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Differences in educational attainment by country of origin: Evidence from Australia

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Abstract:

This study investigates native-migrant differences in engagement in post-school education. Using a longitudinal survey of youth in Australia, we find that immigrants originating from non-English speaking countries are significantly more likely to continue with further study between the ages of 18 and 23. On the other hand, there are no significant differences between immigrants from English-speaking countries and native youth. We find several important factors influencing study decisions, including parents and family background, academic ability, aspirations and age at migration; however, accounting for these factors does not fully explain the higher probability of pursuing higher education for immigrants from non-English speaking countries. Exploring the country of origin effect, we find that immigrants from countries with low tertiary education levels are more likely to study in Australia, while differences in parental attitudes in their origin countries do not have a significant effect. The results show the importance of country of origin on the study decisions of youth, which should be taken into account when formulating migration and education policies.

Keywords: migration, educational achievement, human capital
JEL Codes: I21, J15, J24

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1. Introduction

The transition from school into further study is an important point in the life of an individual. The decision sets up the future career and life direction for many young people. We investigate post-school study choices and the role of migrant status in this decision. Native-migrant differences in pursuing post-school study are the subject of popular debate, with views ranging from perceptions about students from Asian backgrounds excelling at tertiary courses[1] to consideration of evidence about migrant youths suffering significant educational disadvantage.[2] Education is often seen as an important means towards, as well as a marker of, success for migrant families. Successful integration of their children into the educational system reflects the long-term economic and social integration of migrants into the host country. Given that most host countries rely on immigrants to meet their human capital needs, it is important that the skills and talents of the younger generation are fully developed.

Australia is host to one of the largest and most diverse immigrant populations in the world, providing an ideal context in which to investigate the differences between native and immigrant education decisions. At the time of the 2011 Census, 26% of Australia's population was born overseas and a further 20% had at least one parent born overseas (ABS, 2012). The main countries of origin of immigrants have shifted over time, from the United Kingdom, to the rest of Europe, and more recently to Asia. The 2011 Census identified over 300 ancestries, reflecting the diversity of Australia's population (ABS, 2012). Australian immigration policy has shifted from selection based on country of origin to selection based on skilled migration. Australia therefore provides a particularly useful context in which to study differences in education by country of origin. We explore native-migrant differences in pursuing post-school

[1] For example, widespread debate in the media following the publication of a book, "Battle Hymn of the Tiger Mother" in 2011 about educational achievements of children from migrant backgrounds and the reasons behind these.

[2] For example, see OECD (2010) for a review of evidence and policies.

education in Australia at key points in their life, i.e., at 18, 21 and 23 years of age. Defining migrant status by country of birth, we investigate (i) whether immigrant youths are more likely to pursue post-school education compared to natives, (ii) the roles of parental and family backgrounds, attitudes and aspirations, and age of migration in native-migrant education differences, and (iii) the role of country of origin, through education levels and parental attitudes in these countries. We employ data from a longitudinal survey, tracking students through 15-23 years of age and exploiting the rich information from the panel on backgrounds, aspirations and attitudes. This allows us to explore the various channels through which migrant backgrounds affect the education decisions of youths, and further to empirically estimate the effects of the various channels which could not be isolated using the cross-sectional data used in the literature on migrant education so far.

We find that immigrants are indeed more likely to continue studying until age 23, but there are significant differences across countries of origin. While a high proportion of youth from non-English speaking backgrounds (NESB immigrants) continue to study, there are no significant differences between migrants from English speaking background countries (ESB immigrants) and natives. These differences persist, even after controlling for demographic characteristics, academic ability and parental characteristics. The probability of studying is higher for immigrants who arrived in Australia at an older age, compared to those who arrived before age 5, indicating an assimilation trend. While the attitudes and aspirations of students and parents are an important determinant of study choices later in life, they cannot fully explain the native-migrant differences. Immigrants' education significantly and systematically varies across countries of origin, even after controlling for relevant individual, parental and household characteristics. Investigating differences in parental attitudes towards children and education levels across countries of origin, we find that immigrants from countries with a lower prevalence of tertiary education are more likely to study further in Australia.

The literature and evidence on immigrants' educational attainment is presented in Section 2. Section 3 presents features of the employed dataset, the Longitudinal Survey of Australian Youth, and the methodology. Results in Section 4 show the consistent differences by country of origin and Section 5 concludes with discussion and implication of these results.

2. Background and literature

Internationally, the educational performance of migrants varies by destination country, ranging from no or low disadvantage in English speaking countries, to significant disadvantage in Continental Europe (Schnepf, 2007). Educational attainment is lower among immigrant youth in the Netherlands (Van Ours and Veenman, 2003), Germany (Gang and Zimmerman, 2000; Frick and Wagner, 2000) and Denmark (Nielsen et al., 2003), but higher among immigrant youth in Canada (Aydemir et al., 2008) and Australia (Cobb-Clark and Nguyen, 2010). Apart from the role of host country institutions in the educational attainment of migrant youth (Cobb-Clark et al., 2011), studies have documented systematic differences between immigrants from different origin countries relative to the host country population, most particularly, in the USA.

Differences in individual and household characteristics across migrants and natives could explain educational disparities. The composition and characteristics of immigrants influence the education decisions and outcomes of their youth. There is robust evidence pointing to inter-generational correlations with education (Cobb-Clark et al., 2011), and the educational achievement of immigrant children is closely tied to the educational background of their parents (Dustmann et al., 2012, Card et al., 2000). We contribute to the literature by employing longitudinal data with detailed information on both immigrant youth and their families, which enables us to explore the roles of attitudes and aspirations, in addition to broad socio-economic characteristics.

