Second generation									
School considers prior performance:									
Sometimes	14.59*	0.24	9.85	12.35	2.90	4.62	14.07*	-0.29	9.16
Always	16.55**	11.18	11.24	-2.84	6.22	3.48	17.39**	12.10	12.12
Number of tracks	2.79	3.87	4.40	-0.26	3.89	2.11	1.14	2.28	2.62
Sometimes *tracks				1.57	-1.73	3.50			
Always *tracks				9.333*	2.09	4.15			
Parental Background *tracks							-10.84**	-10.67**	-12.15
Natives									
School considers prior performance:									
Sometimes	-2.19	-1.26	-1.50	-6.00**	-4.99**	-6.03**	-2.08	-1.23	-1.46
Always	6.623**	5.92*	7.63**	-9.08**	-7.97*	-9.63*	7.00**	6.153**	7.93**
Number Of tracks	-2.63	1.85	0.67	-5.68**	-0.87	-2.75	-2.39	2.11	0.95
Sometimes *tracks				2.72**	2.60**	3.21***			
Always *tracks				8.26***	7.31***	9.12***			
Parental background *tracks							-3.46***	-3.23***	-3.64***

Notes: Coefficients with standard errors in parenthesis. The superscripts *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The control variables are a constant, student background variables (sex, centred age, centred PB, lower/upper secondary education, vocational/general education), school composition variables (centred school PB, centred standard deviation of school PB, percentage of students speaking a different first language), school input variables (centred student—teacher ratio, centred teacher shortage index, extent of hindrance due to shortage in instruction material, centred index of the extent of responsibility of the school for the curricula and assessment), school characteristics (school type, number of schools competing for students, school location, centred school size, whether the school uses ability grouping), and the 2008 GDP per capita. All models include imputation dummies and imputation variable interaction terms. Poland has no second generation migrants. Full information available from first author.

[5] We present results for three different samples instead of using interactions since using migrant interactions leads to longer tables and does not facilitate the comparability of the results for the three sub groups. When using interactions the results are qualitatively the same.

5.1.1. First generation migrant students

The first model for the first generation migrant students, does not show a significant effect of number of tracks, similar to the first models for native and second generation migrant students. But we also do not find significant effects of entrance requirements, while some of these variables are significant in the models for second generation migrant students (for reading) and native students (always considered).

If we add in model 2 the interactions between number of tracks and entrance selection, we find no significant effect of tracking, similar to results for second generation migrant students but different for native students with one negative coefficient in reading. There are no significant effects of requirements, just like for the second generation, but again this is different to the negative effects of requirements for native students. Finally we do not find significant interaction terms for tracking*requirements, similar to the second generation migrant students (always*tracks as exception), but different to all the significant and positive interactions for tracking* requirements for native students.

In the third model, in which we test for differential parental background effects in relation with tracking, we do not find a significant interaction for tracking*parental background, in contrast to second generation migrant and native students.

Summarizing, we find no relation between the number of tracks and school entrance requirements on educational performance for first generation migrant students. Educational performance of first generation migrant students seems solely driven by individual and school characteristics, and not by the education system of their destination countries.

5.1.2. Second generation migrant students

We find more effects of the number of tracks and school entrance requirements on educational performance of second generation migrant students. In the first model, we find no significant effect of tracking, similar to the native students. But there are two positive coefficients of entrance requirements (for reading only), which is one more than for native students.

In the second model, we do not find a significant effect of tracking, in contrast to one negative effect for native students (reading), or a significant effect of requirements, in contrast to the six negative effects of requirement for native students. Nor do we find significant interactions for tracking* requirements (with the exception of tracks*always, which is significantly positive for reading), in contrast with all significant and positive interactions tracking* requirements for native students.

In the third model, we find a negative interaction for tracking*parental background (also for natives), but the size is more than twice as large as it is for natives. This means that the effect of parental background is strongest in systems with few or no tracks.

