The Intergenerational Mobility of Immigrants and the Native-Born: Evidence from Sweden[*]

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Abstract

We use administrative Swedish data to show that, conditional on parent income, immigrant children have similar incomes and higher educational attainment in adulthood than native-born Swedes. This result, however, masks the fact that immigrant children born into poor families are more likely than similar natives to both reach the top of the income distribution and to stay at the bottom. Immigrant children from high-income families are also more likely than natives to regress to the economic bottom. Notably, however, children from predominantly-refugee sending countries like Bosnia, Syria, and Iran have higher intergenerational mobility than the average immigrant child in Sweden.

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1 Introduction

Immigration is an intergenerational process, often driven by parental desire to ensure a better life for subsequent generations and resulting in demographic changes in the host country that play out over numerous generations. In order to construct optimal immigration policy, it is thus important to consider the effects of multiple generations of immigrants on the host country and the effects of the host country on those multiple generations. We focus on the latter in this paper, documenting how immigrant children compare to native-born counterparts and demonstrating heterogeneities in the way immigrant children integrate into a new society. We primarily use income and educational attainment as measures of integration, but we also look at employment outcomes. Understanding these aspects of the immigration process is especially important today, with the world facing over 65 million displaced persons, the largest number on record (United Nations High Commissioner for Refugees 2016).

We might expect intergenerational mobility to be lower for immigrants than for natives if culture, language barriers, or traumatic origin-country experiences impede a child's ability to obtain a good-paying job or an education. It is also possible that state resources or other forms of social support crucial for intergenerational mobility are more easily accessible for natives than for immigrants. Alternatively, if familial characteristics or domestic investment in the child are especially important for intergenerational mobility, it might be that immigrants, many of whom are fleeing their home country in search of a better future for their children, are highly positively selected on exactly the characteristics that produce higher intergenerational mobility.

Our work investigates the net effect of these forces. We look at how the immigrant experience differs from that of natives using longitudinal data from Sweden. This data allows us to link parents to children over time and follow the children's income and education trajectories. We focus on immigrant children that are born abroad to foreign-born parents and arrive in Sweden before the age of 16.[1] By studying this group, we set ourselves apart from existing studies on the intergenerational mobility of immigrants, which look at children who are born in the host country to foreign-born parents (see Hammarstedt and Palme 2012, Niknami 2016, and Hermansen 2016, among others). Doing so allows us to work with a sample that more closely resembles the recent refugee waves. Moreover, we are able to see how children who do not spend a significant portion of childhood in Sweden fare compared to those who, along with their parents, are born there. As a country that has for decades been accepting large numbers of refugees, family migrants, and workers from all over the world, Sweden provides a useful setting for our analyses. Additionally, our work expands on the existing literature by administratively linking immigrant parents with children and separating out refugees from non-refugees.

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1. These are often called the 1.5 generation in the immigration literature (Sweetman and Ours 2015).

We start by documenting striking similarities in income and educational outcomes between immigrant and native children. We next zoom in on the immigrant group and find that refugee children from countries like Bosnia, Syria, and Iran have higher intergenerational mobility than the average child immigrant. While immigrant parents from these countries on average find themselves with lower incomes than those from other countries, their children show some of the highest levels of income in adulthood among all immigrant children. Still, we find substantial heterogeneity in intergenerational mobility across predominantly-refugee sending countries, revealing the importance of further research to try to understand the mechanisms behind these differences.

Our work stands on the shoulders of an active literature on the intergenerational mobility of immigrants. Focusing on male immigrants who arrive in Sweden before 1970 and their Swedish-born sons, Hammarstedt and Palme (2012) show that the absolute income of these children converges to that of the children of native Swedish fathers. In our sample of immigrants who arrive in Sweden between 1974 and 1999, 21% of children have information on only their mothers, suggesting that looking at parents and children of both genders is important to get the full intergenerational mobility picture. Furthermore, immigration to Sweden changed character quite dramatically in the early 1970s with waves consisting primarily of refugees and family migrants, as opposed to labor immigrants. We focus on immigrant children born outside of Sweden instead of the second generation, with the goal of seeing how those who spend only a portion of their childhood in Sweden do compared to native Swedish children. We measure a child's income when he or she is 30 years old, whereas Hammarstedt and Palme (2012) measure child income in 1997-1999 at ages that range from 20 to 64. Given how variable incomes are across those ages, we argue that our strategy provides a more stable measure of income in adulthood.[2] Similar to us, however, the authors find heterogeneities in income convergence, with children from Turkey, Greece, the Middle East, and Africa displaying the highest earnings gaps relative to natives.

Relatedly, Niknami (2016) looks at how the educational attainment of immigrant and native girls born in Sweden between 1960 and 1980 differs from the educational attainment of their mothers. She finds higher educational intergenerational mobility for girls born to immigrant mothers. The paper complements earlier work by Borjas (1992), Borjas (1993) Card, DiNardo, and Estes (2000), and Aydemir, Chen, and Corak (2009), who study the relationship between immigrant father earnings and child earnings. They conclude, among other things, that sons of immigrants have earnings in adulthood that closely resemble their father's earnings. In contrast to most of these studies, we do not restrict our focus to fathers and sons and we do not rely on a grouped data estimator since we can link children to their parents.

In the Norwegian context, Hermansen (2016) finds evidence of convergence of immi-

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2. We also check the robustness of our results using later ages.

grant children to their native counterparts in terms of absolute income and education. Like us, he sees immigrant children of several non-European ethnic minorities achieve higher educational attainment and earnings than their native counterparts with similar parental socioeconomic backgrounds. Hermansen (2016)'s sample includes children born to foreign-born parents who were either born in Norway or who came to Norway before the school-starting age. Given prior work that shows children moving at earlier ages with higher incomes and education levels in adulthood (see Van den Berg et al. 2014 and Chetty, Hendren, and Katz 2016), we also include children arriving in their teenage years in our sample to ensure a representative picture of immigrant intergenerational mobility.

In the next section we present Sweden's immigration history since World War II and describe how we selected the data and variables for our analyses. Section 3 dives into the main results, showing how immigrant intergenerational mobility compares to native intergenerational mobility and discussing potential sources of measurement error. Section 4 shows how immigrant intergenerational mobility differs across countries of origin. Section 5 discusses whether the patterns we observe in Section 3 can be explained by other family-level background characteristics. Finally, Section 6 concludes.

2 Background and data

2.1 Immigrants in Sweden

Sweden has for decades been a destination for large numbers of immigrants with widely different backgrounds. Since World War II, when Sweden became a net immigrant-receiving country, numerous immigration waves have occurred. The 1950s and 1960s were dominated by labor immigration, primarily from other Nordic countries like Finland, but also from Mediterranean countries like Greece, Italy, and Yugoslavia (Hammarstedt and Palme 2012).

Labor immigration from non-Nordic countries came to a halt in the early 1970s[3], but immigration continued in the form of family reunification and refugee immigration. Refugees from Chile arrived predominantly in the 1970s; from Iran, Iraq, and Lebanon in the 1980s; from Somalia, Eritrea, and Former Yugoslavia in the 1990s. The timing of refugee arrivals has mirrored the timing of conflicts around the world. Given the volume of these refugee waves, 1970 marked a shift in Sweden towards mostly non-European immigration. Our sample, which consists of immigrants who arrived in Sweden between 1974 and 1999, shows 76% of foreign-born children with at least one refugee parent. As of 2016, about 17% of the Swedish population was foreign-born, compared to less than 7% in 1970. By comparison, the share of foreign-born in the United States was at about

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3. Nordic labor immigration continued, primarily from Finland, as the 1954 Nordic Agreement allowed free movement for citizens of the Nordic countries.

13% in 2013 (OECD 2017).

2.2   Sample Selection

We use Swedish register data from the GeoSweden database, which covers all individuals with a permanent residence permit valid for at least one year for the 1990-2014 period.[4] The data contains variables from several different registers, including the education, income, and employment registers. Parent identifiers for each individual are available, provided the parents have also registered in Sweden (either as a resident or as a citizen) at some point between 1990 and 2014.

In order to construct our sample, we first identify all parents of children born in the 1974-1984 cohorts for whom we have information in the population and employment registers. We then identify the children born in the 1974-1984 cohorts who can be found in the population and employment registers when they are 30 years old. For immigrant children, we follow Van den Berg et al. (2014) and impose the restriction that they arrive before the age of 16.[5]

We focus on two groups: the native children in our analysis are children born in Sweden to Swedish-born parents. The immigrant children are born abroad to foreign-born parents. This implies that we exclude children born in Sweden to immigrant parents, children born abroad to Swedish parents, and children born to one Swedish parent and one foreign parent, regardless of the place of birth. Our sample restriction allows us to focus on those immigrant children for whom integration into Swedish society would likely be hardest. This, in turn, likely makes our results lower bounds for the entire population of immigrant children in Sweden.

We have information on both parents for 97% of native children in our data.[6] Only 75% of the immigrant children in our sample have both parents in the register. The majority of those that have only one parent in the register are in Sweden with their mothers. The most likely reason a parent is missing from the register is that this parent lives abroad. Additionally, a parent could be missing in the register if he or she is deceased, has only a temporary residence permit - which allows for less than one year of residence in Sweden - or is somehow not registered at all.

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4. GeoSweden is administered by the Institute for Housing and Urban Research at Uppsala University. The data is collected and anonymized by Statistics Sweden.

