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Educational pathways and earnings trajectories of second-generation immigrants in Australia: New insights from linked census-administrative data

Ha Trong Nguyen[*, †, §] Tomasz Zajac[‡] Wojtek Tomaszewski[‡] Francis Mitrou[†]

This study employs 2011 Census data linked to population-based administrative datasets to explore disparities in educational attainment and earnings trajectories among Australian-born children of diverse parental migration backgrounds from mid-adolescence to early adulthood. Non-English Speaking Background (NESB) second-generation immigrants exhibit superior academic outcomes, primarily driven by children of parents from select Asian countries. These individuals are more likely to complete higher education, particularly bachelor's and master's degrees, and specialise in fields such as management and commerce, health, natural and physical sciences, and engineering. Children of NESB immigrant parents initially earn less than their peers with Australian-born parents at ages 21–22. However, this gap closes by ages 23–24 and reverses by ages 26–27, with children of NESB fathers out-earning their counterparts by ages 28–29. Conversely, children of English-Speaking Background (ESB) immigrant parents, who exhibit weaker academic performance, also experience lower earnings compared to peers with Australian-born parents. This disparity emerges by ages 22–23 and widens throughout the study period, peaking at ages 28–29. The findings underscore the academic and economic advantages of NESB second-generation immigrants, contrasting with the challenges faced by ESB migrant counterparts, and highlight the importance of considering parental migration backgrounds in understanding post-school outcomes of Australian-born children of immigrant parents.

Keywords: Migration; Intergenerational Correlation; Education; Income; Census; Administrative data; Australia

JEL classifications: I24; J24; J62

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1. Introduction

According to the 2021 Census, nearly 30% of individuals living in Australia are foreign-born, and 48% have at least one foreign-born parent (ABS 2024a). These figures represent a significant increase from the 2011 Census, which reported that approximately 27% of the population were born overseas, and 43% had at least one foreign-born parent. Given the current and projected increasing significance of children of migrants in Australia's labour market, it is essential to comprehensively understand their post-school outcomes. Moreover, since Australia's migrants originate from diverse linguistic and cultural backgrounds, it is important to account for this heterogeneity, as individuals from different backgrounds may encounter varied experiences in education and the labour market. Understanding these dynamics is critical for informing policies aimed at enhancing the integration and success of all migrant groups in Australian society (Borjas 1999; Abramitzky & Boustan 2017; Alesina & Tabellini 2024).

This paper examines the educational pathways and earnings trajectories of Australian-born children of immigrants, commonly referred to as second-generation immigrants, from diverse ethnic backgrounds, as well as Australian-born children of native-born individuals. The study focuses on the critical transition from mid-adolescence to early adulthood, a pivotal period in individual development that encompasses the shift from school to higher education or entry into the labour market (Becker 1965; Heckman & Mosso 2014).

Leveraging newly available, high-quality linked Australian census-administrative data, this study makes three key contributions to the literature on children's academic and labour market outcomes across diverse migration backgrounds. First, unlike existing Australian studies that primarily examine academic performance before school completion (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020), this study investigates post-secondary educational attainment, including higher education qualifications and fields of study beyond the typical graduation age. Additionally, administrative higher education data offer granular insights into qualification levels and disciplines. Beyond education, this study also analyses early-career earnings using administrative income tax data.

Second, unlike previous research that often relies on survey datasets with relatively small sample sizes, our study leverages a comprehensive dataset encompassing the entire Australian population. This allows for a more detailed and robust analysis. For instance, the extensive sample size significantly enhances statistical power, enabling us to investigate outcomes at a granular level, such as by specific countries of origin, rather than relying on aggregated

regional classifications as seen in prior studies (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020). Third, the longitudinal nature of our dataset presents a unique opportunity to examine educational and economic outcomes concurrently over time (Deutscher 2020; Islam *et al.* 2022). This dual-pathway approach provides valuable insights into how disparities in educational and economic trajectories develop and interact over an extended period, spanning a decade.

The evidence presented in this study holds significant relevance not only for Australia but also for other immigrant-receiving countries. As a nation with a substantial immigrant population, Australia ranks ninth globally for the proportion of its population born overseas (ABS 2024a). However, the unique immigration composition and policy context in Australia mean that findings from countries like the United States may not be directly transferable. For instance, a much larger share of immigrants in Australia are admitted based on labour market skills compared to the U.S. (Antecol *et al.* 2003), and Australia has a higher proportion of its population born overseas (ABS 2024a).

That said, consistent with Australian evidence (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020), studies in the U.S. have also documented that children from certain immigrant groups achieve superior academic outcomes (Fryer & Levitt 2006; Figlio *et al.* 2019). However, due to data constraints (see Villarreal and Tamborini (2023) for a recent review), U.S. studies typically focus on a single outcome—most often educational achievements—rather than examining both educational and economic outcomes in tandem. By addressing these dual outcomes, this Australian study provides insights that may extend to other multicultural and immigrant-receiving nations.

This study presents three principal findings. First, among Australian-born children, those with Non-English Speaking Background (NESB) immigrant parents demonstrate the strongest academic outcomes. They have the highest probabilities of completing Year 12, achieving the highest Australian Tertiary Admission Rank (ATAR) scores, and attaining higher education qualifications. These outcomes are followed by children of Australian-born parents, with children of English-Speaking Background (ESB) immigrant parents ranking third. Notably, a compounding effect is observed, where children with both parents from NESB countries excel academically. These findings align with prior Australian research (e.g., Cobb-Clark and Nguyen (2012)) and are further substantiated in this study, which employs a longer time horizon and improved precision.

Second, this study reveals new evidence that the superior academic achievements of second-generation NESB immigrants are largely driven by children of parents from select Asian countries. Their higher likelihood of completing higher education is primarily attributed to an increased probability of attaining bachelor's and master's degrees. Furthermore, these individuals are more likely to specialise in disciplines such as management and commerce, health, natural and physical sciences, engineering and related technologies, society and culture, information technology, and architecture and building.

Third, this study provides novel insights into the temporal dynamics of educational and financial disparities among children from diverse migration backgrounds. Consistent with their educational trajectories, children of NESB parents initially earn less than their peers with Australian-born parents at ages 21–22. However, this gap closes by ages 23–24 and reverses by ages 26–27, with children of NESB fathers out-earning their counterparts by ages 28–29. In contrast, children of ESB immigrant parents, who demonstrate weaker academic performance, also experience lower earnings relative to peers with Australian-born parents. This disparity becomes evident at ages 22–23 and continues to widen over time, reaching its peak at ages 28–29, where our follow-up ends.

The structure of this paper is organised as follows: Section 2 provides a concise review of the relevant literature. Section 3 describes the data employed in the analysis. Section 4 outlines the primary empirical findings, followed by Section 5, which delves into additional insights derived from our unique data and methodological approach. These include differences in completed levels of higher education and fields of study among children from diverse migration backgrounds, differences in educational and earnings outcomes by parental country of birth, and temporal trends in educational and financial trajectories. Finally, Section 6 concludes the paper by summarizing the key findings and offering directions for future research.

2. A brief review of related literature

This study, which investigates the educational and earnings pathways of second-generation migrants, contributes to two broadly defined lines of research. The first focuses on the educational performance of second-generation migrants, highlighting varying patterns across different ethnic backgrounds and countries (see comprehensive reviews by Dustmann and Glitz (2011), Sweetman and van Ours (2015) or Duncan and Trejo (2018)). Within this area, the current study aligns closely with a growing body of Australian research. For instance, earlier work by Cobb-Clark and Nguyen (2012) utilised survey data from Youth in Focus linked to

administrative data on parental income support receipts. They found that young Australians aged 20 from NESB immigrant families exhibit an educational advantage compared to their ESB immigrant and Australian-born peers. Their analysis focused on selected educational outcomes observed when individuals were approximately 20 years old, such as Year 12 completion, ATAR scores, and university enrolment.

Other studies have employed survey datasets like the Longitudinal Study of Australian Children (LSAC) to explore the academic outcomes of younger Australian-born individuals (Nguyen *et al.* 2020; Islam *et al.* 2022). These studies typically report that children of NESB immigrants outperform their peers, as measured by National Assessment Program - Literacy and Numeracy (NAPLAN) test scores through Year 9 (around ages 14–15). Nguyen *et al.* (2020) further highlight that children from NESB migrant families allocate more time to education-related activities, with these time investments substantially enhancing academic performance. Additionally, using LSAC data, Nguyen *et al.* (2019) demonstrate distinct temporal patterns in the development of non-cognitive skills among children of parents from various migration backgrounds.

Despite these contributions, prior Australian studies predominantly rely on survey datasets with limited sample sizes, constraining their ability to rigorously analyse the educational performance of children from diverse migration backgrounds beyond aggregated categories such as ESB or NESB.[1] Furthermore, these datasets typically focus on educational outcomes prior to higher education completion. By contrast, the linked census-administrative datasets used in this study enable a comprehensive exploration of post-school educational outcomes. The large sample size of these population-based datasets also facilitates more detailed and robust analyses than what was previously achievable with survey data.

This study also contributes to the extensive body of literature comparing the earnings of individuals from diverse migration backgrounds (Borjas 1985; Gregory 2015). This literature predominantly focuses on earnings disparities between first-generation migrants and native-born individuals, often documenting an initial income disadvantage for migrants that diminishes over time as they integrate into the labour market (for a U.S.-focused review, see Abramitzky and Boustan (2017)). In line with international findings, Australian studies

[1] An exception is the recent study by Zając *et al.* (2023), which utilises datasets largely similar to those employed in this study. However, their research focuses on the labour market trajectories of Australian graduates from advantaged and disadvantaged social backgrounds. In their analysis, the socioeconomic background index is constructed using various factors, including whether the individual was born overseas in an ESB or NESB country (i.e., as a first-generation immigrant).

consistently report wage gaps favouring native-born individuals, with NESB migrants experiencing the largest disadvantages. However, these gaps tend to narrow with migrant integration (Miller & Chiswick 1985; Beggs & Chapman 1988; Kostenko *et al.* 2012; Breunig *et al.* 2013; Islam & Parasnis 2016; To *et al.* 2017; Kifle *et al.* 2019). Additionally, similar to international evidence (Aydemir *et al.* 2009; Abramitzky *et al.* 2021), Australian research finds that while both first- and second-generation immigrants face disadvantages, second-generation migrants generally experience less pronounced disparities (Maani 1994; Deutscher 2020).

