Parents, Schools and Human Capital Differences across Countries

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ONLINE APPENDIX

A Data Appendix

This Appendix discusses in greater detail the construction of some of the variables used in the paper and provides further summary statistics on the PISA and US Census data.

A.1 Data Construction

Additional information on the PISA sample

Given that individual countries participating to PISA have flexibility in choosing how to report parents' countries of birth, some aggregation is necessary to get a set of countries consistently defined over time. For what concerns countries included in the PISA sample, we make the following adjustments: we code *Yugoslavia* and similar labels as Serbia and Montenegro, *USSR* and similar labels as Russia, *Albania or Kosovo* as Albania, *France or Belgium* as France, *Germany or Austria* as Germany, *China (including Hong Kong)* as China. Moreover, for the purpose of estimating (4), we group countries of origin not belonging to the PISA sample in several categories (introducing a fixed effect for each of those): in particular, we create dummies for individual countries when possible (Belarus, Bolivia, Bosnia, Pakistan, Paraguay, Philippines, Ukraine), aggregate others in broad geographical groups (Africa, Europe, Middle East) and classify any remaining case as Rest of the World. We use the same classification of PISA countries when working with the US Census data (for the purpose of estimating specifications with country of origin fixed effects, we create dummies for individual or aggregations of non PISA countries depending on the level of detail of the US Census classification).

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We drop all observations with inconsistent or missing information on students' or parents' countries of birth.

Parents' educational attainment is reported according to the ISCED 1997 classification system. We group levels 0 and 1 into *primary* education, levels 2, 3 and 4 into *secondary* education and levels 5 and 6 into *tertiary* education. We classify parental employment status in working full-time, working part-time and not working using the corresponding question in the Student Questionnaire. This information is not available in the 2006 and 2015 waves; for those waves, we classify as non-working parents that report "housewife", "social beneficiary" or "student" as primary occupations, and as full-time employed everyone else. We also re-classify as non-working any otherwise classified parent in the 2003, 2009 and 2012 waves that reports one of the three occupations mentioned above as primary occupation. The ISEI index, originally developed by Ganzeboom et al. (1992) and updated in Ganzeboom and Treiman (2003), is a measure of occupational status that assigns to each occupation a score based on the average income and education of full-time employed men in that occupation across several countries. It ranges from 16 to 90 for the 2003-2009 waves and from 10 to 90 in the 2012-2015 waves (the difference is due to the fact that the version of the index used in the latter two waves is based on a slightly finer occupational classification).

The educational system controls used in column 2 of Table 1 come from various sources. We take the annual expenditure per student in primary and secondary school from various years of the OECD Education at a Glance dataset, imputing missing observations based on the average expenditure to GDP ratio for each country in the available years. For countries not included in the OECD dataset, we use data on the government expenditure per student in primary and secondary school from the World Development Indicators, and adjust for the fact that this only includes public expenditures by fitting a linear regression on the WDI and OECD data and using the former to predict the latter. Finally, we use data from China to impute values for Shanghai, and rely on country-specific sources for Croatia, Kosovo and Taiwan.[1] We construct our regressor as the sum of expenditure per primary and secondary school student (the cumulative expenditure on a student enrolled in secondary school). Whenever either of the primary or secondary school expenditures is missing, we impute it based on a linear regression on the two variables.

Avg Share Gov Funding and *Share Private* are wave-specific country-level variables constructed using school-level information from the PISA School Questionnaire. In particular, *Avg Share Gov Funding* is the average reported share of funding coming from the government (both local and national), while *Share Private* is the share of schools identified as private, i.e. managed directly or indirectly by a non-government organisation.

External Exit Exams is the share of students subject to exteral exit exams, from Woessmann (2016). This data is only cross-sectional; we use country-level observations across all available waves.

All other controls vary at the school level and come from the School Questionnaires. In particular, *Some Shortage Material* and *Large Shortage Material* are dummies indentifying schools where instruction is "to some extent" and "a lot" hindered by the shortage or inadequacy of instructional materials; *Assessment for Retention*, *Assessment to Group Students* and *Assessment for School Comparison* are dummies identifying schools where formal assessments are used to make decisions about students' retention or promotion, group students for instructional purposes and compare the school to the district or national performance; *Share Certified Teachers (F.T.)* and *Share Certified Teachers (P.T.)* are the reported shares of full-time and part-time teachers who are fully certified by the relevant national authority; *Teacher Monitor - Principal* and *Teacher Monitor - Inspector* are dummies identifying schools where in the previous years teachers had been monitored through class observations

[1]The sources are Eurostat for Croatia, Unicef (2015) for Kosovo and the 2016 Taiwan Statistical Data Book for Taiwan. In all these cases, missing years are imputed using either the average growth rate or the average share of GDP in the available years.

by external inspectors and the school principal; *Autonomy - Hiring*, *Autonomy - Salary*, *Autonomy - Budget* and *Autonomy - Content* are dummies identifying schools where the responsability of selecting teachers for hire, establishing teachers' starting salaries, formulating the budget and determining course content lies with an internal body.

Construction of cultural traits

The five cultural traits considered in Section 6.2 of the paper are costructed as follows.

- *Long term orientation*. We follow Figlio et al. (2016) and several others in using the measure developed by Hofstede (1991) and updated in Hofstede et al. (2010) using data from the World Value Survey. For countries participating only to more recent waves of the World Value Survey - therefore not covered in Hofstede et al. (2010) - we use the estimates provided by Hofstede Insights, available at `https://www.hofstede-insights.com/` (in our regression sample, the only country for which this is relevant is Lebanon; the results are virtually identical when this country is excluded). The original measure ranges from 0 to 100; we rescale it so that it ranges from 0 to 1.

- *Hard work*. We follow Guiso et al. (2003), Alesina and Giuliano (2015) and several others in using answers to the World Value Survey question *How would you place your views on this scale? 1 means you agree completely with the statement "In the long run, hard work usually brings a better life"; 10 means you agree completely with the statement "Hard work doesn't generally bring success - it's more a matter of luck and connections"*. We recode the answers such that high numbers correspond to stronger beliefs that hard work is important, standardize them so that they have an average of 0 and a standard deviation of 1 in the WVS sample and compute country-level averages (using the provided sample weights).

- *Locus of control*. We use answers to the World Value Survey question *Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means "none at all" and 10 means "a great deal" to indicate how much freedom of choice and control you feel you have over the way your life turns out.* This question is commonly referred to as the locus of control measure in the WVS, and closely resembles those included in the Nowicki-Strickland and Rotter Internal-External Locus of Control scales, used respectively in Coleman and DeLeire (2003) and Lekfuangfu et al. (2018). We standardize the answers so that they have an average of 0 and a standard deviation of 1 in the WVS sample and compute country-level averages (using the provided sample weights).

- *Trust*. We follow a large literature (reviewed in, among others, Guiso et al., 2006; Algan and Cahuc, 2014) in using answers to the World Value Survey question *Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*. We recode the answers such that high numbers correspond to higher trust, standardize them so that they have an average of 0 and a standard deviation of 1 in the WVS sample and compute country-level averages (using the provided sample weights).

- *Secular-Rational Values*. We follow Inglehart and Welzel (2005) in constructing an indicator for secular-rational values as the first principal component of average answers across countries and waves to 10 World Value Survey questions (see Inglehart and Welzel, 2005, for the full list).

A.2 Additional Summary Statistics

Table A.2.1: Average PISA Scores across Regions

	Math	Reading	Science	# Countries
East Asia	0.86	0.61	0.73	8
Canada	0.63	0.67	0.70	1
EU North	0.57	0.53	0.57	15
Oceania	0.48	0.56	0.60	2
US	0.26	0.46	0.44	1
EU South	0.18	0.21	0.23	5
EU East	-0.12	-0.20	-0.10	21
Other Asia	-0.40	-0.36	-0.32	5
Middle East/NA	-0.58	-0.53	-0.50	9
Latin America	-0.60	-0.38	-0.49	12

Notes: The Table shows the average PISA score of native students across countries belonging to each region, for all available waves (for Science, only waves from 2006 onwards are considered, since the scale was established in 2006 and results from 2003 are not fully comparable with the subsequent ones). Country averages are computed using the provided sample weights. Scores are standardized to have mean 0 and (individual-level) standard deviation 1 across the (pooled, equally weighted) countries participating to at least one wave of the test. Countries are assigned to regional groups as follows. *East Asia*: China, Hong Kong, Japan, Macao, Shanghai, Singapore, South Korea, Taiwan. *EU North*: Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Liechtenstein, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom. *Oceania*: Australia, New Zealand. *EU South*: Greece, Italy, Malta, Portugal, Spain. *EU East*: Albania, Azerbaijan, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia and Montenegro, Slovak Republic, Slovenia. *Other Asia*: India, Indonesia, Malaysia, Thailand, Vietnam. *Latin America*: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, Venezuela. *Middle East / North Africa*: Algeria, Israel, Jordan, Lebanon, Mauritius, Qatar, Tunisia, Turkey, United Arab Emirates.

Table A.2.2: Second Generation Immigrants by Country of Origin - PISA

Country of Origin	Mothers: Number	Mothers: # Host Countries	Mothers: Top Host Country	Fathers: Number	Fathers: # Host Countries	Fathers: Top Host Country
Albania	542	5	Greece (370)	488	6	Greece (343)
Argentina	107	2	Uruguay (106)	95	1	Uruguay (95)
Australia	190	2	New Zealand (189)	147	1	New Zealand (147)
Austria	253	2	Switzerland (199)	188	2	Switzerland (152)
Azerbaijan	1	1	Moldova (1)	1	1	Moldova (1)
Belgium	356	3	Luxembourg (333)	320	2	Luxembourg (293)
Brazil	243	4	Uruguay (109)	225	4	Uruguay (108)
Bulgaria	57	3	Turkey (54)	37	2	Turkey (34)
Canada	2	1	Ireland (2)	2	1	Ireland (2)
Chile	57	1	Argentina (57)	50	1	Argentina (50)
China	17156	12	Macao (10803)	15994	11	Macao (9840)
Colombia	12	1	Costa Rica (12)	11	1	Costa Rica (11)
Croatia	275	3	Serbia-Mont. (159)	228	3	Serbia-Mont. (108)
Czech Republic	238	2	Slovakia (230)	246	2	Slovakia (237)
Denmark	103	2	Norway (102)	114	1	Norway (114)
Estonia	98	1	Finland (98)	58	1	Finland (58)
Finland	2	1	Denmark (2)	2	1	Denmark (2)
France	1533	6	Switzerland (634)	1357	7	Switzerland (484)
Georgia	1	1	Moldova (1)	2	1	Moldova (2)
Germany	1652	10	Switzerland (661)	1329	10	Switzerland (497)
Greece	101	2	Australia (72)	179	2	Australia (142)
Hong Kong	305	2	Macao (237)	534	3	Macao (450)
Hungary	39	3	Austria (27)	45	3	Slovakia (20)
Iceland	6	1	Denmark (6)	7	1	Denmark (7)
India	294	4	Australia (224)	297	4	Australia (232)
Ireland	102	1	United Kingdom (102)	84	1	United Kingdom (84)
Italy	1681	8	Switzerland (1091)	2803	9	Switzerland (1833)
Jordan	209	1	Qatar (209)	166	1	Qatar (166)
Kazakhstan	12	1	Moldova (12)	9	1	Moldova (9)
Kosovo	34	1	Macedonia (34)	24	1	Macedonia (24)
Lebanon	322	2	Denmark (231)	337	2	Denmark (234)
Liechtenstein	35	1	Switzerland (35)	27	1	Switzerland (27)
Macao	169	1	Hong Kong (169)	159	1	Hong Kong (159)
Macedonia	33	2	Austria (24)	35	2	Austria (24)
Malaysia	65	4	Australia (52)	56	4	Australia (44)
Netherlands	278	4	Belgium (247)	334	5	Belgium (263)
New Zealand	966	1	Australia (966)	1014	1	Australia (1014)
Norway	11	1	Denmark (11)	7	1	Denmark (7)
Panama	26	1	Costa Rica (26)	33	1	Costa Rica (33)
Poland	367	4	Germany (266)	278	4	Germany (219)
Portugal	3073	4	Luxembourg (2057)	2945	5	Luxembourg (2033)
Romania	80	3	Austria (70)	76	3	Austria (56)
Russia	5532	13	Estonia (1685)	5358	13	Estonia (1733)
Serbia-Mont.	2981	10	Switzerland (1620)	2968	10	Switzerland (1626)
Singapore	11	1	Indonesia (11)	14	2	Indonesia (13)
Slovakia	552	2	Czech Republic (548)	652	2	Czech Republic (649)
Slovenia	11	2	Austria (7)	17	2	Austria (9)
South Korea	52	2	Australia (30)	51	2	Australia (32)
Spain	348	6	Switzerland (325)	428	5	Switzerland (403)
Sweden	468	3	Finland (293)	372	3	Finland (220)
Switzerland	100	1	Liechtenstein (100)	79	1	Liechtenstein (79)
Taiwan	39	1	Hong Kong (39)	13	2	Hong Kong (10)
Thailand	24	2	Finland (23)	2	1	Finland (2)
Turkey	2527	8	Denmark (579)	2793	9	Denmark (595)

United Kingdom	4302	5	Australia (2528)	4561	5	Australia (2778)
United States	493	7	Mexico (210)	631	7	Mexico (346)
Uruguay	89	1	Argentina (89)	88	1	Argentina (88)
Vietnam	464	4	Australia (397)	464	3	Australia (383)
Average	846.19	3.16		841.97	3.16	

Notes: The Table shows summary statistics on second generation immigrants from each country of origin in the PISA sample (with at least one observation per parent). *# Host Countries* is the number of different host countries in which second generation immigrants are observed. *Top Host Country* is the host country where the highest number (reported in brackets) of second generation immigrants are observed.

Table A.2.3: Second Generation Immigrants by Host Country - PISA

Host Country	Mothers: Number	Mothers: # Countries of Origin	Mothers: Top Country of Origin (in PISA)	Fathers: Number	Fathers: # Countries of Origin	Fathers: Top Country of Origin (in PISA)
Argentina	723	6	Uruguay (89)	668	6	Uruguay (88)
Australia	10242	17	United Kingdom (2528)	10714	17	United Kingdom (2778)
Austria	2106	16	Turkey (419)	2071	16	Turkey (451)
Belgium	3304	7	Turkey (397)	3738	7	Turkey (433)
Costa Rica	939	3	Panama (26)	984	3	Panama (33)
Croatia	2739	4	Serbia-Mont. (451)	2545	4	Serbia-Mont. (414)
Czech Republic	814	6	Slovakia (548)	1069	6	Slovakia (649)
Denmark	2758	12	Turkey (579)	2899	12	Turkey (595)
Dominican Republic	149	3	United States (9)	203	3	United States (19)
Estonia	2049	2	Russia (1685)	2266	2	Russia (1733)
Finland	1253	10	Sweden (293)	1385	10	Sweden (220)
Georgia	244	2	Russia (105)	238	2	Russia (99)
Germany	1607	11	Turkey (416)	1702	11	Turkey (462)
Greece	1677	3	Albania (370)	1115	3	Albania (343)
Hong Kong	6458	4	China (5597)	5959	4	China (5494)
Indonesia	116	5	Singapore (11)	141	4	Singapore (13)
Ireland	1519	14	United Kingdom (1157)	1451	15	United Kingdom (1078)
Israel	2808	5	Russia (850)	3019	5	Russia (798)
Kazakhstan	1101	2	Russia (921)	1052	2	Russia (860)
Kyrgyzstan	423	2	Russia (93)	258	2	Russia (91)
Latvia	2220	4	Russia (952)	2558	4	Russia (1090)
Liechtenstein	271	9	Switzerland (100)	223	11	Switzerland (79)
Luxembourg	5091	10	Portugal (2057)	5133	10	Portugal (2033)
Macao	11583	5	China (10803)	10904	7	China (9840)
Macedonia	245	5	Serbia-Mont. (52)	179	5	Serbia-Mont. (38)
Mauritius	75	4	China (10)	51	4	China (8)
Mexico	999	4	United States (210)	1299	4	United States (346)
Moldova	541	9	Russia (122)	554	10	Russia (125)
Netherlands	1769	17	Turkey (206)	1884	16	Turkey (239)
New Zealand	2266	8	United Kingdom (581)	2399	8	United Kingdom (666)
Norway	1425	3	Sweden (163)	1435	3	Sweden (139)
Portugal	1996	5	Brazil (82)	1760	5	Brazil (84)
Qatar	6205	4	Jordan (209)	5419	4	Jordan (166)
Serbia-Mont.	2422	4	Croatia (159)	1813	4	Croatia (108)
Slovakia	632	4	Czech Republic (230)	695	4	Czech Republic (237)
Slovenia	1872	3	Italy (16)	1973	3	Italy (21)
South Korea	71	7	China (24)	19	2	United States (2)
Switzerland	8499	11	Serbia-Mont. (1620)	8341	11	Italy (1833)
Turkey	340	5	Germany (89)	294	5	Germany (48)
United Kingdom	2655	10	Ireland (102)	2840	10	Ireland (84)
Uruguay	389	4	Brazil (109)	427	4	Brazil (108)
Average	2307.20	6.56		2284.81	6.54	

Notes: The Table shows summary statistics on second generation immigrants observed in each country in the PISA sample, across all available waves. Only host countries with second generation immigrants from at least one country of origin in the PISA sample are included. *# Countries of Origin* is the number of different countries of origin of second generation immigrants in a given host country. *Top Country of Origin (in PISA)* is the country of origin from which the highest number (across all countries in the PISA sample, not considering other countries of origin) of second generation immigrants in a given host country are observed (number reported in brackets).

Table A.2.4: Second Generation Immigrants by Country of Origin - US Census

Country of Origin	Mothers	Fathers
Albania	24	66
Algeria	12	7
Argentina	369	338
Australia	182	87
Austria	474	434
Azerbaijan	28	33
Belgium	172	138
Brazil	219	109
Bulgaria	11	44
Canada	5239	3918
Chile	145	124
China	1446	1523
Colombia	648	556
Costa Rica	166	86
Denmark	230	180
Dominican Republic	611	585
Estonia	63	69
Finland	131	73
France	754	368
Germany	6498	3555
Greece	1263	1597
Hong Kong	176	113
Hungary	562	905
Iceland	28	16
India	501	670
Indonesia	181	189
Ireland	2053	1529
Israel	311	387
Italy	4454	5493
Japan	1345	271
Jordan	65	96
Latvia	210	214
Lebanon	131	138
Liechtenstein	24	13
Lithuania	217	268
Luxembourg	24	5
Macao	18	4
Malaysia	16	13
Malta	68	96
Mauritius	8	7
Mexico	13575	13830
Moldova	-	3
Netherlands	766	776
New Zealand	70	41
Norway	271	246
Panama	343	233
Peru	269	355
Poland	1199	1589
Portugal	702	781
Qatar	1	-
Romania	199	251
Singapore	30	13
South Korea	750	419
Spain	336	324
Sweden	280	125

Switzerland	246	194
Taiwan	154	109
Thailand	108	46
Trinidad and Tobago	172	198
Tunisia	20	27
Turkey	97	147
United Kingdom	4641	2326
Uruguay	65	53
Venezuela	66	59
Vietnam	116	36
Average	823.89	715.35

Notes: The Table shows the numbers of second generation immigrants on the mother's and father's sides from each country of origin in the US Census sample.