5. The average age at arrival for immigrant children is 9, with a standard deviation of 4 years.

6. We restrict our attention to whether parents are present in the register during the period in which we are interested in measuring parental outcomes - when the child is between 15 and 19 years old. This means that we include children who either had only one parent or both parents in the register *throughout the entire 5-year period*. A further implication is that we are not capturing those children whose parents migrate in and out of Sweden during that time.

2.3 Key Variables

We calculate *family income* as the average combined income[7] of the parents in the register during the years when the child is 15 to 19 years old.[8] We include families with zero income. We follow Chetty et al. (2014) and define the family's *percentile rank* based on its position in the *national* distribution of incomes relative to all parents with children in the same birth cohort, regardless of immigrant status.

We measure *child income* as the individual income the child earns when he or she is 30 years old. Just as for the parents, we define the child's percentile rank based on his or her position in the national distribution of incomes relative to all children in the same birth cohort.

Both income variables are measured in 2014 Swedish crowns, adjusting for inflation using Statistics Sweden's Consumer Price Index.

We define *parental education* as the maximum level of education observed throughout the time the parent is in the register, so as to reduce the number of missing values for immigrant parents in their first years in Sweden.[9] We categorize families based on whether neither or at least one parent has a college degree or above.[10] In our data, this corresponds to having at least a post-secondary education that takes fewer than 3 years to complete.[11]

Similarly, we measure whether the child has a *college degree or above* when the child is 30 years old.

A parent is a *refugee* if the *first* reason for settlement in Sweden is recorded as such. Sweden grants asylum to people classified as refugees in accordance with the Geneva Convention and also to those considered to be "in need of subsidiary protection" according to EU regulations. The information on residence permits is missing for some observations.

We show summary statistics for native and immigrant children in Table 1. On average, immigrants (Panel B) grow up in families that earn less than 35% of what native families earn. Yet, as adults, immigrant children earn about 80% of what native children earn. The average native parents and children are more likely to have college or above levels of education than the average immigrant parents and children, respectively.

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7. Our income variable includes income from employment and self-employment. Using instead only labor income gives similar results. These are available upon request.

8. When the child has only one parent in the register, we measure family income as the average income of the existing parent during the years when the child is 15 to 19 years old. For the 1974 cohort, we measure family income when the child is between 16 and 20, because our income data start in 1990.

9. Immigrant parents might see their skills and degrees obtained abroad recognized some time after arrival.

10. We do so only for families where both parents have non-missing education information when both parents are in the register (or the one existing parent has non-missing information when only one parent is in the register). However, if we assign families the level of education from just one parent when only one parent has non-missing information, the average share of families with college or above changes only slightly, from 42.92% to 42.89% for natives and from 33.8% to 33.11% for immigrants.

11. The equivalent in the United States would be an associate's degree.

3   Results

3.1   Immigrants vs. Native-born

To better understand how immigrants integrate into Swedish society, we turn our attention to intergenerational mobility. We measure the extent of integration by comparing the outcomes of immigrant children to the outcomes of native-born children from the same birth cohorts and the same family income.

Figure 1 plots child income ranks against parent income ranks, revealing a slightly higher intergenerational mobility for natives than for immigrants. The rank-rank slope for immigrants is a little steeper, at about 0.22, than the 0.18 slope for natives. The ranks of the native and immigrant children born into the bottom of the income distribution are very similar, with differences arising as we move up the parental income distribution in part because the number of immigrant parents decreases.[12]

These results, however, do not fully capture what is happening at the extremes. Looking at a child's probability of ending up in the top income quintile in Figure 2a, we can see that when the parents are in the first half of the income distribution, immigrant children have slightly higher probabilities than native children. At the same time, they are also more likely to end up in the bottom income quintile (Figure 2b), even if they start at high family income levels. This higher likelihood of regression to the bottom of the income distribution echoes findings in Chetty et al. (2018) where the authors look at the United States and find that black children born into high-income families are more likely to fall back into the bottom income quintile than white children.[13]

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12. Since we later discuss how the immigrant-native income gap varies by gender, it is worth pointing out here that both the slope and intercept we estimate for immigrant women are similar to those we estimate for native women. In contrast, immigrant men are both less mobile and do worse than native men on an absolute level. These results are available upon request.

13. Importantly, as Figure A.1 shows, parental education levels cannot fully explain what is happening at the extremes. The gap between native and immigrant child income percentile ranks is virtually constant across parental education levels, suggesting that other factors are driving immigrant children to be concentrated at the extremes.

Table 1: Summary statistics

	Mean	Std. dev.	No. of obs.
Panel A: Natives			
Parent family income	455.43	243.31	819,422
Parent percentile income rank	53.72	27.45	819,422
Age mother when child 15-19	44.57	4.88	814,610
Age father when child 15-19	47.17	5.35	800,860
At least one parent with college or above	42.92	n/a	818,014
Both parents in the register	97.15	n/a	819,422
Only mother in the register	2.27	n/a	819,422
Child individual income	236.26	157.72	819,422
Child percentile income rank	50.75	29.15	819,422
Child has college or above	48.20	n/a	814,931
At least one child	43.48	n/a	819,422
Age at first child, men	27.05	2.58	145,045
Age at first child, women	26.06	3.20	211,239
Number of unique mothers	543,430		
Number of unique fathers	534,200		
Panel B: Immigrants			
Parent family income	153.38	177.00	52,772
Parent percentile income rank	15.55	19.74	52,772
Age mother when child 15-19	42.11	5.34	50,943
Age father when child 15-19	46.29	6.26	41,552
Mother years since arrival when child 15-19	8.35	4.08	50,027
Father years since arrival when child 15-19	8.67	4.53	40,598
At least one parent with college or above	33.80	n/a	50,662
Both parents in the register	75.27	n/a	52,772
Only mother in the register	21.26	n/a	52,772
At least one parent refugee	76.37	n/a	43,983
Child individual income	191.07	162.09	52,772
Child percentile income rank	40.82	30.77	52,772
Child has college or above	37.35	n/a	52,336
Average age at arrival	8.99	4.04	52,772
At least one child	44.03	n/a	52,772
Age at first child, men	26.37	2.91	9,660
Age at first child, women	24.67	3.50	13,574
Number of unique mothers	35,092		
Number of unique fathers	27,515		

Notes: This table reports summary statistics for natives and immigrants, respectively. Immigrant children are born abroad to foreign parents; native children are born in Sweden to Swedish parents. Children are born between 1974 and 1984. Income is in thousands of 2014 SEK. Child income is individual income measured when the child is 30 years old. Parent family income is the combined income of the parents during the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. A college degree corresponds to having at least a post-secondary education that takes fewer than 3 years to complete. We classify a child as a refugee if at least one of his or her parents is classified as a refugee in our data. Where standard deviations are not reported, the Mean column shows shares.

Figure 1: Average child income percentile rank, conditional on family income percentile rank
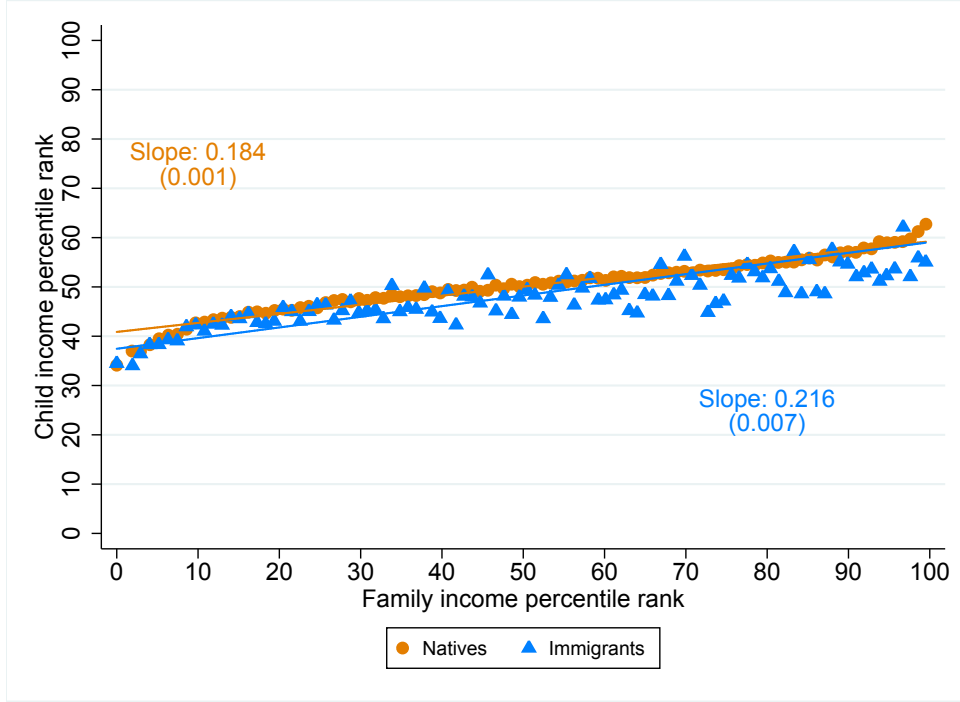
Notes: The figure plots the percentile income rank of children in the 1974-1984 birth cohorts at age 30 against the percentile rank of their parents for natives and immigrants, respectively. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Turning to educational attainment, we can see in Figure 3 that immigrant children are considerably more likely than native children to complete college, especially at the lower parts of the parental income distribution. Our data also shows that the share of parents with college degrees at the bottom of the income distribution is higher for immigrant parents than it is for native parents, by somewhere between a few percentage points for the children born in the mid-1970s and as many as 15 percentage points for children born in the mid-1980s. Taken together, these findings suggest a strong familial transmission mechanism of the importance of education that is separate from family income.[14]

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14. We see further evidence of this when we condition on parental educational characteristics instead of income characteristics in Figure A.2 and find that immigrant children and native children look similar. Children born into families where neither parent has a college education have about a 35% probability of obtaining a college education themselves, whether they are immigrants or natives. When only their mother has a college degree, that probability rises to about 60% for both groups. The largest gaps in college attainment between immigrants and natives occur when only the father has a college degree (50% for immigrants vs. 60% for natives) and when both parents are college-educated (70% for immigrants vs. 80% for natives).