This study builds on prior Australian research by Maani (1994) and Deutscher (2020) to examine the relative earnings of second-generation immigrants. However, it advances the field through several unique contributions enabled by superior data and methodology. First, unlike Maani (1994), which utilised the Australian Longitudinal Survey (ALS) from 1985–1988 to document disadvantages among both young first- and second-generation immigrants, this study leverages more robust and detailed data to focus exclusively on the second generation. Similarly, Deutscher (2020), which relied on survey datasets such as Census, the Household, Income and Labour Dynamics in Australia (HILDA), and Youth in Focus to investigate intergenerational income mobility among second-generation Australians, does not analyse the relative earnings trajectories of second-generation immigrants in detail as this study does.

Moreover, previous Australian studies have been limited in their ability to examine educational and economic outcomes concurrently over extended periods due to data constraints. To our knowledge, this study is among the first in Australia—and rare internationally—to analyse disparities in educational and economic trajectories in tandem over a significant and important timeframe. For instance, a recent review of U.S. literature by Villarreal and Tamborini (2023) underscores that most studies tend to focus on either educational or earnings outcomes, but rarely both. By adopting a dual-focus approach, this study provides a more comprehensive understanding of the interlinked pathways influencing the outcomes of second-generation immigrants.

3. Data and sample

3.1. Data

This study utilises the Person Level Integrated Data Asset (PLIDA), developed and maintained by the Australian Bureau of Statistics (ABS). PLIDA is a secure and comprehensive integrated dataset that combines longitudinal information across multiple domains, including health,

education, government payments, income, taxation, employment, and population demographics, such as Census data (ABS 2024b).

The analysis draws upon three principal datasets. The first dataset is the 2011 Census, which provides extensive socio-demographic information, including gender, age, educational attainment, and country of birth. It also offers detailed data on family relationships, which are critical for identifying individuals' parental migration backgrounds. Additional variables derived from the Census include Year 12 completion status, which is employed as an outcome variable, as well as parental characteristics (e.g., age and education) and household attributes (e.g., tenure status and income), which serve as key explanatory variables in the empirical models.

The second dataset is the Higher Education Information Management System (HEIMS), an administrative resource provided by the Department of Education, Skills, and Employment. HEIMS encompasses nationwide data on higher education enrolments and completions spanning 2005 to 2019. This dataset contributes variables such as Australian Tertiary Admission Rank (ATAR) scores,[2] higher education qualification completion, qualification levels, and fields of study.

The third dataset, the Personal Income Tax (PIT) records, is sourced from the Australian Taxation Office (ATO). PIT data includes comprehensive information on total personal taxable income for each financial year (FY),[3] serving as the primary measure of earnings in this study. The PIT data span the 2011/12 to 2018/19 financial years.

These datasets are linked through the Person Linkage Spine, a system designed to integrate records for all individuals residing in Australia during the reference periods. The linkage process employs a deterministic method using identifiers such as names, date of birth, gender, and address (ABS 2024b).

3.2. Sample

This study focuses on individuals born in Australia to examine the influence of parental immigrant backgrounds on those who were born and raised domestically. These individuals

[2] In Australia, domestic students aspiring to attend university typically require an ATAR, a percentile ranking ranging from 0.00 to 99.95. Students generally receive their ATAR score upon completing Year 12, the final year of secondary school. Most students are 17 or 18 years old at this stage, depending on their birthdate and the state or territory in which they studied. In our regression analysis of ATAR score, we additionally include a dummy variable to indicate the year in which an individual left school. It is important to note that ATAR scores are only observed for individuals who enrolled in higher education and appear in the HEIMS dataset.

[3] The financial year in Australia spans from July 1 to June 30 of the following year.

are commonly referred to as second-generation immigrants. Following methodologies employed in previous studies (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020), this approach allows for a clearer attribution of differences in children's outcomes to variations in their parents' migration backgrounds.

We focus on individuals aged 15 to 18 as of the Census month in August 2011 for three primary reasons. First, we rely on household relationships reported in the 2011 Census to identify connections between household members. Specifically, we determine the country of birth of parents for individuals residing with both natural or adopted parents at the time of the census.[4] Consequently, we can only link children to their parents if they were co-residing during the 2011 Census. This approach allows us to directly observe parental age, education, and income as reported by the parents themselves, facilitating an examination of their potential influence on the subsequent educational and income trajectories of their children.

Second, by focusing on 15- to 18-year-olds, most of whom co-reside with their parents, we mitigate the issue of older children leaving the parental home for education- or work-related reasons. Such patterns of leaving home may differentially affect observations across migration backgrounds.

Third, this age range allows us to track these individuals through to potential completion of higher education within the timeline of our higher education dataset, which extends to 2019. Since a typical undergraduate degree takes around four years, by 2019, individuals in our sample would have reached 23 to 26 years of age, providing an adequate timeframe to capture higher education outcomes. In subsequent sections, we will examine older cohorts and show that our results remain consistent across age groups.

We further refine the sample by excluding individuals with missing data on key variables, such as parental country of birth and education. This restrictive sample criterion, made possible by the extensive size of our original population datasets, allows for a nuanced examination of how variations in parental background, specifically the educational attainment and country of birth of both mothers and fathers, may differentially influence the educational and earnings outcomes of individuals. This approach is essential for understanding the potential moderating

[4] While the 2011 Census provides an indicator of whether an individual's mother or father was born overseas, we chose to use the direct reports from the individuals instead. This is because parental information does not provide the exact country of birth of the overseas-born parent, and as demonstrated further in the paper, a more detailed classification of country of birth is crucial. Furthermore, our approach, using country of birth as directly reported by the individual, provides greater precision than relying on information reported by another household member (Nguyen *et al.* 2023).

effects of parental characteristics on socioeconomic outcomes, consistent with findings in the literature on intergenerational transmission of advantage (Dustmann *et al.* 2012; Sweetman & van Ours 2015; Zając *et al.* 2023; Haeck & Laliberté 2024).

4. Main results

4.1. Descriptive results

Table 1 presents summary statistics for key variables, disaggregated by parental migration status, highlighting notable differences in socioeconomic, educational, and earning outcomes among children from different migration backgrounds.[5] While there is minimal variation in the age of children, parents born overseas are, on average, older than their Australian-born counterparts. This trend is consistent for both mothers and fathers and suggests a positive association between international migration and higher childbearing ages among immigrants.

Additionally, consistent with Australia's skill-based migration policies, immigrant parents demonstrate higher levels of educational attainment, with a significantly greater likelihood of holding a bachelor's degree or higher compared to Australian-born parents (Antecol *et al.* 2003; Gregory 2015). This pattern is evident for both mothers and fathers. In terms of homeownership, children of migrant parents are more likely to live in outright-owned homes and less likely to reside in homes with mortgages. However, they are associated with lower household income compared to children of Australian-born parents.[6] The final rows of Table 1 reveal that children of migrant parents achieve statistically significantly higher educational outcomes but exhibit lower income levels, regardless of whether the mother or father is a migrant.

4.2. Regression model

To investigate the factors associated with outcome Y for individual i at time t, we employ the following regression model:

$$Y_{i,t} = \alpha + D_i\beta + X_{i(t=2011)}\gamma + \varepsilon_i \qquad (1)$$

[5] For brevity and demonstration purposes, we categorise whether the mother or father was born overseas without more detailed disaggregation. Unreported results show that the top ten countries of birth for migrant mothers are: England, Vietnam, New Zealand, Lebanon, China (excluding Hong Kong and Taiwan), the Philippines, India, Malaysia, Scotland, and Italy. The list for fathers is similar, with Sri Lanka replacing Malaysia.

[6] Similar patterns have been observed in other Australian studies. Immigrants tend to have higher qualifications than native-born Australians, largely due to Australia's skilled migration policies (Antecol *et al.* 2006). However, despite these higher qualifications, immigrants—particularly in the initial years after arrival—often earn less than their Australian-born counterparts (Breunig *et al.* 2013; Nguyen & Duncan 2017).

where D_i is a vector of two categorical variables, each indicating the country of birth of the individual's mother or father. $X_{i(t=2011)}$ is a set of explanatory variables derived from the 2011 Census. These variables are measured at the time of the 2011 Census for two primary reasons. First, they are constructed using Census data and are not widely available in other datasets. Second, for certain time-varying variables, such as household income, measuring them at the beginning of the study period helps mitigate concerns about reverse causality—for instance, the possibility that children's income may influence household income. ε_i denotes the usual idiosyncratic term and α, β and γ are vectors of parameters to be estimated. The coefficients in β are of particular interest, as they capture differences in the outcome associated with individuals coming from various migration backgrounds.

Following the approach commonly adopted in the literature (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020), the vector X_i includes a range of individual and household characteristics potentially correlated with the outcome of interest. These variables encompass individual attributes (e.g., gender and age, included flexibly as month-of-birth dummies), parental characteristics (e.g., age and age squared, and highest qualifications for both mother and father), and household features (e.g., residential tenure indicators and household income). Similarly, to allow sufficient time for certain outcomes to materialise, baseline analyses measure outcomes such as higher education completion and income at the latest available time point in the dataset. Additionally, state/territory dummy variables are included to account for geographic and institutional differences in observed outcomes.

For binary outcomes, such as Year 12 completion or the attainment of a higher education qualification, a logit model is employed to appropriately account for the dichotomous nature of the dependent variable. The results are reported as marginal effects to facilitate interpretation. When multiplied by 100, these marginal effects represent percentage changes in the probability of the outcome. For continuous outcomes, such as ATAR scores or annual income, we utilise an Ordinary Least Squares (OLS) regression, which provides estimates of the average effect of the explanatory variables on the dependent variable.

