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Socio-economic backgrounds, choice of disciplines, and post-university labour market performance

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Acknowledgement of Country

The Australian Centre for Student Equity and Success acknowledges Indigenous peoples across Australia as the Traditional Owners of the lands on which the nation's campuses are situated. With a history spanning more than 60,000 years as the original educators, Indigenous peoples hold a unique place in our nation. We recognise the importance of their knowledge and culture, and reflect the principles of participation, equity, and cultural respect in our work. We pay our respects to Elders past, present, and future, and consider it an honour to learn from our Indigenous colleagues, partners, and friends.

At a glance

What we did

Using data from multiple waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey, this study empirically examined the long-term labour market outcomes of university graduates from different socio-economic backgrounds, with a particular focus on the role of subject choice at university. Our sample comprised of 9,810 observations for 4,910 individuals over three HILDA waves (waves 12, 16, and 20). HILDA also provides information on 15 detailed fields of study, which were divided into high-, middle-, and low-paying categories, with each category containing five fields.

What we found

1. The labour market outcomes of graduates varied according to their field of study. Some fields offer more robust employment opportunities, higher earnings, and greater job satisfaction than others.
2. We found that coming from a non-English-speaking background (NESB) was the only significant socio-economic predictor of field-of-study choice. NESB students were more likely to choose high-paying fields and less likely to choose low-paying fields, suggesting that they are not disadvantaged in education. In contrast, the other four measures of socio-economic backgrounds (namely, Indigenous origin, low socio-economic status (SES) in childhood, father's unemployment experience during childhood, and living in a single-parent family at age 14) had negligible effects on the likelihood of choosing a high- or low-paying field of study.
3. Of the five socio-economic backgrounds analysed, the labour market challenges faced by NESB workers were the most pronounced. In comparison with their English-speaking background (ESB) counterparts, NESB workers were less likely to be in managerial or professional occupations and had significantly lower weekly earnings. For NESB graduates, their choice of high-paying fields helped to narrow the earnings gap and improve their employment prospects but did not fully close the earnings gap between NESB and ESB graduates. For other disadvantaged groups, the influence of field of study appeared limited, possibly because their field-of-study choices did not differ substantially from those of their non-disadvantaged counterparts.

What we recommend

1. More and clear career guidance and access to information should be provided for students from disadvantaged backgrounds.
2. Targeted support is needed to increase the representation of disadvantaged students in high-return disciplines at university.
3. Policymakers should develop targeted strategies to address the persistent and multifaceted challenges faced by NESB Australians in the labour market.
4. Governments should introduce initiatives to remove structural barriers that limit the career progression of workers from disadvantaged backgrounds, particularly NESB individuals and those who experienced low SES in childhood.

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Abbreviations

ATAR	Australian Tertiary Admission Rank
ESB	English-Speaking Background
FE	Fixed Effects
HILDA	Household, Income, and Labour Dynamics in Australia
LPM	Linear Probability Model
LSAY	Longitudinal Study of Australian Youth
NAPLAN	National Assessment Program – Literacy and Numeracy
NESB	Non-English-Speaking Background
OLS	Ordinary Least Squares
RE	Random Effects
SES	Socio-economic status
STEM	Science, Technology, Engineering, and Mathematics

1. Executive summary

It has long been recognised that higher education leads to improved labour market outcomes, including higher wages and better job opportunities. In Australia, people from lower socio-economic backgrounds have made significant progress in accessing and completing higher education, helping to reduce social inequality. However, a more nuanced form of inequality has not received adequate attention. Even among university students, their childhood socio-economic backgrounds may influence the field of study they choose, which in turn may affect their career prospects and labour market outcomes. As such, inequality may persist even among those who have completed tertiary education.

This report aims to improve understanding of how childhood socio-economic backgrounds influence academic subject choice at university and subsequent labour market performance. Our analysis is based on data from the nationally representative Household, Income and Labour Dynamics in Australia (HILDA) Survey, which includes five key indicators of childhood backgrounds, namely Aboriginal or Torres Strait Islander origin, non-English-speaking background (NESB), low socio-economic status (SES) in childhood, father's unemployment experience during childhood, and living in a single-parent family at age 14. HILDA also includes five key labour market outcomes: full-time employment status, permanent or ongoing employment, employment in managerial or professional occupations, gross weekly earnings, and job satisfaction. In addition, it provides information on 15 detailed fields of tertiary education, including Natural and Physical Sciences, Information Technology, Architecture and Building, Management and Commerce, and Society and Culture.