B Robustness of Baseline Result

B.1 PISA

Results for Second Generation Immigrants on the Father's Side

Table B.1.1: Results for Second Generation Immigrants on Father's Side - PISA

	Dependent Variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
	All				No East Asia
Score Country *f*	0.792***	0.653***	0.305**	0.202**	0.148
	(0.194)	(0.215)	(0.132)	(0.085)	(0.096)
Female	-0.113***	-0.142***	-0.156***	-0.199***	-0.183***
	(0.035)	(0.034)	(0.030)	(0.026)	(0.029)
Father Sec Edu		-0.063**	-0.024	-0.005	-0.004
		(0.030)	(0.028)	(0.017)	(0.035)
Father Ter Edu		-0.134**	0.003	-0.003	-0.010
		(0.055)	(0.043)	(0.037)	(0.054)
Mother Sec Edu		0.078	0.088**	-0.009	0.041
		(0.060)	(0.039)	(0.041)	(0.077)
Mother Ter Edu		-0.025	0.106***	0.009	0.050
		(0.072)	(0.038)	(0.040)	(0.077)
Mother Working × Working Mother ISEI		0.004***	0.004***	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Father Working × Working Father ISEI		0.006***	0.005***	0.002***	0.002***
		(0.001)	(0.001)	(0.000)	(0.001)
Different Lang at Home		-0.113**	-0.105***	-0.070***	-0.067**
		(0.054)	(0.040)	(0.026)	(0.027)
11-25 Books		0.188***	0.139***	0.081***	0.101***
		(0.039)	(0.027)	(0.025)	(0.034)
26-100 Books		0.431***	0.353***	0.200***	0.238***
		(0.049)	(0.037)	(0.037)	(0.042)
101-200 Books		0.566***	0.482***	0.266***	0.304***
		(0.063)	(0.037)	(0.047)	(0.050)
201-500 Books		0.777***	0.663***	0.385***	0.426***
		(0.075)	(0.049)	(0.061)	(0.075)
500+ Books		0.698***	0.600***	0.351***	0.398***
		(0.081)	(0.053)	(0.082)	(0.100)
N	48834	48834	48834	48834	32069
# Country f	58	58	58	58	52
R Squared	0.11	0.24	0.35	0.66	0.62
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the father's side. The sample includes only cases where both parents report a country of origin and the country of origin of the father participates to PISA. *Score Country f* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the father, across all available waves. All specifications control for intercept, students' age (in months), wave fixed effect and a dummy for mother's immigrant status; specifications 2-5 additionally control for dummies for parents' employment status (full-time employed, part-time employed, not working). *Working* refers to either full-time or part-time employed. Observations are weighted according to the provided sample weights. Standard errors are clustered by father's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Results for Second Generation Immigrants and Natives

Table B.1.2: Results for All Second Generation Immigrants and Natives - PISA

	Dependent Variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Country *m*	0.414**	0.371**	0.229*	0.150**	0.105*
	(0.177)	(0.172)	(0.123)	(0.067)	(0.059)
Score Country *f*	0.459**	0.403**	0.248**	0.160**	0.102
	(0.180)	(0.177)	(0.118)	(0.065)	(0.063)
Score Country *m* * Native Mother	0.174	0.067	-0.031	-0.032	0.055
	(0.149)	(0.163)	(0.098)	(0.059)	(0.051)
Score Country *f* * Native Father	-0.026	-0.088	-0.176	-0.114**	-0.035
	(0.153)	(0.167)	(0.112)	(0.057)	(0.060)
Female	-0.110***	-0.113***	-0.112***	-0.143***	-0.145***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)
Native Mother	-0.117*	-0.179**	-0.052	-0.013	0.035
	(0.064)	(0.086)	(0.060)	(0.040)	(0.032)
Native Father	-0.009	-0.142*	-0.028	0.004	0.009
	(0.069)	(0.076)	(0.066)	(0.029)	(0.029)
Father Sec Edu		-0.041	0.004	-0.024	-0.007
		(0.038)	(0.027)	(0.020)	(0.033)
Father Ter Edu		-0.087	0.044	-0.049	-0.035
		(0.062)	(0.045)	(0.034)	(0.046)
Mother Sec Edu		0.002	0.082*	-0.004	0.058*
		(0.063)	(0.048)	(0.037)	(0.032)
Mother Ter Edu		-0.111	0.098*	-0.024	0.034
		(0.089)	(0.059)	(0.043)	(0.038)
Native Father * Father Sec Edu		0.105***	0.082***	0.041**	0.021
		(0.039)	(0.029)	(0.016)	(0.029)
Native Father * Father Ter Edu		0.193***	0.095**	0.070*	0.052
		(0.062)	(0.047)	(0.036)	(0.048)
Native Mother * Mother Sec Edu		0.041	0.008	0.006	-0.055*
		(0.064)	(0.047)	(0.038)	(0.030)
Native Mother * Mother Ter Edu		0.161*	0.020	0.021	-0.039
		(0.089)	(0.058)	(0.044)	(0.037)
Mother Working × Working Mother ISEI		0.004***	0.005***	0.003***	0.003***
		(0.001)	(0.001)	(0.000)	(0.000)
Father Working × Working Father ISEI		0.006***	0.006***	0.003***	0.003***
		(0.000)	(0.000)	(0.000)	(0.001)
Different Lang at Home		0.006	-0.026	0.015	0.025
		(0.031)	(0.044)	(0.038)	(0.035)
11-25 Books		0.093***	0.091***	0.042*	0.037
		(0.028)	(0.027)	(0.022)	(0.022)
26-100 Books		0.283***	0.287***	0.158***	0.155***
		(0.032)	(0.032)	(0.030)	(0.032)
101-200 Books		0.402***	0.417***	0.240***	0.242***
		(0.045)	(0.043)	(0.044)	(0.048)
201-500 Books		0.575***	0.594***	0.371***	0.381***
		(0.055)	(0.051)	(0.054)	(0.058)
500+ Books		0.548***	0.567***	0.362***	0.362***
		(0.070)	(0.067)	(0.062)	(0.070)
N	1445071	1445071	1445071	1445071	1326079
# Country *m*	59	59	59	59	52
# Country *f*	58	58	58	58	52
R Squared	0.34	0.43	0.45	0.62	0.60
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants and natives. The sample includes only cases where both parents report a country of origin that runs a PISA test on natives. *Score Country m* and *Score Country f* are the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and father, across all available waves. All specifications control for intercept, students' age (in months), wave fixed effect and a dummy for father's immigrant status; specifications 5-6 additionally control for dummies for parents' employment status (full-time employed, part-time employed, not working). *Working* refers to either full-time or part-time employed. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's and father's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Results for Reading and Science

Table B.1.3: Reduced Form Results - Reading

	Dependent Variable: Reading Test Score				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Read Country *m*	0.600**	0.409*	0.095	0.143***	0.112**
	(0.248)	(0.212)	(0.091)	(0.047)	(0.048)
Female	0.296***	0.264***	0.255***	0.208***	0.229***
	(0.034)	(0.028)	(0.023)	(0.028)	(0.029)
Father Sec Edu		0.039	0.061**	0.055	0.113***
		(0.056)	(0.031)	(0.038)	(0.033)
Father Ter Edu		-0.049	0.085**	0.049	0.093**
		(0.077)	(0.038)	(0.041)	(0.045)
Mother Sec Edu		0.072	0.090**	-0.023	-0.003
		(0.072)	(0.042)	(0.026)	(0.047)
Mother Ter Edu		-0.044	0.110***	-0.017	-0.005
		(0.095)	(0.039)	(0.035)	(0.057)
Mother Working × Mother ISEI		0.004***	0.004***	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Father Working × Father ISE		0.005***	0.004***	0.001**	0.002**
		(0.001)	(0.001)	(0.001)	(0.001)
Different Lang at Home		-0.212**	-0.139***	-0.105***	-0.096*
		(0.091)	(0.054)	(0.040)	(0.050)
11-25 Books		0.201***	0.198***	0.126***	0.149***
		(0.060)	(0.046)	(0.031)	(0.039)
26-100 Books		0.465***	0.398***	0.219***	0.262***
		(0.048)	(0.037)	(0.038)	(0.039)
101-200 Books		0.607***	0.542***	0.273***	0.314***
		(0.068)	(0.048)	(0.046)	(0.055)
201-500 Books		0.768***	0.666***	0.373***	0.433***
		(0.078)	(0.057)	(0.075)	(0.088)
500+ Books		0.753***	0.647***	0.397***	0.449***
		(0.089)	(0.052)	(0.065)	(0.069)
N	49097	49097	49097	49097	31347
# Country *m*	59	59	59	59	52
R Squared	0.07	0.22	0.35	0.68	0.64
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample includes only cases where both parents report a country of origin and the country of origin of the mother runs a PISA test on natives. *Score Read Country m* is the average reading PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. All specifications control for intercept, students' age (in months), wave fixed effect and a dummy for father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Table B.1.4: Reduced Form Results - Science

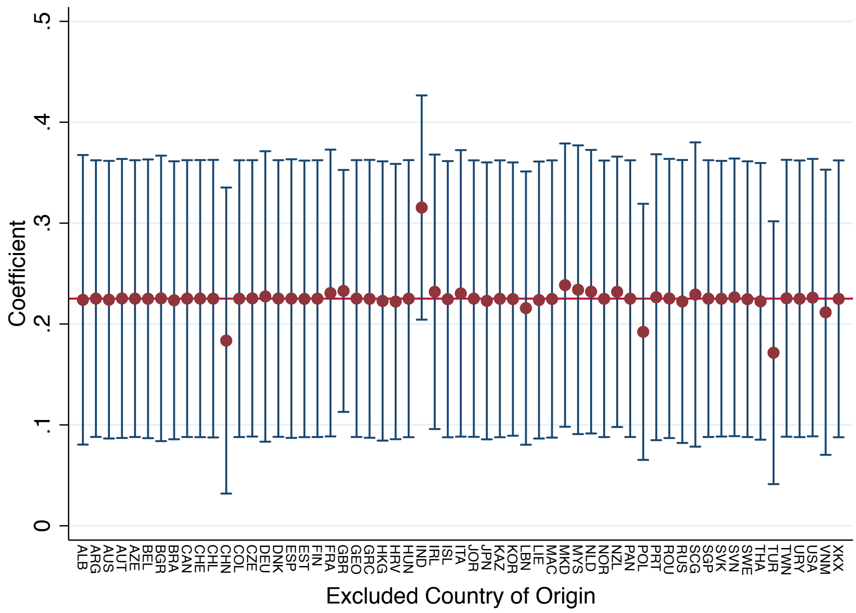
	Dependent Variable: Science Test Score				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Science Country *m*	0.711***	0.507**	0.227**	0.245***	0.209***
	(0.240)	(0.228)	(0.115)	(0.068)	(0.076)
Female	-0.038	-0.070**	-0.082***	-0.125***	-0.103***
	(0.037)	(0.030)	(0.026)	(0.026)	(0.023)
Father Sec Edu		0.046	0.079**	0.066*	0.122***
		(0.064)	(0.033)	(0.034)	(0.040)
Father Ter Edu		-0.021	0.123***	0.084**	0.126***
		(0.074)	(0.028)	(0.040)	(0.049)
Mother Sec Edu		0.005	0.063	-0.023	0.013
		(0.068)	(0.038)	(0.030)	(0.050)
Mother Ter Edu		-0.111	0.086**	-0.024	-0.002
		(0.091)	(0.037)	(0.033)	(0.057)
Mother Working × Mother ISEI		0.004***	0.003***	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Father Working × Father ISEI		0.005***	0.004***	0.001***	0.002**
		(0.001)	(0.001)	(0.001)	(0.001)
Different Lang at Home		-0.189***	-0.131***	-0.122***	-0.114***
		(0.073)	(0.047)	(0.034)	(0.037)
11-25 Books		0.186***	0.188***	0.128***	0.145***
		(0.055)	(0.039)	(0.029)	(0.038)
26-100 Books		0.477***	0.415***	0.250***	0.298***
		(0.051)	(0.040)	(0.043)	(0.043)
101-200 Books		0.605***	0.546***	0.299***	0.341***
		(0.068)	(0.045)	(0.054)	(0.068)
201-500 Books		0.839***	0.736***	0.457***	0.527***
		(0.085)	(0.067)	(0.077)	(0.084)
500+ Books		0.790***	0.693***	0.499***	0.567***
		(0.088)	(0.062)	(0.079)	(0.077)
N	43463	43463	43463	43463	27503
# Country *m*	58	58	58	58	51
R Squared	0.08	0.23	0.35	0.66	0.61
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample includes only cases where both parents report a country of origin and the country of origin of the mother runs a PISA test on natives. *Score Science Country m* is the average science PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. All specifications control for intercept, students' age (in months), wave fixed effect and a dummy for father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

The Influence of Single Origin and Host Countries

In this section we investigate to what extent our results are driven by specific countries of origin or host countries. Figure B.1.1 shows the estimated coefficient of interest when countries of origin are excluded one by one. The resulting estimates are never significantly different from the baseline, represented by the horizontal line. Even if the difference is insignificant, the coefficient is substantially higher when second generation students from India are excluded; this reflect the fact that these students are outliers since they perform relatively well even though, across natives, India is near the bottom of the international ranking. On the other hand, the coefficient becomes somewhat smaller when second generation immigrants from China, Poland and Turkey are excluded. Overall, the statistical significance and the rough magnitude of our coefficient of interest is not driven by any specific country of origin.

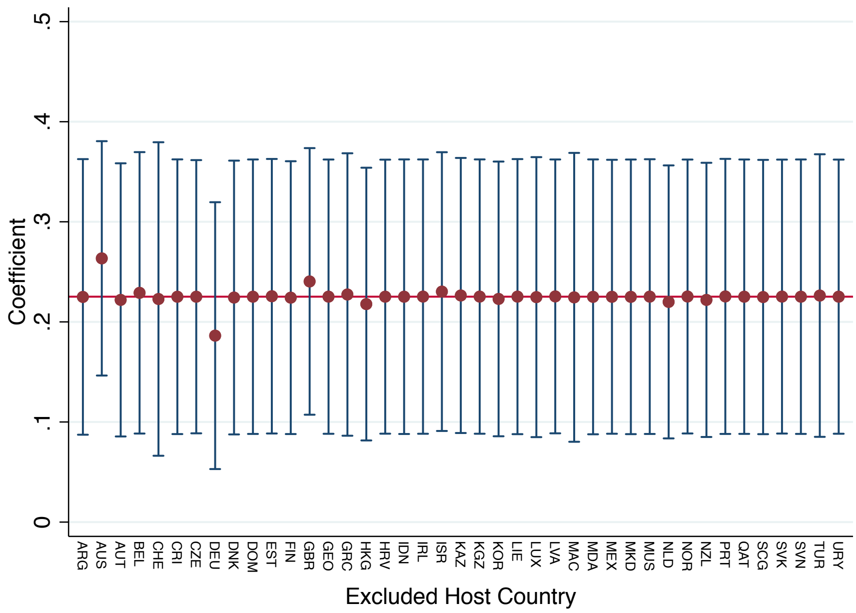
Figure B.1.1: Reduced Form Coefficient when Excluding Countries of Origin One by One



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the average PISA score of natives in mother's country of origin, with the dependent variable and other controls being the same as in column 4 of Table 4 in the paper. Each dot corresponds to a different specification, where students with mothers from the indicated country of origin are excluded. Standard errors are clustered by mother's country of origin.

Figure B.1.2 shows the result from the corresponding exercise on host countries. The coefficient is positive, significant and quite stable across all specifications. The coefficient is a bit higher (even though the difference is not statistically significant) when second generation immigrants in Australia are excluded from the sample. While in principle this might be due to a number of factors, a possible rationalization is the relatively stronger negative selection of East Asian emigrant parents to Australia, given the geographic proximity.

Figure B.1.2: Reduced Form Coefficient when Excluding Host Countries One by One



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the average PISA score of natives in mother's country of origin, with the dependent variable and other controls being the same as in column 4 of Table 4 in the paper. Each dot corresponds to a different specification, where students in the indicated host country are excluded. Standard errors are clustered by mother's country of origin.

Excluding Host Countries with Low Secondary School Enrollment

The PISA test is only adminstered to children that are in school at age 15, and misses by construction early dropouts. In this section we examine whether differential selection in this dimension significantly biases our cross-parental-nationality comparisons for second generation immigrants. Table B.1.5 reports results from our baseline reduced form specification, with the sample being progressively restricted to host countries with nearly universal gross secondary school enrollment.[2] The underlying idea is that selection into enrollment is unlikely to be an important margin in countries where it is nearly universal.

Compared to the full sample specification (reported in Column 1), restricting the sample to host countries with a secondary enrollment of at least 90% (Column 2), 95% (Column 3) and 100% (Column 4) hardly changes the coefficient on the PISA score in mothers' countries of origin.

[2]We use the (year-specific) gross secondary enrollment ratio from the World Bank's World Development Indicators database. We impute missing observations fitting a linear time trend (only for countries for at least one yearly observation). For most developed countries, the gross enrollment rate is higher than 100%, due to underage and overage children attending secondary school.

Table B.1.5: Reduced Form Results-PISA (Host Countries with High School Enrollment)

	Dependent Variable: Math Test Score			
	[1]	[2]	[3]	[4]
	All	Enrollment $\geqslant 90\%$	Enrollment $\geqslant 95\%$	Enrollment $\geqslant 100\%$
Score Country *m*	0.225***	0.223***	0.221***	0.216**
	(0.072)	(0.076)	(0.079)	(0.090)
Female	-0.200***	-0.193***	-0.194***	-0.187***
	(0.022)	(0.023)	(0.024)	(0.025)
Father Sec Edu	0.028	0.050*	0.050	0.057*
	(0.021)	(0.027)	(0.030)	(0.034)
Father Ter Edu	0.019	0.039	0.040	0.048
	(0.028)	(0.035)	(0.039)	(0.044)
Mother Sec Edu	-0.038	-0.039	-0.043	-0.062
	(0.032)	(0.046)	(0.050)	(0.048)
Mother Ter Edu	-0.035	-0.037	-0.035	-0.050
	(0.033)	(0.042)	(0.045)	(0.045)
Mother Working × Mother ISEI	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Father Working × Father ISEI	0.002***	0.002***	0.002***	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Different Lang at Home	-0.066**	-0.052*	-0.052*	-0.059*
	(0.029)	(0.029)	(0.030)	(0.034)
11-25 Books	0.092***	0.121***	0.110***	0.113***
	(0.027)	(0.025)	(0.027)	(0.032)
26-100 Books	0.201***	0.230***	0.224***	0.223***
	(0.037)	(0.032)	(0.032)	(0.038)
101-200 Books	0.260***	0.294***	0.290***	0.288***
	(0.044)	(0.041)	(0.042)	(0.046)
201-500 Books	0.392***	0.431***	0.424***	0.423***
	(0.063)	(0.059)	(0.060)	(0.067)
500+ Books	0.404***	0.436***	0.431***	0.435***
	(0.072)	(0.069)	(0.071)	(0.077)
N	49097	38539	32052	23422
# Country m	59	54	53	53
# Host Country	59	54	53	53
R Squared	0.66	0.63	0.61	0.59
School × Wave FE	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The specification is the same as in Table 4 in the main text. Columns 2, 3 and 4 exclude students in host countries where the gross secondary enrollment ratio is smaller than the indicated thresholds. Standard errors are computed using the provided replicate weights, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Standard Errors

Computation of Sampling and Imputation Variances

Throughout the paper, standard errors for the analyses on PISA data are constructed taking into account the fact that student performance is reported through plausible values. Using the average of the five plausible values as a measure of individual performance guarantees unbiased estimates of group-level means and regression coefficients; however, measures of dispersion need to take into account the within-student variability in plausible values.

As recommended in OECD (2009), for the purpose of computing standard errors all regression with individual test scores as dependent variable are estimated five times, using all plausible values in turn. For each regression we employ an estimator for the sampling variance clustered at the level of the mother's country of origin. The final sampling variance, SV, is given by the average of the sampling variances obtained with the five plausible values.

In addition, standard errors are inflated by the imputation variance due to the fact that test scores measure the latent student's skills with error. The imputation variance, IV, is estimated as the average squared deviation between the estimates obtained with each plausible value and the final estimate (obtained using the average of the plausible values), with the appropriate degree of freedom adjustment.

Finally, as shown in Little and Rubin (1987), the final error variance TV can be obtained by combining the sampling and imputation variance in

$$TV = SV + \left(1 + \frac{1}{K}\right) IV$$

where $K = 5$ is the number of plausible values for each student. The final standard errors are given by the squared roots of the final error variances.

Balance Repeated Replication Method

As an alternative to estimate SV, OECD (2009) recommends to apply Fay's variant of the Balanced Repeated Replication (BRR) method, which directly takes into account the two-stage stratified sampling design of the PISA test. This is implemented by iterating each regression over the 80 sets of replicate weights provided in the PISA dataset. The sampling variance estimate is then given by the average squared deviation between the replicated estimates and the estimate obtained with final weights, with a degree of freedom correction depending on the Fay coefficient (a parameter that governs the variability between different sets of replicate weights).

Table B.1.6 shows the resulting standard errors for our baseline specification. For computational convenience, we implemented the "unbiased shortcut" procedure described in OECD (2009), which uses only one set of plausible values to estimate the sampling variance (while the imputation variance is estimated using all five sets, as described above). In all specifications, the standard error on our coefficient of interest is smaller compared to Table 4 in the main text, suggesting that our clustered sampling variance is rather conservative.