In our baseline regression, and for interpretative simplicity, we follow prior Australian studies (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020) by categorizing each parent's country of birth into three broad groups: Australian-born (the reference category), born overseas in an

English-speaking background (ESB) country, or born in a non-ESB (NESB) country.[7] The emphasis on English-speaking backgrounds is particularly pertinent, given that Australia—an English-speaking nation—reported in the 2021 Census that 22% of its population speaks a language other than English at home (ABS 2024a). This categorization also reflects the well-documented substantial economic benefits associated with greater English language proficiency (Bleakley & Chin 2010; Guven & Islam 2015).

4.3. Main regression results

Table 2 presents regression estimates for two migration background groups for each parent, controlling for variables specified in Equation 1. The findings reveal significant differences in children's educational attainment and earnings based on parental migration background. Specifically, children of ESB immigrant parents are more likely to have completed Year 12 by 2011 compared to children of Australian-born parents.[8] This effect is more pronounced for maternal migration background, as evidenced by estimates that are both statistically stronger and of greater magnitude for mothers than for fathers (0.85, statistically significant at the 1% level for mothers, compared to 0.32, statistically significant at the 10% level for fathers, as shown in Column 2 of Table 2). However, children of ESB immigrant parents underperform academically relative to their peers with Australian-born parents, as reflected in lower ATAR scores and a decreased likelihood of obtaining a higher education qualification by 2019. Within this group, paternal migration background demonstrates a stronger association with ATAR scores, whereas maternal migration background has a greater impact on higher education attainment, with estimates approximately 50% larger for mothers (-2.16 compared to -1.42 for fathers, as shown in Column 7 of Table 2).

In contrast, children of NESB immigrants outperform children of Australian-born parents across all educational outcomes considered. Within the NESB group, there is no substantial difference between maternal and paternal migration backgrounds regarding Year 12 completion. However, maternal migration background exerts a significantly greater influence on ATAR scores and the probability of obtaining higher education qualifications. For instance, the estimated effect of NESB maternal migration background on ATAR scores is nearly three times greater than that of paternal migration background (1.81 compared to 0.62, as presented

[7] Building on previous Australian studies (Cobb-Clark & Nguyen 2012; Nguyen *et al.* 2020), this study classifies ESB countries as Canada, England, New Zealand, Northern Ireland, Scotland, South Africa, Wales, and the United States. Countries of origin not included in this classification are categorised as NESB.
[8] However, it is important to note that, due to our sample restriction to individuals aged 15 to 18 at the time of the 2011 Census, most were not yet old enough to have completed Year 12 by that year.

in Column 4). Similarly, the estimate for NESB maternal migration background on the likelihood of obtaining a higher education qualification is over 15% higher than that for paternal migration background (9.46 compared to 8.27, as shown in Column 7).

Column 9 of Table 2 indicates that children of immigrant parents have statistically significantly lower taxable incomes compared to children of Australian-born parents, with a difference ranging from 1.48 to 1.81 thousand AU$ per year (measured in the 2018/19 financial year). This pattern is consistent regardless of whether the parents are from ESB or NESB countries. However, children of NESB immigrant parents face a slightly greater disadvantage in taxable income compared to children of ESB immigrant parents. For example, children of NESB immigrant mothers earn approximately $270 less annually than children of ESB immigrant mothers.

Table 2 also presents results from a modified regression based on Equation (1), which includes an interaction term between the categorical variables capturing the migration backgrounds of both parents. The findings from this extended regression (shown in Columns 3, 5, 8, and 10) indicate some compounding effects of having both parents from specific migration background combinations. Notably, the statistically significant and positive coefficient (at the 1% level) for the interaction term between NESB mother and NESB father variables suggests that children of parents who both originate from a NESB country achieve better outcomes both academically and financially. For example, compared to children of two Australian-born parents, children of two NESB immigrant parents have ATAR scores that are 2.52 points higher. Furthermore, these children earn 1.25 thousand AU$ more annually than their counterparts with two Australian-born parents.[9]

4.4. Other regression results

The estimates for other important variables, presented in Appendix Table A1, align largely with expectations. For example, consistent with prior Australian research, males typically underperform academically (Booth & Kee 2011; Le & Nguyen 2018a; Nguyen *et al.* 2022), whereas they exhibit stronger financial performance in line with international findings (Blau & Kahn 2017; Le & Nguyen 2018b). Additionally, children's educational attainment, particularly in terms of ATAR scores and higher education completion, as well as earnings, increase with parental age, albeit at a decreasing rate. This is evidenced by statistically

[9] For representational purposes, we do not report marginal effects following the logit regression in this extended model, as the marginal effect for the interaction term is not defined.

significant and positive coefficients for parental age, contrasted with statistically significant and negative coefficients for parental age squared.

The relationship between parental education and children's outcomes varies by outcome type. Specifically, children of more highly educated parents—whether maternal or paternal—demonstrate higher academic achievement, reflected in higher ATAR scores and a greater likelihood of completing higher education. However, no consistent relationship is observed between parental education and children's earnings, as children of parents with the highest educational qualifications do not necessarily earn more. This pattern holds for both maternal and paternal education.

Household wealth and income are also significant predictors of children's academic and financial outcomes. Children from wealthier households, as indicated by homeownership status, and those from higher-income households tend to perform better academically and financially. Moreover, the stronger statistical significance of household income estimates on children's earnings suggests that children's financial outcomes are more closely correlated with parental income than with parental education. These findings are consistent with broader research on intergenerational transmission, which highlights the critical role of parental education, health, and income in shaping children's outcomes (Black & Devereux 2011; Mendolia & Siminski 2016; Le & Nguyen 2017; Hancock *et al.* 2018; Le & Nguyen 2018c).

5. Additional results

Overall, our findings thus far corroborate much of the prior literature while offering enhanced precision due to the use of exceptionally large and high-quality datasets. This robust data foundation allows us to expand upon existing research by addressing previously underexplored dimensions of intergenerational outcomes.

5.1. Level and field of higher education completion

First, we examine differences in completed levels of higher education and fields of study among children from diverse migration backgrounds. For the analysis of completed higher education levels, we classify outcomes into five mutually exclusive categories: no higher education qualification (the reference group), diploma, bachelor's degree, graduate diploma, and master's degree or higher. For fields of study, we adopt the Australian two-digit classification system for fields of education, categorizing individuals into 11 mutually exclusive groups: no higher education qualification (the reference group); natural and physical sciences; information technology; engineering and related technologies; architecture and

building; agriculture and environmental studies; health; education; management and commerce; society and culture; and creative arts.[10]

We employ a multinomial logit regression model where the dependent variable is a categorical indicator representing either the completed level of education or the field of study. These outcomes, as noted above, are measured at the end of the study period in 2019. The regression controls for the same set of explanatory variables outlined in Equation (1), ensuring consistency in the modelling framework and comparability with prior analyses.

Table 3 presents the marginal effects of parental migration background on the likelihood of attaining different levels of higher education. The findings indicate notable differences in educational outcomes for children based on the migration background of their parents. Specifically, children of ESB parents exhibit lower probabilities of completing a bachelor's or graduate diploma degree compared to children of Australian-born parents. This pattern appears more pronounced for maternal migration background, as reflected in larger absolute values or greater statistical significance for maternal estimates relative to paternal ones.

In contrast, children of NESB parents are more likely to achieve higher education qualifications across all levels compared to their peers with Australian-born parents. Specifically, children of NESB mothers are 7.66 percentage points (pp) more likely to complete a bachelor's degree, 1.22 pp more likely to attain a master's degree or higher, 0.36 pp more likely to obtain a graduate diploma, and 0.21 pp more likely to earn a diploma. Similarly, children of NESB fathers demonstrate a 6.38 pp higher probability of completing a bachelor's degree, a 1.24 pp higher likelihood of attaining a master's degree or higher, a 0.47 pp higher probability of earning a graduate diploma, and a 0.17 pp increased likelihood of completing a diploma.

The predominance of bachelor's and master's degrees in these results is especially noteworthy, as these qualifications represent the majority of higher education outcomes among graduates in the dataset (84% and 8%, respectively). These patterns suggest that the superior academic performance observed among children of NESB parents is primarily driven by achievements

[10] For a small proportion of higher education graduates (less than 3% in our dataset) who obtained multiple degrees in a given year, we assigned the degree with the highest educational level. The field of study corresponding to this highest-level degree was also attributed to these individuals. In rare cases where individuals completed multiple degrees of the same level within the same year, the field of study was determined based on the order of classification in the Australian two-digit system for fields of education. For example, if an individual completed degrees of the same level in both natural and physical sciences, and information technology, the field listed first in the classification system (natural and physical sciences) was selected. Observations where individuals completed a field in food, hospitality, and personal services are grouped with those who completed a degree in management and commerce due to the insufficient sample size for separate analysis.

in these two educational categories. Conversely, the lower academic performance of children of ESB parents is largely attributable to their reduced likelihood of attaining bachelor's or graduate diploma qualifications.

Table 4 presents the estimated effects of parental migration background on the likelihood of attaining higher education qualifications across various fields of study. The findings indicate that, compared to children of Australian-born parents, children of ESB parents exhibit distinct educational patterns. Specifically, children of ESB parents are significantly less likely to complete degrees in engineering and related technologies, health, education, and management and commerce, as evidenced by negative and statistically significant estimates ($p < 0.1$) for both maternal and paternal migration backgrounds. Notably, children of ESB fathers are 0.43 pp more likely to complete a degree in creative arts, as indicated by a positive and statistically significant estimate at the 1% level.

In contrast, children of NESB parents generally exhibit a higher likelihood of attaining higher education qualifications across most fields of study compared to children of Australian-born parents, with patterns remaining relatively consistent between maternal and paternal migration backgrounds. Specifically, children of NESB parents are more likely to complete degrees in fields such as management and commerce, health, natural and physical sciences, engineering and related technologies, society and culture, information technology, and architecture and building. Conversely, children of NESB mothers are less likely to complete degrees in education compared to their counterparts with Australian-born mothers. Furthermore, children of NESB parents are less likely to attain qualifications in agriculture and environmental studies, as indicated by statistically significant ($p < 0.1$) and negative estimates. Notably, the negative association in this field is more pronounced for paternal migration background than for maternal migration background.