Figure 2: Average child outcomes, conditional on family income percentile rank

(a) Top income quintile (b) Bottom income quintile
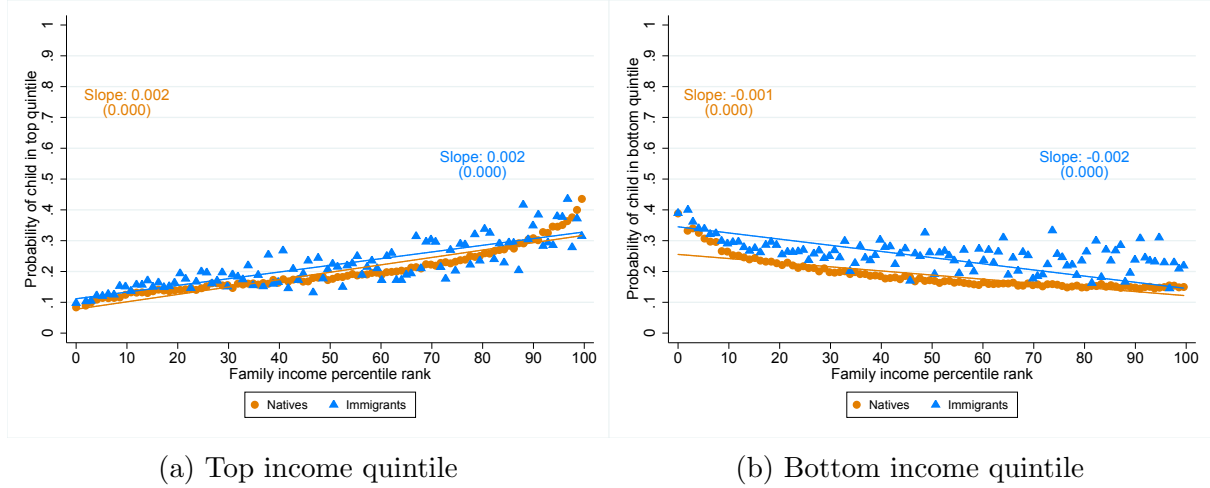
Notes: Figure 2a (2b) plots the probability of reaching the top (bottom) 20% in the income distribution for children in the same birth cohort, against the percentile income rank of their parents. Probabilities are shown for natives and immigrants. Children are born between 1974 and 1984. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Figure 3: Average share of children obtaining college or above education conditional on family income percentile rank
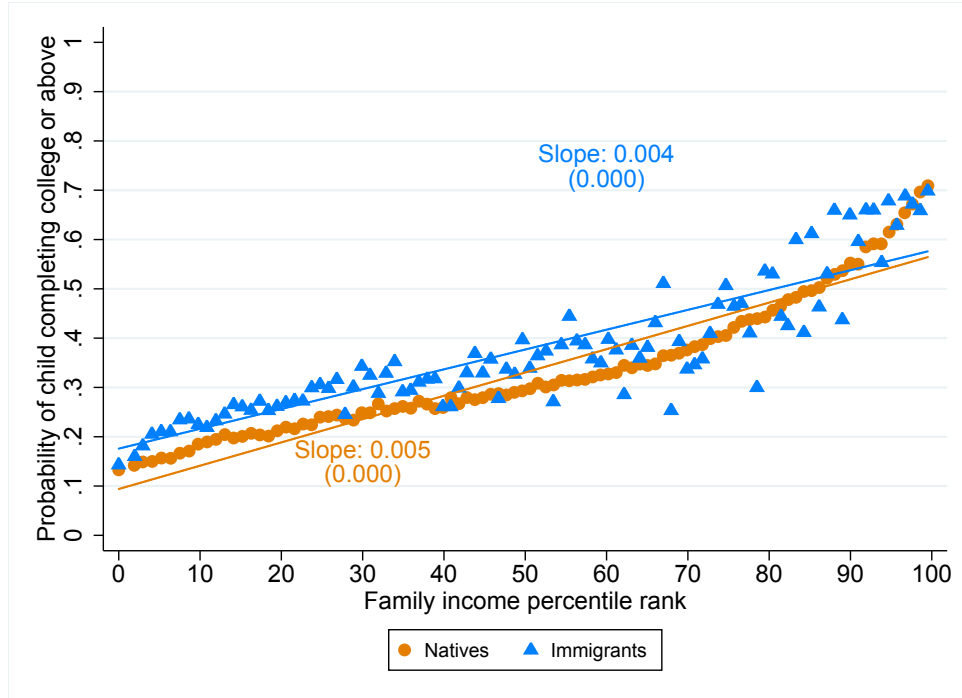
Notes: The figure plots the probability of children having completed a college degree or above by age 30, against the percentile income rank of their parents. Probabilities are shown for natives and immigrants. Children are born between 1974 and 1984. A college degree corresponds to having at least a post-secondary education that takes fewer than 3 years to complete. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Notwithstanding the fact that immigrant children, and especially those born to lower-income parents, are more likely to complete university education, they are slightly less likely to be employed than natives.[15] As Figure 4 shows, employment rates are high for both groups, but they are higher for natives across the parental income distribution. These patterns could be indicative of discrimination in the labor market.[16]

Figure 4: Average share of children who are employed conditional on family income percentile rank
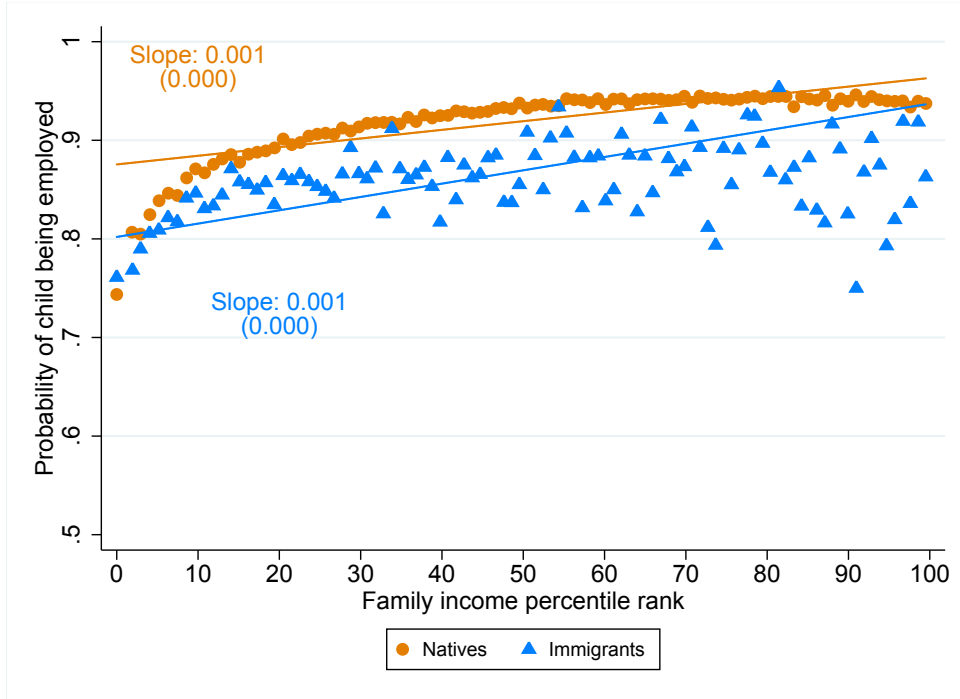
Notes: The figure plots the probability of children being employed at age 30, against the percentile income rank of their parents. Probabilities are shown for natives and immigrants. Children are born between 1974 and 1984. Employment includes self-employment. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Overall, however, whether the outcome of interest is income in adulthood or educational attainment, children of immigrants on average perform similarly or even better than children of natives when we condition on parental income (or, as we show in Figures A.1 and A.2, on parental education). On average, it seems that forces like cultural differences or language barriers or differential access to services, which might be hurting intergenerational mobility for immigrant children, do not outweigh the forces that immigrant parents bring with them to help propel their children upward.

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15. Our measure of employment includes self-employment.

16. Using a correspondence testing design, Carlsson and Rooth (2007) find that job applicants with Middle Eastern names are significantly less likely to receive callbacks than identically skilled applicants with Swedish names. A significant fraction of the immigrants in our sample originate from Middle Eastern countries.

3.2 Robustness of baseline estimates

We now document whether our results are driven by measurement error. In what follows, we discuss sources of measurement error in both the dependent and independent variables and show that our results are robust to alternative specifications. We focus exclusively on the integernerational income mobility estimates.