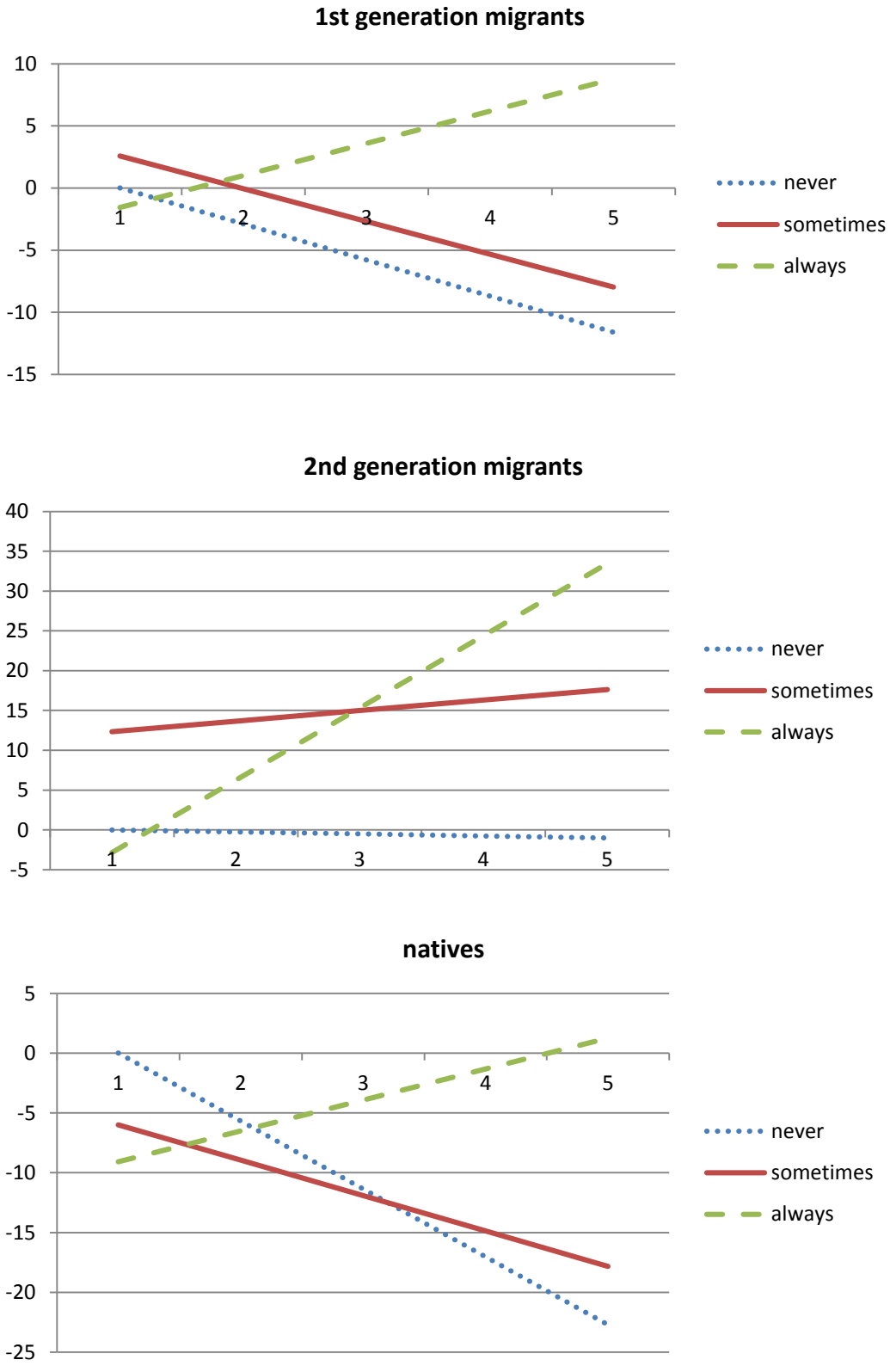
Summarizing, we find only few effects of the number of tracks and school entrance requirements on educational performance of second generation migrant students. Educational performance of second generation migrant students seems mainly driven by individual and school characteristics, and only very marginally by the education system of their destination countries.

5.1.3. Conclusion

Figure 1 displays the values of the combined interactions from Table 2 with reading as the dependent variable. The education system differences in figure 1 for the reading score of native students are more pronounced than for migrant students: for native students there is a positive effect of many tracks on performance, but only if school principals always consider prior performance, while these results for second generation migrant students and first generation migrant students are less outspoken or significant. For the second generation migrant students, there is a positive significant effect of tracking on performance, but only if school principals always consider prior performance. For first generation migrant students, there is no significant difference between the three lines.