5.2. Detailed country of birth of each parent

This subsection utilises the extensive sample size of our dataset to investigate variations in educational outcomes and earnings by the detailed country of birth of each parent, focusing on the top 30 countries of origin for immigrant mothers in the sample. The findings for Year 12 completion, visually summarised in Figure 1, highlight substantial differences in this educational achievement based on the parental country of birth. Specifically, as shown in Panel A, children of mothers born in most countries exhibit a higher likelihood of completing Year 12 by the 2011 Census compared to children of Australian-born mothers. The top ten countries

associated with the highest probabilities, in descending order, are Turkey, the Philippines, Fiji, Vietnam, China, Lebanon, Cambodia, Malaysia, Chile, and Italy. However, there is no statistically significant difference in Year 12 completion rates for children of mothers from countries such as the U.S., Germany, Poland, the Netherlands, South Africa, Croatia, Indonesia, Singapore, Papua New Guinea, and Sri Lanka, relative to children of Australian-born mothers.

Panel B presents the estimates for fathers' countries of birth and highlights a distinct pattern. Children with fathers born in Lebanon, China, Singapore, Indonesia, former Yugoslavia, Vietnam, Italy, the Philippines, Greece, and Fiji, ranked in descending order of probability, are significantly more likely to complete Year 12 compared to children of Australian-born fathers. Conversely, children of migrant fathers from other countries, such as the U.S., South Africa, England, the Netherlands, Scotland, Chile, Papua New Guinea, Germany, Poland, and Turkey, exhibit no statistically significant difference in Year 12 completion rates relative to their peers with Australian-born fathers.

Figure 2 illustrates significant differences in ATAR scores by the country of birth of each parent. Panel A highlights that children of immigrant mothers born in China, Sri Lanka, Hong Kong, Malaysia, Vietnam, South Korea, Singapore, Cambodia, India, and South Africa achieve the highest ATAR scores. In contrast, children of mothers originating from Chile, Lebanon, Turkey, Fiji, and the Philippines exhibit the lowest performance. Similarly, Panel B demonstrates that children of fathers from China, Hong Kong, Vietnam, Cambodia, and Malaysia attain the highest ATAR scores, whereas those with fathers born in former Yugoslavia, Chile, the Philippines, Turkey, Fiji, Scotland, and Egypt achieve the lowest scores.

Figure 3 – Panel A demonstrates that children of mothers born in China, Hong Kong, Cambodia, Vietnam, Sri Lanka, Indonesia, Malaysia, India, Poland, and Singapore exhibit the highest likelihood of completing a higher education qualification by 2019. Conversely, children of mothers from New Zealand and England show the lowest probability of attaining a higher education qualification within the same timeframe.

Similarly, Panel B of Figure 3 indicates that children of fathers originating from Cambodia, Hong Kong, Vietnam, China, Malaysia, Singapore, South Korea, Sri Lanka, India, and Lebanon are most likely to complete higher education by 2019. By contrast, children of fathers from major English-speaking background (ESB) countries, including the U.S., New Zealand, and England, have the lowest likelihood.

In terms of annual taxable income, Figure 4 – Panel A shows that children of immigrant mothers from South Korea, the U.S., Singapore, Lebanon, Turkey, Germany, Cambodia, and Scotland have the lowest income as of the 2018/19 financial year. However, for children of mothers from other major source countries, there are no statistically significant differences in income compared to children of Australian-born mothers. Similarly, Panel B in Figure 4 demonstrates that children of fathers immigrating from Turkey, Chile, Lebanon, the U.S., Papua New Guinea, Fiji, Germany, England, and New Zealand earn less than those with Australian-born fathers. For children of fathers from other major source countries, no statistically significant income differences are observed compared to those of Australian-born fathers.

Overall, while patterns vary slightly depending on specific educational outcomes and the parents' country of birth, the findings indicate that children of immigrants from Asian countries—notably China, Hong Kong, Cambodia, Vietnam, Sri Lanka, Indonesia, Malaysia, Singapore, and India—consistently achieve superior academic outcomes. Our observation that children of Asian immigrants outperform both children of non-immigrant parents and children of other immigrant parents aligns with evidence from other multicultural Anglo-Saxon countries (Dustmann & Glitz 2011; Duncan & Trejo 2018). Furthermore, this study introduces a novel finding: by the ages of approximately 23 to 26, these children earn at least as much as their counterparts with Australian-born parents or parents from other immigrant backgrounds, underscoring their strong academic and economic achievements.

5.3. Temporal differences in educational and financial outcomes

This subsection examines the educational and financial disparities over time among children from various migration backgrounds. To explore these differences, we apply Equation (1) to two key time-varying outcomes: higher education attainment and annual individual taxable income. For educational attainment, separate regressions are conducted for each calendar year from 2013 to 2019, using a sample of individuals aged 17 or 18 at the time of the 2011 Census. For earnings, we focus on an older cohort of individuals aged 21 or 22 at the time of the 2011 Census, ensuring sufficient observation of their earnings outcomes for each financial year from 2011/12 to 2018/19. Additionally, we intentionally employ a smaller sample of individuals with similar ages (i.e., individuals no more than two years apart, as opposed to the four-year age difference in the baseline analysis) to minimize the effect of age on outcomes, providing a more meaningful temporal analysis. This approach also ensures that we observe the earnings outcomes of older individuals, particularly for NESB children, who are more likely to enrol in

higher education and enter the labour market later. Furthermore, to ensure clarity and manageability of the results, this subsection focuses on two migration background groups for each parent, as defined in the baseline regression.

Table 5 presents the estimates of parental migration background on the likelihood of completing any higher education degree over time, revealing distinct temporal patterns. For children of ESB immigrant mothers, a reduced probability of completing higher education compared to children of Australian-born mothers emerges at ages 21–22, widens until ages 24–25, and then plateaus. Similarly, for children of ESB immigrant fathers, a disadvantage in higher education attainment appears at ages 22–23 but diminishes in later years. In contrast, Table 5 shows that the pattern of higher education attainment favouring children of NESB immigrant mothers and fathers relative to children of Australian-born parents begins at ages 19–20, accelerates through ages 24–25, and subsequently levels off.

Turning to earnings, Table 6 reveals distinct patterns associated with parental migration background over time. For children of ESB migrant parents, lower earnings compared to children of Australian-born mothers emerge at ages 23–24, widen by ages 27–28, and slightly decrease by ages 28–29. Similarly, children of ESB migrant fathers exhibit lower earnings than their counterparts with Australian-born fathers, with this disparity appearing earlier, at ages 22–23, and progressively increasing through the end of the study period at ages 28–29.

In contrast, children of NESB migrants exhibit a different trajectory. Initially, they earn less than children of Australian-born parents at ages 21–22, but this gap narrows by ages 23–24 and becomes statistically insignificant thereafter. This trend aligns with earlier findings that children of NESB migrants tend to spend more time pursuing higher education, delaying labour market entry and resulting in temporarily lower earnings. By ages 26–27, children of NESB fathers begin to out-earn their peers with Australian-born fathers, with an average annual earnings advantage of AU$1,300—a 2.5% increase relative to the sample mean. This gap becomes even more pronounced at ages 28–29, where children of NESB fathers earn AU$1,550 more annually—a 2.8% increase relative to the sample mean.

6. Conclusion

Leveraging newly available linked 2011 Census-administrative datasets, this study investigates disparities in educational attainment and earnings trajectories among children from diverse parental migration backgrounds in Australia, tracing their development from mid-adolescence to early adulthood. By adopting an extended time horizon and enhanced analytical precision,

the study corroborates established findings, such as the superior academic performance of second-generation NESB immigrants, while also uncovering several novel insights.

Specifically, the study reveals that the strong academic outcomes of NESB second-generation immigrants are largely attributable to children of parents from select Asian countries, including China, Hong Kong, Cambodia, Vietnam, Sri Lanka, Indonesia, Malaysia, Singapore, and India. Their higher likelihood of completing higher education is predominantly driven by increased probabilities of attaining bachelor's and master's degrees. Furthermore, they tend to specialise in fields such as management and commerce, health, natural and physical sciences, engineering, society and culture, information technology, and architecture and building.

The study also highlights temporal patterns in educational and financial trajectories. For children of NESB immigrant parents, the academic advantage—reflected in their higher likelihood of completing higher education—emerges around ages 19–20, accelerates until ages 24–25, and then plateaus. This educational pathway aligns with financial outcomes: while these individuals initially earn less than their peers with Australian-born parents at ages 21–22, the earnings gap narrows by ages 23–24 and disappears thereafter. By ages 26–27, children of NESB fathers begin to out-earn their counterparts with Australian-born fathers, with this advantage becoming more pronounced by ages 28–29.

In contrast, children of ESB immigrant parents, who demonstrate weaker academic performance, also experience lower earnings compared to peers with Australian-born parents. This disparity becomes evident as early as ages 22–23 and continues to widen throughout the study period, peaking at ages 28–29, where our follow-up ends. Overall, the findings emphasise the strongest academic and economic outcomes among second-generation NESB immigrants, while highlighting comparatively weaker outcomes for second-generation ESB immigrants within the Australian context.

While our study makes significant contributions, several limitations warrant consideration and present opportunities for future research. First, due to current data constraints, the analysis does not extend to income outcomes in later life stages from age 30 years and beyond. Expanding income data integration within the PLIDA framework could enable longitudinal studies on income disparities beyond early adulthood. Second, while this study focuses on human capital in terms of educational attainment and monetary outcomes, future research should explore additional dimensions, such as non-cognitive skills and health outcomes, to provide a more comprehensive understanding of integration metrics. Third, further investigation is needed into

the factors driving the superior outcomes observed among specific migrant groups. Future studies addressing these areas would contribute to a more nuanced understanding of immigrant integration within Australia's multicultural context.