Table B.1.6: Reduced Form Results - PISA (BRR Standard Errors)

	Dependent Variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Country *m*	0.755***	0.628***	0.271***	0.225***	0.174***
	(0.038)	(0.036)	(0.039)	(0.039)	(0.046)
Female	-0.116***	-0.145***	-0.155***	-0.200***	-0.186***
	(0.024)	(0.020)	(0.018)	(0.018)	(0.023)
Father Sec Edu		0.015	0.027	0.028	0.053
		(0.040)	(0.030)	(0.023)	(0.042)
Father Ter Edu		-0.044	0.051	0.019	0.034
		(0.049)	(0.038)	(0.029)	(0.044)
Mother Sec Edu		0.033	0.064**	-0.038	-0.007
		(0.032)	(0.031)	(0.023)	(0.041)
Mother Ter Edu		-0.071	0.081*	-0.035	-0.012
		(0.049)	(0.043)	(0.030)	(0.046)
Mother Working × Mother ISEI		0.003***	0.004***	0.001**	0.001*
		(0.001)	(0.001)	(0.000)	(0.001)
Father Working × Father ISEI		0.006***	0.005***	0.002***	0.002***
		(0.001)	(0.001)	(0.000)	(0.001)
Different Lang at Home		-0.131***	-0.081***	-0.066***	-0.056*
		(0.031)	(0.027)	(0.026)	(0.030)
11-25 Books		0.124***	0.139***	0.092***	0.116***
		(0.037)	(0.029)	(0.026)	(0.036)
26-100 Books		0.398***	0.359***	0.201***	0.242***
		(0.029)	(0.026)	(0.029)	(0.042)
101-200 Books		0.519***	0.487***	0.260***	0.302***
		(0.037)	(0.032)	(0.034)	(0.046)
201-500 Books		0.726***	0.661***	0.392***	0.453***
		(0.040)	(0.033)	(0.033)	(0.044)
500+ Books		0.677***	0.613***	0.404***	0.465***
		(0.052)	(0.044)	(0.044)	(0.055)
N	49097	49097	49097	49097	31347
# Country m	59	59	59	59	52
R Squared	0.10	0.23	0.34	0.66	0.62
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample and specifications are the same as in Table 4 in the main text. Standard errors are computed using the provided replicate weights, and inflated by the estimated measurement error in test scores. The sampling variance is estimated through the "unbiased shortcut" procedure described in OECD (2009). * denotes significance at 10%, ** at 5%, *** at 1%.

Corrections for Small Number of Clusters

Throughout the paper we take into account that the regression error can be correlated within countries of origin by clustering standard errors at the country of origin level through the cluster-robust estimator proposed by White (1984) and Liang and Zeger (1986). Differently from other estimators (like the FGLS estimator), these standard errors do not require assumptions on the pattern of within cluster error correlation. However, they require that the number of clusters goes to infinity. Inference when there are few clusters can be difficult. There is no clear consensus on when the number of clusters should be considered too small; depending on the situation it ranges from 20 to 50 (Cameron and Miller, 2015). The current consensus seems to be that 50 clusters - as for state-year panel data in the US - should be sufficient for reliable inference (Cameron and Miller, 2015; Angrist and Pischke, 2009). Since our estimates rely on about 60 clusters, standard errors should not be considerably biased.

In Table B.1.7 we assess the robustness of our inference by adopting several alternative clustering techniques, specifically designed to take into account possible biased given by the presence of few clusters. First, we use the wild cluster bootstrap resampling method suggested by Cameron et al. (2008). The second panel of Table B.1.7 reports in squared brackets the p-value obtained from the wild cluster bootstrap, using 999 replications and Rademacher weights.[3] Moreover, Cameron and Miller (2015) stress the need to tackle the presence of possible outliers when wild bootstrapping clusters, since the results may be very sensitive to the inclusion of clusters with many outliers. Below we also report the p-values obtained from the wild cluster bootstrap technique, computed on a sample where we excluded the lowest and the top percentile of the grade distribution. The results are very similar to those that include outliers, but slightly more statistically significant. Second, we follow the aggregation method proposed by Donald and Lang (2007) and suggested to address cases where the independent variable of interest does not vary within clusters (see Angrist and Pischke, 2009). The third panel of Table B.1.7 reports the p-values obtained from the regressions aggregated at the country of origin level, performed both weighting and not weighting the sample by the number of second generation immigrants per country of origin.[4] Finally, in the last panel we report standard errors obtained adopting a two-way clustering technique that allows for both within country of origin and within school error correlation.

[3]Inference is obtained using the stata command *boottest* (Roodman et al., 2019); as suggested, we report p-values because their estimation requires less assumptions in terms of asymptotic distribution of the estimated coefficient.

[4]As suggested byAngrist and Pischke (2009), in the regression at the country of origin level, we always report the p-values obtained from the most conservative estimate between the one obtained correcting and the one obtained not correcting the standard errors for heteroskedasticity (i.e. that with the largest standard errors).

Table B.1.7: Corrections for Few Clusters - PISA

	[1]	[2]	[3]	[4]	[5]
		All			No East Asia
	Dependent Variable: Math Test Score				
Score Country *m*	0.755	0.628	0.271	0.225	0.174
Standard clustering p-value (White)	*[0.001]*	*[0.006]*	*[0.025]*	*[0.002]*	*[0.027]*
	Wild Boostrap p values (Cameron et al., 2008)				
Wild bootstrap p-value	*[0.023]*	*[0.063]*	*[0.112]*	*[0.000]*	*[0.020]*
Wild bootstrap p-value (No Outliers)	*[0.009]*	*[0.022]*	*[0.036]*	*[0.000]*	*[0.007]*
	Donald and Lang (2007) procedure				
Donald Lang p-value (Unweighted)	*[0.000]*	*[0.000]*	*[0.001]*	*[0.003]*	*[0.161]*
Donald Lang p-value (Weighted)	*[0.000]*	*[0.000]*	*[0.001]*	*[0.000]*	*[0.014]*
	Two-way clustering school and country of origin				
Two-way clustering p-value	*[0.001]*	*[0.006]*	*[0.025]*	*[0.001]*	*[0.008]*
N	49097	49097	49097	49097	31347
# Country m	59	59	59	59	52
Host Country × Wave FE	No	No	Yes	No	No
School × Wave FE	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample and specifications are the same as in Table 4 in the main text. The displayed p-values are obtained: (i) using the standard clustering procedure (White, 1984); (ii) using the wild cluster bootstrap procedure (999 replications with Rademacher weights) suggested by Cameron et al. (2008) on the entire sample and excluding outliers in the grade distribution; (iii) using the procedure proposed by Donald and Lang (2007) based on data aggregate at the cluster-level; and (iv) clustering both by country of origin and by school-wave (two-way clustering).

Controlling for alternative Measures of Socio-Economic Status

Table B.1.8 considers alternative measures of parental socio-economic status available from the PISA questionnaires. In Column 2 we control for an index of family wealth, based on the presence and the number of various items in students' homes, including computers, cars, cellular phones, televisions and rooms with bath or shower. Column 3 includes an index of home possessions, which is based on all elements in the wealth index and additionally considers books, various educational resources and pieces of classical culture. Column 4 considers the broadest measure available in PISA, an index of Economic, Social and Cultural Status (ESCS) which combines home possessions with information on parents' education and occupational status. All indexes are standardized to take mean 0 and (individual-level) standard deviation 1 across all the countries (pooled, equally weighted) participating to the test.

The results are very similar compared to the baseline specification, reported in column 1. The magnitude of our coefficient of interest varies little across specifications, even when (in Column 5) we introduce all indexes of socio-economic status in the same regression. Home possessions and the ESCS index are positively related to students' performance, while wealth is not.[5] Overall, the results suggest the controlling further for observable measures of socio-economic background does not affect affect the magnitude of our estimated parental component.

[5]Much of the variation in wealth seems to be absorbed by the school fixed effect, since this index enters positively and significantly in a specification with host country fixed effects (results not shown, available upon request).

Table B.1.8: Alternative Measures of Socio-economic Status

	Dependent Variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
Score Country *m*	0.225***	0.298***	0.267***	0.255***	0.282***
	(0.072)	(0.081)	(0.077)	(0.074)	(0.079)
Female	-0.200***	-0.185***	-0.194***	-0.191***	-0.193***
	(0.022)	(0.027)	(0.024)	(0.024)	(0.026)
Father Sec Edu	0.028	0.066**	0.036		
	(0.021)	(0.033)	(0.023)		
Father Ter Edu	0.019	0.101**	0.061*		
	(0.028)	(0.041)	(0.033)		
Mother Sec Edu	-0.038	0.001	-0.020		
	(0.032)	(0.036)	(0.033)		
Mother Ter Edu	-0.035	0.063	0.016		
	(0.033)	(0.038)	(0.035)		
Mother Working × Mother ISEI	0.001				
	(0.001)				
Father Working × Father ISEI	0.002***				
	(0.001)				
Different Lang at Home	-0.066**				
	(0.029)				
11-25 Books	0.092***				
	(0.027)				
26-100 Books	0.201***				
	(0.037)				
101-200 Books	0.260***				
	(0.044)				
201-500 Books	0.392***				
	(0.063)				
500+ Books	0.404***				
	(0.072)				
Wealth		-0.010			-0.224***
		(0.020)			(0.040)
Home Possessions			0.095***		0.210***
			(0.017)		(0.034)
ESCS				0.099***	0.075***
				(0.027)	(0.026)
N	49097	43427	49090	49090	43427
# Country m	59	58	59	59	58
R Squared	0.66	0.66	0.65	0.65	0.67
School × Wave FE	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample includes only cases where both parents report a country of origin and the country of origin of the mother runs a PISA test on natives. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. All specifications control for intercept, students' exact age (in months), wave fixed effect and a dummy for father immigrant status; specification 1 additionally controls for dummies for parents' employment status (full-time employed, part-time employed, not working). *Working* refers to either full-time or part-time employed. *Wealth*, *Home Possessions* and *ESCS* are indexes of socio-economic status, discussed in the text. Observations weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** denotes significance at 5%, *** denotes significance at 1%.

Misclassification of Parental Immigration Status

The classification of parents' migration status and of their country of origin relies on answers given by students to the Student Questionnaire. A possible concern is that students might fail to accurately recall this information. Here we investigate this by exploiting the fact that for some countries participating to the 2012 and 2015 waves the Parent Questionnaire includes a question on whether parents were born there or abroad. While this does not speak to the possibility that the immigrant parents' country of origin might be misclassified, it allows to explore the importance and consequences of measurement error in the recorded immigration status.

Out of the 8758 immigrant mothers in our sample for which this additional source of information is available, 727 (8.3%) are reported to be native in the Parent Questionnaire (the corresponding figure for fathers is 11.7%). To assess the possible consequences for our results, Table B.1.9 reports estimates from our baseline specification when the sample is restricted to mothers for whom the migration information from the Parent Questionnaire is available (column 2), and those for whom the Parent Questionnaire confirms that they were born abroad (column 3). The full sample results are reported for reference in column 1.

While the substantially smaller sample size comes with a loss of precision, the point estimates for our coefficient of interest are similar across specifications. If anything, limiting the sample to mothers consistently classified as immigrants across questionnaires increases the gap across nationalities.

Table B.1.9: The Consequences of Misclassification of the Parental Immigration Status - PISA

	Dependent Variable: Math Test Score		
	[1]	[2]	[3]
	All	Migration Status Available in Parent Questionnaire	Classified as Migrants in Parent Questionnaire
Score Country *m*	0.225***	0.248	0.291
	(0.072)	(0.183)	(0.188)
Female	-0.200***	-0.245***	-0.235***
	(0.022)	(0.029)	(0.025)
Father Sec Edu	0.028	0.104	0.099
	(0.021)	(0.074)	(0.079)
Father Ter Edu	0.019	0.040	0.036
	(0.028)	(0.078)	(0.074)
Mother Sec Edu	-0.038	-0.119**	-0.124**
	(0.032)	(0.051)	(0.059)
Mother Ter Edu	-0.035	-0.050	-0.048
	(0.033)	(0.080)	(0.074)
Mother Working × Mother ISEI	0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)
Father Working × Father ISEI	0.002***	0.001	0.000
	(0.001)	(0.001)	(0.001)
Different Lang at Home	-0.066**	0.010	0.065
	(0.029)	(0.128)	(0.127)
11-25 Books	0.092***	0.152**	0.122*
	(0.027)	(0.068)	(0.063)
26-100 Books	0.201***	0.215***	0.193***
	(0.037)	(0.058)	(0.049)
101-200 Books	0.260***	0.259***	0.253***
	(0.044)	(0.081)	(0.080)
201-500 Books	0.392***	0.264***	0.232**
	(0.063)	(0.101)	(0.113)
500+ Books	0.404***	0.408**	0.343***
	(0.072)	(0.168)	(0.126)
N	49097	8758	8031
# Country m	59	25	23
R Squared	0.66	0.73	0.69
School × Wave FE	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The specification is the same as in Table 4 in the main text. Column 2 restricts the sample to host countries where the migration status question is available in the Parent Questionnaire, and column 3 to the cases where parents report to be immigrants when answering that question. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Unreported Countries of Origin

Across host countries, Student Questionnaires include different countries or group of countries as possible answers to the question identifying mothers' and fathers' countries of origin. For example, the 2015 Questionnaire in Australia lists 10 countries and one residual category ("Other country") as possible answers, while in Costa Rica there only 5 available options (Costa Rica, Colombia, Nicaragua, Panama and Other). This reflects choices of the national educational authorities, aimed to avoid the identification of individual test takers. As a result, in most countries only the most frequent nationalities are reported separately.

As shown in Tables A.2.2 and A.2.3, this implies that several countries of origin are reported in a limited number of host countries, and that in several host countries a limited number of countries of origin are observed.

While this fact implies a particular country-of-origin selection criterion, we do not see any reason why this should bias our result. Our strategy is based on within-country or within-school comparisons across reported parental nationalities; any systematic difference between reported and unreported countries of origin would not affect these comparisons. Reported countries of origin are generally closer and culturally more similar to the host country than unreported ones, but not differentially so between high- and low-scoring countries of origin (consistently with the fact, shown in Table 7 of the paper, that controls for linguistic and cultural distance do not explain our correlation of interest).

As a further check, Table B.1.10 displays results when the sample is restricted to host countries where several parental nationalities are observed. For both the host-country and school fixed effects specifications, our relationship of interest remains positive and significant when focusing on host countries with at least 5 (columns 2 and 4) or 10 (columns 3 and 6) reported countries of origin that participate to the PISA test. This suggests that the result is not driven by some selection pattern occurring in countries with more selective reporting (or less variety) of parents' nationalities.

Table B.1.10: Reduced Form Results for Host Countries with Several Recorded Parental Nationalities - PISA

	Dependent Variable: Math Test Score					
	[1]	[2]	[3]	[4]	[5]	[6]
	Number of Parental Nationalities in Host Country					
	$\geqslant 1$	$\geqslant 5$	$\geqslant 10$	$\geqslant 1$	$\geqslant 5$	$\geqslant 10$
Score Country *m*	0.271**	0.375**	0.215*	0.225***	0.245***	0.193**
	(0.119)	(0.153)	(0.119)	(0.072)	(0.080)	(0.093)
Female	-0.155***	-0.175***	-0.185***	-0.200***	-0.211***	-0.227***
	(0.024)	(0.033)	(0.030)	(0.022)	(0.030)	(0.036)
Father Sec Edu	0.027	-0.027	0.080	0.028	0.041	0.027
	(0.027)	(0.027)	(0.070)	(0.021)	(0.039)	(0.072)
Father Ter Edu	0.051	0.013	0.108	0.019	0.017	-0.001
	(0.038)	(0.041)	(0.087)	(0.028)	(0.052)	(0.081)
Mother Sec Edu	0.064*	0.077	0.005	-0.038	-0.017	0.031
	(0.037)	(0.053)	(0.059)	(0.032)	(0.061)	(0.063)
Mother Ter Edu	0.081**	0.097*	0.005	-0.035	-0.037	0.029
	(0.039)	(0.053)	(0.066)	(0.033)	(0.055)	(0.057)
Mother Working × Mother ISEI	0.004***	0.004***	0.003***	0.001	0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Father Working × Father ISEI	0.005***	0.004***	0.006***	0.002***	0.001	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Different Lang at Home	-0.081*	-0.079	-0.051	-0.066**	-0.057	-0.020
	(0.045)	(0.063)	(0.039)	(0.029)	(0.035)	(0.040)
11-25 Books	0.139***	0.168***	0.134***	0.092***	0.102***	0.058
	(0.033)	(0.041)	(0.036)	(0.027)	(0.033)	(0.045)
26-100 Books	0.359***	0.429***	0.344***	0.201***	0.222***	0.230***
	(0.036)	(0.037)	(0.042)	(0.037)	(0.046)	(0.038)
101-200 Books	0.487***	0.586***	0.506***	0.260***	0.285***	0.322***
	(0.039)	(0.038)	(0.048)	(0.044)	(0.051)	(0.052)
201-500 Books	0.661***	0.713***	0.693***	0.392***	0.436***	0.470***
	(0.059)	(0.055)	(0.049)	(0.063)	(0.070)	(0.046)
500+ Books	0.613***	0.679***	0.663***	0.404***	0.440***	0.505***
	(0.046)	(0.053)	(0.064)	(0.072)	(0.082)	(0.061)
N	49097	19005	7312	49097	19005	7312
# Country m	59	48	35	59	48	35
R Squared	0.34	0.27	0.24	0.66	0.60	0.49
Host Country × Wave FE	Yes	Yes	Yes	No	No	No
School × Wave FE	No	No	No	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The specification is the same as in Table 4 in the main text. Columns 2-3 and 5-6 restrict the sample to host countries where more than the indicated threshold of parental nationalities are reported. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

B.2 US Census

Results for Second Generation Immigrants on the Father's Side

Table B.2.1: Reduced Form Results on Second Generation Immigrants on the Father's Side - US Census

	Dependent variable: 1 = Never repeated a grade				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Country f	0.114***	0.063***	0.039***	0.033**	0.027**
	(0.039)	(0.020)	(0.014)	(0.013)	(0.013)
Female	0.071***	0.071***	0.070***	0.070***	0.071***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mother Sec Edu		0.074***	0.058***	0.058***	0.057***
		(0.017)	(0.015)	(0.015)	(0.016)
Mother Ter Edu		0.082***	0.071***	0.072***	0.071***
		(0.014)	(0.012)	(0.013)	(0.013)
Father Sec Edu		0.037***	0.031***	0.028***	0.030***
		(0.007)	(0.006)	(0.007)	(0.007)
Father Ter Edu		0.044***	0.043***	0.040***	0.043***
		(0.011)	(0.008)	(0.007)	(0.007)
Log Family Income		0.044***	0.035***	0.033***	0.034***
		(0.007)	(0.005)	(0.005)	(0.005)
N	46310	46310	46310	46310	43875
# Country f	64	64	64	64	57
R Squared	0.07	0.09	0.13	0.13	0.13
Comm Zone FE	No	No	Yes	Yes	Yes
Years Since Migr Father	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the father's side. *Score Country f* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the father, across all available waves. All specifications control for intercept, child age dummies, parents' age, number of siblings, year fixed effect, (year-specific) quarter of birth fixed effect and mother's immigrant status. Observations weighted according to the provided sample weights. Standard errors are clustered by father's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

Results for Second Generation Immigrants and Natives

Table B.2.2: Reduced Form Results on All Second Generation Immigrants and Natives - US Census

	Dependent variable: 1 = Never repeated a grade				
	[1]	[2]	[3]	[4]	[5]
			All		No East Asia
Score Country *m*	0.052**	0.024**	0.016	0.013	0.011
	(0.023)	(0.010)	(0.010)	(0.008)	(0.009)
Score Country *f*	0.083***	0.042***	0.030***	0.024**	0.020**
	(0.030)	(0.014)	(0.011)	(0.010)	(0.010)
Native Mother	-0.006	-0.061***	-0.067***	0.000	-0.071***
	(0.007)	(0.021)	(0.016)	(0.000)	(0.019)
Native Father	-0.004	-0.047**	-0.055***	-0.061***	-0.058***
	(0.009)	(0.020)	(0.014)	(0.016)	(0.015)
Female	0.084***	0.085***	0.085***	0.085***	0.085***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Mother Sec Edu		0.059***	0.056***	0.054***	0.055***
		(0.017)	(0.015)	(0.015)	(0.016)
Mother Ter Edu		0.069***	0.067***	0.065***	0.062***
		(0.017)	(0.014)	(0.015)	(0.016)
Father Sec Edu		0.039***	0.035***	0.033***	0.036***
		(0.012)	(0.009)	(0.009)	(0.009)
Father Ter Edu		0.049***	0.047***	0.046***	0.048***
		(0.018)	(0.013)	(0.013)	(0.013)
Mother Sec Edu × Native Mother		0.054***	0.054***	0.056***	0.055***
		(0.017)	(0.015)	(0.015)	(0.016)
Mother Ter Edu × Native Mother		0.060***	0.061***	0.063***	0.066***
		(0.017)	(0.015)	(0.015)	(0.016)
Father Sec Edu × Native Father		0.034***	0.039***	0.041***	0.038***
		(0.013)	(0.010)	(0.010)	(0.009)
Father Ter Edu × Native Father		0.048***	0.053***	0.055***	0.052***
		(0.018)	(0.014)	(0.013)	(0.013)
Log Family Income		0.035***	0.035***	0.035***	0.035***
		(0.001)	(0.000)	(0.000)	(0.000)
N	1299888	1293208	1293208	1293208	1288857
# Country *m*	64	64	64	64	57
# Country *f*	64	64	64	64	57
R Squared	0.04	0.07	0.08	0.08	0.08
County FE	No	Yes	Yes	Yes	Yes
Years Since Migr Mother	No	No	No	Yes	Yes
Years Since Migr Father	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants and natives. Sample includes only cases where both parents report a country of origin that runs a PISA test on natives. *Score Country m* and *Score Country f* are the average math PISA score of natives (standardized to have mean 0 and standard deviation 1) in the country of birth of the mother and father, across all available waves. All specifications control for intercept, child age dummies, parents' age, number of siblings, log family income, year fixed effect and (year-specific) quarter of birth fixed effect. Observations are weighted accordind to the provided sample weights. Robust standard errors clustered by mother's and father's country of origin. * denotes significance at 10%, ** denotes significance at 5%, *** denotes significance at 1%.