3.2.1 Measurement error in the parental income measure

Life-cycle bias. The intergenerational mobility coefficient we wish to estimate should reflect the correlation between the child's and parents' *lifetime* income. In order to do so, we need to make sure that parents are not very old or very young when we measure their income. As Table 1 shows, native (immigrant) mothers are about 44.6 (42.1) years old on average, whereas native (immigrant) fathers are slightly older, about 47.2 (46.3) years old. These averages are very similar to those of parents in the sample used in, e.g. Chetty et al. (2014).[17] However, given that among our sample of immigrants there are children who arrive as late as at age 15, starting to measure parental income when the child is 15 is the lowest age we *can* use in order to have a consistent measure between the two groups.

Bias due to immigrant parents' low earnings upon arrival. Given that immigrant children arrive before the age of 16 and we calculate parents' income when the child is between 15 and 19, there is significant variation in the amount of time immigrant parents have to enter the labor market before we measure their income. This likely contributes to the low incomes we observe for immigrant families. On average, however, we see in Table 1 that immigrant parents have been in Sweden for about eight years. Nevertheless, to understand if our estimates are sensitive to different measures of parental income, we do the following exercise. For immigrant parents, instead of measuring income when the child is between 15 and 19, we do so when the parents have been in Sweden for 10 to 14 years.[18][19] During this period, mothers are on average 45.9 years old and fathers are on

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17. Note that Chetty et al. (2014) report average parental ages during the first year in the period over which they calculate parental income. For us, the equivalent would be reporting average ages when the child is 15, in which case the average is 42.6 (40.1) for native (immigrant) mothers and 45.2 (44.3) for native (immigrant) fathers, respectively.

18. We are able to calculate parental income during this time window for 97.7% of children in the immigrant sample. Note that ideally, we would observe income over the entire five-year period, for both parents (ten observations). In reality, we have on average 8.3 observations per family. The main reason is that our income data begins in 1990, hence the theoretically available number of observations starts declining for parents arriving in 1979. Furthermore, there may be return migration during this time window. It is often also the case that parents do not arrive during the same year, in which case the number of available observations might differ between parents. Therefore, in order to conduct this exercise we calculate average income over the period for each parent separately, so as to correctly account for the number of yearly income observations, and then we sum over the two averages.

19. We choose this time window as various reports have documented that a significant share of the immigrant population - and in particular refugees - are in employment ten years after arrival (see, e.g. Bevelander 2011 who shows that refugees, resettled refugees and family reunification immigrants

average 49.8 years old. On average, the immigrant parents' income we observe during this period is indeed higher than in the baseline, at 201.13 (thousand) compared to 153.38. We show the new rank-rank plot in Figure A.3 in the Appendix. The rank-rank coefficient is lower than when using the baseline measure, but falls within the baseline estimate's confidence interval.[20] Hence, although we might be worried that using parents' income early with respect to their year of arrival might bias our results, addressing this issue by recalculating income after parents have spent a significant number of years in Sweden does not affect the results significantly.

Bias due to parents being absent from the register. We have seen in Table 1 that for 25% of immigrant children, we can only find one parent in the register. Since we calculate income at the family level, this means that immigrant parents will have a lower income rank by virtue of there not being two incomes that make up the family income. We test whether our results are driven by missing parents in the register by calculating average *parental* income when the child is between 15 and 19. With this method, we essentially get parental incomes for those with both parents in the register that are half as large as in the baseline. The parental income of those with only one parent in the register remains unchanged. The resulting rank-rank plot is shown in Figure A.4. For natives, the estimate barely changes, which isn't surprising given that few natives have only one parent in the register. For immigrants, the rank-rank slope goes down with respect to the baseline and it is very close to that of natives. We conclude that immigrants are at most slightly less mobile than natives but may even be at least as mobile.

3.2.2 Measurement error in the child income measure

Life-cycle bias. As discussed earlier, results may be biased if incomes are measured too early or too late in life, as they will not accurately reflect lifetime incomes. Nybom and Stuhler (2016) have shown that for Swedish men born between 1955 and 1957, a three-year average around the age of 33 gives an income measure that is highly correlated with the average of annual lifetime income. Figure A.5 shows that calculating the income rank using the average annual income when children are between 32 and 34 does not significantly change our results: the rank-rank slope is now 0.19 for natives and 0.21 for immigrants.[21] Since our data ends in 2014, the exercise means that we are able

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who arrive after 1987 have employment rates between 60 and 70% 11-15 years after arrival). We have performed similar exercises looking at the 15-19 and 20-24 years since arrival time windows, respectively. However, we run into the issue of large number of zero-income observations due to retirement. Therefore, by choosing the 10-14 time window, we give immigrant parents enough time to enter the labor market and we maintain an average parental age that is far enough from the retirement age to give us a reasonable estimate of lifetime income.

20. Adding dummies for the number of observations used to calculate income during the 10-14 time window does not alter the results. They are available upon request.

21. This result is not surprising since the correlation between a child's income rank at age 30 and the average income rank at ages 32-34 is 0.7.

to include only cohorts between 1974 and 1980. Nevertheless, these results show that prioritizing including more cohorts over observing their incomes at slightly later ages does not compromise the validity of our results.

Bias due to parental leave. We might be concerned that we are measuring income around an age when individuals have their first children. Sweden has a generous parental leave system that means that parents of small children, and in particular women, are on leave during the first one to two years of their child's life, which means that we would observe lower incomes for them than we would otherwise. As Table 1 shows, however, less than half of the sample - native or immigrant - have children by the time they are 30.[22] Furthermore, of those that have children, the average age at first child is around 25 (26) for immigrant women (men) and 26 (27) for native women (men). Hence, fertility patterns are very similar between groups. What may differ, however, is the propensity of taking parental leave in the first place, as well as the time spent on parental leave. Our results should be interpreted with this caveat in mind.

4 Country of origin differences

The similarities in intergenerational mobility that we uncover between native and immigrant children do, however, mask substantial heterogeneity in immigrants' later-life outcomes. Focusing on income, one such dimension along which we can see differences in later-life outcomes is country of origin.

Each circle in Figure 5 represents a different country of origin, with each circle radius equal to the square root of the number of children coming from each country. The y-axis captures the mean child income rank and the x-axis represents the mean parent income rank, both at the country level. The regression line and the estimated slope do not include native-born children, though we do include a circle for Sweden here for perspective. We label the countries representing our largest immigrant groups and some of the outliers.[23]

Most of the refugee-sending countries of origin are on the far-left of Figure 5, with parents on average starting off in the very bottom ranks of the income distribution. Though they start off at about the same point in the distribution, children from Somalia, Lebanon, Turkey, Iraq, Afghanistan, and Syria have mean income percentile ranks in adulthood that range from 30 to 40. Children from Iran, Bosnia, Former Yugoslavia, and Syria, countries whose vast majority of immigrant children are refugees (see Figure A.6), all have higher intergenerational mobility than the average intergenerational mobility across all immigrant groups.[24]

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22. Both native and immigrant women are more likely to have children by the time they are 30 than men, 53% and 55%, respectively, compared to a virtually identical share of 34% of men in both groups.

23. Note that if we exclude the countries with fewer than 30 immigrant children in our sample, the estimated slope becomes 0.261 (standard deviation 0.075).

24. Though Bosnia is also a former Yugoslavian country, it is labeled separately in our data. We

Figure 5: Intergenerational income mobility, by country of origin
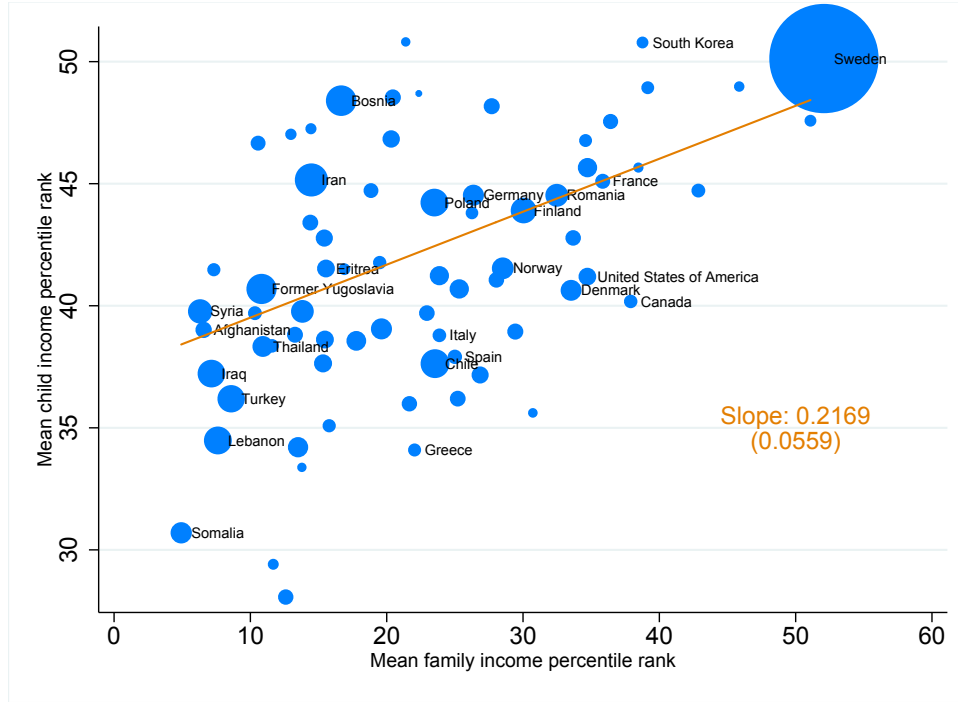
Notes: The figure plots the mean child income percentile rank against the mean family income rank, for each country of origin. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. Each circle represents a different country of origin, with each circle radius equal to the square root of the number of children from each country. We include a circle for Swedish children as a point of reference, but the observation is not included in the regression. The slope is estimated using weighted OLS. Standard error in parentheses.