Despite the above limitations, our study provides clear contributions to the literature, by presenting novel evidence based on unique data. Specifically, it is the first study to leverage linked census and administrative population-based datasets on higher education and income to examine the dynamics of educational attainment and earnings trajectories during early adulthood for individuals with diverse migration backgrounds in Australia. As such, it paves the way for subsequent studies to build on, and further our understanding of socio-economic disparities among the diverse Australian society, including those with different migrant backgrounds.

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Table 1: Summary statistics by parental migration background

Variable	Mother born			Father born		
	In Australia	Overseas	Difference (Australia – Overseas)	In Australia	Overseas	Difference (Australia – Overseas)
	(1)	(2)	(3)	(4)	(5)	(6)
SC male	0.52	0.51	0.01**	0.52	0.51	0.00
SC age (years)	16.51	16.52	-0.01**	16.51	16.51	0.00
Mother age (years)	46.14	47.27	-1.13***	46.21	47.02	-0.81***
Mother born in Australia	1.00	0.00	1.00***	0.88	0.38	0.5***
Mother ESB migrant	0.00	0.31	-0.31***	0.07	0.11	-0.04***
Mother NESB migrant	0.00	0.69	-0.69***	0.05	0.52	-0.47***
Mother Year 11 or lower	0.37	0.31	0.06***	0.37	0.32	0.04***
Mother Year 12	0.16	0.23	-0.07***	0.16	0.22	-0.06***
Mother Certificate	0.13	0.10	0.04***	0.13	0.10	0.03***
Mother Diploma	0.12	0.13	0.00***	0.12	0.13	0.00
Mother Bachelor degree or higher	0.22	0.24	-0.02***	0.22	0.23	-0.01***
Father age (years)	48.53	50.55	-2.02***	48.53	50.46	-1.94***
Father born in Australia	0.87	0.35	0.52***	1.00	0.00	1.00***
Father ESB migrant	0.07	0.12	-0.04***	0.00	0.32	-0.32***
Father NESB migrant	0.06	0.54	-0.48***	0.00	0.68	-0.68***
Father Year 11 or lower	0.25	0.25	0.01**	0.25	0.26	0.00
Father Year 12	0.10	0.16	-0.06***	0.10	0.16	-0.06***
Father Certificate	0.34	0.23	0.11***	0.34	0.23	0.11***
Father Diploma	0.09	0.10	0.00	0.09	0.10	0.00***
Father Bachelor degree or higher	0.21	0.26	-0.05***	0.21	0.25	-0.04***
Renter	0.12	0.12	0.00	0.12	0.12	-0.01***
Mortgage owner	0.64	0.59	0.05***	0.63	0.59	0.04***
Outright owner	0.25	0.29	-0.05***	0.25	0.28	-0.03***
Household income ($1,000)	106.29	98.80	7.48***	106.44	98.73	7.71***
SC completed Year 12 at 2011 census	0.10	0.14	-0.04***	0.10	0.14	-0.04***
ATAR scores	78.77	79.74	-0.97***	78.95	79.35	-0.4***
SC completed a HE degree by 2019	0.36	0.49	-0.14***	0.36	0.48	-0.13***
SC taxable income in 2018/19 FY ($1,000)	42.18	38.94	3.25***	42.26	38.88	3.38***
Observations	198,695	67,668		195,337	71,026	

Notes: Figures are sample mean. SC denotes Study Child. Tests are performed on the significance of the difference between the sample mean for “In Australia” and “Overseas” sub-group. The symbol * denotes statistical significance at 10% level, ** at 5%1 level, and *** at 1% level.

Table 2: Educational and financial outcomes by parental migration background

	Year 12 completion at 2011 census			ATAR scores		Any higher education qualification by 2019			Taxable income (2018/19 FY)	
	Estimate	ME	Interaction	Estimate	Interaction	Estimate	ME	Interaction	Estimate	Interaction
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mother ESB migrant	11.92***	0.85***	10.34***	-0.31*	-0.46**	-11.27***	-2.16***	-9.94***	-1.48***	-1.46***
	(2.81)	(0.20)	(3.41)	(0.16)	(0.20)	(1.69)	(0.32)	(2.03)	(0.26)	(0.33)
Mother NESB migrant	49.53***	3.82***	40.96***	1.81***	0.62***	47.20***	9.46***	26.04***	-1.75***	-2.35***
	(2.62)	(0.21)	(3.97)	(0.15)	(0.21)	(1.58)	(0.32)	(2.33)	(0.22)	(0.32)
Father ESB migrant	4.62*	0.32*	2.80	-0.49***	-0.54***	-7.37***	-1.42***	-6.86***	-1.72***	-1.72***
	(2.78)	-0.2	(3.38)	(0.16)	(0.19)	(1.64)	(0.31)	(1.96)	(0.22)	(0.26)
Father NESB migrant	51.01***	3.95***	44.12***	0.62***	-0.52**	41.44***	8.27***	24.61***	-1.81***	-2.30***
	(2.59)	(0.21)	(3.68)	(0.15)	(0.20)	(1.56)	(0.32)	(2.14)	(0.21)	(0.29)
Mother ESB migrant – Father ESB migrant			10.57		0.29			-1.47		0.02
			(6.58)		(0.39)			(3.99)		(0.58)
Mother ESB migrant – Father NESB migrant			-20.17*		1.08*			-14.63**		-0.31
			(11.22)		(0.62)			(6.55)		(0.87)
Mother NESB migrant – Father ESB migrant			-10.95		0.44			0.63		-0.01
			(10.51)		(0.57)			(6.05)		(0.80)
Mother NESB migrant – Father NESB migrant			17.74***		2.52***			43.90***		1.25***
			(5.63)		(0.31)			(3.35)		(0.46)
Observations	241,645	241,645	241,645	102,730	102,730	266,363	266,363	266,363	266,363	266,363
R-squared				0.161	0.162				0.039	0.039
Mean dependent variable	11.25	11.25	11.25	79.07	79.07	39.22	39.22	39.22	41.36	41.36

Notes: Results from an Ordinary Least Squares (OLS) regressions for continuous outcomes and from a Logit model for binary outcomes. Marginal effects (ME) are reported for Logit model. Results (coefficients and standard errors) for the Logit model are multiplied by 100 for aesthetic purposes. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Remaining results are reported in Appendix Table A1. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Table 3: Differences in level of education by parental migration background

Parental migration background:	Mother ESB migrant	Mother NESB migrant	Father ESB migrant	Father NESB migrant
Child's level of education	(1)	(2)	(3)	(4)
Diploma or lower	-0.03	0.21***	-0.10	0.17**
	(0.07)	(0.07)	(0.07)	(0.07)
Bachelor	-1.70***	7.66***	-0.99***	6.38***
	(0.32)	(0.32)	(0.31)	(0.31)
Graduate diploma	-0.25***	0.36***	-0.17*	0.47***
	(0.09)	(0.09)	(0.09)	(0.09)
Master or higher	-0.18	1.22***	-0.16	1.24***
	(0.12)	(0.12)	(0.12)	(0.12)

Notes: Results (coefficients and standard errors) are from a multinomial model, reported in marginal effects, and multiplied by 100 for aesthetic purposes. Outcome variable: Level of higher education by 2019. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Number of observations: 266,363. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Table 4: Differences in field of study by parental migration background

Parental migration background:	Mother ESB migrant	Mother NESB migrant	Father ESB migrant	Father NESB migrant
Child's field of study	(1)	(2)	(3)	(4)
Natural and physical sciences	0.19	1.68***	0.09	0.73***
	(0.13)	(0.13)	(0.13)	(0.12)
Information technology	-0.03	0.72***	-0.04	0.45***
	(0.07)	(0.08)	(0.07)	(0.07)
Engineering and related technologies	-0.20*	1.48***	-0.25**	0.93***
	(0.10)	(0.12)	(0.10)	(0.11)
Architecture and building	-0.11	0.20***	0.06	0.43***
	(0.07)	(0.07)	(0.07)	(0.08)
Agriculture and environmental studies	-0.10**	-0.09*	0.04	-0.18***
	(0.05)	(0.05)	(0.05)	(0.04)
Health	-0.45**	2.31***	-0.78***	1.71***
	(0.19)	(0.19)	(0.18)	(0.18)
Education	-0.70***	-1.14***	-0.70***	0.02
	(0.15)	(0.13)	(0.14)	(0.15)
Management and commerce	-0.56***	3.10***	-0.64***	3.00***
	(0.17)	(0.18)	(0.17)	(0.18)
Society and culture	-0.30*	0.98***	0.34*	1.09***
	(0.18)	(0.18)	(0.18)	(0.18)
Creative arts	0.08	-0.03	0.43***	-0.03
	(0.14)	(0.14)	(0.14)	(0.14)

Notes: Results (coefficients and standard errors) are from a multinomial model, reported in marginal effects, and multiplied by 100 for aesthetic purposes. Outcome variable: Field of higher education study by 2019. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Number of observations: 266,363. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Table 5: Difference in higher education attainment by parental migration background over time

Calendar year:	2013	2014	2015	2016	2017	2018	2019
Age of individuals in the respective year:	19-20	20-21	21-22	22-23	23-24	24-25	25-26
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mother ESB migrant	0.10	-0.23	-1.14***	-1.76***	-1.89***	-2.07***	-2.03***
	(0.13)	(0.29)	(0.43)	(0.51)	(0.53)	(0.54)	(0.54)
Mother NESB migrant	0.40***	2.10***	4.42***	6.92***	8.67***	9.18***	9.43***
	(0.12)	(0.30)	(0.45)	(0.51)	(0.54)	(0.54)	(0.55)
Father ESB migrant	-0.10	0.03	-0.52	-1.65***	-1.41***	-0.90*	-1.16**
	(0.11)	(0.29)	(0.43)	(0.50)	(0.53)	(0.54)	(0.54)
Father NESB migrant	0.57***	2.51***	5.17***	6.79***	7.53***	8.01***	8.07***
	(0.13)	(0.31)	(0.45)	(0.51)	(0.53)	(0.54)	(0.54)
Observations	93,771	93,771	93,771	93,771	93,771	93,771	93,771
Mean dependent variable	0.01	0.07	0.18	0.29	0.35	0.39	0.42