Standard Errors

Corrections for Small Number of Clusters - US Census

As we did for the PISA sample, we now assess the robustness of our standard error estimators also for the regressions run on the US Census data. We adopt the same set of alternative methods to take into account within cluster correlation and the possible bias given by the presence of few clusters. Table B.2.3 reports in squared brackets the p-values obtained from: (i) the wild cluster bootstrapping method, using 999 replications and Rademacher weights,[6] (ii) the aggregation method proposed by Donald and Lang (2007)[7] and (iii) the two-way clustering method to account for both within commuting zone (since we do not have information on schools in the US Census data) and within country of origin error correlation.

Table B.2.3: Corrections for Few Clusters - US Census

	Dependent Variable: 1= Never repeated a grade				
	[1]	[2]	[3]	[4]	[5]
	All				No East Asia
Score Country *m*	0.094	0.050	0.032	0.029	0.023
Standard clustering p-value (White)	*[0.003]*	*[0.001]*	*[0.002]*	*[0.000]*	*[0.034]*
	Wild Boostrap p values (Cameron et al., 2008)				
Wild bootstrap p-value	*[0.076]*	*[0.020]*	*[0.014]*	*[0.031]*	*[0.127]*
	Donald and Lang (2007) procedure				
Donald Lang p-value (Unweighted)	*[0.032]*	*[0.129]*	*[0.117]*	*[0.151]*	*[0.439]*
Donald Lang p-value (Weighted)	*[0.004]*	*[0.007]*	*[0.005]*	*[0.008]*	*[0.023]*
	Two-way clustering commuting zone and country of origin				
Two-way clustering p-value	*[0.003]*	*[0.001]*	*[0.002]*	*[0.006]*	*[0.037]*
N	53553	53553	53553	53553	49634
# Country m	64	64	64	64	57
Comm Zone FE	No	No	Yes	Yes	Yes
Years Since Migr Mother	No	No	No	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample and specifications are the same as in Table 5 in the main text. P-values obtained: (i) using the standard clustering procedure (White, 1984); (ii) using the wild cluster bootstrap procedure (999 replications with Rademacher weights) suggested by Cameron et al. (2008); (iii) using the procedure proposed by Donald and Lang (2007) based on data aggregate at the cluster-level; and (iv) clustering both by country of origin and by commuting zone-wave (two-way clustering).

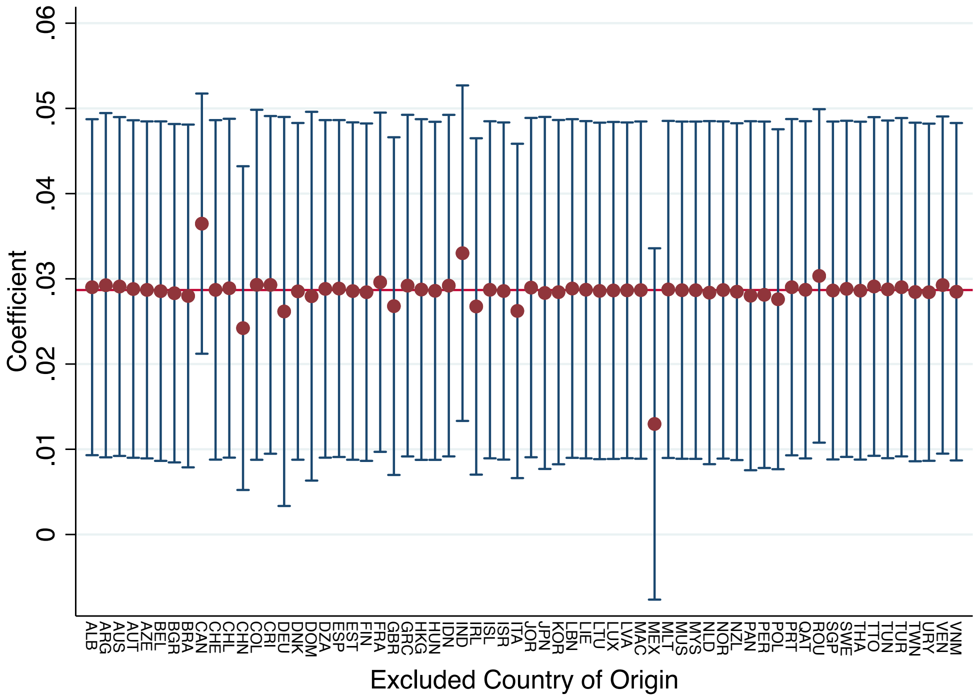
[6] In this case, since the dependent variable is a dummy variable, we do not report the p-values obtained from a regression that excludes outliers.

[7] Again, as suggested by Angrist and Pischke (2009), for the regression at the country of origin level we always report the p-values relative to the most conservative estimate between the one obtained correcting and the one obtained not correcting the standard errors for heteroskedasticity (i.e. that with the largest standard errors).

The Influence of Single Origin Countries

This section investigates the role of specific countries of origin in driving the US Census result. Figure B.2.1 displays the estimates of the coefficient of interest from the specification in column 4 of Table 5 in the paper, when students whose mothers come from specific countries of origin are removed from the sample. It is apparent that some countries play an important role. In particular, the coefficient roughly halves and loses statistical significance when Mexico is excluded. Moreover, the exclusion of China leads to a visible decrease in the coefficient, while the exclusions of Canada or India lead to visible increases.

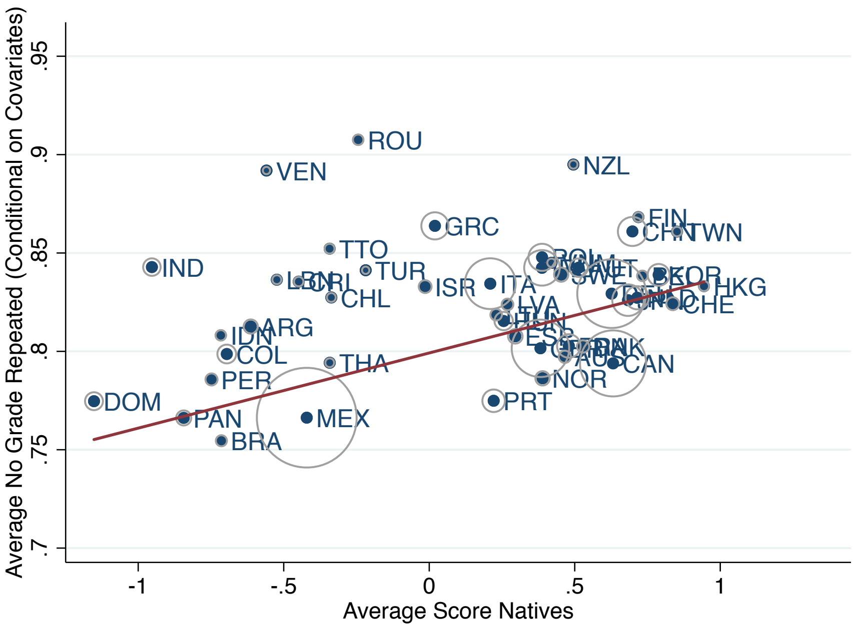
Figure B.2.1: Reduced Form Coefficient when Excluding Countries of Origin One by One - US Census



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the average PISA score of natives in mother's country of origin, with the dependent variable and other controls being the same as in column 4 of Table 5. Each dot corresponds to a different specification, where students with mothers from the indicated country of origin are excluded. Standard errors are clustered by mother's country of origin.

To better visualise the contribution of these countries, Figure B.2.2 plots the predicted values of *No Grade Repeated* (conditional on all covariates) across countries of origin, against the average performance of natives in those countries. Mexico plays an important role given that it is by far the largest country of origin in the sample, especially on the bottom half of the country of origin PISA score distribution: Mexican mothers account for 25% of the whole sample, and 74% of the observations from countries with a PISA score below the international mean (see Table A.2.4 for the sample sizes by country of origin). When Mexico is excluded, the relationship of interest is estimated mostly out of the performance gaps in the upper end of the PISA score distribution. Among those countries, Canada drives the estimate down, as second generation immigrants from this country perform relatively poorly and represent a large portion of the sample. Excluding both Mexico and Canada leads to a point estimate of 0.02, statistically different from 0 at the 5% confidence level.

Figure B.2.2: Grade Repetition across Mothers' Countries of Origin - US Census

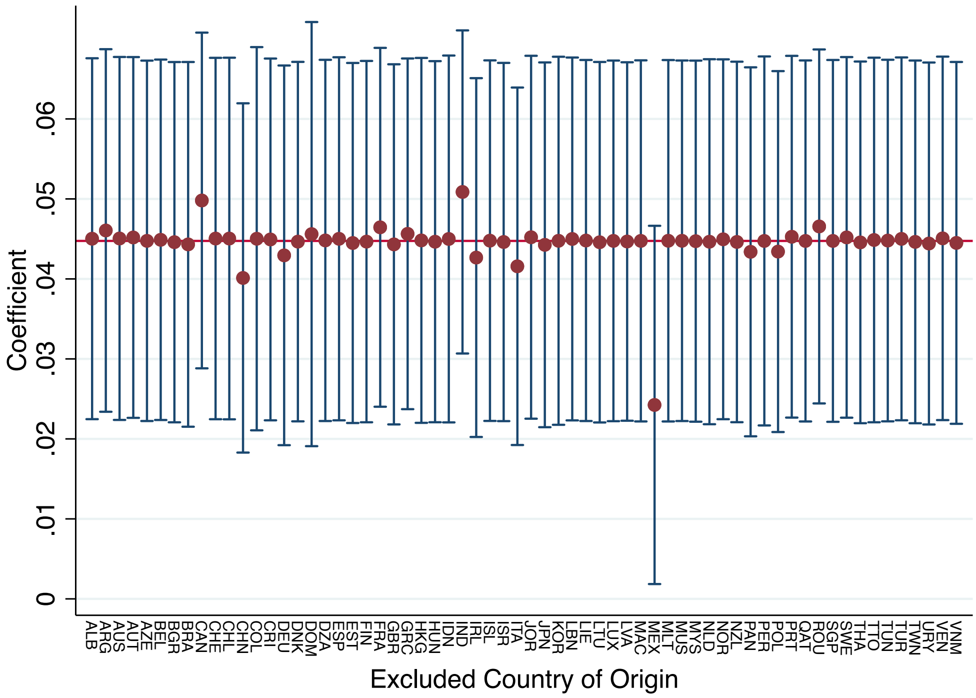


Notes: The Figure plots the predicted values from a regression with *No Grade Repeated* as dependent variable and fixed effects for mother's country of origin, year-specific commuting zones fixed effects and all the other controls included in column 4 of Table 5, with all covariates except country of origin fixed effects set at their sample mean and the sample restricted to second generation immigrants on the mother's side. The size of the circles is proportional to the number of second generation immigrants on the mother's side in the sample; only countries with 100 or more are displayed. The line shows the best (weighted) linear fit.

An additional reason why Mexico is particularly influential for the result is related to the composition of the sample along some observable characteristics. In Appendix D.1 we show that the baseline result for the US Census is mostly driven by mothers with an immigrant partner, while the effect is not statistically different from zero for mothers with a native partner. It turns out that Mexican mothers are disproportionately more likely to be matched with an immigrant partner (61% of Mexican mothers in the sample fall in this category, compared to an overall sample share of 46%), so that, when they are excluded, the sample becomes significantly more tilted towards mothers with a native partner, for whom the correlation between their kids' performance and T^m is much weaker. To illustrate this, Figure B.2.3 displays the estimates of the coefficient of interest (based once again on the specification in column 4 of Table 5 in the paper) for mothers with an immigrant partner only, when specific countries of origin are removed from the sample. While the coefficent drops substantially when Mexico is excluded from the sample, it remains quantitatively large and statistically significant at the 5% confidence level.

Overall, the analysis in this section suggests that the US Census sample is strongly skewed towards some countries of origin, which play a quantitatively important role for the overall result. This is different from what documented above for the PISA data, and highlights an advantage of analyzing samples of second generation immigrants spread over several host countries, where the influence of specific countries of origin (overly represented in specific host countries) is likely to be weaker.

Figure B.2.3: Reduced Form Coefficient for Mothers with an Immigrant Father when Excluding Countries of Origin One by One - US Census



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the interaction term between the average PISA score of natives in mother's country of origin and a dummy identifying immigrant fathers, with the dependent variable and other controls being the same as in column 4 of Table 5. Each dot corresponds to a different specification, where students with mothers from the indicated country of origin are excluded. Standard errors are clustered by mother's country of origin.

C Additional Results on Selection

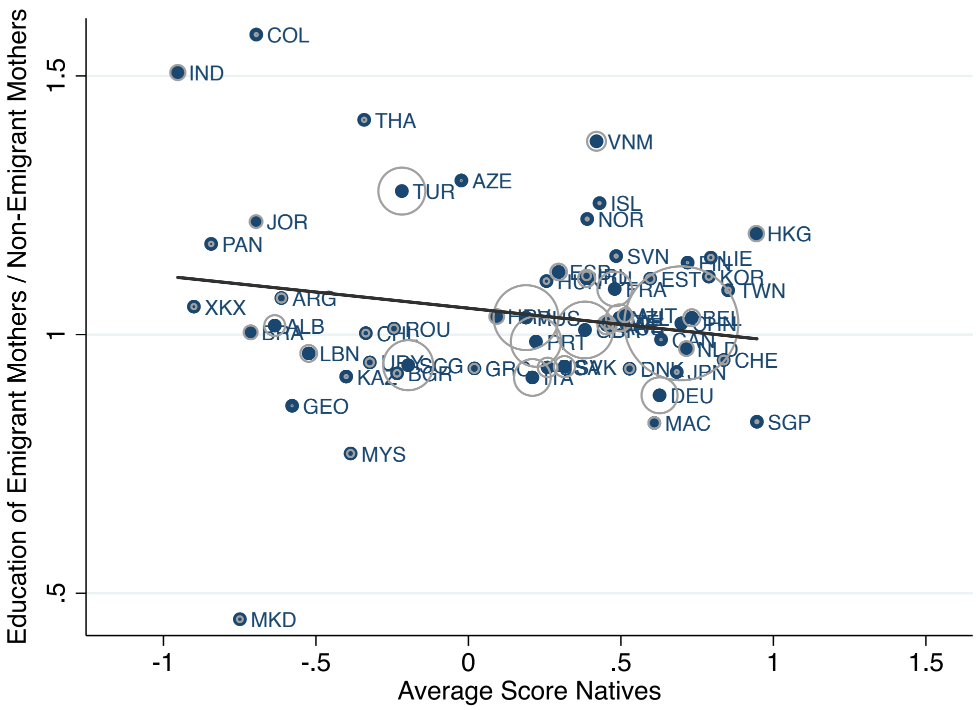
C.1 Alternative Measures of Selection

C.1.1 Alternative Functional Forms

The proxy for selection used in the paper is migrant parents' education standardized by the average and standard deviation of parents' education in the country of origin. This section shows that the conclusions on selection do not depend on the choice of this particular measure. We consider two alternative functional forms: the ratio and the difference between migrant and non-migrant parents' years of education.

Figure C.1.1 and Table C.1.1 show the results for the ratio measure, while Figure C.1.2 and Table C.1.2 show the results for the difference measure. In all cases, the evidence is not consistent with the hypothesis of positive differential selection across countries. If anything, when focusing on within-school variation in Tables C.1.1 and Table C.1.2, a pattern of negative differential selection emerges. Such form of selection would imply that our estimates of the contribution of unobservable parental influence for cross-country differences in human capital is a conservative one.

Figure C.1.1: Selection on Parental Education - Years of Schooling Ratio



Notes: The Figure plots the average years of schooling of emigrant mothers from country m divided by the average years of schooling of non-emigrant mothers in country m (y-axis) against the average PISA score of native students in country m (x-axis). The sizes of the circles are proportional to the number of emigrant mothers in the sample. The line shows the best (weighted) linear fit.

Figure C.1.2: Selection on Parental Education - Years of Schooling Difference

Notes: The Figure plots the difference between the average years of schooling of emigrant mothers from country m and the average years of schooling of non-emigrant mothers in country m (y-axis) against the average PISA score of native students in country m (x-axis). The sizes of the circles are proportional to the number of emigrant mothers in the sample. The line shows the best (weighted) linear fit.