Specifically, we use data from the HILDA Survey to address the following three research questions:

1. What are the patterns in graduates' fields of study and their subsequent labour market performance?
2. How do multidimensional socio-economic backgrounds influence the choice of fields of study in tertiary education?
3. How does the choice of university fields of study contribute to differences in employment and earnings outcomes among Australians from different socio-economic backgrounds?

The main findings of our empirical analysis are summarised as follows:

- **Patterns in graduates' fields of study and subsequent labour market performance**: Our analysis shows that graduates are concentrated in a few key fields including Management and Commerce, Education, and Society and Culture; these together account for around half of all tertiary degrees awarded. We also find that preferences have changed across birth cohorts, with a shift from fields such as Education, Society and Culture, and Nursing to fields such as Creative Arts, Law, and Other Health-Related subjects. Labour market outcomes also vary according to academic specialisation. For example, fields such as Information Technology, and Engineering and Related Technologies are

associated with higher salaries, as well as more prestigious and stable job opportunities, compared to fields such as Creative Arts and Society and Culture, which are generally associated with lower earnings and less stable employment prospects. This divergence in career paths highlights the importance of academic specialisation at university in shaping long-term career trajectories.

- **Influence of socio-economic backgrounds on the choice of fields of study in tertiary education**: Of the five indicators of socio-economic backgrounds analysed, being from a non-English-speaking background is the strongest predictor of field-of-study choice. NESB students are more likely to select high-paying fields and less likely to choose low-paying fields than their ESB counterparts, suggesting that their educational decisions are related to future earnings potential. In contrast, the other four measures of socio-economic backgrounds (namely Indigenous origin, low SES in childhood, father's unemployment experience during childhood, and living in a single-parent family at age 14) do not show a statistically significant relationship with the choice of high- or low-paying fields of study.
- **Socio-economic backgrounds, choice of fields of study, and post-university labour market outcomes**: Post-university labour market outcomes vary by childhood socio-economic background. Indigenous Australians and those whose fathers were unemployed for six months or more during childhood have similar employment outcomes to their non-disadvantaged counterparts. Graduates from single-parent families earn higher wages than their peers from two-parent families, while other employment outcomes are comparable. This finding may reflect a selection effect. Students from single-parent families often face greater barriers to entering higher education. Those who manage to access and complete tertiary study may possess unobserved positive characteristics that also contribute to stronger earnings outcomes. The results are more mixed for those with low SES in childhood. While low SES is not significantly associated with full-time employment, weekly earnings, or job satisfaction, it is positively associated with permanent or ongoing employment but negatively associated with holding managerial or professional occupations. Furthermore, NESB workers face the most pronounced disadvantages. Compared to their ESB counterparts, they are less likely to hold managerial and professional positions and more likely to have much lower earnings. For NESB graduates, academic field choice plays a particularly important role in mediating the relationship between childhood socio-economic backgrounds and labour market performance. Their preference for high-paying fields has helped to narrow the earnings gap and to improve their employment opportunities compared to ESB graduates. However, this does not fully address their disadvantages in the labour market. In contrast, for individuals from the other four socio-economic backgrounds, field of study is not a significant mediator of labour market performance because these backgrounds are not statistically significantly associated with the choice of high- or low-paying fields of study.

Our empirical analysis reveals the complex relationship between socio-economic backgrounds and Australians' choice of tertiary fields of study, highlighting the need for targeted policy interventions. For NESB students, efforts should focus on further improving access to and success in high-paying fields, so that their labour market

disadvantages can be further reduced. In terms of labour market outcomes, our findings highlight the importance of policies that take into account the long-term effects of socio-economic backgrounds. Governments should implement strategies to address the persistent and multifaceted labour market challenges faced by NESB graduates. Targeted interventions are also needed to help NESB Australians and those who experienced low SES in childhood to overcome the glass ceiling that limits their career progression.

2. Recommendations

Recommendation 1: Improving career guidance and access to information

More and clear career guidance and access to information should be provided for students from disadvantaged backgrounds, including Indigenous students and those from low socio-economic status (SES) and single-parent families.

Recommendation 2: Addressing socio-economic barriers in field-of-study choice

Targeted support from governments and universities is needed to increase the representation of disadvantaged students in high-return disciplines at university.

Recommendation 3: Addressing the challenges faced by NESB Australians

Policymakers should develop targeted strategies to address the persistent and multifaceted challenges faced by NESB Australians in the labour market.

Recommendation 4: Breaking the glass ceiling for disadvantaged graduates

Governments should introduce initiatives to remove structural barriers that limit the career progression of workers from disadvantaged backgrounds, particularly NESB individuals and those who experienced low SES in childhood.