In contrast, though most of the children from Chile are refugees as well, their parents start off at about the same position in the income distribution as parents of Norwegian children and their intergenerational mobility is below the average across immigrant groups. Thus, not all refugees are the same, and some integrate into Swedish society better than others. We find similar heterogeneities by country of origin when we look at the probability of reaching the top quintile, the probability of ending up in the bottom quintile, and the probability of completing college or above (see Figures A.7 - A.9).

5   Immigrant-native intergenerational gaps

A different way to summarize our findings so far is to look at immigrant-native intergenerational gaps and understand what generates them. In particular, we focus on parental education, country of origin and parental wealth. We follow Chetty et al. (2018) who perform this exercise to study intergenerational gaps between black and white men in the

maintain that separate labeling here.

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United States and estimate regressions of the following type:

$$y_{ic} = \alpha + \beta_p y_{ip} + \beta_{im} immigrant_i + \beta_{imp} immigrant_i \times y_{ip} + \gamma X_i + \varepsilon_i \qquad (1)$$

where y_{ic} is the child's income rank, y_{ip} is the family income rank, $immigrant_i$ is a dummy that indicates immigrant status and X_i is a covariate. We are interested in the intergenerational gap in income at a given parental income rank $\bar{p}$ and how it changes with X_i, given by $\beta_{im} + \beta_{imp}\bar{p}$.

Figure 6: Intergenerational income gaps
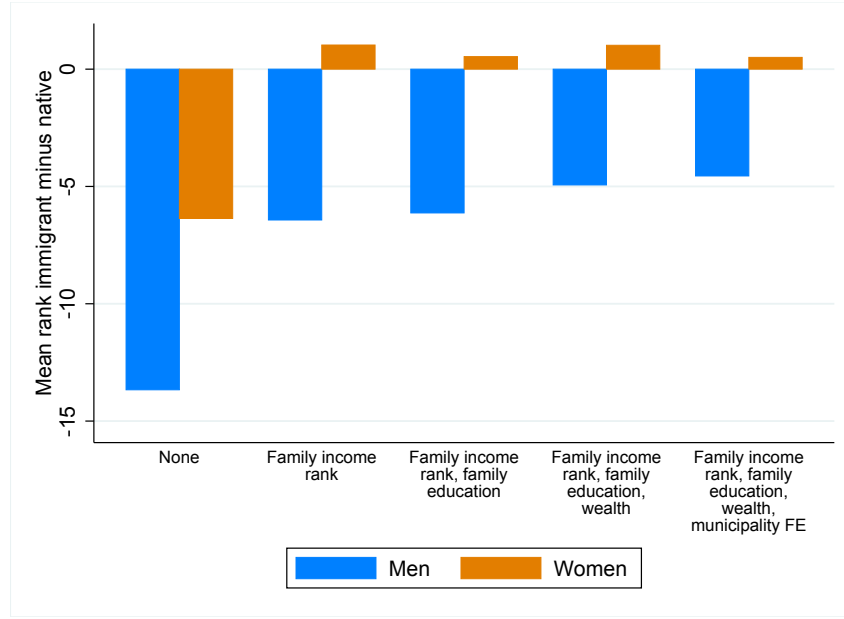
(a) Children with parents at the 25th percentile
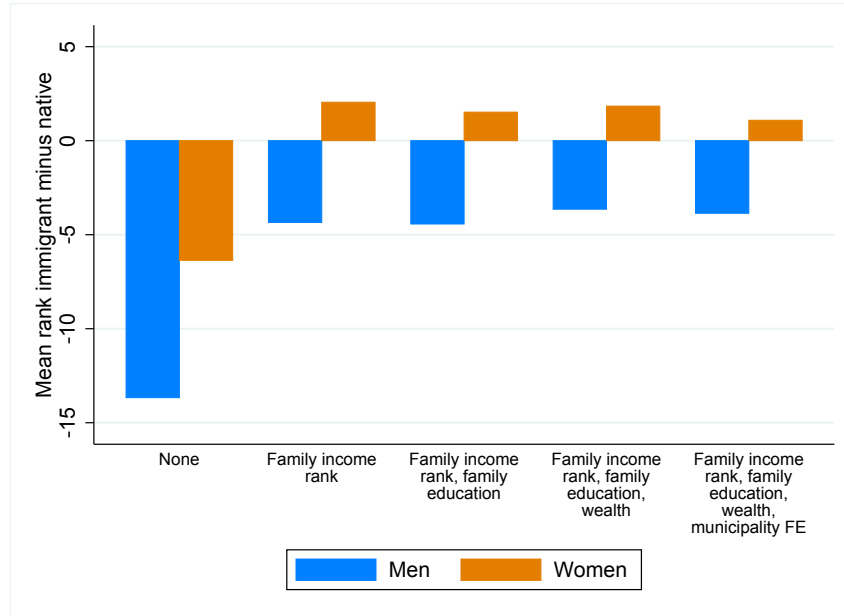
(b) Children with parents at the 75th percentile

Notes: The figure shows how the immigrant-native income gap changes with family-level controls. Panel (a) shows estimates for $\bar{p} = 25$ and Panel (b) for $\bar{p} = 75$. In each panel, the blue bars show estimates for men and the orange bars for women. The first group of bars shows the unconditional immigrant-native income gap. The next group shows the unconditional gap at $\bar{p}$. The third, fourth and fifth group show how the gap at $\bar{p}$ changes as we add, respectively, family education, municipality fixed effects, and parental wealth as proxied by homeownership.

Figure 6 shows our results. Panel (a) plots the estimates for $\bar{p} = 25$ and Panel (b) for $\bar{p} = 75$. We run separate regressions by gender. The first group of bars in each panel shows the unconditional immigrant-native gap, which, for $\bar{p} = 25$, is -13.7 for men and -6.4 for women. Family income rank goes a long way in explaining this gap, as the

second group of bars shows. The gap roughly halves for men and entirely disappears for immigrant women, who have a higher income rank than native women once family income rank is accounted for. Family education does not significantly alter the gap. We next control for parental wealth, as proxied by homeownership during the period when the child is between 15 and 19.[25] Again, the gaps do not change significantly. As a last explanation, we check how controlling for the municipality of residence affects the income gap. We define municipality of residence as the municipality where the child has spent the most time between the ages of 15 to 19.[26] Perhaps due to the fact that it is a broad measure of residential location, the results change little with the addition of this variable.

To sum up, parental background explains more than half of the immigrant-native income gap for men born in families at the 25th and 75th percentile, respectively. For immigrant women, once we control for family characteristics, we find that they have higher income ranks than native women.

We further want to examine the immigrant-native income gap for children born in families at percentile rank $\bar{p}$ and education level $\bar{e}$.[27] We therefore estimate the following equation:

$$y_{ic} = \sigma + \phi_p y_{ip} + \phi_{im} immigrant_i + \phi_{imp} immigrant_i \times y_{ip} +$$
$$\phi_{ime} immigrant_i \times e_{ip} + \theta X_i + \nu_i \tag{2}$$

We summarize our results in Figures A.10 and A.11. In each panel of each of the figures, the first set of bars corresponds to the gap defined by $\phi_{im} + \phi_{imp}\bar{p} + \phi_{ime}\bar{e}$. The upper panel in each of the figures evaluates the gap at $\bar{e} = 0$ and the lower panel at $\bar{e} = 1$. The subsequent sets of bars add our proxy for wealth and municipality of residence fixed effects, respectively. There a few takeaways from these figures. First, if we focus on children born in families at the 25th percentile, we see that immigrant women do at least as well as native women regardless of their parents' education and they do especially well when their parents are highly-educated. Immigrant men from high-educated families do better than immigrant men from low-educated families but they do worse than natives in both cases. We observe similar parents for children born in families at the 75th percentile. Together, these figures suggest that immigrants with college-educated parents, and in particular women, do better than immigrants whose parents do not have a high level of education, regardless of whether the parents are in the bottom or the top of the distribution. Given that immigrant parents at the 25th percentile

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25. We consider parents as homeowners if they lived in owned housing throughout most of the period when the child is between 15 and 19.

26. To be more precise, we use the municipality where the mother resided during the relevant period and when the mother can be found in the register, and the father's municipality of residence otherwise.

27. In our case, this means looking at children born in families at percentile rank $\bar{p}$ with or without parents with a university degree.

are on average more likely to have a university degree than similar native parents, these patterns are to an extent the result of positively selected immigrant parents relative to native parents.

6   Conclusion

We use administrative Swedish data to document that, conditional on parent income, immigrant children have comparable incomes to their native-born counterparts. Digging deeper into the conditional expectation, we reveal that immigrant children born into poor families are slightly more likely than native children born into poor families to reach the very top of the income distribution. They are also considerably more likely to obtain a college degree. At the same time, immigrant children are also more likely than native children to stay at the very bottom of the income distribution or to regress from middle and high family incomes to the very bottom.

We additionally show that substantial heterogeneities in later-life child outcomes exist depending on the country of origin. Children from predominantly-refugee sending countries like Bosnia, Syria, and Iran have higher incomes and higher intergenerational mobility than the average child immigrant to Sweden. Further research is needed to understand what helps the average immigrant child born in families at the bottom of the income distribution do as well as native children, why immigrant children who arrive at middle and high family incomes are more likely than native children to fall back to the economic bottom, and why some refugee children integrate better into Swedish society than other immigrant children.