These results show that the effects of education systems for migrants are not the same as those for native students. Educational performance of migrant students seems less dependent on characteristics of education systems, than the performance of native students. This is especially true for those who are not born in their destination country, ie first generation migrant students.

Figure 1: Combined coefficients for the interactions between the number of tracks and entrance selection based on earlier performances on the reading performance, for 31 countries, separately for first and second generation migrant and native students.



note: source model 2 of table 2; slope differences for migrant students are not significant.

5.2. Fifteen destination countries, but without origin dummies

Table 3 shows our results for first generation migrant, second generation migrant and native students of the 15 destination countries, for which we know the origin countries of the migrants. We run the same models as for the 31 countries in section 5.1. This allows us to see whether the results between these 31 and 15 countries are very different. However, we have not included yet the dummies for the origin of migrant students, as we do in section 5.3.

Table 3: The relation between the number of tracks, entrance requirements based on earlier performances and test scores the restricted sample

model	(1)	(1)	(1)	(2)	(2)	(2)	(3)	(3)	(3)
dependent variable	read	math	science	read	math	science	read	math	science
First generation									
School considers prior performance:									
Sometimes	7.83	6.24	10.05	-7.12	2.58	-11.96	7.04	5.47	9.20
Always	11.49	12.28	9.68	-18.35	-18.53	-27.77	10.53	11.33	8.67
Number Of tracks	1.15	4.54	4.25	-5.75	0.98	-5.35	-0.08	3.34	2.92
Sometimes *tracks				9.95***	2.81	14.54***			
Always *tracks				13.89***	12.64***	17.87***			
Parental background *tracks							-6.67***	-6.44***	-7.15***
Second generation									
School considers prior performance:									
Sometimes	16.88***	9.48	17.77***	9.65	7.73	7.46	16.83***	9.47	17.77***
Always	23.34***	24.33***	30.44***	-3.09	1.50	-10.53	23.47***	24.48***	30.25***
Number of tracks	-4.615**	0.62	-0.91	-9.820***	-2.64	-9.168***	-4.97**	0.28	-0.40
Sometimes *tracks				5.156*	1.21	7.59***			
Always *tracks				12.30***	10.18***	19.16***			
Parental background *tracks							-1.47	-1.41	1.92
Natives									
School considers prior performance:									
Sometimes	-3.89	-2.12	-3.13	-7.834**	-5.71	-8.156**	-4.11	-2.31	-3.33
Always	3.94	6.26	6.04	-19.78**	-17.30**	-20.93**	4.55	6.81	6.73
Number of tracks	-0.96	4.63	3.41	-4.68	1.02	-0.98	-0.68	4.91	3.74
Sometimes *tracks				2.87	2.62	3.64**			
Always *tracks				11.05***	11.03***	12.76***			
Parental background *tracks							-5.24***	-4.91***	-5.58***

Notes: see table 2.

5.2.1. First generation migrant students

The first model for the first generation migrants does not show a significant effect of the number of tracks, nor do we find a significant effect of entrance requirements. These outcomes are not different for the sample with 31 countries (section 5.1.1).

If we add, in model 2, the interactions between the number of tracks and entrance selection, we find no significant effect of tracking, just like for the 31 countries. There are no significant effects of requirements, also in accordance with the results for the 31 countries. However, we do find five positive significant interaction terms tracking*requirements, in contrast with the insignificant interactions tracking* requirements for the sample containing 31 countries.

In the third model, in which we test for differential parental background effects in relation with tracking, we find three negative significant interactions for tracking*parental background, which differs from the sample where we included all 31 countries. In the full sample we found only insignificant interactions.

Summarizing, we find for these 15 destination countries that first generation migrant students have higher educational performance in highly stratified education systems if school principals always or sometimes use earlier performance in the entrance selection. Educational performance of first generation migrant students in these 15 countries is mainly, but not solely, driven by individual and school characteristics. The performance of migrant students is also influenced by the combination of the school entrance requirements and stratification of the education system of their destination countries.

5.2.2. Second generation migrant students

In the first model, we find one significant effect for the number of tracks, unlike for the second generation migrant students in the 31 countries (section 5.1.2). Table 3 also shows five positive effects of entrance requirements (mostly when the dependent variable is reading or science), which are three more than for the second generation migrant students in the 31 countries.