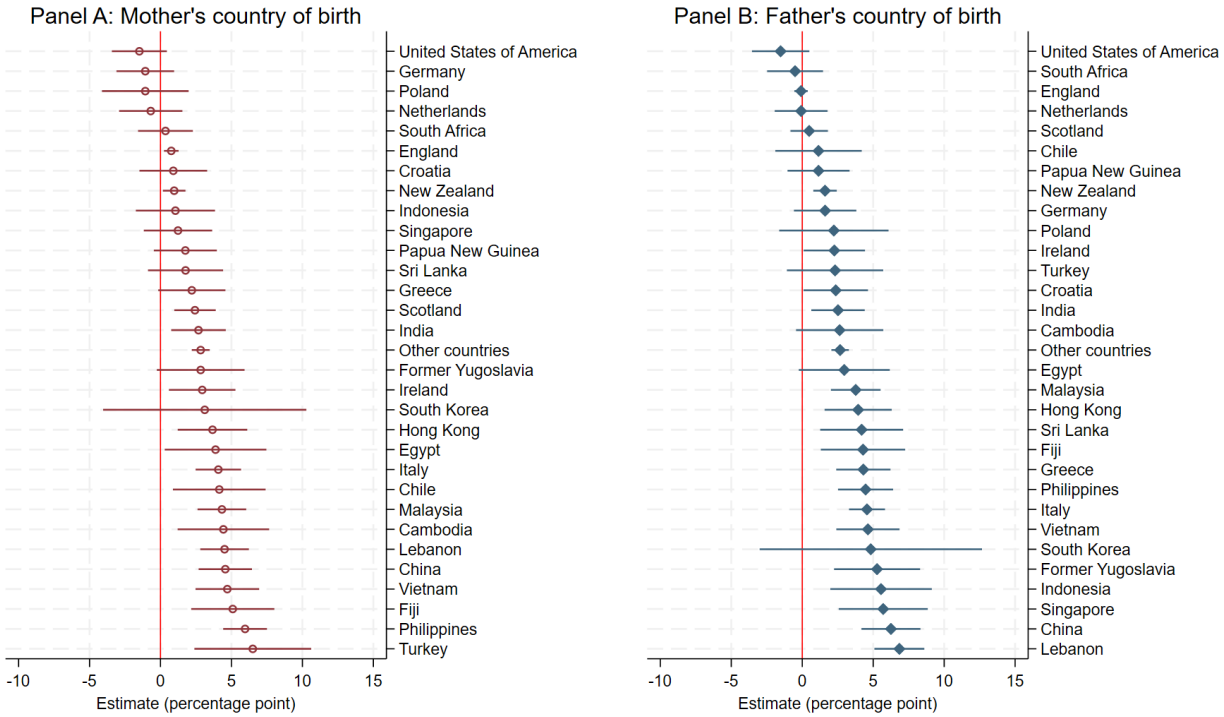
Notes: Results (coefficients and standard errors) are from a Logit model, reported in marginal effects, and multiplied by 100 for aesthetic purposes. Outcome variable: higher education attainment. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Table 6: Difference in annual individual taxable income by parental migration background over time

Financial year:	2011	2012	2013	2014	2015	2016	2017	2018
Age of individuals in the respective year:	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother ESB migrant	-0.26	-0.43	-0.94**	-0.89*	-1.37***	-1.45***	-1.61***	-1.48**
	(0.37)	(0.40)	(0.44)	(0.49)	(0.51)	(0.54)	(0.60)	(0.65)
Mother NESB migrant	-2.68***	-1.70***	-1.09***	0.01	-0.02	0.27	0.59	0.92
	(0.32)	(0.36)	(0.42)	(0.60)	(0.54)	(0.54)	(0.61)	(0.66)
Father ESB migrant	-0.70*	-1.38***	-1.30***	-1.40***	-1.38***	-1.86***	-1.85***	-2.32***
	(0.37)	(0.39)	(0.46)	(0.49)	(0.51)	(0.52)	(0.59)	(0.62)
Father NESB migrant	-1.76***	-1.43***	-0.88**	-0.18	0.80	1.30**	0.95	1.55**
	(0.32)	(0.36)	(0.40)	(0.52)	(0.51)	(0.52)	(0.58)	(0.63)
Observations	56,868	56,868	56,868	56,868	56,868	56,868	56,868	56,868
R-squared	0.05	0.06	0.06	0.04	0.04	0.04	0.04	0.03
Mean dependent variable	28.32	33.10	38.02	42.35	46.96	50.24	53.53	56.05

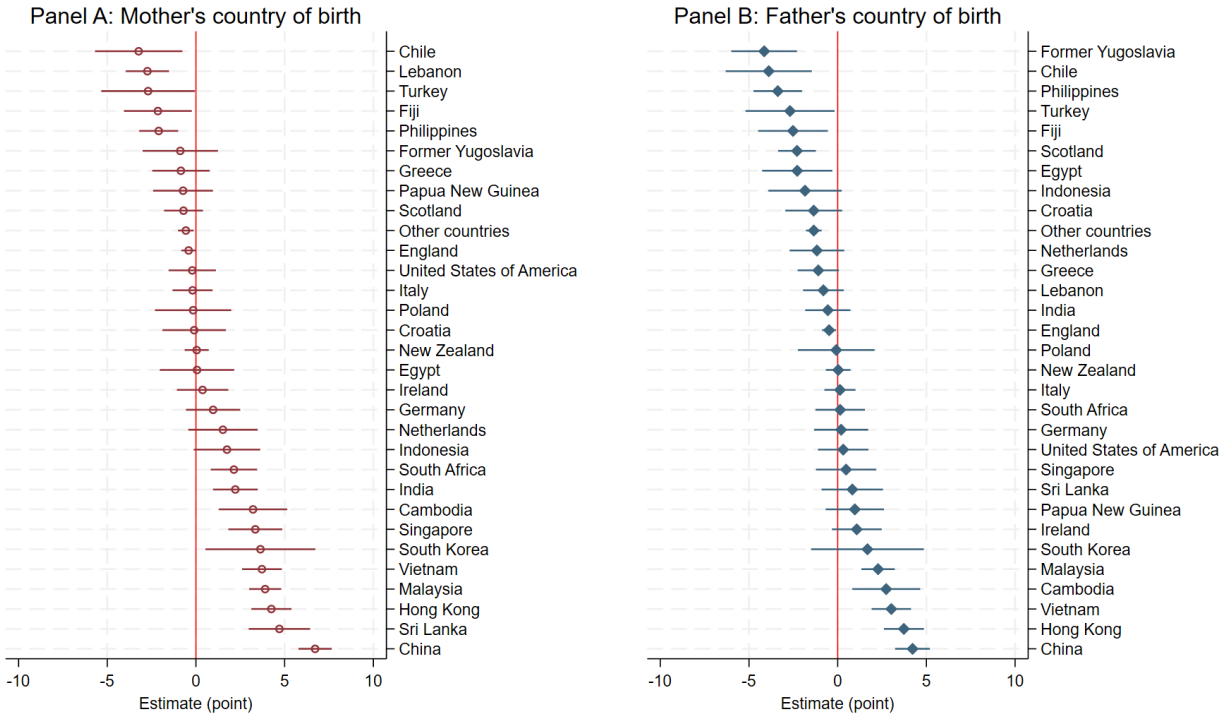
Notes: Results are from an OLS regression. Outcome variable: annual individual taxable income (in AU$). Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Figure 1: Differences in Year 12 completion by the top 30 parental countries of birth



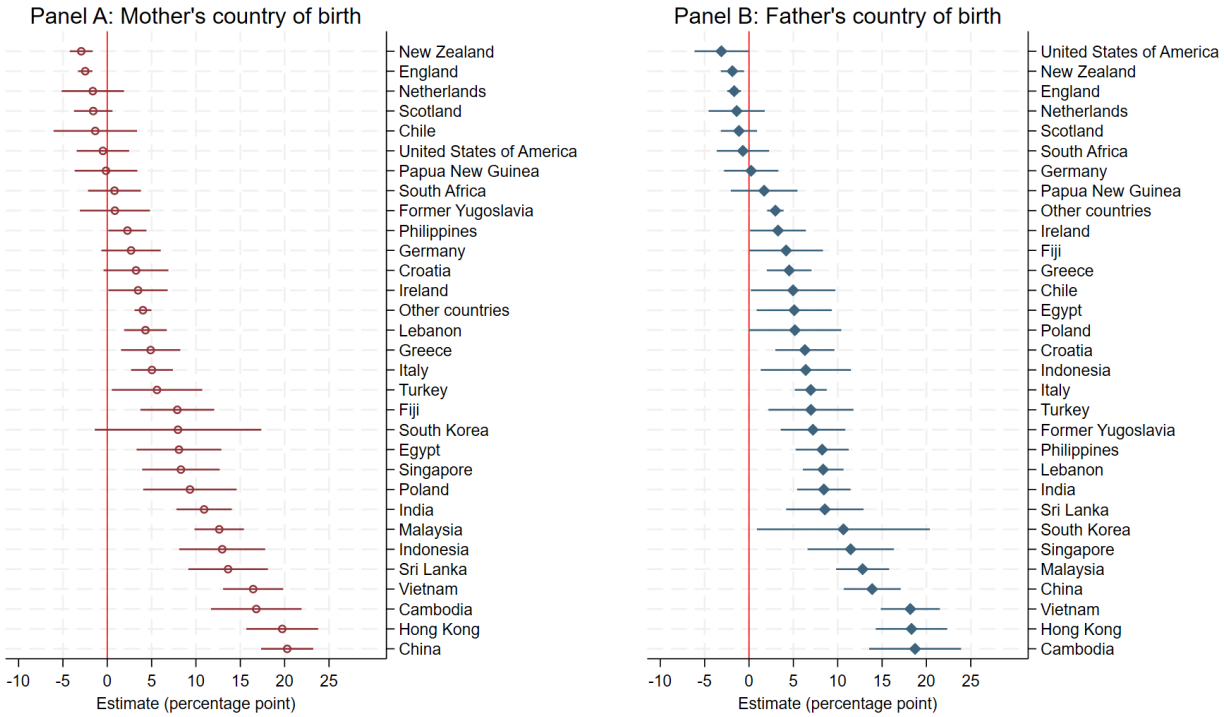
Notes: Results (coefficients and 95% confidence intervals, multiplied by 100 for aesthetic purposes) are from a Logit model and are reported in marginal effects. Outcome variable: Year 12 completion at 2011 census. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Detailed regression results are reported in Appendix Table A2.