Table C.1.1: Selection - Years of Schooling Ratio

	Dependent Variable: Years of Education Ratio			
	[1]	[2]	[3]	[4]
	Mothers		Fathers	
Score Country *m*	-0.161	-0.221**		
	(0.107)	(0.109)		
Score Country *f*			-0.108	-0.175**
			(0.078)	(0.075)
N	49097	49097	48834	48834
R Squared	0.08	0.52	0.09	0.53
Host Country × Wave FE	Yes	No	Yes	No
School × Wave FE	No	Yes	No	Yes

Notes: The sample includes emigrant mothers (columns 1 and 2) and fathers (3 and 4). The dependent variable is years of education divided by the average mothers' (columns 1 and 2) and fathers' (3 and 4) years of education in the country of origin. *Score Country m* and *Score Country f* are the average math PISA scores of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father. All specifications control for intercept and wave fixed effect. Standard errors clustered by mother's (columns 1 and 2) and father's (3 and 4) country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

Table C.1.2: Selection - Years of Schooling Difference

	Dependent Variable: Years of Education Difference			
	[1]	[2]	[3]	[4]
	Mothers		Fathers	
Score Country *m*	-0.717	-1.200		
	(0.853)	(0.804)		
Score Country *f*			-0.709	-1.387**
			(0.764)	(0.670)
N	49097	49097	48834	48834
R Squared	0.09	0.56	0.09	0.55
Host Country × Wave FE	Yes	No	Yes	No
School × Wave FE	No	Yes	No	Yes

Notes: The sample includes emigrant mothers (columns 1 and 2) and fathers (3 and 4). The dependent variable is years of education minus the average mothers' (columns 1 and 2) and fathers' (3 and 4) years of education in the country of origin. *Score Country m* and *Score Country f* are the average math PISA scores of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father. All specifications control for intercept and wave fixed effect. Standard errors clustered by mother's (columns 1 and 2) and father's (3 and 4) country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

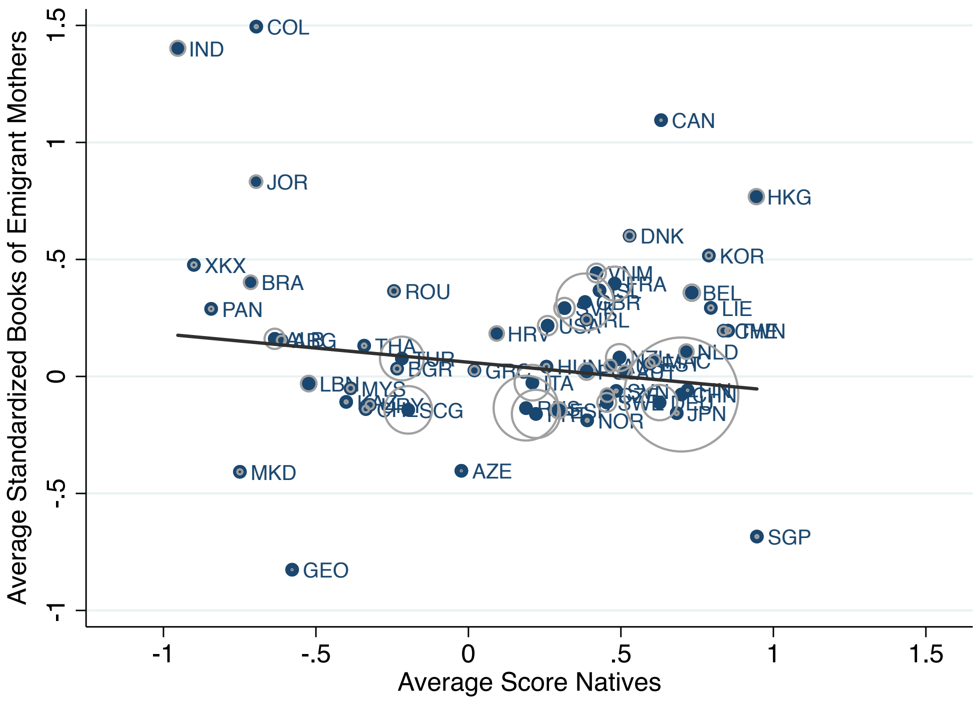
C.1.2 Selection on Other Observables

This Section shows results on selection on additional observable characteristics. As discussed in the paper, any analysis on selection should ideally be based on characteristics that are determined before migration, so that emigrant parents can be compared on the same ground to stayers. Education partially satisfies this requirement, as for many parents educational decision were taken before migration (as discussed later in this Appendix, the US Census allows us to identify parents for which this is the case). Unfortunately, all other socio-economic variables available in the PISA dataset are directly shaped by the host country's socio-economics environment, implying that a comparison between migrants and non-migrants from the same country of origin would not be informative on selection.

One observable that is perhaps less subject to this concern is the number of books at home (which, as shown in Table 4 in the paper, is strongly correlated with students' performance). While there might be cross-country differences in the availability and prices of books, it is plausible that an important part of any systematic difference in the number of books at home of migrants and non-migrants reflects differences in migrants' underlying characteristics as opposed to differences in the local environment. Motivated by this reasoning, Figure C.1.3 and Table C.1.3 show results on selection in terms of the number of books at home.[8] Both the visual evidence and the regression results suggest some degree of negative differential selection, which turns statistically significant when school fixed effects are controlled for. This is broadly consistent with the education results.

[8]For the purpose of this exercise, we created a continuous measure of the number of books by imputing the mid-point of the categories available in the data (we set 600 for the "500+" category).

Figure C.1.3: Selection - Number of Books at Home



Notes: The Figure plots the average number of books at home of emigrant mothers from country m standardized by the average and standard deviation of the number of books at home of non-emigrant mothers in country m (y-axis) against the average PISA score of native students in country m (x-axis). The sizes of the circles are proportional to the number of emigrant mothers in the sample. The line shows the best (weighted) linear fit.

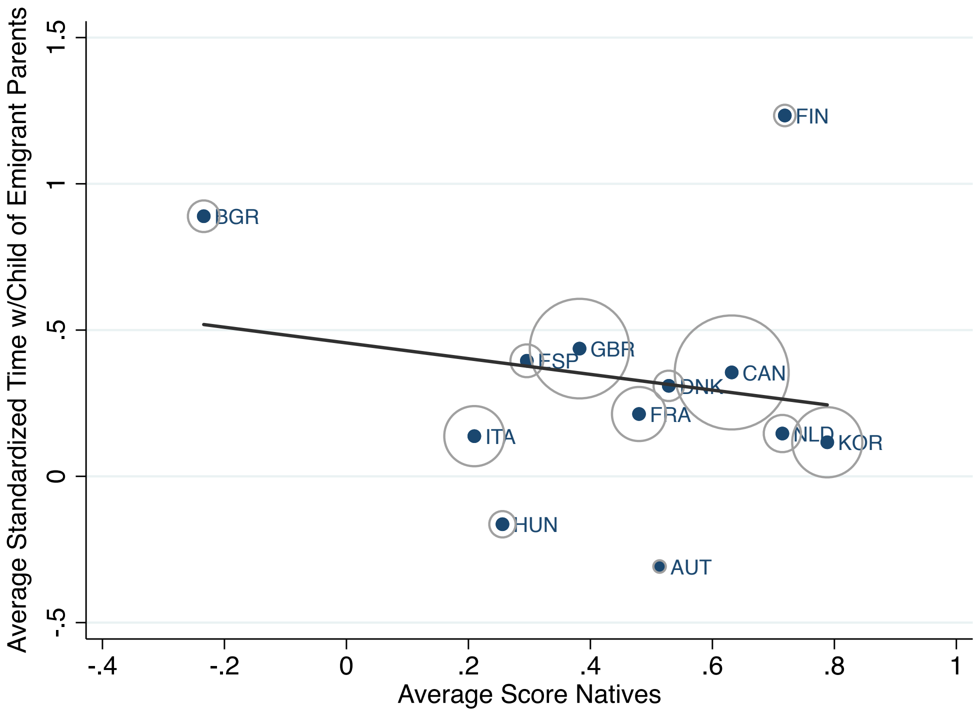
Table C.1.3: Selection - Number of Books at Home

	Dependent Variable: Standardized Number of Books at Home			
	[1]	[2]	[3]	[4]
	Mothers		Fathers	
Score Country *m*	-0.199	-0.408***		
	(0.143)	(0.131)		
Score Country *f*			-0.242	-0.415***
			(0.155)	(0.135)
N	49097	49097	48834	48834
R Squared	0.06	0.57	0.07	0.54
Host Country × Wave FE	Yes	No	Yes	No
School × Wave FE	No	Yes	No	Yes

Notes: The sample includes emigrant mothers (columns 1 and 2) and fathers (3 and 4). The dependent variable is the number of books at home standardized by the average and the standard deviation of the number of books at home of native students in the country of origin. *Score Country m* and *Score Country f* are the average math PISA scores of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father. All specifications control for intercept and wave fixed effect. Standard errors clustered by mother's (columns 1 and 2) and father's (3 and 4) country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

As an additional exercise, we turn to the time use data to examine how emigrant parents from different countries compare to stayers in terms of time spent in child care activities. As for the number of books at home, while time use decisions will be partially shaped by the local environment, parental preferences and characteristics are likely to play a relatively more important role in this dimension. We use the Multinational Time Use Study (MTUS) to calculate the total child care time for parents across 11 countries of origin, and then construct selection indicators for parents in ATUS as previously done for education and books.[9] Figure C.1.4 displays the resulting cross-country variation in selection: once again, there appears to be a weak pattern of negative differential selection. This result is confirmed in an individual-level regression specification (Table C.1.4), conditional on State fixed effects and separately for mothers and fathers.

Figure C.1.4: Selection - Time Use



Notes: The Figure plots the average child care time of emigrant parents standardized by the average and standard deviation of child care time of non-emigrant parents in the country of origin (y-axis) against the average PISA score of native students in the country of origin (x-axis). The sizes of the circles are proportional to the number of emigrant parents in the sample. The line shows the best (weighted) linear fit.

Our conclusions on differential selection are also in line with the development accounting literature, which has examined this issue in different contexts. In particular, Hendricks and Schoellman (2018) construct measures of selection into migration by comparing pre-migration wages of future migrants with those of non-migrants, across different bins of countries grouped by the level of GDP per capita. Figure C.1.5 displays their measure of selection against the average PISA score of all countries in our sample belonging to each GDP group. Overall, there appears to be a pattern of negative differential selection, with migrants coming from poorer (and, on average, lower PISA) countries being more positively selected. As shown by the sizes of the circles around each data point, our

[9] We consider all countries with at least one available survey in 2000-2015, and we pool multiple surveys for a given country. Since in most countries no direct information is available on family relationship, we identify as "parents" couples between 18-65 years old with at least one child younger than 18 in the same household. Total child care is the sum of the *Physical, medical, routine child care* and *Play/sports with, read to, teach child* activities. When multiple diaries (referring to different days) are available for a given parent, we take a simple average. All figures are weighted by the provided sampling weights.

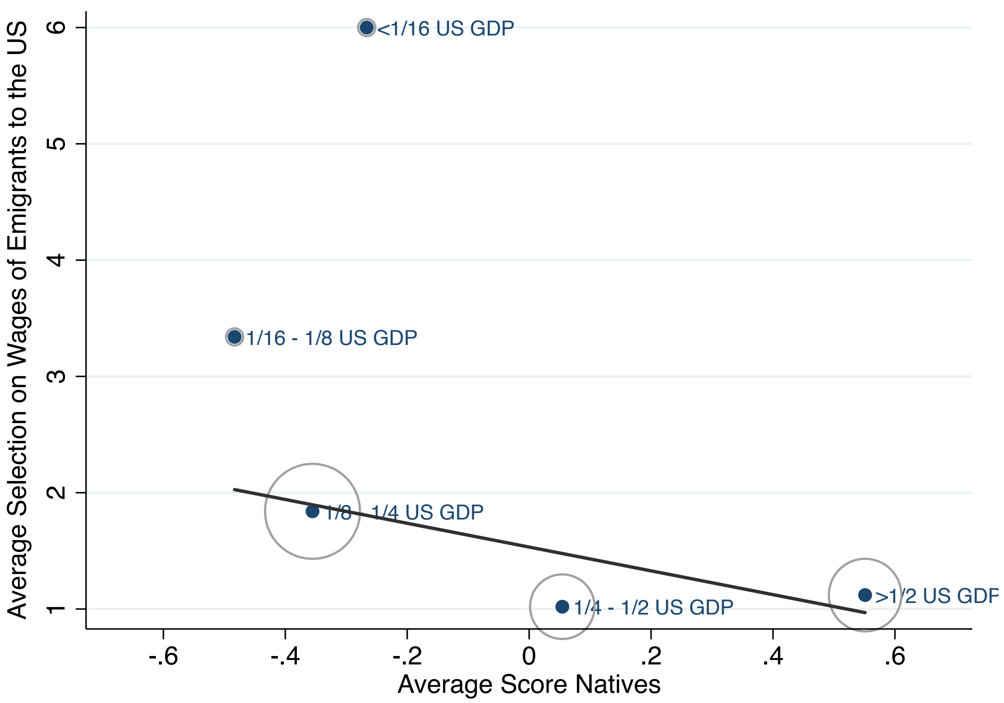
sample is mostly composed of middle- and high-income countries, where the pattern of differential selection is weaker (though still negative on average).

Table C.1.4: Selection - Time Use

	Dependent Variable: Standardized Child Care Time		
	[1] All	[2] Mothers	[3] Fathers
Score Country *p*	-0.490	-0.343	-0.522
	(0.443)	(0.308)	(0.874)
N	519	257	262
# Country *p*	11	11	11
R Squared	0.13	0.17	0.20
State FE	Yes	Yes	Yes

Notes: The sample includes emigrant parents in the ATUS sample from countries where the MTUS includes information on child care time. The dependent variable is the total child care time standardized by the (gender-specific, for columns 2 and 3) average and the standard deviation of the total child care time of parents in the country of origin. Standard errors are clustered by the parent's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

Figure C.1.5: Selection - Wages



Notes: The Figure plots the measure of emigrants' selection on wages from Hendricks and Schoellman (2018) against the average PISA score in the country of origin. Each observation corresponds to a group of countries based on their relative GDP per worker in 2005 with respect of the United States, as indicated by the labels. The PISA scores are computed as simple averages across the scores of all countries belonging to a given group. The Figure is constructed using the 59 countries of origin included in the specifications of Table 4 in the paper. The sizes of the circles are proportional to the number of emigrant mothers in the sample. The line shows the best (weighted) linear fit.

C.1.3 Correlation Between Plausible Determinants of Selection and PISA Scores

The migration literature has extensively debated the country-level determinants of emigrants' self-selection in terms of observable and unobservable skills. While, to our knowledge, the PISA score itself has not been explicitly considered in this literature, this variable is correlated with several others that have been advocated as measuring direct determinants of selection. In Figure C.1.6 we plot some of these variables against the PISA score of native students in the country of origin; since in the PISA sample we do not know the exact date of migration, we use data on selection determinants in 1985 or the closest available data, which should plausibly approximate the pre-migration conditions for the average migrant in our sample.[10]

First, the seminal contribution of Borjas (1987) gives a central role to the difference in income inequality between the origin and destination countries, predicting positive selection if the wage structure of the host country is such that skills are rewarded more compared to the country of origin, and negative selection in the opposite case. Panels (a) and (b) of Figure C.1.6 show that on average emigrant parents from high PISA countries do emigrate to countries more unequal (as measured by the Gini coefficient and the estimated return to education) than their countries of origin, implying that they would be more positively selected according to Borjas' theory.[11] However, this theory has received mixed support (Chiquiar and Hanson, 2005; Belot and Hatton, 2012), and in particular Grogger and Hanson (2011) argue that the absolute (as opposed to the relative) wage gap between high and low earners provides a better rationalization of the patterns of selection observed in the data. Panel (c) shows that, according to the preferred measure in Grogger and Hanson (2011), emigrants from high PISA countries (if anything) face a relatively lower absolute earning spread in their host countries, implying that they would be more negatively selected.[12]

Another strand of the literature emphasizes the importance of liquidity constraints (Chiswick, 2000; Belot and Hatton, 2012). These papers suggest that emigrants' self-selection should be more negative from richer countries, where facing emigration costs is affordable for a larger share of the population. Since the average PISA score is positively correlated with real GDP in 1985 (Panel d), we should expect negative differential selection according to this mechanism as well. Panel (e) shows instead the extent to which emigrants choose countries with a large pre-existing community from the same country of origin, since McKenzie and Rapoport (2010), among others, argue that stronger social networks act to reduce the effective cost of migration inducing negative selection.[13] China is an outlier in this dimension, since many Chinese parents are observed in Macao and Hong Kong, where Chinese-born represented respectively the 37% and 36% of the population in 1980; therefore, this "chain migration" view would predict negative selection for China, and no systematic pattern of differential selection for the other countries.[14] Finally, Panel (f) shows that emigrants from high PISA countries are not systematically located in a country closer or farther from their country of origin.[15]

[10]In the US Census, where we observe years since migration, the average mother of a US-born 15-year-old student migrated 20 years earlier.

[11]We take the Gini Index from the cross-country dataset constructed in Brueckner and Lederman (2015), and we use the 1985 observation when available and 1990 or 1995 when not. The Mincerian coefficients come from Psacharopoulos and Patrinos (2004), who collect estimates from a large set of papers; most observations refer to the 1980s.

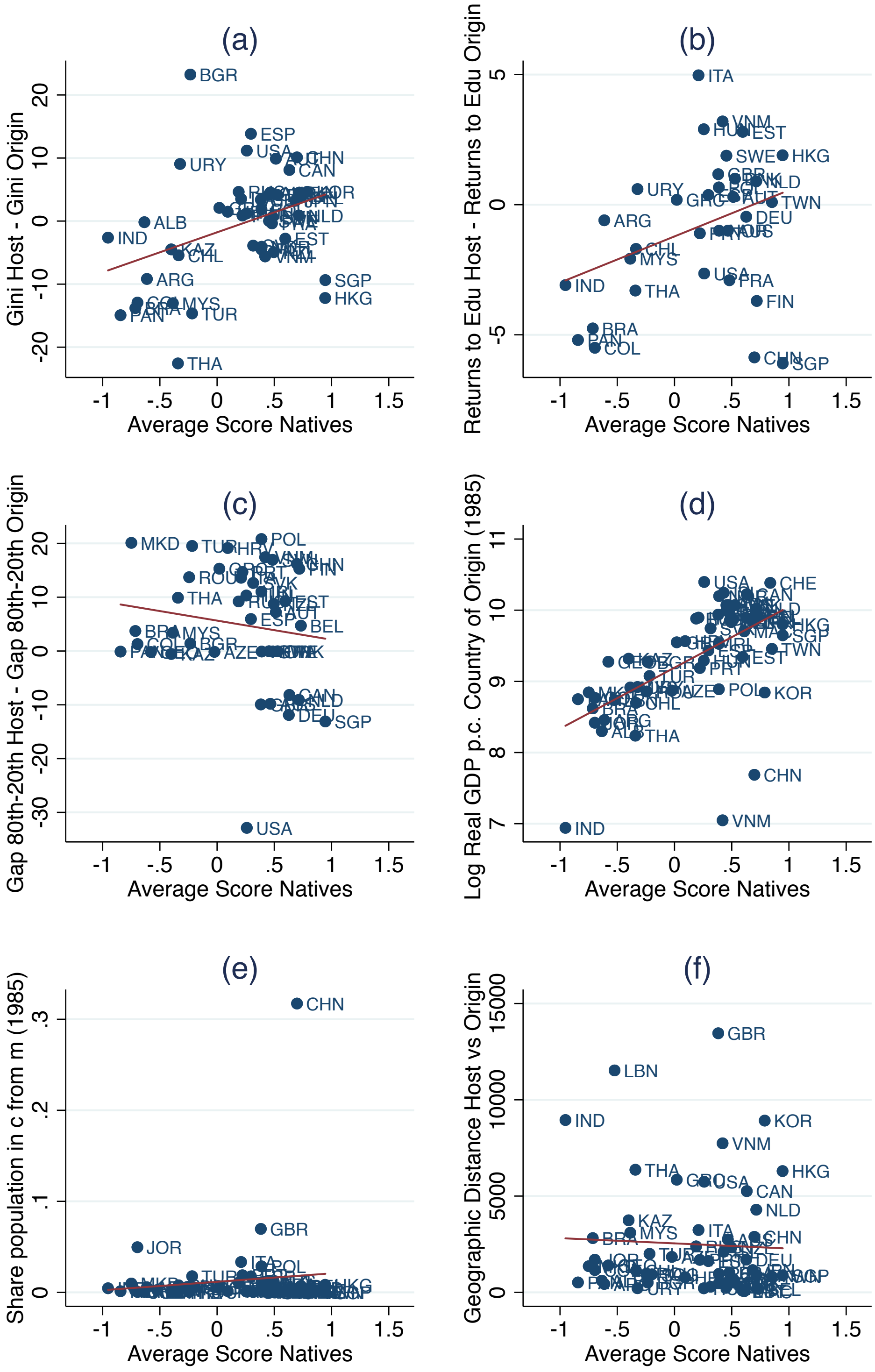
[12]Grogger and Hanson (2011) combine information from the Luxembourg Income Study and the WIDER dataset to construct an estimate of the absolute income gap (in thousands of 2000 US dollars) between the 80^{th} and 20^{th} percentiles of the income distribution in each country.

[13]We construct a matrix of bilateral migration shares in 1980 from the Global Bilateral Migration Database, discussed in Ozden et al. (2011). Each entry of this matrix gives us the share of the resident population in country i that was born in country j.

[14]The results of the paper are robust to the omission of Macao and Hong Kong as host countries, and to their aggregation to China as well. If anything, the relative over-performance of Chinese second-generation immigrants compared to other countries of origin is weaker in these two countries, perhaps due to the patterns of selection discussed in this section.

[15]The geographical distance data comes from the CEPII's GeoDist dataset (Mayer and Zignago, 2011). We use the

Figure C.1.6: Possible Determinants of Emigrants' Selection



Notes: Each Panel plots the relationship between the average score among natives and a possible determinat of emigrants' selection. Panel (a) plots the difference between the average Gini Index faced by emigrants from country m in their respective host countries and the Gini Index in country m. Similarly, Panels (b) and (c) plot the difference between the average value faced by emigrants from country m and country m's value for the estimated return to education and the absolute income gap between the 80^{th} and the 20^{th} percentiles (in thousands of 2000 US dollars). Panel (d) plots the log real GDP per capita in 1985. Panel (e) and (f) plot the average across emigrants from m of the share of host country population born in country m and of the geographic distance between the host country and country m (in kilometers). The lines show the best linear fits.