In the second model, we find two significant effects of tracking (for reading and science), in contrast to no effect for the second generation migrant students in the 31 countries. There are no significant effects of entrance requirements, similar for the 31 countries. However, we find five significant interactions tracking* requirements (mostly for reading and science), in contrast with only one for second generation migrant students in 31 countries.

In the third model, we do not find a negative effect of the interaction tracking*parental background, but we do find one significant effect of number of tracks (for reading only), in contrast with the two significant interactions and no effect of the number of tracks for the second generation migrant students in the 31 countries.

Summarizing, we find more effects of the number of tracks and school entrance requirements on educational performance of second generation migrant students in the 15 destination countries compared to the 31 destination countries. Educational performance of second generation migrant students seems mainly driven by individual and school characteristics, but in the 15 destination countries the education system of seems more influential, than in the 31 destination countries.

5.2.3. Conclusion

The relations between student performance and the education system for native students in 31 versus 15 countries are quite similar, despite some variation in the strength of the coefficients. But the results of first and second generation migrant students deviate between the two samples for 31 countries versus 15 countries: the results from the sample of 15 countries are more diverse and more significant than in the sample with 31 countries. These differences between the two samples show that the general direction of effects of education systems for migrants might be biased by a particular choice of destination countries. Given the similarity of the results between the 31 and 15 countries for the native students, the explanation for the differences for migrant students between the two samples cannot be that the 15 countries are deviant compared to the 31 countries.

Secondly, the results again show that the effects of education systems for migrants might not be the same as for native students.

5.3 Fifteen destination countries with region of origin dummies

Table 4 shows our results for first and second generation students of the 15 destination countries for which we know the countries of origin of the migrants. We run the same models as for the 15 countries in section 5.2. This allows us to see whether the results without and with origin dummies are different from each other and to see the importance of the inclusion of origin dummies to obtain a less biased effect of education systems on performance of migrant students.

Table 4: The relation between the number of tracks, entrance requirements based on earlier performances and test scores for the restricted sample, including region of origin dummies

model dependent variable	(1) read	(1) math	(1) science	(2) read	(2) math	(2) science	(3) read	(3) math	(3) science
First generation									
School considers prior performance:									
Sometimes	6.58	4.80	8.62	-4.99	6.11	-7.57	5.75	4.00	7.75
Always	13.53	15.42	13.99	-11.48	-7.25	-14.47	12.49	14.42	12.88
Number of tracks	-2.99	-1.93	-2.89	-8.45	-3.34	-10.00	-4.42	-3.28	-4.39
Sometimes *tracks				7.741**	-0.48	10.72***			
Always *tracks				11.50***	8.73**	13.51**			
Parental background *tracks							-6.76***	-6.31***	-7.03***
Second generation									
School considers prior performance:									
Sometimes	16.70**	9.56	17.72***	10.75	9.75	8.66	16.67**	9.53	17.77***
Always	25.20***	24.74***	31.19***	2.25	5.69	-6.65	25.38***	24.90***	30.91***
Number Of tracks	-5.05**	0.16	1.53	-9.55***	-2.13	-5.71*	-5.36**	-0.15	2.04
Sometimes *tracks				4.26	-0.23	6.47*			
Always *tracks				10.68***	8.31***	17.54***			
Parental background *tracks							-1.28	-1.36	2.16

Notes: see table 2. Region of origin dummies included.

5.3.1. First generation migrant students

The first model for the first generation does not show a significant effect of the number of tracks, just like in the first models for 15 countries and no origin dummies (section 5.2.1). But we again do not find a significant effect of entrance requirements, just like without the region of origin dummies.

If we add in model 2 the interactions between number of tracks and entrance selection, we find no significant effect of tracking, just like as before. There are no significant effects of requirements, again in accordance with the results without origin dummies. We do find the same five positive significant interaction terms for tracking*requirements as in the sample of 15 countries without region of origin dummies.

In the third model, in which we test for differential parental background effects in relation with tracking, we find the same three negative significant interactions tracking*parental background as for the 15 countries without dummies.

Summarizing, adding the region of origin dummies to the models (which are significant and substantial; see table 5) does not change the effects for entrance requirements and number of tracks for the first generation.

5.3.2. Second generation migrant students

In the first model, we find no significant effect of tracking, just like for the second generation migrant students in 15 countries without origin dummies (section 5.2.2). And there are five positive significant effects of entrance requirements (the dummy for always is most often significant), as for second generation migrant in the 15 countries without origin dummies.