In a seminal contribution, Borjas (1994, 2001) show a long-term persistence of skill differences across migrant groups. His results demonstrate a correlation between migrants' education and the education attainment of their children and grandchildren. More recently, Feliciano (2005), in the USA, and Inchou (2014), in France, show the importance of immigrants' relative education level in their country of origin for the education of their children in the host country. Giannelli and Rapallini (2016) showed that immigrant students whose parents originate from countries with higher average maths levels, have higher math scores. By controlling for parental education as well as education levels in the country of origin, we contribute to the debate on selection in migration and its persisting effects on education in the following generations in the host country.

Debate in the public arena and sociological explanations highlight differences in parental expectations, aspirations and preferences between natives and immigrants. A few recent studies have explored the importance of these factors on educational attainment. Tramonte and Willms (2010) show that cultural capital is associated with educational outcomes, after controlling for measures of socio-economic status. Mothers' educational expectations vary by migration background (Cobb-Clark and Nguyen, 2010), as well as by race and ethnicity (Kim et al, 2013). In response to the popular debate about attitudes of Chinese parents, Guo (2014) shows that Chinese immigrant parents hold aspirations and place great value on a better life for their children, viewing academic achievement as a measure of a better life. Our data enables us to control for parents' and students' attitudes and aspirations. Furthermore, we investigate whether the differences in parents' attitudes towards children between countries provides an explanation for the country of origin effects.

In the following section, we document the data which enables us to investigate the relative importance of socio-economic factors, attitudes and aspirations, and migrant status on higher education.

3. Data and Methodology

3.1 Data

We employ data from the 2003 cohort of the Longitudinal Survey of Australian Youth (LSAY). The survey consists of a large, nationally representative sample of young people, collecting information across the broad themes of education and training, work, and societal development. Individuals were surveyed annually for ten years from the age of 15 until they turned 25. A particularly useful feature of this survey is that the 2003 cohort was drawn from the 2003 Australian Programme for International Student Assessment (PISA), administered by the Organisation for Economic Cooperation and Development (OECD). Of the initial 12,551 individuals from the PISA sample, 10,370 make up the LSAY 2003 cohort. In our analysis, migration status is defined by country of birth, so youth born in Australia are classified as natives and those born overseas are classified as immigrants.

In addition to using the baseline data collected in the first wave (when participants were aged 15), this research focuses on Wave 4 from 2006, Wave 7 from 2009 and Wave 9 from 2011, which correspond to the ages of 18, 21 and 23, respectively. Most Australian children start school at age 5 and end their secondary schooling after completing 12^{th} grade. It is mandatory to attend school until 17 years of age. In the context of our data, students are expected to complete secondary school at age 18. A basic tertiary degree (bachelor's or equivalent) is generally a three-year course. Under the Australian education system, the majority of students complete secondary school by 18-19 years of age, and university by the time they are 22. The specific variables employed in this analysis are described in Section 3.2 in context of the employed methodology.

An important feature of this longitudinal data is that it enables us to empirically estimate the effects of parental characteristics, family background, ability, attitudes and study aspirations.

These measures and indicators are collected in the first wave (when the respondent is 15) and we then estimate their effects on study decisions at later ages. This avoids the problem of *ex post* justification, which is likely to be present when variables are collected concurrently. The data captures the experiences in formative years which shape education decisions later in life.

We extend the analysis by adding educational attainment and parental attitudes in origin countries. The indicator for education levels in origin countries is the enrolment in tertiary education per 100,000 inhabitants from the World Bank database. This variable is available for 119 countries of origin, out of about 170 from our sample. Parental attitudes towards important qualities in children from each country of origin are sourced from the World Values Survey. The question asks parents to choose up to 5 qualities they consider to be important which children can be encouraged to learn at home. We use the percentage of parents in the country who emphasis a particular quality as a variable. Variation in this measure indicates the differences in child qualities emphasised across countries of origin. This variable is available for 54 countries of origin, out of about 170 from our sample. Both country-level variables cover the main countries of origin, which contribute the majority of immigrants in our sample.[3] Table A1 in the appendix summarises the details of all the variables and data availability.

3.2 Methodology

We estimate the following reduced form model to investigate the education choices of the individual,

$$Y_i^* = \alpha + X_i\beta + \varepsilon_i \qquad (1)$$

where Y_i^* is the binary variable (equals 1 if the individual is studying at age 18, 21 or 23, and 0 otherwise). We use probit regression to estimate the determinants of the probability of

[3] Lists of countries for each variable are available for the authors.

studying at the ages of 18, 21 and 23. The dependent variable *studying* denotes individuals in full-time or part-time study[4]. X_i includes an individual's background characteristics, including gender, location, and disability, and controls for marital status and number of children. We report estimates using weights to account for both initial sampling and subsequent attrition.

We first distinguish between natives and migrants, and subsequently account for differences in countries of origin. Differences between immigrants from English speaking countries (ESB) and non-English speaking countries (NESB) are well documented in Australia.[5] ESB immigrants are from the United Kingdom, Ireland, the Unites States, Canada, and New Zealand. The remaining countries are classified as NESB countries. The Philippines, India and China contribute 9.3%, 8.8% and 7.1% of the NESB migrants, while other Asian countries, such Malaysia, Singapore, Indonesia and Sri Lanka, each contribute 4.7% to 3% of the NESB immigrants.