This is relevant since geographical distance has been shown to be associated with negative selection (Grogger and Hanson, 2011; Belot and Hatton, 2012), most likely due to its effect on the cost of migrating.

Recent work by Albornoz et al. (2012) examines theoretically the determinants of selection in terms of parental motivation for their children's education, which might be only partially correlated with parents' skills. Among other channels, the authors stress the importance of the relative quality of the school systems in the host and source countries, since highly motivated parents are more likely to migrate to countries with better educational prospects for their children.[16] Under the presumption that high PISA countries have better schools on average, parents emigrating from these countries should be, ceteris paribus, relatively more negatively selected.

All in all, given the determinants of self-selection considered in the literature, we conclude that a pattern of (weakly) negative differential selection should be expected.

simple distance between the most populated cities, expressed in kilometers.

[16]Other determinants of selection considered in Albornoz et al. (2012) are the absolute skill premia in host and source countries and migration costs. As discussed above, the available evidence on these dimensions suggests that, if anything, we should expect parents emigrating from high PISA countries to be relatively negatively selected.

C.2 Selection Corrections

This Section implements alternative methods to explicitly correct our estimates for differential selection into migration. The first approach simply consists of introducing the measures of selection on observable characteristics as additional controls in the baseline regression: to the extent that selection is correlated with the average score in the parental country of origin, controlling for it might affect the magnitude of our coefficient of interest. The first row of Table C.2.1 shows the results of this exercise for alternative selection controls based on different observables: mother's education (as in the paper), number of books at home (as in Section C.1.2 of this Appendix), or both at the same time.[17] The magnitudes of the coefficient should be benchmarked against the corresponding baseline specifications in Table 4 in the paper, i.e. Columns 3 and 4 for the host country and school fixed effect specifications respectively. Depending on the selection measures and the specification, the estimates in Table C.2.1 are either very similar or somewhat larger compared to these benchmarks.

Our second approach is based on an application of *inverse probability weighting* (IPW), a statistical methodology developed by Horvitz and Thompson (1952). IPW consists in re-weighting observations in order to make a given sample representative of a different target population: in particular, given an estimate of the probability of being selected into the sample, by weighting observations by the inverse of such probability one can obtain a consistent estimate of the statistics of interest in the target population. In our context, we aim to make the subsamples of migrant parents from each country of origin as representative as possible of the corresponding populations of non-migrant parents; IPW attempts to achieve that by giving more weight to migrant parents that are observationally similar to non-migrants in their country of origin.

We implement this idea as follows. First, using the PISA data, we construct samples consisting of all mothers born in a given country, irrespective of their current host country. Second, we estimate separately for each country of origin a probit model for whether mothers are migrants or stayers, using the same observables discussed above (education, number of books at home or both) as controls. Third, we use the inverse of the predicted probability of being a migrant as weight in our baseline regression specifications. As shown in the second row of Table C.2.1, our coefficient of interest is very similar to the corresponding estimates in Table 4 of the paper. Given that IPW is inherently sensitive to extreme probability weights, we also explore a version where we trim weights below the 1^{st} and above the 99^{th} percentiles of the weight distribution in the sample, by setting them equal to these percentiles; as shown in the third row of Table C.2.1, the magnitudes are again very similar to our benchmarks.

As a final exercise, we also implement IPW for our decomposition exercise. To simplify the implementation, we focus on the sample of parents from the same country of origin, which, as discussed in greater detail in Appendix E, gives very similar results to the baseline ones. We estimate the probability of migration using information on both parents' educational attainment and the number of books at home, and re-weight observations relative to second-generation immigrant students according to the inverse of that probability (the weights for native students are instead left as in the baseline). Table C.2.2 shows the results. The contribution of parental unobservables is somewhat higher than in the baseline, ranging between 19% and 25% for the host country fixed effects specification and between 15% and 16% for the school fixed effects one.

Overall, the results documented in this Section show that accounting for selection either does not affect or slightly increases the inferred role of parental influence, depending on the methodology used and on the specification.

[17] More specifically, we use as additional controls the mother's years of schooling and the number of books at home standardized by the average and the standard deviation of the corresponding variable in the mother's country of origin.

Table C.2.1: Selection Corrections

	Dependent Variable: Math Test Score					
	[1]	[2]	[3]	[4]	[5]	[6]
			Controlling for Selection Measures			
Score Country *m*	0.286**	0.342***	0.345***	0.223***	0.231***	0.230***
	(0.124)	(0.119)	(0.121)	(0.072)	(0.068)	(0.068)
			Inverse Probability Weighting			
Score Country *m*	0.271***	0.260***	0.278***	0.233***	0.265***	0.232***
	(0.098)	(0.085)	(0.087)	(0.079)	(0.074)	(0.070)
			Inverse Probability Weighting (Trimmed Weights)			
Score Country *m*	0.262***	0.282***	0.277***	0.201***	0.227***	0.211***
	(0.080)	(0.083)	(0.080)	(0.059)	(0.053)	(0.055)
N	49097	49097	49097	49097	49097	49097
# Country m	59	59	59	59	59	59
Selection Measure	Edu	Books	Edu & Books	Edu	Books	Edu & Books
Socio-Econ Controls	Yes	Yes	Yes	Yes	Yes	Yes
Host Country × Wave FE	Yes	Yes	Yes	No	No	No
School × Wave FE	No	No	No	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side; each row shows the results with a different adjustment for selection (as explained in the text). Sample includes only cases where both parents report a country of origin and the country of origin of the mother participates to PISA. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. All specifications control for intercept, students' age (in months), wave fixed effect, a dummy for father's immigrant status and dummies for parents' employment status (full-time employed, part-time employed, not working) as well as all other parental socio-economic characteristics included in columns 2-5 of Table 4 in the paper. *Working* refers to either full-time or part-time employed. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Table C.2.2: Decomposition Results - Inverse Probability Weigthing

	Dependent Variable: Math Test Score					
	[1]	[2]	[3]	[4]	[5]	[6]
$\frac{\text{Cov}(\widehat{ParentsObs_c}, T_c)}{\text{Var}(T_c)}$	20.99	21.00	20.99	10.39	10.38	10.39
$\frac{\text{Cov}(\widehat{ParentsUnobs_c}, T_c)}{\text{Var}(T_c)}$	24.38	19.19	24.81	16.01	14.70	15.85
# Country	31	31	31	31	31	31
Selection Measure	Edu	Books	Edu & Books	Edu	Books	Edu & Books
Host Country × Wave FE	Yes	Yes	Yes	No	No	No
School × Wave FE	No	No	No	Yes	Yes	Yes

Notes: The Table shows decomposition results for native students, using second generation immigrants with parents of the same nationality (weighted according to inverse probability weighting) to estimate parental unobservables. Only countries with at least 100 emigrant mothers and 100 emigrant fathers in the sample are included in the computation. $\widehat{ParentsObs_c}$ and $\widehat{ParentsUnbs_c}$ are the effects of observable and unobservable parental characteristics.

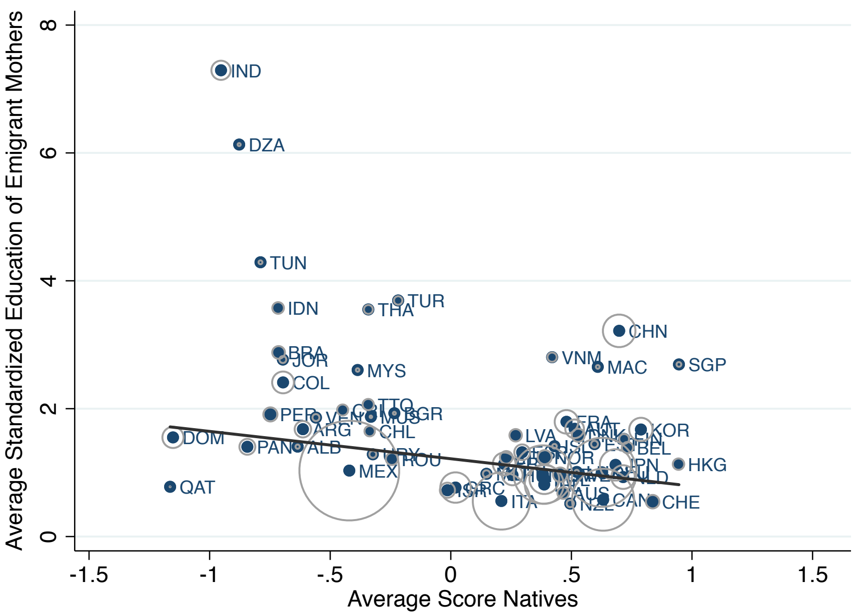
C.3 Selection Analysis for the Census Data

In this Appendix we provide a discussion of the patterns of differential selection in the US Census data. While the analysis parallels the one in the main text on the PISA sample, the information on years since migration available in the Census allows us to implement additional checks.

In order to benchmark emigrant parents against non-emigrants in their country of origin, we use school attainment data from Barro and Lee (2013), combined with information on the duration of primary and secondary school in each country from the World Development Indicators, to construct estimates for the average and the standard deviation of years of education in the across countries of origin.[18] Differently from the PISA data, we cannot build these measures for parents of school-age children only; we can, however, restrict attention to adults between 35 and 45 years of age. At the individual level, our proxy for selection is therefore years of education standardized by the (gender-specific) average and standard deviation in the country of origin. At the country level, we simply take the average of this measure.

In Figure C.3.1 we plot these country of origin-level averages against the PISA score of native students in those countries. Similarly to the PISA sample, we find a weakly negative pattern, suggesting that parents from high PISA countries are somewhat more negatively selected. In Table C.3.1 we check whether this pattern arises also when we include commuting zone fixed effects: for both mothers and fathers, the coefficients are negative and not statistically different from 0.

Figure C.3.1: Selection on Parental Education - US Census



Notes: The Figure plots the average years of schooling of emigrant mothers from country m standardized by the average and the standard deviation of years of schooling of non-emigrant mothers in country m (y-axis) against the average PISA score of native students in country m (x-axis). The line shows the best (weighted) linear fit.

[18] Following Barro and Lee (2013), we impute a duration of 4 years for tertiary education in all countries.

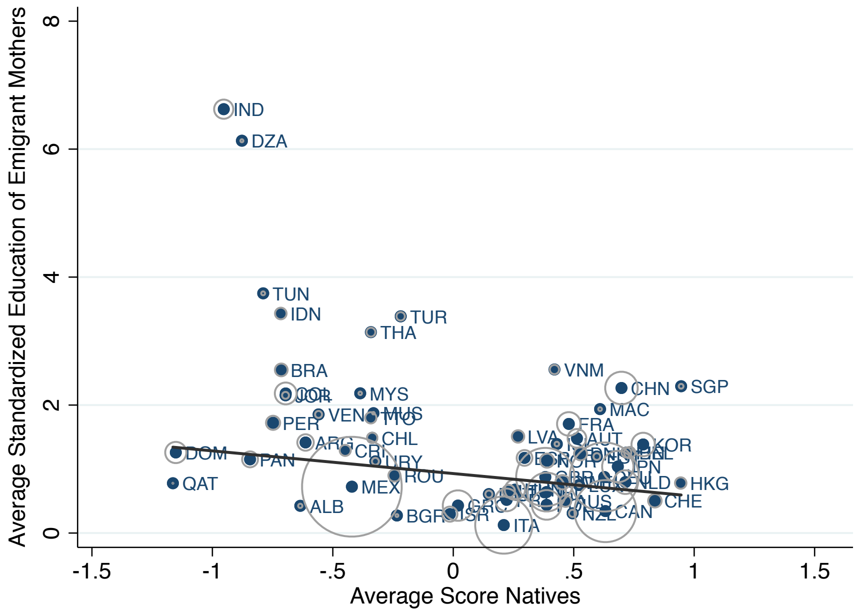
Table C.3.1: Selection - US Census

	Dependent Variable: Standardized Years of Education	
	[1] Mothers	[2] Fathers
Score Country *m*	-0.571	
	(0.370)	
Score Country *f*		-0.206
		(0.319)
N	53216	45516
R Squared	0.09	0.09
Year FE	Yes	Yes
Comm Zone FE	Yes	Yes

Notes: The Table shows results for emigrant mothers in specification (1) and emigrant fathers in specification (2). The dependent variable is years of education standardized by the average and standard deviation of mothers' (specification 1) and fathers' (specification 2) years of education in the country of origin. *Score Country m* and *Score Country f* are the average math PISA scores of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father, across all available waves. All specifications control for intercept and wave fixed effect. Standard errors are clustered by mother's country of origin in specification (1) and by father's country of origin in specifications (2). * denotes significance at 10%, ** at 5%, *** at 1%.

One of the concerns highlighted in Section 4.3 was that years of education are not necessarily pre-determined with respect to migration, and parents might have acquired more or less education as a consequence of their migration decision (and, importantly, for our purposes, might have done so differentially from different countries of origin). We can make some progress in testing this hypothesis by analyzig selection patterns for parents that completed their education in their home country, since for those individuals the relative quality of the US school system should have not played any role in their education choices (and therefore education is more likely to represent a good proxy of pre-determined skills). Figure C.3.2 and Table C.3.2 are the counterparts of Figure C.3.1 and Table C.3.1 when the sample is restricted only to parents more likely to have completed their education before migrating to the US (see Section 6 for a description of how these parents are identified based on the available information). For both mothers and fathers, the pattern of differential selection is weakly negative with respect to the average PISA score, and not very different from the one obtained in the full sample.

Figure C.3.2: Selection on Parental Education (Mothers Entirely Educated in Home Country) - US Census



Notes: The Figure plots the average years of schooling of emigrant mothers from country m standardized by the average and the standard deviation of years of schooling of non-emigrant mothers in country m (y-axis) against the average PISA score of native students in country m (x-axis). The sample includes only mothers entirely educated in their home country. The line shows the best (weighted) linear fit.

Table C.3.2: Selection - US Census (Parents Entirely Educated in Home Country)

	Dependent Variable: Standardized Years of Education	
	[1]	[2]
	Mothers	Fathers
Score Country *m*	-0.414	
	(0.292)	
Score Country *f*		-0.277
		(0.257)
N	30118	26647
R Squared	0.09	0.10
Year FE	Yes	Yes
Comm Zone FE	Yes	Yes

Notes: The Table shows results for emigrant mothers in specification (1) and emigrant fathers in specification (2). In all specifications, the sample includes only cases where the parent was entirely educated in his or her home country. The dependent variable is years of education standardized by the average and standard deviation of mothers' (specification 1) and fathers' (specification 2) years of education in the country of origin. *Score Country m* and *Score Country f* are the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father, across all available waves. All specifications control for intercept and wave fixed effect. Standard errors are clustered by mother's country of origin in specification (1) and by father's country of origin in specification (2). * denotes significance at 10%, ** at 5%, *** at 1%.

Still, parents might have based their educational choices based on their future relocation to the US, and perhaps this might bias the pattern of selection differentially across countries. It would be worrying if differential selection turned out to be negative only for those parents for whom migration is likely to have played a bigger role in their educational choices, and perhaps positive for the rest of the sample. To check for this possibility, in Table C.3.3 we present results from specifications where we interact the average PISA score in the country of origin with the number of years between education completion and migration (still restricting the sample to parents entirely educated in their home country). The underlying idea is that the more time has passed between education completion and migration, the less is likely that educational choices were made taking future relocation into account, and the closer we get to the ideal situation where education truly reflects skills pre-determined with respect to migration. For both mothers and fathers, the coefficient on the interaction term is positive but not statistically significant, and its magnitude is so small that the pattern of differential selection would not be positive and significant for any gap between education completion and migration observed in the sample. This result gives us some further confidence that our findings on selection are not driven by a differential effect of migration on parental education.

Table C.3.3: Selection US Census - Heterogeneity with respect to Education Completion and Migration Dates

	Dependent Variable: Standardized Years of Education	
	[1]	[2]
	Mothers	Fathers
Score Country *m*	-0.645*	
	(0.380)	
Score Country *m* × Years betw Edu and Migration Mother	0.014	
	(0.015)	
Years betw Edu and Migration Mother	-0.060***	
	(0.007)	
Score Country *f*		-0.458
		(0.330)
Score Country *f* × Years betw Edu and Migration Father		0.006
		(0.012)
Years betw Edu and Migration Father		-0.055***
		(0.005)
N	30118	26647
R Squared	0.19	0.23
Year FE	Yes	Yes
Comm Zone FE	Yes	Yes

Notes: The Table shows results for emigrant mothers in specification (1) and emigrant fathers in specification (2). In all specifications, the sample includes only cases where the parent was entirely educated in his or her home country. The dependent variable is years of education standardized by the average and standard deviation of mothers' (specification 1) and fathers' (specification 2) years of education in the country of origin. *Score Country m* and *Score Country f* are the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother and the father, across all available waves. *Years betw Edu and Migration* refers to the number of years occurred between education completion (imputed from the educational attainment) and migration to the US. All specifications control for intercept and wave fixed effect. Standard errors are clustered by mother's country of origin in specification (1) and by father's country of origin in specification (2). * denotes significance at 10%, ** at 5%, *** at 1%.

D Additional Evidence on Mechanisms

D.1 Alternative Measures of Immigrants' Assimilation

In this section we show interaction results on the US Census data using different proxies for parents' integration in their host country. While we focus on years since migration in the main text, immigrants' assimilation is a complex process involving cultural, economic, linguistic and relational transitions, some of which might not be well captured by our proxy. At the same time, some dimensions of parents' assimilation considered here might be direct outcomes of their propensity to human capital accumulation, making the results harder to interpret.

We consider two sets of alternative measures. First, we study the heterogeneity with respect to the father's country of origin in the baseline specification with second generation immigrants on the mother's side. On one hand, immigrants with a native partner are likely to be more integrated in their host country; indeed, intermarriage with natives has been widely used as proxy for immigrants' assimilation (Gordon, 1964; Pagnini and Morgan, 1990), and is usually associated with favourable economic outcomes (Furtado and Trejo, 2013). On the other hand, immigrants with a connational partner might be less likely to integrate and more likely to transmit cultural traits of their country of origin. We therefore distinguish three mutually exclusive cases: native fathers, immigrant fathers from the same country of origin and immigrant father from a different country.

Table D.1.1 shows the results. Consistently with the previous discussion, the effect of T^m is strongest for mothers with a connational partner, intermediate for mothers with an immigrant partner from a different country and weakest for mothers with a native partner (column 1). Indeed, the latter is not statistically significant from zero, while the effect for mothers with a connational partner is about twice as large as the baseline coefficient in column 4 of Table 5 in the paper (the coefficient for mothers with an immigrant partner from a different country of origin is statistically different from zero at the 5% confidence level). In principle, these differential effects might simply be explained by the direct influence of father's nationality on school performance, which, for mothers with a connational partner, is absorbed by the coefficient of T^m in the specification in column 1. To investigate this, column 2 introduces mother's and father's country of origin fixed effects: the differential effect for mothers with a connational father is still positive and significant, though less precisely estimated. Columns 3 and 4 implement a "horse race" between these proxies for immigrants' assimilation and years since migration, as used in the paper: when country of origin fixed effects are included in the regression, only the latter retains statistical significance.

Table D.1.1: Heterogeneity with respect to Father's Immigrant Status - US Census

	Dependent Variable: No Grade Repeated			
	[1]	[2]	[3]	[4]
Score Country *m*	0.013		0.059***	
	(0.011)		(0.015)	
Father from Same Country × Score Country *m*	0.042***	0.040*	0.031***	0.029
	(0.008)	(0.024)	(0.007)	(0.023)
Father from Other Foreign Country × Score Country *m*	0.010	0.006	0.005	0.001
	(0.018)	(0.021)	(0.017)	(0.021)
Female	0.068***	0.067***	0.067***	0.067***
	(0.003)	(0.003)	(0.003)	(0.003)
Yrs Schooling Father	0.006***	0.005***	0.006***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Yrs Schooling Mother	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Yrs Since Migr Mother	0.001**	0.001**	0.002***	0.002***
	(0.001)	(0.001)	(0.000)	(0.000)
Log Family Income	0.030***	0.030***	0.030***	0.029***
	(0.007)	(0.007)	(0.007)	(0.007)
Score Country *m* × Yrs Since Migr Mother			-0.002***	-0.002***
			(0.001)	(0.001)
N	53553	53553	53553	53553
# Country *m*	64	64	64	64
R Squared	0.12	0.12	0.12	0.12
Comm Zone FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country *m* FE	No	Yes	No	Yes
Country *f* FE	No	Yes	No	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. All specifications control for intercept, child age dummies, parents' age, family size, log family income, year fixed effect, (year-specific) quarter of birth fixed effect and dummies for father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

Finally, we study the heterogeneity with respect to measures of distance between the US and the mother's country of origin. The first two columns of Table D.1.2 consider the measures of linguistic and cultural distances already discussed in the paper. The idea here is that parents which are linguistically or culturally far from the US norms are less likely to integrate, and perhaps to adapt to the locally prevalent practices and values in terms of children's education. The gap between second generation immigrants from high and low PISA countries is larger when parents are linguistically far from the US (column 1), while we do not find any significant heterogeneity with respect to cultural distance (column 2). Column 3 explores the heterogeneity with respect to geographic distance, for which the interpretation is less clear-cut: on one hand, parents farther from their country of origin might have less contacts with (or opportunities to travel to) it, as a consequence being more likely to lose some of the traits of their origin culture; on the other end, geographic distance might proxy for other forms of cultural distance, perhaps not well captured by the survey-based measure of Spolaore and Wacziarg (2015).[19] The interaction term is negative and significant, which is consistent with the importance of the cultural channel under the former interpretation of the role of geographic distance.