In the second model, we find two negative significant effect of tracking (for the models with as dependent variables the reading and science test scores), just as for second generation in 15 countries without origin dummies. We find four significant positive interactions tracking* requirements (mostly for reading and science), which is one less than for second generation in 15 countries without origin dummies.

In the third model, we do not find negative significant effects of the interaction tracking*parental background, and we find only one significant negative effect of the number of tracks. This is the same as for second generation migrant students in the 15 countries without origin dummies.

5.3.3 Effects of origins

Table 5 shows the coefficients of the origin regions. The reference group is when the origin region is unknown, which, given the cause of this unavailability, can be interpreted as the 'average migrant'. Some coefficients are significant and substantial, both in positive (Northern Europe; Western Europe; North Africa; South-east Asia) and negative terms (West Asia; Oceania), which underlines the importance of the inclusion of the region of origin in cross national analysis of migrant performances. But the coefficients of the region of origin dummies are not always similar across the dependent variables (for instance West Asia) and the same holds for both generations (for instance South Asia).

Table 5: Region of origin dummies from model 2 with the reading test score as the dependent variable, 15 destination countries.

	reading		math	
sample	2nd	1st	2nd	1st
South America	7.83 (6.49)	-2.18 (22.66)	0.197 (5.92)	5.11 (9.41)
North America	4.77 (4.02)	12.39 (14.83)	12.38*** (4.14)	14.10 (12.14)
Caribbean	-10.74 (6.69)	-25.18* (14.78)	5.52 (5.53)	8.80 (14.16)
Northern Europe	41.23** (18.98)	6.63 (11.27)	52.34*** (18.38)	13.89 (9.19)
Western Europe	12.86** (5.79)	12.02 (8.01)	29.11** (14.03)	22.33*** (6.87)
Eastern Europe	9.33 (10.41)	38.14*** (10.09)	6.84 (14.68)	60.66*** (9.89)
Southern Europe	-3.26 (4.75)	11.95 (10.77)	6.05 (7.22)	21.44 (13.33)
North Africa	10.04** (4.21)	0.59 (13.39)	8.71* (5.00)	12.48 (10.29)
Sub-Saharan Africa	-2.23 (7.77)	3.04 (9.35)	-20.17*** (6.24)	1.662 (11.08)
West Asia	-16.95*** (4.61)	-16.43** (6.60)	-8.66 (5.50)	-3.48 (9.58)
South Asia	1.98 (5.33)	-22.37*** (6.76)	-1.43 (6.42)	-20.94*** (6.31)
East Asia	20.38 (17.34)	-2.90 (19.24)	36.72*** (11.61)	13.69(20.43)
South-east Asia	54.38*** (5.52)	56.93*** (7.96)	77.49*** (9.12)	81.10*** (10.74)
Oceania	4.88 (3.34)	-32.92*** (3.16)	-3.43 (2.51)	-39.64*** (3.50)