Since the LSAY cohort is drawn from PISA sample, the data contains variables from PISA survey as well. The PISA survey assesses the reading, mathematical and scientific literacy of 15 year olds in terms of general competencies; that is, how well students can apply the knowledge and skills they have learned at school to real-life challenges (OECD, 2014). These literacy scores are often used as proxies for academic performance or ability (for example, Gemici et al., 2014). In this study, we include a composite academic performance measure created by averaging students' PISA literacy scores across all three domains. By including a measure of ability at the age of 15, we can assess the effect of this factor on further study decisions and control for any differences in academic ability. In addition to achievement at school, we include a measure for motivation and attitude. The measure *school attitude* is

[4]We allow for both part-time and full-time study in our definition, however, the results are similar if we restrict the analysis to full-time study.
[5] The classification of countries of origin is based on the English proficiency of recent arrivals in Australia.

constructed by aggregating the answers to questions (administered at age 15) about the perceived role of school in preparing them for the future.

If the host country language and institutions are an important determinant of educational attainment choices, we expect migrants to assimilate towards native educational levels with time spent in the host country. In line with the evidence that educational attainment systematically varies with age at migration (Cortes, 2006; Van Ours and Veenman, 2006; Colding et al., 2009; Guven and Islam, 2015), we control for the age at migration.

We explore the role of parental background, family background and family influences. Parents are the most important influence on children's education decisions. We investigate the channels through which both mother and father could affect the probability of further study by controlling for their education, work status and migrant background.

A family's socio-economic status influences education decisions through multiple channels, such as availability of resources and intergenerational mobility (Cobb-Clark & Nguyen, 2010). We include the index of economic, social, and cultural status *(ESCS*) in order to control for family status. *ESCS* is a summary measure that jointly reflects parental occupation, parental education and a wide range of home possessions. In the first wave of the survey, respondents report their attitudes, aspirations and the role of family. We investigate the effect of these variables, as reported at age 15, on the probability of studying in later years. *Life satisfaction* measures the level of satisfaction with aspects of their life. The variable *family influence* is the self-assessed measure of the extent to which the family influences their thinking. The importance of family members and relatives in the individual's life (*family importance*) is reported by individuals at age 18. The dummy variable *student aspiration* indicates whether the respondent plans to go to university; similarly, *parents' aspiration* indicates whether

parents aspire for the respondent to go to university. Appendix A1 contains the details of all variables. We further control for whether the individual is living at home.

3.3 Descriptive statistics

Figure 1 illustrates the proportion of youth studying between the ages of 16 and 24 by migrant status. The overall proportion of students studying decreases from 90.5% at age 16 to 26% at age 24. The differences between youth from different origin countries can be clearly seen. Immigrants from NESB backgrounds are significantly more likely to study at each age. This is especially so at the ages of 18 and 21, when the proportion of NESB immigrants in the study are 19 and 16 percentage points higher, respectively, compared to natives.[6] In contrast, there is a small difference between natives and ESB immigrants.

INSERT FIGURE 1 HERE

INSERT TABLE 1 HERE

Table 1 reports the descriptive statistics for natives, ESB immigrants and NESB immigrants. Consistent with the differences in study choices noted above, almost 80% of NESB immigrants are studying at age 18, and 62% continue to study at age 21. In contrast, 61% of natives are studying at age 18, dropping to 49% at age 21. Almost all NESB immigrants complete secondary schooling, while 12% of natives and ESB immigrants do not complete secondary schooling.

The descriptive statistics reveal differences in background characteristics, attitudes and aspirations. NESB immigrants are less likely to be married or to have children by the age of

[6]To put this in context, consider the gender differences. 60% females and 62% males are studying at age 18 and 51% females and 50% males are studying at age 21.

23. Immigrants are concentrated in urban areas, while 30% of natives live in provincial locations.

NESB immigrants report lower socio-economic status levels, while ESB immigrants report the highest levels, as measured at age 15. On the other hand, NESB immigrants report higher levels of satisfaction with life (*life satisfaction*), importance of family (*family importance*) and influence of family (*family influence*). There are significant differences in living arrangements across the three groups: a high proportion of NESB immigrants live at home with parents, even at the age of 23. Student and parents' aspirations as reported at age 15 differ by the country of origin: 77 percent of NESB immigrants report that they plan to go to university, compared to 52 percent of natives and ESB immigrants. These differences in post-school plans are reflected in parents' aspirations as well: 81 percent of NESB immigrants report that their parents want them to go to university, versus 56 percent of natives and 63 percent of ESB immigrants.

The bottom two panels of Table 1 report parental characteristics. NESB immigrants are less likely to have parents who were working when the respondent was aged 15, with only 56 percent reporting their mothers as working. Despite this, reflecting the composition of migrants in Australia, both ESB and NESB immigrants have better qualified parents, compared to natives. Immigrants and their parents share similar backgrounds in terms of their countries of birth and around 24 percent of native-born students have an overseas-born parent, (i.e., are second generation migrants). The majority of immigrants in our sample arrived in Australia when they were aged between 6 to 7 years.

Descriptive analysis of the data in this section reveals interesting differences in the study choices of Australian youth by their country of origin. Differences by country of origin are also observed for individual, parental and household characteristics, and attitudes and aspirations, all of which are likely to be associated with education. This motivates us to explore whether

these observed differences in education by country of origin can be explained by the above differences in background characteristics. In Section 4 we report the empirical estimations from of Equation 1 to shed light on this question.