Finally, we look at immigrant-native income gaps for children born in families at the bottom and top 25th percentile of the distribution, respectively and find that once family income rank is accounted for, the gap shrinks little as we add other family background controls. This exercise also reveals that immigrant women do better in terms of income relative to native women. The gender differences we uncover warrant further research into what generates them.

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A   Appendix

Figure A.1: Average child income percentile rank, by family education
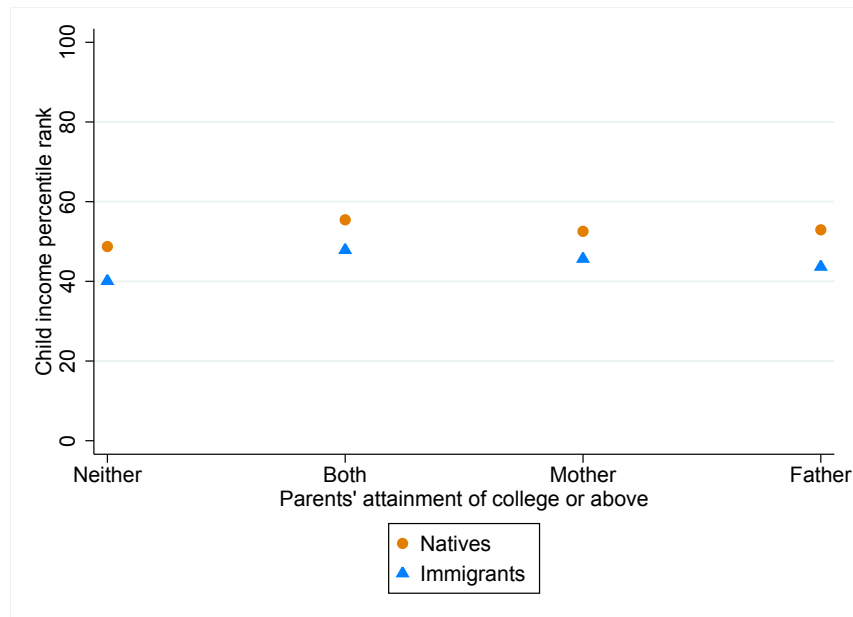
Notes: The figure plots the average child income percentile rank by family education. Children are born between 1974 and 1984. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. A college degree corresponds to having at least a post-secondary education that takes fewer than 3 years to complete.

Figure A.2: Average share of children obtaining college or above education conditional on parents' education
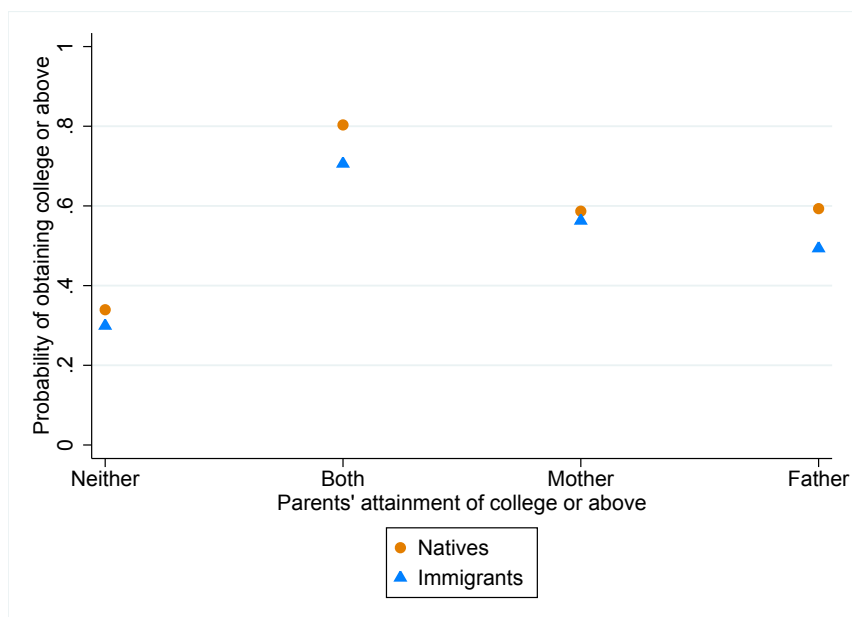
Notes: The figure plots the mean child probability of completing a college degree or above by family education. Children are born between 1974 and 1984. A college degree corresponds to having at least a post-secondary education that takes fewer than 3 years to complete.

Figure A.3: Average child income percentile rank, conditional on family income percentile rank (family income measured 10-14 years after arrival)
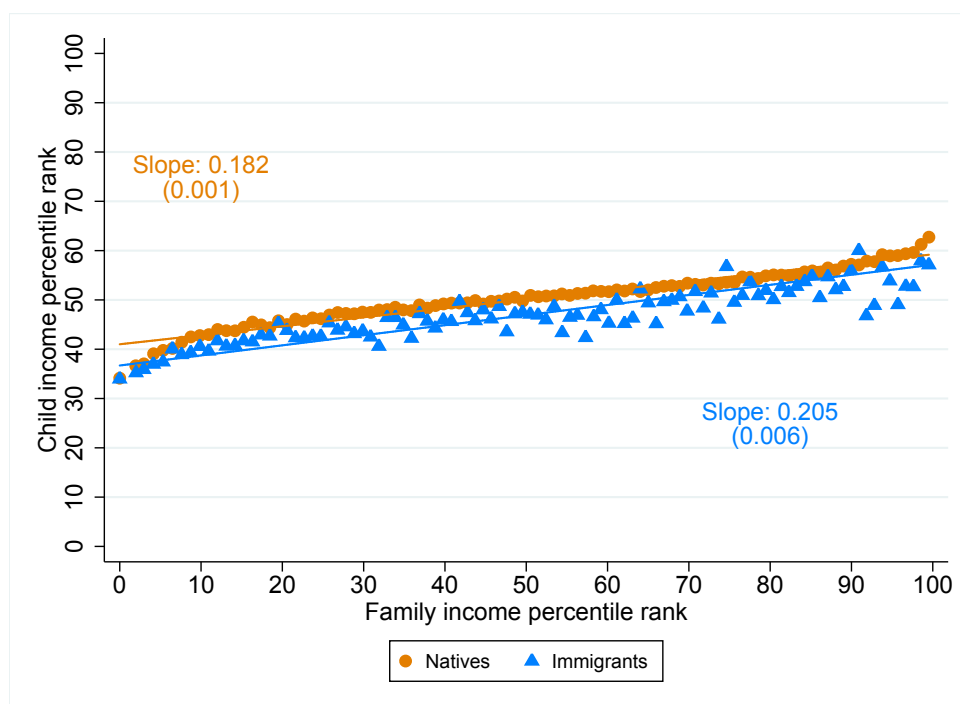