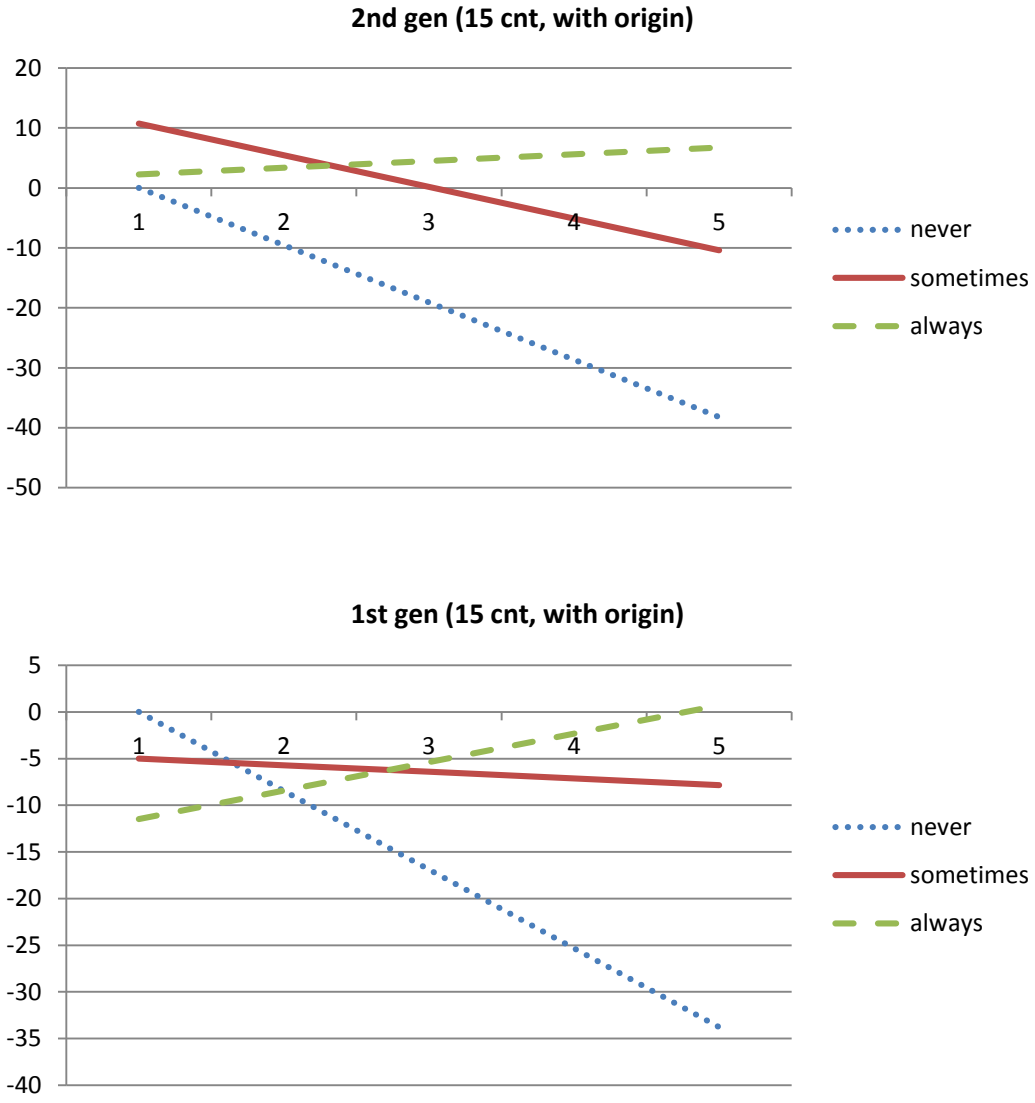
Note: reference category 'origin region unknown'.

The effects of the region of origin dummies on educational performance are substantial and significant, which means that the omission of the origin of migrants as a source of variance in educational performance might lead to flawed conclusions. Table 5 thus shows that the origin composition of migrant population can influence the average educational performance outcomes of destination countries. However, in this particular circumstance, the inclusion of region of origin of the migrant student does not change the relation between tracking, entrance selection of their destination countries, and student performance. Or, in other words, the general direction of effects of education systems for migrants is not biased by the omission of their origin in these analyses (which can be seen by comparing section 5.2 and 5.3).

5.3.4. Conclusion

Figure 2 displays the values of the combined interactions from Table 4 with reading as the dependent variable controlling for region of origin. The education system differences in Figure 2 for the reading score of migrant students, is more or less equal for both generations: negative effect of many tracks on performance if schools never consider prior performance. Another formulation of the same results is that the educational performance of both generation migrant students is the same no matter the numbers of tracks of the education system, as long as schools always consider prior performance when accepting students to the school.

Figure 2: Combined coefficients for the interactions between the number of tracks and entrance selection based on earlier performances on the reading performance, for 15 countries, separate for second and first migrant students with dummies for region of origin



note: source model 2 of table 5; slope differences are not always significant.

6. School-features

Table 6 shows the coefficients of the school-features, other than school selection policies, controlled for in the analyses. The Table shows the same models as model 2 of the Tables 2, 3, and 4 with the reading test score as the dependent variable. Comparison of the second and fifth column (natives) learns us more about the differences between the 31 destination countries and the 15 countries. Most coefficients of the school-features are very similar over the two columns, except for a high percentage of students with another language, which is insignificant in the sample with 15 countries, and mean parental background of schools, which is larger in the sample with 15 countries.