4. Results

INSERT TABLE 2 HERE

The average marginal effect of immigrant background on the probability of studying at age 18, 21 and 23 is reported in Table 2. Immigrants are significantly more likely to study, even after controlling for demographic variables (in column 2) and ability (column 3). Consistent with the descriptive statistics in Table 1, this effect is fully driven by NESB immigrants. ESB immigrants are less likely to study compared to natives at age 18, and the difference between natives and ESB immigrants becomes insignificant afterwards. NESB immigrants, on the other hand, are significantly more likely to study. Interestingly, controlling for ability increases the marginal effect of immigrant variables. This indicates that differences in education decisions across natives and immigrants from different origin countries are not explained by any systematic differences in academic ability of the individual students. Furthermore, these differences persist after controlling for individual characteristics. We therefore explore whether family background, attitudes and aspirations can explain these differences. The results are reported in Table 3.

INSERT TABLE 3 HERE

The average marginal effects reported in Table 3 explore the roles of family status, attitudes and aspirations in explaining the migrant-native difference. We control for individual characteristics, including academic ability, in the estimations. Firstly, we discuss the results reported in columns (1)-(3) of Table 3. Consistent with the earlier evidence, NESB migrants

are more likely to study, even after controlling for other potential channels through which immigrant background could be affecting the decision to pursue further education. Respondents from a higher socio-economic background (*ESCS*) are more likely to study; this effect is significant for ages 21 and 23. As noted from the descriptive statistics in Table 2, NESB immigrants report lower levels of *ESCS*. Thus, youth from NESB countries of origin overcome the effect of their lower socio-economic status on the probability of study. Perceived role of school, as measured by *school attitude*, and satisfaction with life (*life satisfaction*) have a small effect on the probability of studying at age 18. Although NESB immigrants report higher levels of importance and influence of family, these variables (*family importance* and *family influence*) have no significant effect on the education decisions under consideration.

In contrast, the respondents' own aspirations to go to university are a significant factor, increasing the probability of studying at age 18. These aspirations were expressed at age 15 and are reflected in education choices made later in life, increasing the probability of studying at 21 years of age by 6 percentage points and at 23 years by 7 percentage points. Parents' aspirations play a part as well, significantly increasing the probability of studying up to 21 years. Given the significance of aspiration variables, we explore their role in native-migrant differences further. Columns (4)-(6) report the results of the specification, excluding *student aspiration* and *parent aspiration* for comparison. Results across two specifications show that while aspirations play an important role, differences in aspirations do not fully explain the differences by country on origin. Comparing columns (1)-(3) with corresponding columns (4)-(6), controlling for aspirations reduces the size of average marginal effects for ESB and NESB variables, but these country of origin differences in probability of study remain consistent and significant.

INSERT TABLE 4 HERE

We investigate whether immigrants assimilate towards native studying patterns by estimating the effects of age at migration on the probability of studying. Results reported in Table 4 show that, compared to natives, immigrants are more likely to study, regardless of their age at migration. The results are again particularly significant for study decisions at age 18 and exhibit an assimilation trend. The gap in the probability of studying at 18 is smaller for immigrants who arrived in Australia at a younger age and increases with the age of arrival. In general, native-migrant differences, while present, are smallest for immigrant youths who arrived in Australia by 5 years of age. Immigrants arriving at 6 to 10 years of age are more than 10 percent more likely to continue studying at all the ages under consideration. This suggests that early childhood experiences influence future study decisions.

We now explore the effects of parents, country of origin, and their interaction on the probability of further study for an individual. With this objective, we first look at the effects of parents' country of origin, their education and employment status. Table 5 reports the average marginal effects of mothers' and fathers' characteristics on the probability of studying at ages 18, 21 and 23.

INSERT TABLE 5 HERE

The differences in education decisions by country of origin are also reflected in the parents' country of origin. Respondents with an immigrant mother or an immigrant father originating from NESB countries are more likely to study; the effect is significant at age 18. Having an ESB mother significantly reduces the probability of studying at age 18, and an ESB father significantly reduces the probability of studying at age 21. In order to check if these results are being driven by the possibility that immigrant parents are better educated and/or more likely to be working, we report estimates controlling for parents' education and employment status in columns (2), (4) and (6). The size and statistical significance of the coefficient for ESB and

NESB immigrant parents remain consistent with earlier estimates. That is, the effect of coming from an immigrant background persists after controlling for parental education and employment status as potential channels of parental influence. Intergenerational transmission of education is observed: having a tertiary educated parent significantly increases the probability of studying at age 21. In fact, having a university educated father increases the probability of studying at all ages. However, since the country of origin effects remain significant, the higher probability of studying for immigrants from NESB countries cannot be solely attributed to more educated parents.

Country of origin effects

Our results so far highlight the differences by country of origin which are significant and persistent across specifications and controls. In this section, we explore whether these country of origin effects can be explained by education levels in these countries or by an emphasis on particular qualities in children. We supplement the analysis of the individual data with data on tertiary education levels and parental attitudes towards children in origin countries. The analysis in this section is restricted to immigrants and further, to the origin countries where data was available (See Appendix Table A1 for details).

INSERT TABLE 6 HERE

We explore the significance of parental education vis-à-vis country of origin by controlling for education levels in the country of origin as well as parental education. The results are reported in Table 6. We first report the estimates excluding the country of origin education variable, followed by estimates including the variable in the adjoining column. While the size of the coefficient for mother's and father's education changes, the direction and significance across the two specifications is consistent with the results in Table 5. Interestingly, the education levels in origin countries are significant and negatively correlated; thus, immigrant youth from

countries with lower tertiary education levels are more likely to study. Along with the estimated positive effect of parents' tertiary education, this result suggests that children of more educated parents originating from countries with low tertiary enrolments are more likely to study. This finding is indicative of the positive selection of immigrants in the Australian context. The result is consistent with studies for the USA which use the mean parental education of individuals from the same origin country as a proxy for parental education, finding that immigrants' education selectivity influences educational outcomes among groups of immigrants' children (Feliciano, 2005). Our analysis finds a similar effect using actual parental education instead of group-level proxies.