Notes: The figure plots the percentile income rank of children in the 1974-1984 birth cohorts at age 30 against the percentile rank of their parents for natives and immigrants, respectively. Child income is individual income at age 30. For natives, parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). For immigrants, parent family income is the average family income calculated 10-14 years after immigration. We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Figure A.4: Average child income percentile rank, conditional on *parental* income percentile rank
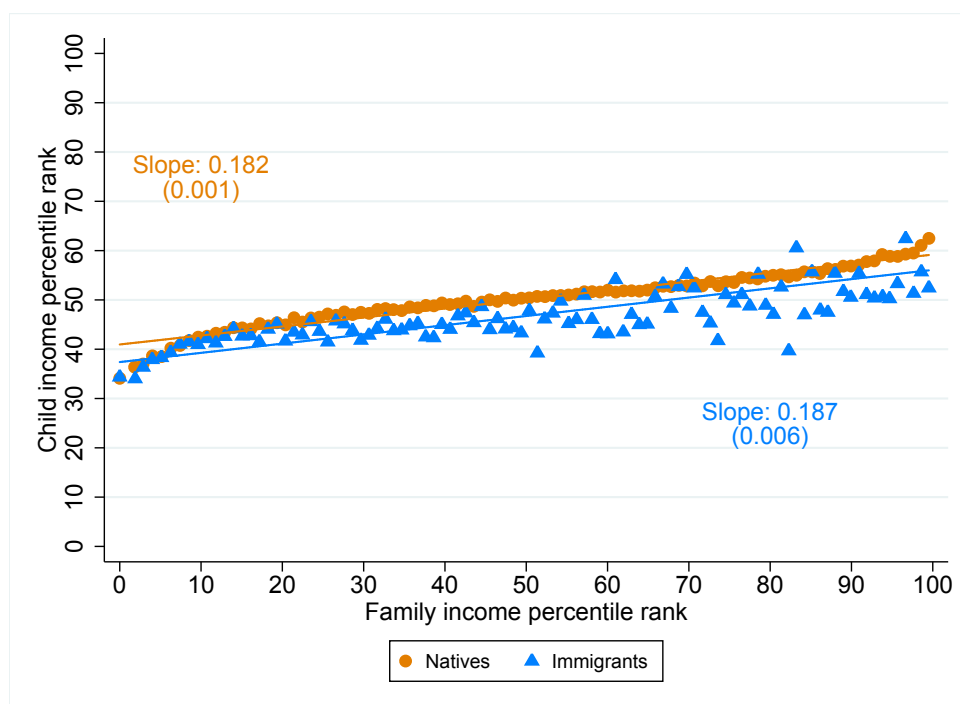
Notes: The figure plots the percentile income rank of children in the 1974-1984 birth cohorts at age 30 against the percentile rank of their parents for natives and immigrants, respectively. Child income is individual income at age 30. Parent income is the average parental income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Figure A.5: Average child income percentile rank at ages 32-34, conditional on family income percentile rank
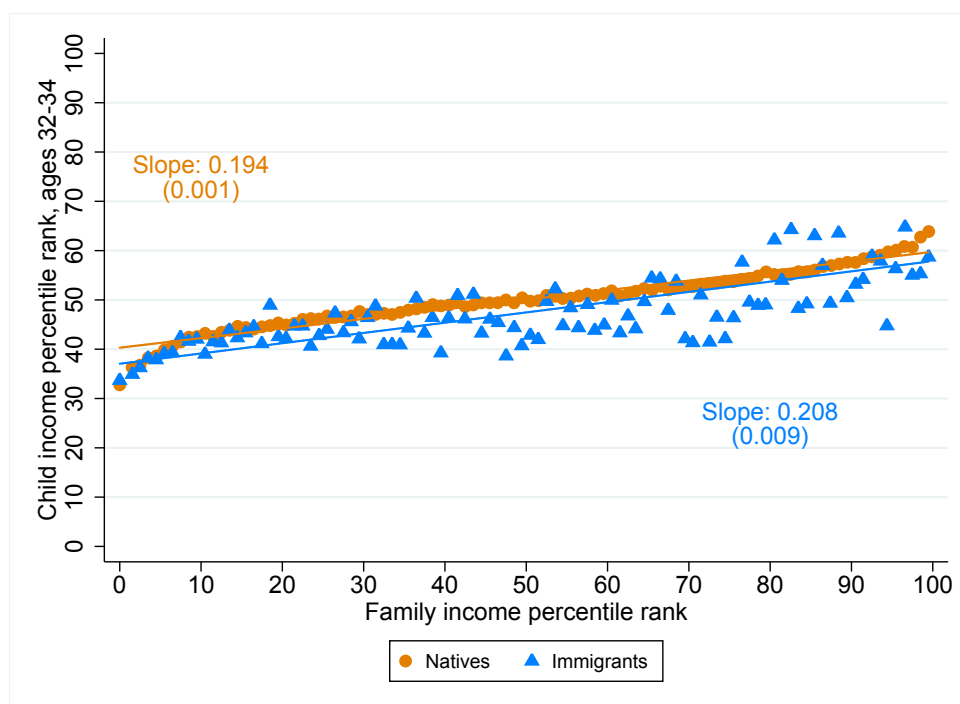
Notes: The figure plots the percentile income rank of children in the 1974-1980 birth cohorts at ages 32-34 against the percentile rank of their parents for natives and immigrants, respectively. Child income is average annual individual income when the child is between 32 and 34 . Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. The slopes are estimated using OLS. Standard errors are in parentheses.

Figure A.6: Top ten countries of origin for immigrant children, with refugee share
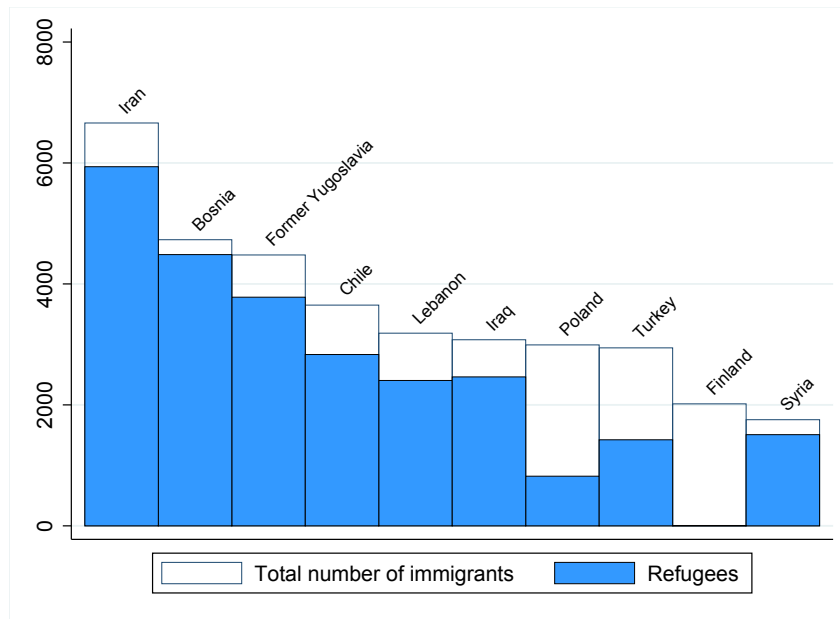
Notes: The figure plots the top ten countries of origin for immigrant children in Sweden and shows the share of refugees coming from each country. We classify a child as a refugee if at least one of his or her parents is classified as a refugee in our data. The information on residence permits is missing for some parents (see Table 1).

Figure A.7: Intergenerational mobility into top income quintile, by country of origin
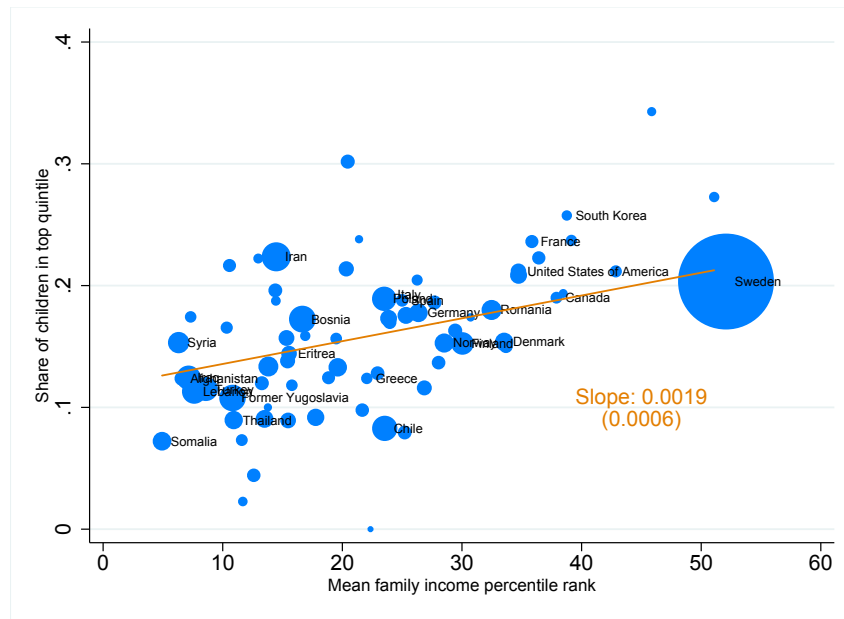
Notes: The figure plots the mean child probability of reaching the top 20% in the income distribution for children in the same birth cohort, against the mean family income rank, for each country of origin. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. Each circle represents a different country of origin, with each circle radius equal to the square root of the number of children from each country. We include a circle for Swedish children as a point of reference, but the observation is not included in the regression. The slope is estimated using weighted OLS. Standard error in parentheses.

Figure A.8: Intergenerational mobility into bottom income quintile, by country of origin
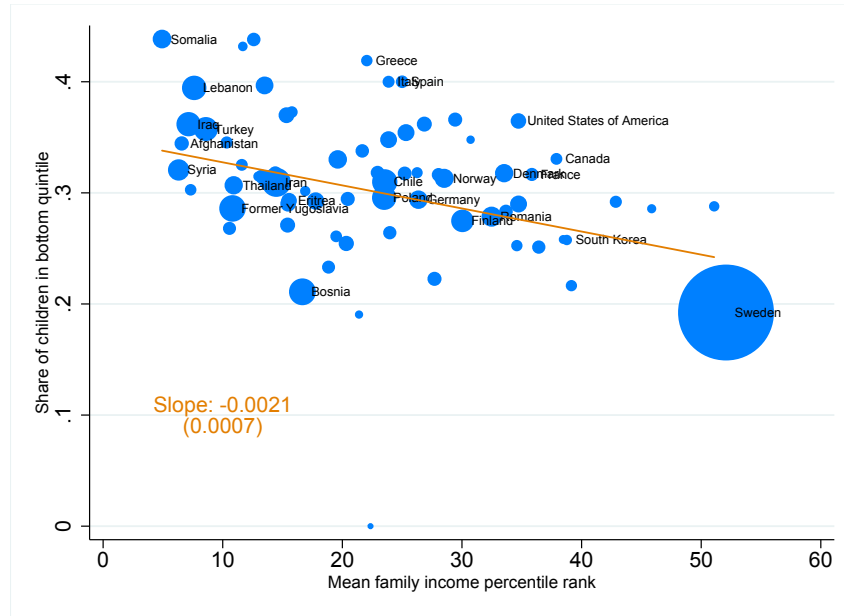

Notes: The figure plots the mean child probability of reaching the bottom 20% in the income distribution for children in the same birth cohort, against the mean family income rank, for each country of origin. Child income is individual income at age 30. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank children relative to all other children in their birth cohort. We rank parents relative to all other parents of children in the same birth cohort. Each circle represents a different country of origin, with each circle radius equal to the square root of the number of children from each country. We include a circle for Swedish children as a point of reference, but the observation is not included in the regression. The slope is estimated using weighted OLS. Standard error in parentheses.