[19]We use data on geographical distance from the CEPII's GeoDist dataset (Mayer and Zignago, 2011), already discussed in the paper and in Appendix C. A few small countries or regions of origin listed in the US Census are not included in this dataset; when possible, we impute the geographical distances based on the closest available country.

Table D.1.2: Heterogeneity with respect to Linguistic and Cultural Distance - US Census

	Dependent Variable: No Grade Repeated		
	[1]	[2]	[3]
Score Country *m*	0.040***	0.036**	0.230***
	(0.009)	(0.015)	(0.083)
Score Country *m* × Mother Linguistic Distance	0.025***		
	(0.006)		
Mother Linguistic Distance	-0.005		
	(0.003)		
Father Linguistic Distance	-0.003		
	(0.002)		
Score Country *m* × Mother Cultural Distance		0.001	
		(0.018)	
Mother Cultural Distance		0.016	
		(0.010)	
Father Cultural Distance		-0.011***	
		(0.004)	
Score Country *m* × Mother Log Geographic Distance			-0.023**
			(0.010)
Mother Log Geographic Distance			0.029***
			(0.006)
Father Log Geographic Distance			0.003***
			(0.001)
Female	0.068***	0.067***	0.067***
	(0.003)	(0.003)	(0.003)
Yrs Schooling Father	0.006***	0.006***	0.006***
	(0.001)	(0.001)	(0.001)
Yrs Schooling Mother	0.006***	0.006***	0.005***
	(0.001)	(0.001)	(0.001)
Log Family Income	0.029***	0.030***	0.029***
	(0.008)	(0.008)	(0.008)
N	52086	49707	53185
# Country *m*	62	48	64
R Squared	0.12	0.12	0.12
Comm Zone FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. *Linguistic Distance* and *Cultural Distance* are standardized to take mean 0 and standard deviation 1 across all country pairs in the PISA sample (sources are discussed in the paper). All specifications control for intercept, child age dummies, parents' age, family size, log family income, mother's years since migration, year fixed effect, (year-specific) quarter of birth fixed effect and father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

D.2 Immigrants' Ethnic Network

Throughout the paper, we stress the role of parents in the transmission of human capital, and we focus on second generation immigrants in order to fix the characteristics of the local environment. A potential complication arises from the fact that immigrant parents from different nationalities are likely to be differentially exposed to their own ethnic network, even within the same host country or region. The transmission of country-specific skills or attitudes towards education could also take place thorugh this channel, and the objective of this section is to investigate this possibility.

Borjas' Ethnic Capital

In his seminal work, Borjas (1992) uses data from the General Social Survey (GSS) and the National Longitudinal Survey of Youth (NLSY) to argue that the average level of education in the ethnic environment of parents, what he calls "ethnic capital", plays a role in the human capital accumulation process of the following generations in the US. To the extent that second generation immigrants from high-scoring countries are exposed to higher ethnic capital, this could represent a factor behind their superior performance at school additional to any direct interaction with their parents.

We use the Census data to construct a measure of the average years of education of parents of school-age children for each commuting zone and country of origin.[20] In Table D.2.1, we add this measure of ethnic capital as a control to our baseline specifications, shown in columns 1 and 3. No matter whether commuting zone fixed effects are introduced (column 4) or not (column 2), the coefficient on ethnic capital is positive and significant, consistently with Borjas' result. The coefficient on the average score of natives in the mother's country of origin is somewhat smaller in magnitude, but still positive and significant.

Table D.2.1: Ethnic Capital - US Census

	Dependent Variable: No Grade Repeated			
	[1]	[2]	[3]	[4]
Score Country *m*	0.046***	0.029***	0.029***	0.024**
	(0.014)	(0.010)	(0.010)	(0.009)
Ethnic Capital		0.008***		0.003
		(0.002)		(0.002)
Female	0.069***	0.069***	0.068***	0.068***
	(0.003)	(0.003)	(0.003)	(0.003)
Mother Sec Edu	0.052***	0.040***	0.044***	0.041***
	(0.012)	(0.012)	(0.011)	(0.013)
Mother Ter Edu	0.057***	0.036***	0.050***	0.044***
	(0.012)	(0.013)	(0.010)	(0.012)
Father Sec Edu	0.045***	0.039***	0.040***	0.038***
	(0.014)	(0.012)	(0.010)	(0.010)
Father Ter Edu	0.064***	0.054***	0.063***	0.060***
	(0.015)	(0.012)	(0.011)	(0.012)
Log Family Income	0.041***	0.038***	0.034***	0.033***
	(0.009)	(0.008)	(0.008)	(0.008)
N	53553	53553	53553	53553
# Country *m*	64	64	64	64
R Squared	0.09	0.09	0.12	0.12
Comm Zone FE	No	No	Yes	Yes
Years Since Migr Mother	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. *Ethnic Capital* is the average years of education of all parents of 8- to 15-year-old children in the same commuting zone and born in country m. All specifications control for intercept, child age dummies, parents' age, family size, year fixed effect, (year-specific) quarter of birth fixed effect and father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

[20]We consider children between 8 and 15 years of age, consistently with the criterion used for our baseline sample. The results are similar when we use the same measure constructed at the state or the country level.

Horizontal and Obliqual Transmission

Parents' ethnic network could also play a role in the transmission of country-specific skills and attitudes towards education. Indeed, the literature on cultural transmission stresses the distinction between the vertical (parents to children), horizontal (children to children) and obliqual (other children's parents to children) transmission of cultural traits, all of which have been shown to be active in different settings (Bisin and Verdier, 2010). In the paper we stress the vertical channel, but to what extent does the performance of second generation immigrants also reflect the horizontal or obliqual ones?

To shed some light on this issue, we exploit the variation across commuting zones in the level of segregation across countries of origin. As discussed by Fernandez and Fogli (2009), local communities with a large share of individuals with the same ancestry might offer more opportunities for the horizontal or obliqual transmission of values through direct interaction, role models and punishments for behaviours not consistent with the social norm. If these channels are important, we would expect a larger country of origin-effect for parents located in such communities, as opposed to more isolated parents.

In Table D.2.2 we augment the baseline specification (shown in column 1) with interaction terms between T^m and measures of commuting zone-level segregation by country of origin. In particular, we consider the share of all (column 2) and 35- to 45-year-old (column 3) residents born in country m, and the share 8- to 15-year-old which are either born in country m or with at least one parent born in country m (column 4). The coefficients for the interaction terms are positive for all specifications but marginally significant only for the second measure. Moreover, from the coefficient on T^m we can see that in all cases virtually the whole effect persists when the size of the ethnic network approaches zero. The gap in performance is therefore strong even when we focus on rather isolated parents, suggesting that our focus on the vertical channel of transmission might be well-warranted.

The results of Table D.2.2 should be interpreted with a couple of qualifications in mind. First, parents living in more segregated areas might themselves be less culturally integrated in the United States and more likely to transmit cultural traits of their country of origin. In this sense, the positive interaction terms in Table D.2.2 might actually reflect a combination of stronger horizontal or obliqual *and* vertical transmissions of values in more segregated areas (therefore reinforcing the conclusion that the vertical channel is important).

Second, and more subtly, several contributions to the cultural transmission literature argue that the prevalence of given cultural traits in the local context affects the incentives parents face when socializing their children, and that, depending on the setting, vertical and non-vertical (horizontal or obliqual) transmission might be either cultural substitutes or complements (Bisin and Verdier, 2010). Under cultural substitutability, it might be that parents that value education the most play a more active role in shaping human capital accumulation of their children when the horizontal transmission of positive attitudes towards education is muted, to some extent invalidating our interpretation of the results in Table D.2.2.

Table D.2.2: Heterogeneity with respect to the Segregation Rate - US Census

	Dependent Variable: No Grade Repeated			
	[1]	[2]	[3]	[4]
Score Country *m*	0.029***	0.021**	0.018*	0.021**
	(0.010)	(0.009)	(0.010)	(0.009)
Female	0.068***	0.068***	0.068***	0.068***
	(0.003)	(0.003)	(0.003)	(0.003)
Mother Sec Edu	0.044***	0.044***	0.044***	0.043***
	(0.011)	(0.012)	(0.012)	(0.012)
Mother Ter Edu	0.050***	0.050***	0.050***	0.049***
	(0.010)	(0.010)	(0.010)	(0.010)
Father Sec Edu	0.040***	0.040***	0.040***	0.039***
	(0.010)	(0.010)	(0.010)	(0.010)
Father Ter Edu	0.063***	0.063***	0.063***	0.062***
	(0.011)	(0.012)	(0.012)	(0.012)
Log Family Income	0.034***	0.033***	0.033***	0.033***
	(0.008)	(0.008)	(0.008)	(0.008)
Score Country *m* × Share from *m*		0.010		
		(0.009)		
Share from *m*		0.001		
		(0.004)		
Score Country *m* × Share 35-45 from *m*			0.013*	
			(0.007)	
Share 35-45 from *m*			0.003	
			(0.003)	
Score Country *m* × Share 8-15 $1^{st}/2^{nd}$ Gen Imm from *m*				0.004
				(0.003)
Share 8-15 $1^{st}/2^{nd}$ Gen Imm from *m*				0.000
				(0.002)
N	53553	53553	53553	53553
# Country *m*	64	64	64	64
R Squared	0.12	0.12	0.12	0.12
Comm Zone FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. *Share from m* and *Share 35-45 from m* are, within the commuting zone of each student, the shares of all residents and residents aged 35 to 45 and born in country *m*; *Share 8-15* $1^{st}/2^{nd}$ *Gen Imm from m* is the share of residents aged 8 to 15 which are either first or second generation immigrants from country *m* (all in percent). All specifications control for intercept, child age dummies, parents' age, number of siblings, log family income, year fixed effect, (year-specific) quarter of birth fixed effect and father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

In Table D.2.3 we explore these possibilities by turning to the Time Use data, where we can observe a proxy for a parental $input$ for children's human capital accumulation. In particular, we ask whether the gap across nationalities in the time parents spend with their children is smaller when parents live in a community with a larger ethnic network from their country of origin, as it would be implied by cultural substitution. We construct a measure of segregation at the State and country of origin level, given by the share of residents in each State born in each country of origin (results with alternative measures of segregation along the lines of Table D.2.2 are very similar and available upon request). We then add to our baseline specification an interaction between this measure and T^p, the average score of natives in the country of origin of the interviewed parent. The results show that, if anything, the interaction term is positive, implying that parents spend more time with their children when living in a more segregated State. This finding is not consistent with a cultural substitution story, and provides further support for the fact that vertical transmission plays a key role.

Table D.2.3: Time Use - Heterogeneity with respect to the Segregation Rate

	Total	Educational	Recreational	Basic
	[1]	[2]	[3]	[4]
Score Country *p*	7.600	2.295*	1.345	3.960
	(5.028)	(1.363)	(2.542)	(3.105)
Share from *p*	1.176	0.088	1.740*	-0.652
	(1.651)	(0.409)	(1.024)	(0.921)
Score Country *p* × Share from *p*	3.875	0.573	4.629*	-1.327
	(4.079)	(0.898)	(2.475)	(2.145)
Parent Sec Edu	-2.226	4.458***	-3.192	-3.493
	(5.646)	(0.655)	(3.022)	(2.560)
Parent Ter Edu	3.186	3.717***	-2.329	1.799
	(3.276)	(1.207)	(2.193)	(1.807)
Spouse Sec Edu	2.953	-1.979***	6.109**	-1.177
	(3.098)	(0.732)	(2.836)	(1.247)
Spouse Ter Edu	12.072***	1.742	6.516**	3.814
	(3.199)	(1.462)	(2.619)	(2.956)
Log Family Income	5.465**	0.605	-1.440	6.299***
	(2.198)	(0.657)	(0.982)	(1.312)
N	5811	5811	5811	5811
# Country *p*	63	63	63	63
R Squared	0.24	0.06	0.10	0.22
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: The sample includes only immigrant parents of children with at most 18 years. $Parent$ refers to the interviewed parent, $Spouse$ to the other one; $Mother$ is 1 when the interview parent is the mother. $Total$ refers to the total time spent in child care activities, while $Educational$, $Recreational$ and $Basic$ refer to the sub-categories defined in the text. *Score Country* p is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the interviewed parent, across all available waves. *Share from p* is the share of residents in the state where each parent lives born in country p (in percent). All specifications control for parents' age, number of children, number of male children, chidren's average age, years since migration, dummies for native spouses and for retired, full time students and disabled parents. Standard errors are clustered by the interviewed parent's country of origin. * denotes significance at 10%, ** at 5%, *** at 1%.

D.3 Interactions with PISA Data

Table D.3.1 shows heterogeneity results for the PISA specification. Given that PISA does not have information on parents' years since migration, we cannot study the heterogeneity with respect to that, nor distinguishing between education acquired in the host and origin countries. However, some of the exercises considered for the US Census sample can be replicated on the PISA sample as well.

We start with the heterogeneity with respect to mother's years of education (column 1). The interaction term is negative and not statistically different from zero, which once again does not support an interpretation of our results based on an intergenerational transmission of educational quality. Column 2 shows that the effect of T^m is strongest for mothers with a connational partner, though the difference with mother with native partners is not statistically significant. Column 3 considers the heterogeneity with respect to the degree of segregation rate, which in PISA can be constructed at the school level: similarly to the US Census evidence, the country of origin effect is somewhat stronger in schools with more first- or second-generation immigrants from the same country (the interaction term is marginally insignificant), even though most of effect persists when looking at relatively "isolated" students. The last three columns show the results for the three measures of distance between the host country and the country of origin of the mother: the interaction terms between T^m and linguistic and cultural distance are positive (the latter significantly so), while the one between T^m and geographic distance is negative and insignificant. Overall, these results are broadly consistent with the US Census ones.

Table D.3.1: Heterogeneity Results - PISA

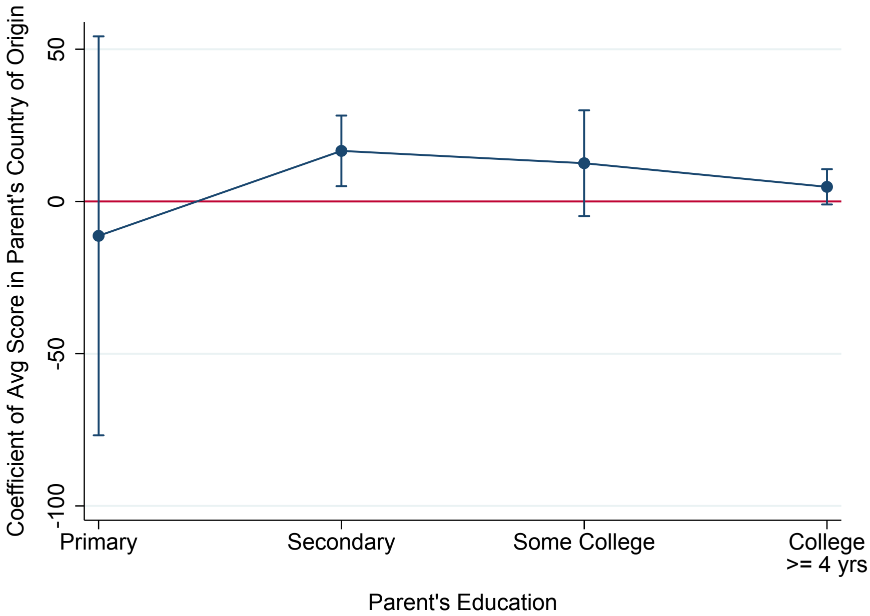
	Dependent Variable: Math Test Score					
	[1]	[2]	[3]	[4]	[5]	[6]
Score Country *m*	0.328***	0.190***	0.191**	0.272***	0.222**	0.271
	(0.113)	(0.070)	(0.082)	(0.071)	(0.112)	(0.320)
Yrs Schooling Mother	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)
Yrs Schooling Father	0.002	0.002	0.002	0.002	0.000	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Score Country *m* × Yrs Schooling Mother	-0.009					
	(0.009)					
Father from Same Country × Score Country *m*		0.060				
		(0.052)				
Father from Other Foreign Country × Score Country *m*		0.008				
		(0.076)				
Share in *s* $1^{st} or 2^{nd}$ Gen Imm from *m*			-0.002			
			(0.002)			
Score Country *m* × Share in *s* 1^{st} or 2^{nd} Gen Imm from *m*			0.003			
			(0.002)			
Mother Linguistic Distance				0.005		
				(0.022)		
Father Linguistic Distance				0.018*		
				(0.009)		
Score Country *m* × Mother Linguistic Distance				0.026		
				(0.045)		
Mother Cultural Distance					-0.011	
					(0.033)	
Father Cultural Distance					0.020	
					(0.024)	
Score Country *m* × Mother Cultural Distance					0.162**	
					(0.077)	
Mother Log Geo Distance						-0.011
						(0.025)
Father Log Geo Distance						0.019
						(0.017)
Score Country *m* × Mother Log Geo Distance						-0.005
						(0.042)
N	49097	49097	49097	46896	23513	47278
# Country m	59	59	59	57	42	59
R Squared	0.66	0.66	0.66	0.66	0.64	0.66
Socio-Econ Controls	Yes	Yes	Yes	Yes	Yes	Yes
School × Wave FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. *Share in s 1^{st} or 2^{nd} Gen Imm from m* is the share of students in school s that are either born in country *m* or with at least one parent born in country *m* (in percent). *Linguistic Distance* and *Cultural Distance* are standardized to take mean 0 and standard deviation 1 across all country pairs in the sample (the sources are discussed in the paper). Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

D.4 Interactions with Time Use Data

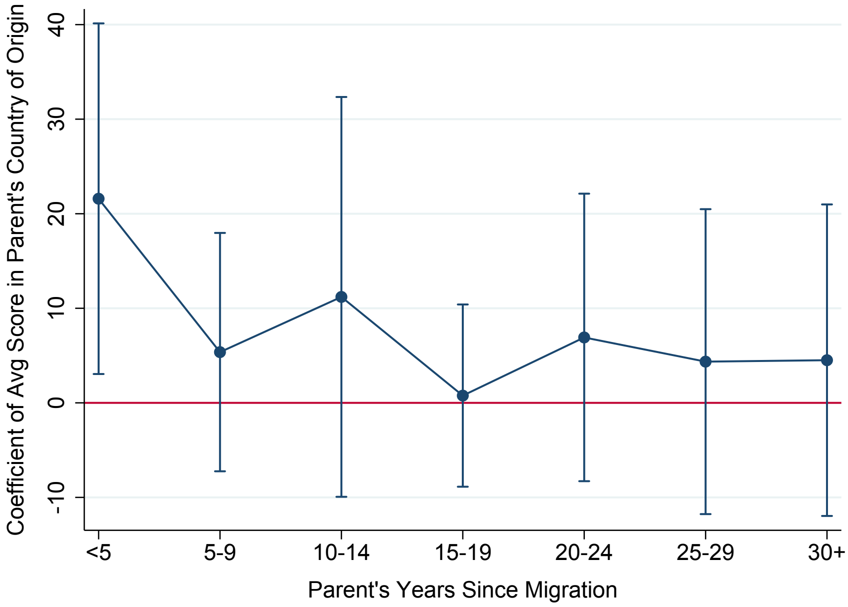
Figures D.4.1 and D.4.2 show heterogeneity results for the Time Use data specification. The results are consistent with the evidence found with the US censes, data: the effect seems to be stronger for lower educated parents (even if the coefficient of the interaction with primary school is lower and not significant, due to the very small sample size of parents with only primary school in the sample) and for parents who migrated more recently to the US.