INSERT TABLE 7 HERE

Next, we explore whether cultural differences, in terms of differences in emphasising particular qualities in children, play a role in the differences seen in education decisions. The results for children's qualities from the World Values Survey are reported in Table 7. In spite of wide variation in the emphasis parents put on particular qualities in children across origin countries, most of these variables have no significant effect. Immigrants from origin countries which place high value on thrift are more likely to study at age 18; however, immigrants from countries emphasising hard work as a quality in children are less likely to continue study after school.

While we attempt to break down the country of origin effects to better understand the drivers of immigrant choices, we acknowledge possible limitations. Apart from the limited data availability, it is possible that variables are not fully capturing the particular attitudes and aspects of culture in the origin countries which lead to the ESB-NESB differences in education choices. It is important to understand the drivers behind these origin countries' effects and

examine which country specific variables can explain these differences, and our analysis is a step in this direction.

We check for the robustness of our results by separately analysing full-time study and part-time study. The results are consistent across these alternative definitions. While NESB immigrants are more likely to be in full-time study compared with natives and ESB immigrants, NESB immigrants are more likely to engage in part-time study as well. We also investigate whether the effects of explanatory variables systematically differ between natives, ESB immigrants and NESB immigrants, by (i) estimating the model separately for the three groups and (ii) including the interactions between migrant status and explanatory variables. Again, the results are consistent with those reported above.[7]

5. Conclusion

In the USA, Cameron and Heckman (2001) find that the racial and ethnic gaps in educational attainment are largely related to differences in parental background and family environment. Similar results are reported for France, where family background accounts for the gap between second generation immigrants and natives (Belzil and Poinas, 2010). On the other hand, Colding *et al.* (2009) find that differences in endowment, while important, cannot fully explain lower transitions into tertiary education for migrant youth in Denmark. We find that in Australia, the native-migrant educational differences favour immigrants from NESB backgrounds, even after controlling for family background. Thus, we find support for the public perception of youth from migrant backgrounds, particularly from countries such as India and China, as being better educated than their native peers.

[7] These results are available from the authors.

The longitudinal data employed in this analysis enables us to assess the role of parental characteristics, family background, academic ability and aspirations at age 15 on their future education decisions. We find that all of these factors play a role, with youth with higher PISA scores, from better socio-economic backgrounds and with educated parents being more likely to continue studying after compulsory schooling. Aspirations towards tertiary education in both the young person and their parents are significant in study choices at ages 18 and 21; however, NESB immigrants are more likely to study than their peers, even after accounting for all these factors.

The effect of immigrant background on increasing the probability of studying could also be consistent with the view of human capital accumulation as a way towards advancement in the destination country. Immigrants typically have access to fewer resources and means for social and economic betterment, as compared to natives. These difference are likely to be more pronounced for NESB immigrants compared to ESB immigrants who originate from developed countries. Education, therefore, could be an important means of achieving a better life in the absence of significant assets and networks in the host country.

In light of the ESB-NESB differences among immigrants, we attempt to better understand the significance of country of origin by incorporating the variables for education levels and parental emphasis on particular child qualities in the origin countries. While we find no significant effect for child quality variables, education levels in origin countries do have a significant effect. Immigrants from countries with lower levels of tertiary enrolment are more likely to study further in Australia. This result, together with the effect of parental education, suggest that immigrants with better educated parents, originating from countries with relatively lower levels of education, are more likely to study further.

Our results suggest that the composition of immigrants arriving in the country will continue to affect the skill composition of the labour force through the education choices of their youth. Young immigrants from non-English speaking countries continue to make investment in further education. Migration policy settings will therefore have implications for skills beyond the immediate changes in the labour force. Policies in the host countries should account for the differences across countries of origin.

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Figure 1: Study status by migration status