Table 6: Significant school features for native and migrant students in the full sample and the restricted sample, controlling for origin dummies (model 2; reading as dependent variable)

	31 countries			15 countries without origin dummies			15 countries with origin dummies	
sample	natives	2nd gen	1st gen	natives	2nd gen	1st gen	2nd gen	1st gen
Mean school Parental Background	51.16***	54.94***	39.29***	57.00***	49.84***	24.30	46.90***	30.06**
SD of school Parental Background	-12.88*	-23.56	-27.47	-8.29	26.69	-13.02	35.21**	-12.56
10-20% students other language	-2.11	7.20	-32.17***	-3.30	-15.41**	-14.37	-15.16**	-7.80
20-40% students other language	-2.87	31.89**	-24.32*	-0.92	0.23	0.51	4.63	8.59
40-60% students other language	-10.33**	1.80	-22.04	-6.64	-29.22**	-12.83	-25.25**	-3.82
> 60% students other language	-9.24**	2.64	-10.54	-4.08	-9.66	-2.85	-7.17	4.49
Student-teacher ratio	-0.34*	0.18	-0.16	0.31	1.580**	0.93	1.45**	0.88
Teacher shortage	-2.72***	-4.40	-0.58	-2.93*	-3.50	1.82	-3.21	0.26
Shortage instructional material very little	-0.28	9.29	15.96*	1.08	10.59	17.57*	9.35	13.93
Shortage instruct Material to some extent	-3.64**	3.66	7.96	-3.26	-4.28	10.99	-3.88	8.51
Shortage instruct material a lot	-17.95***	-15.55	12.59	-14.94**	-1.98	5.75	1.77	4.83
School responsible for curriculum	0.53	7.51*	4.09	-0.62	-4.22	1.67	-6.22	3.03
Private-dependent	2.869	0.68	-5.25	2.56	12.53**	-0.320	11.51	2.98
Private-independent	-18.13***	-9.57	-42.07**	-30.53**	12.91	-49.68*	17.17	-47.87*
School size	0.01***	0.01	0.01	0.01***	0.01***	-0.01	0.01***	-0.01
Ability grouping for some subjects	-6.59***	7.16	4.70	-7.81**	4.45	-5.11	0.18	-5.58
Ability grouping for all subjects	-6.70**	-16.00	1.405	-4.76	14.28	-17.11**	13.96	-18.80**

Note: tables available from first author.

Comparison of the third and sixth column (second generation migrant students) and the fourth and the seventh column (first generation migrant students) also learns us more about the differences between the 31 destination countries and the 15 countries. Only a few coefficients of the school-features are similar in these comparisons. This might again suggest that these 31 and 15 destination countries differ in characteristics which affect the position of migrants in those countries, like labor market opportunities, social welfare, and ethnic niches. These might therefore also affect the position of migrant students and thus are important school-features for educational performance of migrant students.

The coefficients for second and first generation migrant students, without and with origin dummies (see the last four columns), shows that the inclusion of the region of origin dummies lowers the coefficients somewhat (which makes them insignificant) without altering the direction of the coefficients.

7. Individual characteristics

Table 7 shows the coefficients of the individual characteristics included in the analyses. The Table shows the same models as model 2 of the Tables 2, 3, and 4, with the reading test score as the dependent variable.

Table 7: Student characteristics for native and migrant students in the full sample and the restricted sample, controlling for origin dummies (model 2; reading as dependent variable)

	31 countries			15 countries without origin dummies			15 countries with origin dummies	
sample	natives	2nd	1st	natives	2nd	1st	2nd	1st
Parental background	18.08***	9.38	21.89***	17.34***	14.19***	17.72***	12.89***	15.51***
Gender	35.70***	61.38***	50.24***	34.13***	36.98***	15.96***	36.70***	15.48**
Age	7.032**	0.21	-70.93*	5.76	-17.38	-52.31**	-18.45	-54.80*
Student in (pre) vocational education	-42.87***	-49.47***	-49.70**	-42.11***	-44.38***	-70.22**	-44.91***	-64.69**
Student in upper secondary school	43.09***	51.81***	121.90***	45.62***	50.17***	153.7***	51.85***	136.00**
Small town	-8.292***	-6.709	1.20	-8.13**	11.61*	8.12	11.63**	8.53
town	-10.24***	-7.943	-9.41	-9.11	9.07	12.64	8.13	12.87
city	-13.11***	-11.59	-4.81	-11.86*	8.29	13.74	9.74*	13.80
Large city	-17.94***	-15.10	9.85	-20.28***	-6.58	27.79	-7.68	24.80

Note: tables available from first author

Again the coefficients for the natives in the 31 and 15 countries are quite comparable and stable, but this is less true for the first and second generation migrant students: they vary far more. The coefficients for second and first generation migrant students, without and with origin dummies, differ not much and thus the inclusion of the region of origin of migrant students do not influence the coefficients of the individual characteristics of migrants.