Figure A.9: Educational attainment conditional on family income, by country of origin
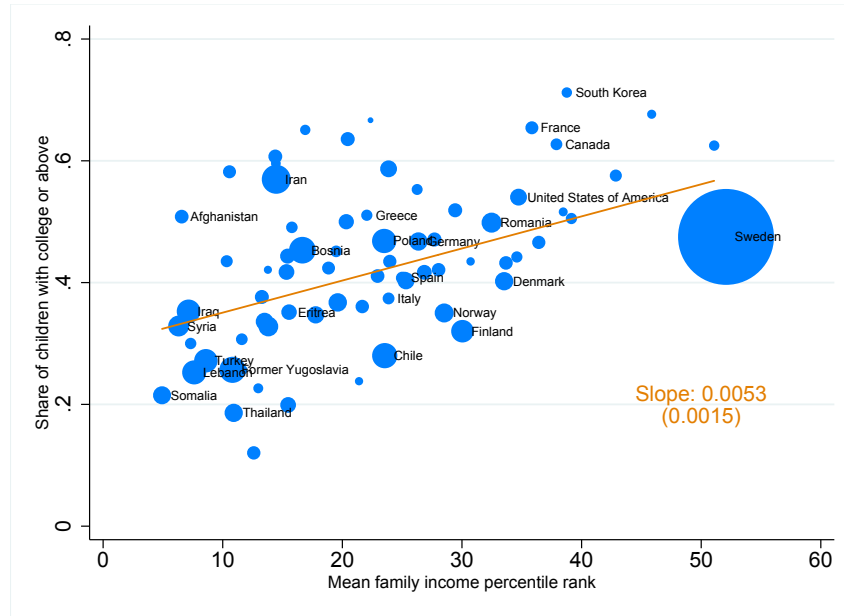

Notes: The figure plots the mean child probability of completing a college degree or above, against the mean family income rank, for each country of origin. Children are born between 1974 and 1984. A college degree corresponds to having at least a post-secondary education that takes fewer than 3 years to complete. Parent family income is the average family income over the period when the child is between 15 and 19 (between 16 and 20 for the 1974 cohort). We rank parents relative to all other parents of children in the same birth cohort. Each circle represents a different country of origin, with each circle radius equal to the square root of the number of children from each country. We include a circle for Swedish children as a point of reference, but the observation is not included in the regression. The slope is estimated using weighted OLS. Standard error in parentheses.

Figure A.10: Intergenerational income gaps for children with parents at the 25th percentile
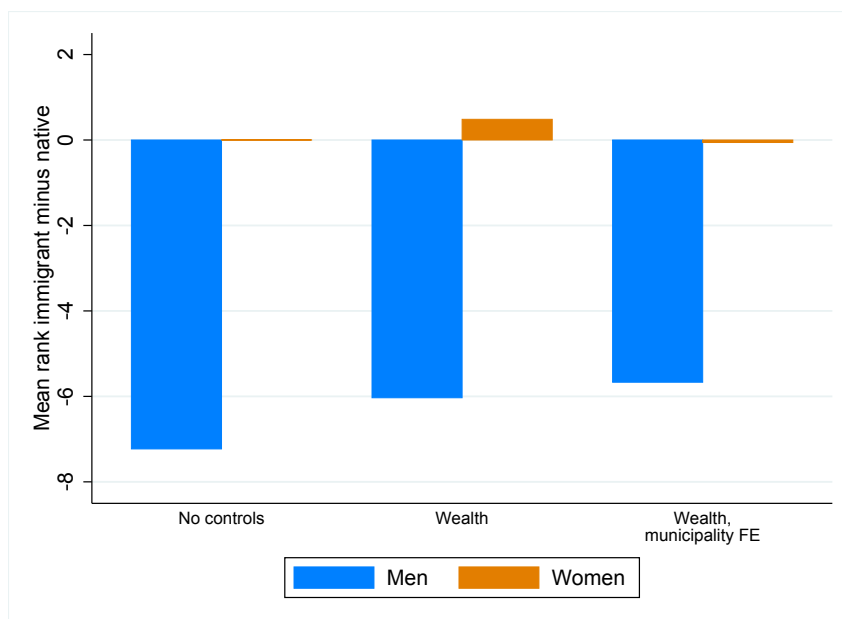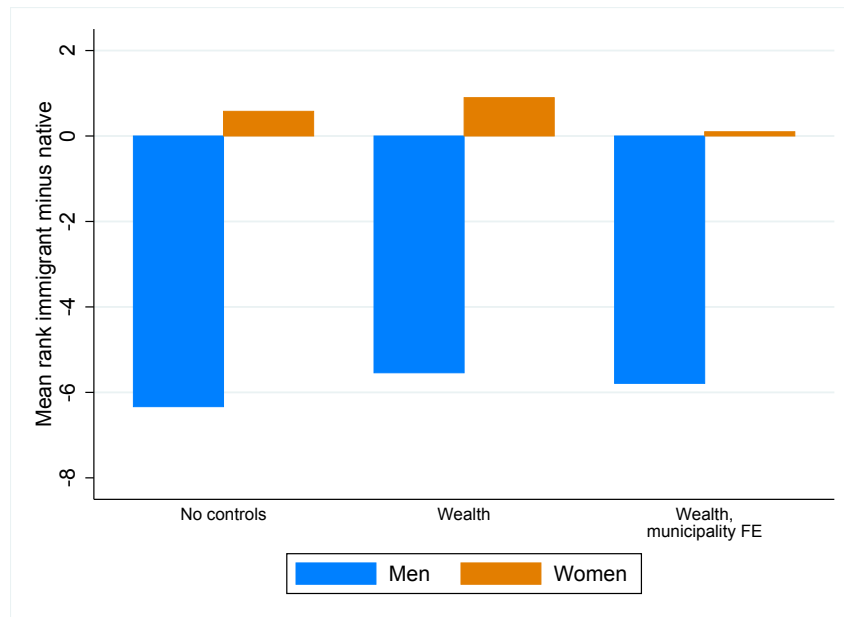
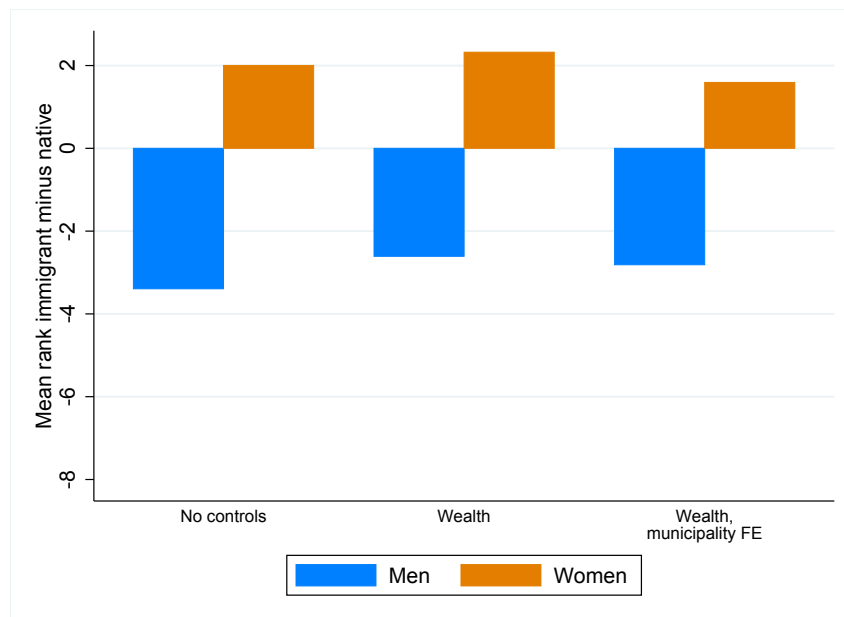

(a) Parents without college education
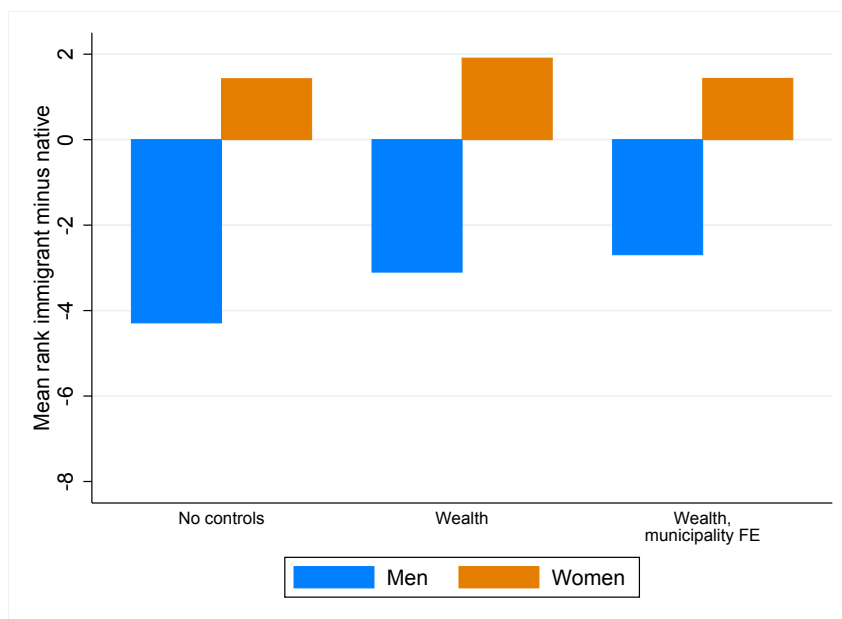
(b) Parents with college education

Figure A.11: Intergenerational income gaps for children with parents at the 75th percentile

(a) Parents without college education

(b) Parents with college education