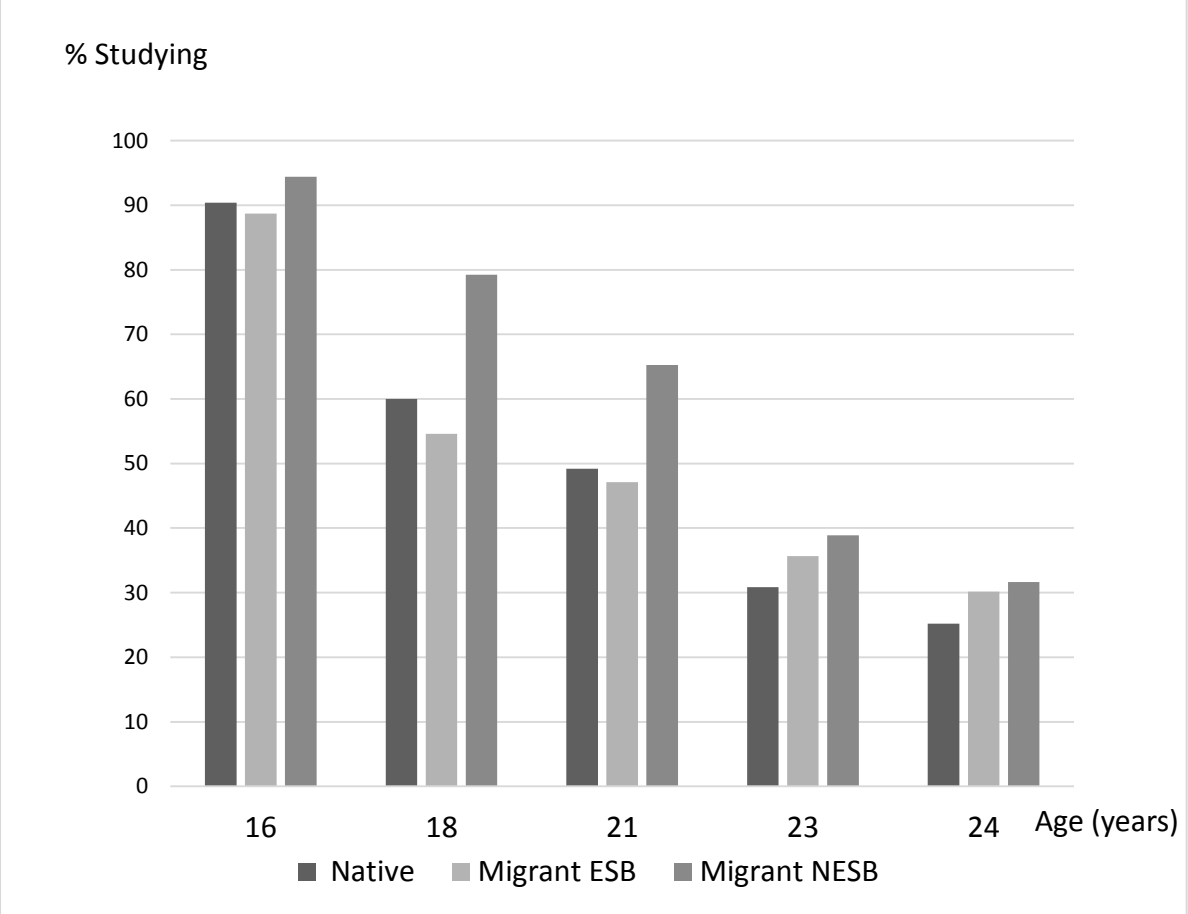

Table 1: Descriptive statistics by migration status

Variable	**Native**		**ESB migrants**		**NESB migrants**	
	Mean		Mean		Mean	
Studying at age 18	0.61	(0.49)	0.56	(0.50)	0.79	(0.41)
Studying at age 21	0.49	(0.50)	0.51	(0.50)	0.62	(0.49)
Studying at age 23	0.30	(0.46)	0.38	(0.49)	0.38	(0.49)
Complete secondary school (age 18)	0.78	(0.41)	0.83	(0.38)	0.85	(0.35)
Complete secondary school (age 21)	0.86	(0.34)	0.87	(0.33)	0.95	(0.23)
Complete secondary school (age 23)	0.88	(0.33)	0.88	(0.32)	0.96	(0.19)
Male	0.50	(0.50)	0.55	(0.50)	0.52	(0.50)
Disability	0.05	(0.23)	0.05	(0.21)	0.03	(0.16)
Location (provincial)	0.30	(0.46)	0.09	(0.29)	0.07	(0.26)
Location (remote)	0.01	(0.08)	0.00	(0.05)	0.00	(0.05)
Has children (age 18)	0.01	(0.09)	0.01	(0.11)	0.00	(0.04)
Has children (age 21)	0.03	(0.17)	0.05	(0.22)	0.02	(0.14)
Has children (age 23)	0.06	(0.24)	0.09	(0.29)	0.04	(0.19)
Married (age 21)	0.02	(0.14)	0.04	(0.19)	0.02	(0.12)
Married (age 23)	0.06	(0.24)	0.05	(0.21)	0.05	(0.21)
ESCS	0.23	(0.82)	0.49	(0.84)	0.20	(0.88)
school attitude	12.56	(2.37)	12.52	(2.58)	12.46	(2.56)
life satisfaction	11.34	(7.47)	10.84	(7.94)	11.71	(7.13)
family importance	12.84	(7.70)	11.61	(8.12)	13.17	(7.45)
family influence	3.20	(0.86)	3.14	(0.96)	3.31	(0.85)
living at home (age 18)	0.83	(0.38)	0.79	(0.41)	0.90	(0.30)
living at home (age 21)	0.61	(0.49)	0.58	(0.49)	0.78	(0.41)
living at home (age 23)	0.48	(0.50)	0.41	(0.49)	0.72	(0.45)
university plan	0.52	(0.50)	0.52	(0.50)	0.77	(0.42)
parent aspiration	0.56	(0.50)	0.63	(0.48)	0.81	(0.39)
Mother						
Working	0.71	(0.45)	0.73	(0.44)	0.56	(0.50)
Completed upper secondary education	0.52	(0.50)	0.78	(0.41)	0.69	(0.46)
Completed university education	0.26	(0.44)	0.38	(0.49)	0.36	(0.48)
ESB migrant	0.09	(0.29)	0.74	(0.44)	0.03	(0.17)
NESB migrant	0.14	(0.34)	0.13	(0.33)	0.93	(0.25)
Father						
Working	0.90	(0.30)	0.93	(0.26)	0.84	(0.37)
Completed upper secondary education	0.50	(0.50)	0.73	(0.44)	0.71	(0.45)
Completed university education	0.26	(0.44)	0.43	(0.50)	0.47	(0.50)
ESB migrant	0.09	(0.29)	0.78	(0.42)	0.03	(0.18)
NESB migrant	0.15	(0.35)	0.11	(0.32)	0.88	(0.32)
Age at migration			6.54	(4.93)	6.26	(4.67)

Notes: Standard deviation reported in parentheses. Descriptive statistics calculated using weights reported. See Appendix table A1 for details of the variables.