8. Conclusions

The aim of this paper is to investigate the relation between tracking and migrant students' performance (and parental background). To reach this aim, in this paper we combine two insights from the literature on education systems and the literature on migrant outcomes. First, the need for taking into account intervening school level variables, as suggested by Korthals (2012), and, second, the need for including region of origin to correctly estimate models for migrant students, as suggested by Dronkers et al. (2012).

We use a three level model including students, schools and countries. The school level absorbs between-school segregation. In systems that track students, this between-school segregation is related to entrance selection to the school, based on a varying combination of ability and parental background, and in comprehensive systems this between-school segregation is based on parental background (mostly related to spatial segregation). Between-school segregation in tracked systems which select on prior performance, controls for part of the primary effect of parental background, since that children from more privileged background ceteris paribus display higher achievement levels at primary schools and thus have a higher propensity to be selected into higher tracks achievement.

When we simply extend the earlier analyses by separating natives and first and second generation migrant students, we find similar results as Korthals (2012). We find that migrant students in education systems with many tracks which are themselves in schools in which the principal always considers prior performance in accepting students to the school have equal or higher scores than students in systems with only one track, irrespective to whether or not the school principal considers prior performance. We also find that migrant students in education systems with many tracks which

are themselves in schools in which the principal never considers prior performance in accepting students to the school, have lower scores than students in systems with only one track, and also lower than students in systems with many tracks if entrance selection is always based on prior performance. However, in the full sample (31 countries), an influence of education systems for first generation students is absent, while the performance of second generation migrant students is to some extent influenced by tracks or prior performance. But the significance of the combination of tracks and entrance selection is largest for native students: we find the highest number of significant parameters of tracks and entrance selection.

Similarly to for the native students, the effect of parental background is lower for first generation migrant students in systems with many tracks as long as schools consider prior performance. For the first generation migrants in the 15 destination countries we find that many tracks decreases the effect of parental background, if achievement entrance requirements of schools are included, which is similar to the results for native students. The effect of parental background of the second generation in the 15 destination countries does not differ significantly in systems with many or few tracks. However, this deviates from the results for the 31 countries. For these 31 countries we find that many tracks, decreases the effect of parental background if achievement entrance requirements of schools are included for the second generation, but that the effect of parental background of the first generation does not differ significantly in systems with many or few tracks.

Including dummies for the region of origin for the migrant students does not substantially change the outcomes for education systems. Unfortunately we have the origin of migrant students for only 15 of the original 31 countries. Using 15 or 31 countries does not change the results for the native students. This consistency suggests that the 15 countries are not deviant cases compared to the 31 countries. But using 15 or 31 countries does change the results for the migrant students. A possible explanation of these differences for migrant students between both samples might be different origins of the migrant population in the 31 countries compared to the migrant population in the 15 countries. However, the addition of origin dummies does not affect the education system coefficients and the implication of that finding is that the difference between the 15 and 31 destination countries cannot be explained by be the different origins of migrants in these countries. Another explanation of these migrant differences between both samples can be that the general policies and attitudes towards migrants in the 15 countries deviates from those in the 31 countries, and thus that the functioning of education differs between these countries. This might not so much be due to systematic educational differences but more due to general country characteristics, as labor market opportunities, social welfare, and ethnic niches.

Inclusion of region of origin dummies for the migrant students to capture differences in the migrant population of destination countries, influences the coefficients of some individual and school characteristics, but it does not change the main outcomes. Region of origin dummies have in most cases a significant and substantial additive effect on average performance scores, but hardly interact with other individual, school or system effects.

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ImPRovE: Poverty Reduction in Europe. Social Policy and Innovation

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

> How can social cohesion be achieved in Europe?
>
> How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7th Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise two international conferences (Spring 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website http://improve-research.eu.

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