Figure 2: Differences in ATAR scores by the top 30 parental countries of birth



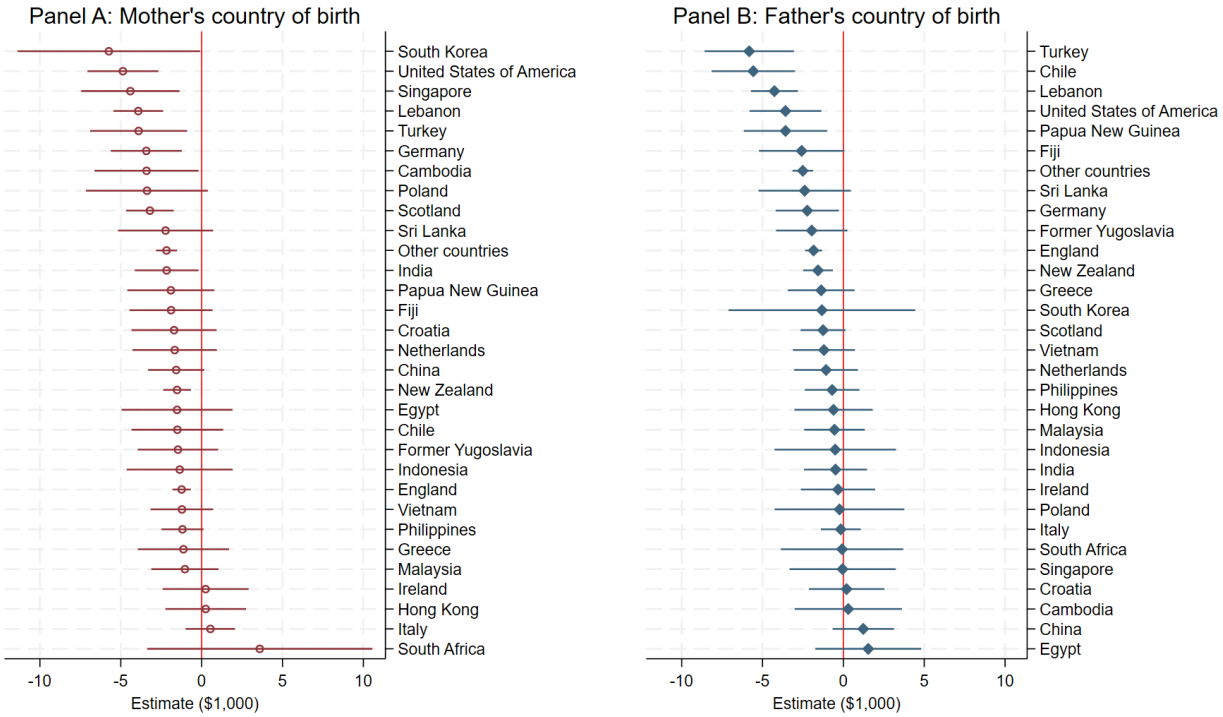
Notes: Results (coefficients and 95% confidence intervals) are from an OLS model. Outcome variable: ATAR scores. Other explanatory variables include SC month of birth dummies, SC gender, year left school, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Detailed regression results are reported in Appendix Table A2.

Figure 3: Differences in higher education attainment by the top 30 parental countries of birth



Notes: Results (coefficients and 95% confidence intervals, multiplied by 100 for aesthetic purposes) are from a Logit model and are reported in marginal effects. Outcome variable: higher education attainment by 2019. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Detailed regression results are reported in Appendix Table A2.

Figure 4: Differences in annual taxable income by the top 30 parental countries of birth



Notes: Results (coefficients and 95% confidence intervals) are from an OLS model. Outcome variable: annual taxable income in 2018/19 FY. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Detailed regression results are reported in Appendix Table A2.

Online Appendix

For refereeing purposes and to be published online

Appendix Table A1: Factors influencing educational attainment and earnings outcomes (remaining results)

	Year 12 completion at 2011 census			ATAR scores		Any higher education qualification by 2019			Taxable income (2018/19 FY)	
	Estimate	ME	Interaction	Estimate	Interaction	Estimate	ME	Interaction	Estimate	Interaction
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Male	-23.81***	-1.72***	-23.83***	-1.17***	-1.17***	-80.35***	-15.57***	-80.44***	3.75***	3.75***
	(1.52)	(0.11)	(1.52)	(0.09)	(0.09)	(0.89)	(0.16)	(0.89)	(0.12)	(0.12)
Mother age	-2.85	-0.03*	-2.67	1.56***	1.56***	27.03***	0.51***	27.35***	2.62***	2.63***
	(2.35)	(0.02)	(2.35)	(0.17)	(0.17)	(1.69)	(0.03)	(1.69)	(0.19)	(0.19)
Mother age squared	0.03		0.02	-0.01***	-0.01***	-0.26***		-0.26***	-0.03***	-0.03***
	(0.02)		(0.02)	(0.00)	(0.00)	(0.02)		(0.02)	(0.00)	(0.00)
Mother Year 12	-6.93***	-0.52***	-6.94***	2.04***	2.05***	46.17***	9.13***	46.28***	0.82***	0.82***
	(2.18)	(0.16)	(2.18)	(0.14)	(0.14)	(1.31)	(0.26)	(1.31)	(0.18)	(0.18)
Mother Certificate[(a)]	-6.95***	-0.53***	-6.73***	0.72***	0.75***	21.32***	4.10***	21.75***	-0.26	-0.25
	(2.54)	(0.19)	(2.54)	(0.17)	(0.17)	(1.51)	(0.29)	(1.51)	(0.19)	(0.19)
Mother Diploma[(a)]	-19.37***	-1.43***	-19.15***	3.01***	3.03***	59.19***	11.85***	59.62***	-0.62***	-0.61***
	(2.60)	(0.19)	(2.60)	(0.15)	(0.15)	(1.47)	(0.30)	(1.47)	(0.20)	(0.20)
Mother Bachelor degree or higher[(a)]	-42.36***	-2.97***	-42.05***	5.67***	5.70***	92.67***	18.98***	93.16***	-1.35***	-1.34***
	(2.43)	(0.17)	(2.43)	(0.13)	(0.13)	(1.34)	(0.28)	(1.34)	(0.19)	(0.19)
Father age	0.08	-0.01	-0.27	0.85***	0.81***	14.67***	0.15***	13.96***	0.41***	0.40***
	(1.58)	(0.01)	(1.58)	(0.10)	(0.10)	(1.08)	(0.02)	(1.08)	(0.12)	(0.12)
Father age squared	-0.00		0.00	-0.01***	-0.01***	-0.14***		-0.13***	-0.01***	-0.01***
	(0.02)		(0.02)	(0.00)	(0.00)	(0.01)		(0.01)	(0.00)	(0.00)
Father Year 12[(a)]	-9.49***	-0.72***	-9.48***	2.42***	2.43***	61.38***	12.19***	61.41***	0.79***	0.79***
	(2.61)	(0.20)	(2.62)	(0.17)	(0.17)	(1.58)	(0.32)	(1.58)	(0.21)	(0.21)
Father Certificate[(a)]	-8.58***	-0.65***	-8.37***	0.75***	0.77***	28.98***	5.52***	29.50***	2.18***	2.19***
	(2.04)	(0.16)	(2.04)	(0.15)	(0.15)	(1.26)	(0.24)	(1.26)	(0.16)	(0.16)
Father Diploma[(a)]	-19.24***	-1.43***	-18.92***	3.04***	3.07***	75.16***	15.13***	75.68***	0.76***	0.77***
	(2.97)	(0.22)	(2.97)	(0.18)	(0.18)	(1.70)	(0.35)	(1.70)	(0.23)	(0.23)
Father Bachelor degree or higher[(a)]	-47.91***	-3.36***	-47.64***	6.76***	6.77***	123.36***	25.63***	123.80***	-0.22	-0.21
	(2.58)	(0.18)	(2.58)	(0.15)	(0.15)	(1.46)	(0.30)	(1.47)	(0.20)	(0.20)
Mortgage owner[(b)]	5.69**	0.41**	5.69**	1.55***	1.55***	57.19***	10.54***	57.40***	6.18***	6.19***

	Year 12 completion at 2011 census			ATAR scores		Any higher education qualification by 2019			Taxable income (2018/19 FY)	
	Estimate	ME	Interaction	Estimate	Interaction	Estimate	ME	Interaction	Estimate	Interaction
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(2.53)	(0.18)	(2.53)	(0.18)	(0.18)	(1.59)	(0.28)	(1.60)	(0.18)	(0.18)
Outright owner[(b)]	8.10***	0.58***	8.09***	4.06***	4.07***	92.06***	17.57***	92.35***	9.62***	9.63***
	(2.80)	(0.20)	(2.80)	(0.19)	(0.19)	(1.73)	(0.31)	(1.74)	(0.22)	(0.22)
Total household income (yearly, $ mil)	27.03*	1.96*	27.91*	4.24***	4.41***	-2.07	-0.40	0.24	33.93***	33.99***
	(15.11)	(1.09)	(15.10)	(0.84)	(0.84)	(8.17)	(1.58)	(8.17)	(1.18)	(1.18)

Notes: Results from an Ordinary Least Squares (OLS) regressions for continuous outcomes and from a Logit model for binary outcomes. Marginal effects (ME) are reported for Logit model. Results (coefficients and standard errors) for the Logit model are multiplied by 100 for aesthetic purposes. Other explanatory variables include SC month of birth dummies and state/territory dummies. [(a)] and [(b)] denotes "Under Year 12", and "Renters" as the base group, respectively. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.