Figure D.4.1: Heterogeneous Effect with respect to Parental Education - Time Use



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the interactions between the average PISA score of natives in the interviewed parent's country of origin and dummies corresponding to parent's educational achievement, with the dependent variable and other controls being the same as in column 3 of Table 14. Standard errors are clustered by mother's country of origin.

Figure D.4.2: Heterogeneous Effect with respect to Years Since Migration - Time Use



Notes: The Figure plots the estimated coefficients and 95% confidence intervals on the interactions between the average PISA score of natives in the interviewed parent's country of origin and dummies corresponding to parent's years since migration, with the dependent variable and other controls being the same as in column 3 of Table 14. Standard errors are clustered by mother's country of origin.

D.5 Additional Results with Controls on the Country of Origin's Educational System

Table D.4.1: Country of Origin Characteristics - Additional Educational Controls - PISA

	Dependent variable: Math Test Score									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Score Country *m*	0.237***	0.234***	0.235***	0.183**	0.265***	0.240***	0.208**	0.173*	0.173*	0.719
	(0.074)	(0.060)	(0.075)	(0.072)	(0.077)	(0.085)	(0.101)	(0.102)	(0.102)	(0.569)
Expenditure per Student in *m*		-0.013***					-0.008			0.043
		(0.004)					(0.007)			(0.036)
Some Shortage Material in *m*		-0.045					-0.584*			3.561*
		(0.215)					(0.355)			(2.085)
Large Shortage Material in *m*		-0.304					-0.311			-5.949***
		(0.222)					(0.490)			(1.381)
Avg Share Gov Funding in *m*		0.003***					0.002			0.019**
		(0.001)					(0.002)			(0.009)
Share Private in *m*		0.234**					0.364**			-0.489
		(0.114)					(0.176)			(0.733)
Assessment for Retention in *m*			0.009				-0.110			0.179
			(0.112)				(0.085)			(0.928)
Assessment to Group Students in *m*			-0.120				-0.033			-0.262
			(0.137)				(0.194)			(0.508)
Assessment for School Comparison in *m*			0.124				0.136			-0.192
			(0.132)				(0.227)			(0.975)
Share Certified Teachers (F.T.) in *m*				0.289			0.001			-1.708
				(0.373)			(0.388)			(1.613)
Share Certified Teachers (P.T.) in *m*				-0.015			0.076			0.740
				(0.236)			(0.259)			(1.783)
Teacher Monitor - Principal in *m*					0.154***		0.121			2.366***
					(0.060)		(0.112)			(0.557)
Teacher Monitor - Inspector in *m*					0.108		0.086			-1.460***
					(0.077)		(0.083)			(0.420)
Autonomy - Hiring in *m*						0.146***	0.086			-2.881***
						(0.045)	(0.129)			(0.834)
Autonomy - Salary in *m*						0.064	0.056			-0.075
						(0.065)	(0.127)			(0.364)
Autonomy - Budget in *m*						-0.094	-0.246**			1.573**
						(0.072)	(0.118)			(0.714)
Autonomy - Content in *m*						-0.192**	-0.236			0.787
						(0.094)	(0.165)			(1.338)
External Exit Exams in *m*									-0.022	-0.143
									(0.057)	(0.207)
N	48775	48775	48775	48775	48775	48775	48775	17846	17846	17846
# Country m	55	55	55	55	55	55	55	33	33	33
R Squared	0.66	0.67	0.66	0.66	0.67	0.67	0.67	0.68	0.68	0.68
Socio-Econ Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School × Wave FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. All specifications control for intercept, students' age (in months), wave fixed effect, a dummy for father's immigrant status, dummies for parents' employment status (full-time employed, part-time employed, not working) as well as all other parental socio-economic characteristics included in columns 2-5 of Table 4 in the paper. All educational controls are averages across all available waves of the corresponding variables used in Table 1 in the paper (see Appendix A for a detailed description) in the country of birth of the mother. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

D.6 Additional Results on Observable Cultural Traits

Table D.5.1 displays results for specifications including the cultural traits considered in the paper, without simultaneously controlling for the PISA score in the mother's country of origin. Table D.5.2 shows the cross-correlations between the PISA score as the cultural traits, both at the individual- and country-level.

Table D.5.1: Country of Origin Characteristics - Cultural Traits (Unconditional) - PISA

	Dependent variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
Long Term Orientation	0.265*				
	(0.154)				
Hard Work		-0.083			
		(0.157)			
Trust			0.386***		
			(0.106)		
Locus of Control				0.351***	
				(0.122)	
Secular-Rational Values					0.088***
					(0.034)
N	48720	48720	48720	48720	48720
# Country *m*	53	53	53	53	53
R Squared	0.66	0.66	0.67	0.67	0.67
Socio-Econ Controls	Yes	Yes	Yes	Yes	Yes
School × Wave FE	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. All specifications control for intercept, students' age (in months), wave fixed effect, a dummy for father's immigrant status, dummies for parents' employment status (full-time employed, part-time employed, not working) as well as all other parental socio-economic characteristics included in columns 2-5 of Table 4 in the paper. *Hard Work*, *Trust* and *Locus of Control* are constructed from answers of natives in the mother's country of birth to the corresponding questions in the World Value Survey (described in the text), and are standardized to take mean 0 and standard deviation 1 in the WVS sample. *Long Term Orientation* is from Hofstede et al. (2010) and ranges from 0 to 1. *Secular-Rational Values* is constructed as the first principal component of the average answers to 10 questions in the World Value Survey, following Inglehart and Welzel (2005). Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

Table D.5.2: Cross-Correlations between PISA and Cultural Traits

	Score Country *m*	Long Term Orientation	Hard Work	Trust	Locus of Control	Secular-Rational Values
Panel A: Individual-Level Correlations						
Score Country *m*	1					
Long Term Orientation	0.617	1				
Hard Work	0.390	0.525	1			
Trust	0.814	0.641	0.681	1		
Locus of Control	0.535	0.088	0.416	0.686	1	
Secular-Rational Values	0.714	0.831	0.382	0.740	0.364	1
Panel B: Country-Level Correlations						
	Score Country *m*	Long Term Orientation	Hard Work	Trust	Locus of Control	Secular-Rational Values
Score Country *m*	1					
Long Term Orientation	0.486	1				
Hard Work	0.026	0.089	1			
Trust	0.622	0.090	0.096	1		
Locus of Control	0.086	-0.484	0.111	0.264	1	
Secular-Rational Values	0.645	0.652	0.001	0.531	-0.207	1

Notes: The Table shows the cross-correlations between the average math PISA score and the cultural traits considered in Table 12. Correlations in Panel A are computed from the individual-level sample used to estimate the specifications in Table 12, while correlations in Panel B are computed from the country-level sample of the 52 countries of origin observed in the individual-level sample.

E Complementarities

E.1 Complementarities between School and Parental Influence

Both our reduced form evidence and decomposition exercise are based on a specification where school inputs (as proxied by school fixed effects) and unobservable parental influence (as proxied by either the average score in parents' country of origin or country of origin fixed effects) are additively separable. However, a reasonable alternative would be having an interaction between these variables, capturing patterns of complementarity or substitutability between these two kinds of inputs. Were these interactions quantitatively important, the matching pattern between parents and schools of different "qualities" would become potentially important in explaining cross-country differences in the average PISA score, substantially complicating our decomposition analysis.[21]

To assess the importance of this possibility, we allow for an interaction between the quality of school and parental inputs in our baseline reduced form specification. In particular, we use the average score among students with native parents in a given school as a proxy for school quality, and we ask whether the difference in performance between second generation immigrants from high and low PISA countries varies as a function of school quality.

Table E.1.1 shows our results. We find that the interaction term is small in magnitude and not significantly different from 0, no matter whether we use the school and country of origin PISA scores as baseline controls (column 2) or whether we absorb those in school and country of origin fixed effects. Moreover, the coefficient on T^m and the R^2 are virtually unaffected by the introduction of the interaction term (columns 2 and 4), suggesting that the linear specification is not missing much in terms of the fitting of the data.

[21]For example, in the case of complementarity between schooling and parental inputs, countries with a more assortative matching between parents and schools would obtain higher average scores.

Table E.1.1: Complementarities between School and Parental Influence - PISA

	Dependent Variable: Math Test Score				
	[1]	[2]	[3]	[4]	[5]
Score Country *m*	0.322***	0.292***	0.221***	0.246***	
	(0.116)	(0.110)	(0.072)	(0.074)	
Score School *s*	0.754***	0.732***			
	(0.026)	(0.024)			
Score Country *m* * Score School *s*		0.090		-0.038	-0.007
		(0.059)		(0.054)	(0.050)
Female	-0.184***	-0.184***	-0.200***	-0.200***	-0.196***
	(0.017)	(0.017)	(0.023)	(0.023)	(0.024)
Mother Sec Edu	-0.021	-0.019	-0.032	-0.033	-0.040
	(0.035)	(0.035)	(0.033)	(0.033)	(0.031)
Mother Ter Edu	-0.027	-0.024	-0.028	-0.029	-0.041
	(0.042)	(0.042)	(0.031)	(0.031)	(0.031)
Father Sec Edu	-0.024	-0.020	0.025	0.025	0.017
	(0.020)	(0.021)	(0.020)	(0.020)	(0.019)
Father Ter Edu	-0.067**	-0.061**	0.014	0.014	0.005
	(0.030)	(0.030)	(0.027)	(0.027)	(0.028)
Mother Working × Mother ISEI	0.002***	0.002***	0.001	0.001	0.001*
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Father Working × Father ISEI	0.002***	0.002***	0.002**	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Different Lang at Home	-0.156***	-0.150***	-0.067**	-0.066**	-0.080***
	(0.032)	(0.031)	(0.030)	(0.029)	(0.028)
11-25 Books	0.044	0.048*	0.092***	0.092***	0.100***
	(0.027)	(0.025)	(0.027)	(0.027)	(0.028)
26-100 Books	0.198***	0.202***	0.201***	0.200***	0.202***
	(0.030)	(0.030)	(0.039)	(0.039)	(0.039)
101-200 Books	0.259***	0.264***	0.256***	0.256***	0.259***
	(0.038)	(0.037)	(0.046)	(0.045)	(0.046)
201-500 Books	0.371***	0.376***	0.395***	0.395***	0.404***
	(0.054)	(0.053)	(0.064)	(0.064)	(0.065)
500+ Books	0.349***	0.353***	0.412***	0.412***	0.416***
	(0.064)	(0.063)	(0.072)	(0.072)	(0.073)
N	48418	48418	48418	48418	48418
# Country *m*	59	59	59	59	59
R Squared	0.50	0.50	0.66	0.66	0.67
Country *m* FE	No	No	No	No	Yes
School × Wave FE	No	No	Yes	Yes	Yes

Notes: The Table shows results for second generation immigrants on the mother's side. The sample includes only cases where both parents report a country of origin and the country of origin of the mother runs a PISA test on natives. *Score Country m* is the average math PISA score of natives (standardized to have mean 0 and standard deviation 1 across all countries participating to the test) in the country of birth of the mother, across all available waves. *Score School s* is the average math PISA score of students with both native parents in school s. All specifications control for intercept, students' age (in months), wave fixed effect and a dummy for father's immigrant status. Observations are weighted according to the provided sample weights. Standard errors are clustered by mother's country of origin, and inflated by the estimated measurement error in test scores. * denotes significance at 10%, ** at 5%, *** at 1%.

E.2 Complementarities between Maternal and Paternal Influence

Another possible form of complementarity (or substitutability) is the one between the influence exterted by mothers and fathers. We investigate this possibility by replicating our decomposition exercise on the sub-sample of students which have parents of the same nationality. In this case, the country of origin fixed effect captures the combined effect of unobserved maternal and parental influence, including any complementarity between the two. Notably, this specification accomodates also the possibility that the degree of complementarity is country-of-origin-specific.

We estimate the regression

$$T^{p}_{icst} = \rho' X_{icst} + \gamma^{p} + \theta_{st} + \beta' D_{icst} + \theta^{p} NatParents^{p}_{icst} + \varepsilon^{p}_{icst} \tag{1}$$

where the superscript p identifies the country of origin of both parents, γ^p is a parental country of origin fixed effect and $NatParents^{p}_{icst}$ is a dummy that takes value 1 for native parents. As in the baseline decomposition exercise, we explore the role of parental unobservable and observable characteristics, $\widehat{ParentsUnobs}_c = \widehat{\gamma}^c$ and $\widehat{ParentsObs}_c = \widehat{\rho} X_c$ in driving the cross-country variation in T_c.

Table E.2.1 displays the decomposition results. The contributions of unobserved and observed parental characteristics are very similar to the baseline ones, displayed in he paper.

Table E.2.1: Decomposition with Complementarities between Maternal and Paternal Influence

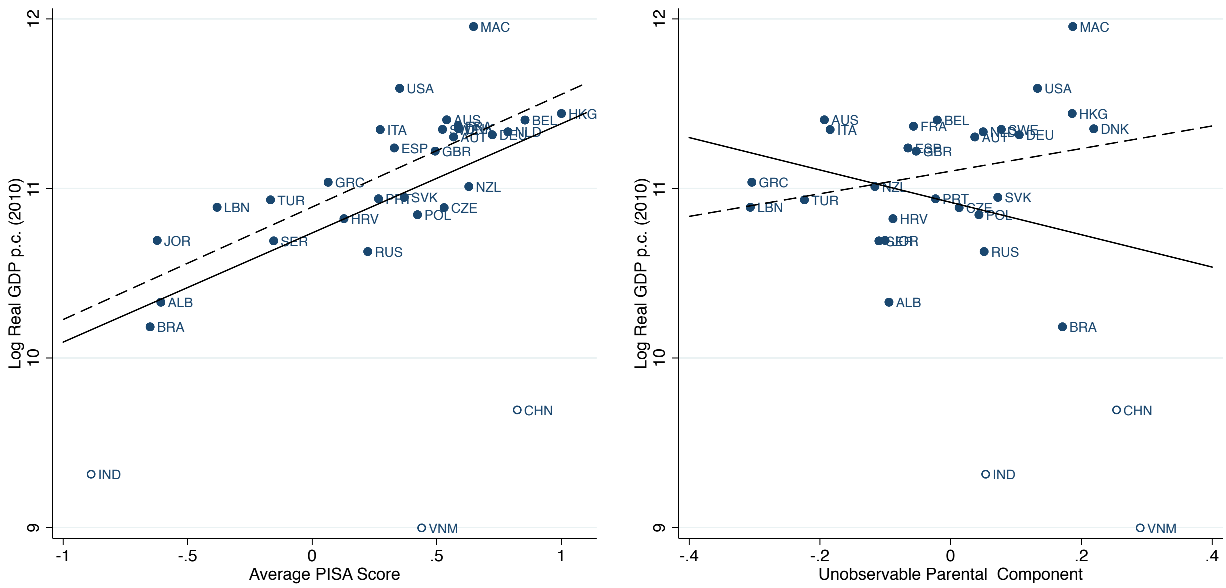
	[1]	[2]
$\frac{\text{Cov}(\widehat{ParentsObs}_c, T_c)}{\text{Var}(T_c)}$	21.02	10.37
$\frac{\text{Cov}(\widehat{ParentsUnobs}_c, T_c)}{\text{Var}(T_c)}$	14.56	10.39
# Country	31	31
Host Country × Wave FE	Yes	No
School × Wave FE	No	Yes
Sample	Sec Gen	Sec Gen

Notes: The Table shows decomposition results for native students, using second generation immigrants with parents of the same nationality to estimate parental unobservables. Only countries with at least 100 emigrant mothers and 100 emigrant fathers in the sample are included in the computation. $\widehat{ParentsObs}_c$ and $\widehat{ParentsUnbs}_c$ are the effects of observable and unobservable parental characteristics. *Sample* indicates the sample inclusion criteria: *Sec Gen* refers to countries from which we observe emigrant parents.

F Development Accounting

In this section we investigate the implications of our results in terms of cross-country differences in output per worker. Figure F.1 displays the relationship between log GDP per capita in 2010 and the average PISA Score on one hand (left panel), and the estimated unobservable parental component on the other (right panel). A few interesting patterns stand out. While, as widely documented, the PISA score is positively correlated with economic prosperity, some countries in our sample, namely China, India and Vietnam (highlighted by empty markers in Figure F.1), are clear outliers in the sense that their PISA performance is comparable with the one of countries at much higher levels of development. The right panel shows that part of the reason for this is that these countries are outliers in terms of our estimated parental unobservable component. Indeed, while $ParentsUnobs_c$ is positively correlated to GDP when these countries are excluded (dashed line), the correlation turns negative when all 31 countries are considered (solid line).

Figure F.1: PISA Performance and Unobservable Parental Component across Countries



Notes: The figure plots the logarithm of real GDP per capita in 2010 (in PPP terms) against the average PISA score (left panel) and the estimated unobservable parental component (right panel), for all countries with at least 100 emigrant mothers and 100 emigrant fathers in the sample. The unobservable parental component is standardized to have a cross-country mean of zero. The solid line shows the best linear fit, while the dashed line shows the best linear fit when China, India and Vietnam are excluded.

We implement a simple development accounting exercise to illustrate the quantitative implications of these facts. We follow Klenow and Rodríguez-Clare (1997) and much of the literature in postulating an aggregate Cobb-Douglas production function which can be written in per worker terms as:

$$y_c = A_c \left(\frac{k_c}{y_c}\right)^{\frac{\alpha}{1-\alpha}} h_c$$

This formulation allows an additive decomposition of the variance of $\log y_c$ into the contributions of the covariances between $\log y_c$ and the appropriately weighted covariances of the logs of TFP, capital to output ratio and human capital. We are interested in the magnitude and the composition of the latter term,

$$\frac{Cov(\log y_c, \log h_c)}{Var(\log y_c)}$$

which represents our measure of the overall contribution of human capital. We assume that human capital per worker is given by the exponential form

$$h_c = \exp\{\beta_s s_c + \beta_t T_c\}$$

where s_c is average years of schooling in country c. For our baseline, we follow Hanushek and Woessmann (2012) in setting $\beta_s = 0.1$ and $\beta_t = 0.2$, which are picked to match estimates of the returns to schooling and test performance in the labour market. We then break down the contribution of human capital into different components by setting either β_s or β_t equal to 0, and by counterfactually setting T_c equal to either our observable or unobservable parental component.

Table F.1 shows the development accounting results. When all 31 countries are considered, the baseline measure of human capital accounts for 26% of the variation in GDP per capita. Differences in years of schooling are responsible for 18% of the variance, while test scores account for the remaining 7%. Out of this 7%, 2-3% is explained by observable parental characteristics, while the contribution of the unobservable component is negative, consistently with the negative correlation in the right panel of Figure F.1 (solid line). The conclusions are different when the 3 outliers evidenced in Figure F.1 are excluded: test scores account for 18% of the cross-country variation among the remaining 28 countries, and about 2 percentage points are due to the unobservable parental component.

Table F.1: Development Accounting - Results

	Baseline	$\beta_t = 0$	$\beta_s = 0$	$\beta_s = 0, T_c = ParentsObs_c$		$\beta_s = 0, T^c = ParentsUnobs_c$	
				School FE	Host Country FE	School FE	Host Country FE
Sample: All Countries							
$\frac{Cov(\log y_c, \log h_c)}{Var(\log y_c)}$ (%)	25.68	18.36	7.33	1.67	3.47	-1.09	-2.55
Sample: All Countries except China, India and Vietnam							
$\frac{Cov(\log y_c, \log h_c)}{Var(\log y_c)}$ (%)	28.95	10.88	18.07	2.01	3.85	1.84	2.25

Notes: The Table shows the ratio (in percent) between the cross-country covariance between log GDP per worker and log human capital per worker and the variance of log GDP per worker. Each column corresponds to a different specification for h_c. Columns denoted by *School FE* (*Host Country FE*) refer to specifications that include school (host-country) times wave fixed effects. The top panel shows results for all countries, while the bottom panel excludes China, India and Vietnam.

To summarise, the unobserved parental component is particularly important to understand why the PISA scores in China, India and Vietnam are much higher to what one would expect based on these countries' incomes. Given that these countries are both relatively poor and characterized by a high unobservable parental component, in a standard development accounting exercise the latter cannot account for a positive share of the cross-country variance in income per capita. However, for the other countries in the sample the effect of parental unobservables is positively related to GDP, and accounts for about 2% of the cross-country dispersion.

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