Table 2: Average marginal effects of migrant background

	(1)	(2)	(3)	(4)	(5)	(6)
Age 18						
migrant	0.114***	0.094***	0.106***			
	(0.018)	(0.019)	(0.019)			
ESB migrant				-0.053*	-0.062**	-0.065**
				(0.029)	(0.030)	(0.029)
NESB migrant				0.213***	0.187***	0.208***
				(0.023)	(0.024)	(0.024)
Observations	7,624	7,200	7,200	7,624	7,200	7,200
Age 21						
migrant	0.101***	0.070***	0.0814***			
	(0.021)	(0.022)	(0.022)			
ESB migrant				-0.020	-0.027	-0.031
				(0.035)	(0.036)	(0.036)
NESB migrant				0.164***	0.119***	0.138***
				(0.026)	(0.026)	(0.027)
Observations	5,421	5,027	5,027	5,421	5,027	5,027
Age 23						
migrant	0.068***	0.043*	0.047**			
	(0.022)	(0.023)	(0.023)			
ESB migrant				0.047	0.028	0.025
				(0.037)	(0.039)	(0.039)
NESB migrant				0.078***	0.050*	0.056**
				(0.026)	(0.027)	(0.027)
Observations	4,391	4,051	4,051	4,391	4,051	4,051
Demographic controls	No	Yes	Yes	No	Yes	Yes
Ability (PISA)	No	No	Yes	No	No	Yes

Notes: The table reports average marginal effects estimated using a probit model with studying as a dependent variable. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Demographic controls include variables to control for sex, disability, living in remote and provincial locations, having completed high school, having children and being married. Ability refers to PISA scores.

Table 3: Average marginal effects of attitudes, family background and aspirations

	(1)	(2)	(3)	(4)	(5)	(6)
	Age 18	**Age 21**	**Age 23**	**Age 18**	**Age 21**	**Age 23**
ESB	-0.048	-0.039	0.017	-0.072**	-0.046	0.016
	(0.030)	(0.039)	(0.042)	(0.029)	(0.036)	(0.039)
NESB	0.194***	0.085***	0.035	0.206***	0.129***	0.052*
	(0.025)	(0.027)	(0.028)	(0.023)	(0.026)	(0.027)
ESCS	0.015*	0.053***	0.049***	0.032***	0.060***	0.048***
	(0.008)	(0.010)	(0.011)	(0.008)	(0.009)	(0.010)
school attitude	0.006**	0.004	-0.005	0.010***	0.007**	-0.002
	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
life satisfaction	0.006***	0.002	-0.008**	0.006***	-0.002	-0.007**
	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
family importance	0.001	-0.004*	0.000	0.001	-0.006**	0.000
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
family influence	0.012*	-0.006	-0.003	0.016**	-0.001	-0.002
	(0.007)	(0.009)	(0.009)	(0.007)	(0.008)	(0.009)
student aspiration	0.137***	0.062***	0.072***			
	(0.017)	(0.021)	(0.023)			
parent aspiration	0.031*	0.056***	0.023			
	(0.017)	(0.020)	(0.022)			
Observations	6,041	4,264	3,444	7,170	5,009	4,037

Notes: The table reports average marginal effects estimated using a probit model with studying asa dependent variable. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Columns (1)-(3) report specification including *student aspiration* and *parent aspiration*, columns (4)-(6) report specification excluding *student aspiration* and *parent aspiration.* Estimations include variables to control for sex, disability, living in remote and provincial locations, having completed high school, having children and being married, living at home and PISA scores.

Table 4: Average marginal effects of age at migration

	Age 18	**Age 21**	**Age 23**
Age of arrival (0-5 yrs)	0.086***	0.068**	0.041
	(0.025)	(0.030)	(0.031)
Age of arrival (6-10 yrs)	0.108***	0.103**	0.104**
	(0.035)	(0.040)	(0.042)
Age of arrival (11-15 yrs)	0.144***	0.089*	0.025
	(0.039)	(0.047)	(0.047)
Observations	7,179	5,011	4,039

Notes: The table reports average marginal effects estimated using a probit model with studying as a dependent variable. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Estimations include variables to control for sex, disability, living in remote and provincial locations, having completed high school, having children and being married, and PISA scores.

Table 5: Average marginal effects of immigrant parents

	Age 18		Age 21		Age 23	
	(1)	(2)	(3)	(4)	(5)	(6)
immigrant	0.045**	0.039*	0.066***	0.055**	0.035	0.019
	(0.022)	(0.023)	(0.026)	(0.027)	(0.027)	(0.029)
Mother						
ESB immigrant	-0.058***	-0.052***	-0.027	-0.012	0.019	0.021
	(0.019)	(0.020)	(0.024)	(0.025)	(0.025)	(0.026)
NESB immigrant	0.090***	0.098***	0.038	0.036	0.036	0.039
	(0.022)	(0.023)	(0.025)	(0.026)	(0.027)	(0.028)
Working		0.006		0.017		0.001
		(0.014)		(0.017)		(0.018)
Completed secondary school		0.008		-0.003		0.055***
		(0.014)		(0.017)		(0.019)
University qualification		0.003		0.059***		0.0194
		(0.016)		(0.018)		(0.019)
Father						
ESB immigrant	-0.025	-0.023	-0.034	-0.041*	-0.046*	-0.051**
	(0.019)	(0.020)	(0.023)	(0.024)	(0.024)	(0.025)
NESB immigrant	0.077***	0.085***	0.010	0.014	-0.007	-0.008
	(0.021)	(0.022)	(0.025)	(0.026)	(0.027)	(0.028)
Working		0.051**		-0.033		-0.027
		(0.021)		(0.026)		(0.028)
Completed secondary school		0.001		0.005		0.010
		(0.015)		(0.018)		(0.019)
University qualification		0.052***		0.060***		0.036*
		(0.016)		(0.019)		(0.020)
Observations	7,098	6,458	4,954	4,535	3,993	3,671

Notes: The table reports average marginal effects estimated using a probit model with studying as a dependent variable. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Estimations include variables to control for sex, disability, living in remote and provincial locations, having completed high school, having children and being married, and PISA scores.