Appendix Table A2: Educational and financial outcomes by the top 30 parental countries of birth

	Year 12 completion at 2011 census	ATAR scores	Any higher education qualification by 2019	Taxable income (2018/19 FY)
	(1)	(2)	(3)	(4)
Mother - England	0.76***	-0.41*	-2.48***	-1.23***
	(0.26)	(0.21)	(0.41)	(0.29)
Mother - Vietnam	4.71***	3.72***	16.45***	-1.22
	(1.14)	(0.57)	(1.73)	(0.99)
Mother - New Zealand	0.97**	0.04	-2.94***	-1.52***
	(0.41)	(0.34)	(0.66)	(0.44)
Mother - Lebanon	4.52***	-2.74***	4.31***	-3.92***
	(0.87)	(0.62)	(1.23)	(0.78)
Mother - China (excludes SARs and Taiwan)	4.57***	6.72***	20.29***	-1.57*
	(0.96)	(0.48)	(1.50)	(0.88)
Mother - Philippines	5.96***	-2.10***	2.28**	-1.19*
	(0.79)	(0.56)	(1.10)	(0.67)
Mother - India	2.68***	2.22***	10.92***	-2.17**
	(0.98)	(0.64)	(1.59)	(1.01)
Mother - Malaysia	4.33***	3.90***	12.62***	-1.03
	(0.87)	(0.46)	(1.42)	(1.06)
Mother - Scotland	2.43***	-0.70	-1.58	-3.20***
	(0.75)	(0.56)	(1.11)	(0.75)
Mother - Italy	4.08***	-0.19	5.04***	0.54
	(0.82)	(0.58)	(1.20)	(0.78)
Mother - Sri Lanka	1.77	4.70***	13.63***	-2.23
	(1.35)	(0.88)	(2.29)	(1.50)
Mother - Hong Kong	3.67***	4.25***	19.73***	0.25
	(1.25)	(0.58)	(2.06)	(1.27)
Mother - Turkey	6.50***	-2.70**	5.61**	-3.90**
	(2.10)	(1.35)	(2.60)	(1.53)
Mother - Fiji	5.09***	-2.15**	7.90***	-1.89
	(1.49)	(0.98)	(2.12)	(1.31)
Mother - Cambodia	4.43***	3.22***	16.80***	-3.41**
	(1.65)	(0.99)	(2.60)	(1.64)
Mother - South Africa	0.35	2.14***	0.82	3.59
	(0.99)	(0.67)	(1.52)	(3.55)
Mother - Former Yugoslavia	2.83*	-0.88	0.86	-1.47
	(1.58)	(1.09)	(2.02)	(1.27)
Mother - United States of America	-1.49	-0.21	-0.49	-4.87***
	(0.99)	(0.68)	(1.51)	(1.12)
Mother - Greece	2.21*	-0.85	4.89***	-1.13
	(1.21)	(0.83)	(1.70)	(1.44)
Mother - Ireland	2.94**	0.37	3.47**	0.25
	(1.20)	(0.74)	(1.70)	(1.36)
Mother - Egypt	3.88**	0.06	8.08***	-1.52
	(1.83)	(1.07)	(2.44)	(1.75)
Mother - Germany	-1.07	0.97	2.68	-3.42***
	(1.04)	(0.78)	(1.71)	(1.12)
Mother - Croatia	0.90	-0.10	3.24*	-1.70
	(1.22)	(0.91)	(1.87)	(1.34)
Mother - Papua New Guinea	1.75	-0.73	-0.14	-1.90
	(1.13)	(0.86)	(1.80)	(1.37)

	Year 12 completion at 2011 census	ATAR scores	Any higher education qualification by 2019	Taxable income (2018/19 FY)
	(1)	(2)	(3)	(4)
Mother - Poland	-1.07	-0.16	9.32***	-3.38*
	(1.56)	(1.10)	(2.69)	(1.92)
Mother - Indonesia	1.05	1.75*	12.96***	-1.36
	(1.42)	(0.96)	(2.47)	(1.67)
Mother - Netherlands	-0.69	1.52	-1.63	-1.66
	(1.14)	(1.00)	(1.79)	(1.33)
Mother - Chile	4.14**	-3.23**	-1.35	-1.50
	(1.66)	(1.26)	(2.40)	(1.45)
Mother - South Korea	3.12	3.64**	7.97*	-5.74**
	(3.65)	(1.58)	(4.79)	(2.88)
Mother - Singapore	1.24	3.35***	8.30***	-4.41***
	(1.23)	(0.78)	(2.23)	(1.55)
Mother - Other countries	2.83***	-0.57**	4.03***	-2.17***
	(0.32)	(0.23)	(0.49)	(0.33)
Father - England	-0.08	-0.49**	-1.67***	-1.84***
	(0.24)	(0.20)	(0.40)	(0.27)
Father - Vietnam	4.63***	3.02***	18.19***	-1.20
	(1.13)	(0.57)	(1.70)	(0.98)
Father - New Zealand	1.61***	0.03	-1.87***	-1.57***
	(0.42)	(0.35)	(0.67)	(0.47)
Father - Lebanon	6.85***	-0.81	8.36***	-4.26***
	(0.90)	(0.58)	(1.17)	(0.74)
Father - China (excludes SARs and Taiwan)	6.25***	4.22***	13.89***	1.23
	(1.06)	(0.50)	(1.64)	(0.97)
Father - Philippines	4.47***	-3.37***	8.25***	-0.70
	(0.99)	(0.70)	(1.53)	(0.86)
Father - India	2.52***	-0.56	8.44***	-0.49
	(0.96)	(0.65)	(1.54)	(0.99)
Father - Malaysia	3.77***	2.28***	12.81***	-0.55
	(0.89)	(0.48)	(1.53)	(0.96)
Father - Scotland	0.49	-2.29***	-1.14	-1.26*
	(0.67)	(0.54)	(1.04)	(0.71)
Father - Italy	4.56***	0.13	6.97***	-0.16
	(0.65)	(0.45)	(0.92)	(0.63)
Father - Sri Lanka	4.19***	0.82	8.55***	-2.39
	(1.49)	(0.89)	(2.23)	(1.46)
Father - Hong Kong	3.94***	3.73***	18.32***	-0.61
	(1.20)	(0.57)	(2.06)	(1.23)
Father - Turkey	2.32	-2.69**	6.99***	-5.82***
	(1.73)	(1.28)	(2.45)	(1.41)
Father - Fiji	4.29***	-2.52**	4.19**	-2.58*
	(1.52)	(1.00)	(2.11)	(1.35)
Father - Cambodia	2.64*	2.73***	18.72***	0.30
	(1.57)	(0.98)	(2.64)	(1.69)
Father - South Africa	-0.50	0.14	-0.69	-0.08
	(1.01)	(0.71)	(1.51)	(1.93)
Father - Former Yugoslavia	5.27***	-4.14***	7.21***	-1.96*
	(1.55)	(0.94)	(1.86)	(1.13)
Father - United States of America	-1.52	0.31	-3.11**	-3.58***
	(1.03)	(0.72)	(1.55)	(1.13)

	Year 12 completion at 2011 census	ATAR scores	Any higher education qualification by 2019	Taxable income (2018/19 FY)
	(1)	(2)	(3)	(4)
Father - Greece	4.31***	-1.09*	4.53***	-1.37
	(0.97)	(0.59)	(1.28)	(1.06)
Father - Ireland	2.26**	1.07	3.27**	-0.33
	(1.10)	(0.72)	(1.60)	(1.17)
Father - Egypt	2.96*	-2.28**	5.10**	1.54
	(1.64)	(1.01)	(2.16)	(1.67)
Father - Germany	1.61	0.19	0.25	-2.23**
	(1.12)	(0.78)	(1.56)	(1.00)
Father - Croatia	2.37**	-1.35*	6.31***	0.20
	(1.16)	(0.82)	(1.70)	(1.19)
Father - Papua New Guinea	1.15	0.97	1.70	-3.58***
	(1.11)	(0.84)	(1.92)	(1.32)
Father - Poland	2.23	-0.08	5.18*	-0.24
	(1.96)	(1.10)	(2.67)	(2.05)
Father - Indonesia	5.55***	-1.84*	6.40**	-0.50
	(1.83)	(1.05)	(2.59)	(1.92)
Father - Netherlands	-0.08	-1.17	-1.38	-1.07
	(0.95)	(0.79)	(1.61)	(1.00)
Father - Chile	1.15	-3.89***	4.97**	-5.57***
	(1.55)	(1.24)	(2.43)	(1.32)
Father - South Korea	4.83	1.68	10.64**	-1.33
	(4.00)	(1.62)	(4.98)	(2.95)
Father - Singapore	5.71***	0.47	11.46***	-0.05
	(1.60)	(0.87)	(2.48)	(1.68)
Father - Other countries	2.67***	-1.35***	2.98***	-2.51***
	(0.31)	(0.23)	(0.47)	(0.32)
Observations	241,645	102,730	266,363	266,363
R-squared		0.189		0.040
Mean dependent variable	11.25	79.07	39.22	41.36

Notes: Results from an Ordinary Least Squares (OLS) regressions for continuous outcomes and from a Logit model for binary outcomes. Marginal effects (ME) are reported for Logit model. Results (coefficients and standard errors) for the Logit model are multiplied by 100 for aesthetic purposes. Other explanatory variables include SC month of birth dummies, SC gender, maternal age, maternal education, paternal age, paternal education, household residential tenue status, total household income, and state/territory dummies. Australian-born mothers and fathers are set as the respective base groups. Robust standard errors are reported in parentheses. The symbol * denotes statistical significance at 10% level, ** at 5% level, and *** at 1% level.