Table 6: Average marginal effect of parent's education and education in country of origin on immigrants' education decisions

	Age 18		Age 21		Age 23	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother						
Completed secondary school	0.023	0.012	0.018	0.003	0.0345	0.068
	(0.044)	(0.047)	(0.061)	(0.066)	(0.068)	(0.074)
Has University Qualification	0.042	0.049	0.081*	0.087*	0.0392	0.077
	(0.038)	(0.040)	(0.047)	(0.051)	(0.052)	(0.055)
Father						
Completed secondary school	-0.042	-0.037	-0.018	0.004	0.0856	0.103
	(0.047)	(0.051)	(0.065)	(0.072)	(0.076)	(0.084)
Has University Qualification	0.081**	0.067*	0.031	0.007	0.0519	0.024
	(0.039)	(0.041)	(0.051)	(0.056)	(0.056)	(0.060)
Tertiary enrolment in country of origin		-0.00005***		-0.00003**		-0.00001
		(0.000)		(0.000)		(0.000)
Observations	732	637	532	462	431	372

Notes: The table reports average marginal effects estimated using a probit model with studying as a dependent variable. Sample restricted to immigrants only. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Estimations include variables to control for sex, disability, living in remote and provincial locations, having completed high school, having children and being married, and PISA scores.

Table 7: Average marginal effect of parental attitudes in country of origin on immigrants' education decisions

Parental attitudes towards child qualities	**Age 18**	**Age 21**	**Age 23**
Independence	-0.001	-0.001	-0.004
	(0.002)	(0.003)	(0.003)
Hard work	-0.003**	-0.004*	0.002
	(0.002)	(0.002)	(0.002)
Feeling of responsibility	-0.002	0.003	0.005
	(0.003)	(0.005)	(0.005)
Imagination	-0.004	0.004	0.003
	(0.004)	(0.006)	(0.007)
Tolerance and respect for other people	-0.005*	-0.005	0.000
	(0.002)	(0.003)	(0.003)
Thrift, saving money and things	0.012***	0.004	-0.002
	(0.003)	(0.005)	(0.005)
Determination and perseverance	-0.004	-0.004	-0.001
	(0.003)	(0.005)	(0.005)
Religious faith	-0.001	0.0007	0.003
	(0.002)	(0.002)	(0.003)
Unselfishness	0.000	0.003	0.000
	(0.003)	(0.005)	(0.006)
Obedience	0.004	0.000	-0.003
	(0.003)	(0.004)	(0.004)
Self-expression	0.002	0.000	0.000
	(0.003)	(0.004)	(0.005)
Observations	485	356	289

Notes: The table reports average marginal effects estimated using a probit model with studying as a dependent variable. Sample consists of immigrants from selected countries. Robust standard for sex, disability, living in remote and provincial locations, having completed high school, having children and being married, and PISA scores.

Appendix

Table A1 Description of variables

Variable	Description
ESCS	Denotes economic social cultural status. Latent variable from PISA. Derived from three variables related to family background: highest level of parental education, highest parental occupation and number of home possessions. Reported in Wave 1 (age 15). Minimum: -3.38, Maximum: 2.15
school attitude	Measured by adding the answers to four questions about life at school: (i) School has prepared them for adulthood; (ii) School is not a waste of time; (iii) School has given them confidence; and (iv) School is useful for a future job. The answer categories are 4: 'Strongly agree', 3. 'Agree', 2. 'Disagree', 1. 'Strongly disagree'. Reported in Wave 1 (age 15).
life satisfaction	Measured by adding the answers to five questions to rate their level of happiness with: (i) their life at home; (ii) their standard of living; (iii) where they live; (iv) their independence; and (v) their life as a whole. The answer categories are 4: 'Very happy', 3: 'Happy', 2: 'Unhappy', 1. 'Very Unhappy'.
family importance	Measured by adding the answers to two questions: 'the importance of immediate family members' and 'importance of family members they don't live with'. The answers are on a scale of 0 - 10 with 0 = 'not important at all' and 10 = 'very important.
family influence	Measured by respondent's self-assessment of the level that their family influences their thinking. The answer categories are 4: 'Quite a bit', 3: 'Some', 2: 'Not much' and 1: 'Not at all'.
student aspiration	Dummy variable, =1 if the respondent's plans to go to university. Derived from question about post school plans. Reported in Wave 1 (age 15).
parent aspiration	Dummy variable, =1 if the respondent reports that parents aspire for the respondent to go to university. Derived from question about post school plans. Reported in Wave 1 (age 15).
Tertiary enrolment in country of origin	Enrolment in tertiary education per 100,000 inhabitants. Source: UNESCO Institute for Statistics, downloaded from World Bank Database. Data available for 119 out of 170 countries of origin in the sample.
Parental attitudes in country of origin	% of parents in a particular country who emphasise on a certain quality. The question in the survey is as follows: Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five! Source: World Values Survey (http://www.worldvaluessurvey.org/WVSOnline.jsp) Data available for 54 out of 170 countries of origin in the sample.