3. Introduction

A large body of empirical evidence highlights the benefits of attaining tertiary education (Leigh, 2008; Borton, 2012; Daly et al., 2015; Leigh, 2025). Individuals with a university degree generally have better labour market outcomes, including higher employment rates and earnings and more prestigious occupations. As a result, improving educational attainment is recognised as a key strategy for reducing poverty, addressing inequality, and breaking the intergenerational transmission of disadvantages (Bradley et al., 2008; Chester and Watson, 2013). The Australian Government recognises the importance of ensuring that young people have access to higher education and the skills and knowledge needed for career success (Productivity Commission, 2019). Increasing access to and participation in higher education, particularly for those from disadvantaged backgrounds, is a priority for the Australian Government, as it is essential for achieving socio-economic outcomes comparable to those of their non-disadvantaged counterparts.

In 2008, the Australian Government set two specific higher education targets for 2020: to increase the proportion of 25–34-year-olds with a bachelor's degree to 40%, and to ensure that 20% of undergraduate enrolments come from low socio-economic backgrounds (Bradley et al., 2008). Progress has been made towards these goals. The first target has been met (Australian Universities Accord Review Panel, 2024), and there has been a notable increase in the participation of disadvantaged students in higher education, including those from low socio-economic backgrounds and those with disabilities (Koshy, 2019).

While efforts to expand access to tertiary education can help reduce inequality, students' choice of fields of study remains a more subtle and overlooked form of inequality. In particular, among those who enrol in higher education, differences in childhood socio-economic backgrounds may influence their choice of academic specialisation. These differences may then shape their career prospects and labour market performance after graduation. If the choice of fields of study is segregated by socio-economic background, inequality may persist even among those with tertiary qualifications.[1]

Our empirical analysis, based on nationally representative data from the Household, Income, and Labour Dynamics in Australia (HILDA) Survey, confirms that labour market outcomes vary by academic discipline. For example, Australians with degrees in Medicine and Engineering and Related Technologies earn the highest gross weekly wages, at $2,537 and $2,139 (2020 AUD), respectively. These figures are significantly above the average weekly wage of $1,642 across the 15 fields of study in our dataset. In contrast, graduates in Food, Hospitality, and Personal Services earn substantially less, with an average weekly wage of $1,241, while those in Creative Arts earn only $1,072 per week. Differences in the field of tertiary education can provide important information for understanding labour market inequality. If Australians from disadvantaged backgrounds are more likely to enter fields with lower earnings potential, this could, at least in part, offset the positive impact of increased participation in higher

[1] In the literature, Daly et al. (2015) showed that the private rate of return to a university degree in Australia varied by academic discipline, with lower returns for those holding degrees in the humanities.

education on reducing inequality. In other words, socio-economic backgrounds may be transmitted intergenerationally through the sorting of university fields of study, which are then reflected in post-university labour market outcomes. Conversely, if disadvantaged Australians are more likely to study disciplines with better career prospects, their improved employment and earnings outcomes may mask the true extent of their disadvantage in the labour market, as university specialisation is often not taken into account in such comparisons.

To assess the role of university subject choice in reducing inequality, this report examines the relationships between multidimensional socio-economic backgrounds, university specialisation, and post-university labour market performance in Australia. Specifically, we conduct three main empirical analyses. First, we describe the distribution of university fields of study, how it has evolved across graduate birth cohorts, and the associated post-university labour market outcomes. This analysis is valuable in its own right and serves as a foundation for the analysis that follows. Second, we examine whether and how socio-economic factors influence university subject choice, with a particular focus on the potential differential effects of multidimensional background characteristics. Lastly, we quantitatively assess the extent to which academic specialisation contributes to differences in employment and earnings outcomes among Australians from different socio-economic backgrounds.

This study advances the existing literature in the following ways. First, it contributes to the understanding of an important source of educational inequality: the sorting of individuals into different university disciplines based on their socio-economic backgrounds (Tomaszewski et al., 2018). Second, using nationally representative data from the HILDA Survey, this analysis provides evidence on how multidimensional backgrounds influence labour market outcomes. In doing so, we address a major limitation of previous studies, which have often relied on non-representative datasets, potentially contributing to the mixed findings in the existing literature (Coates and Edwards, 2009; Edwards and Coates, 2011; Li, 2014; Li et al., 2016, 2017; Tomaszewski et al., 2021; Carroll and Li, 2022). Finally, complementing Tomaszewski et al. (2019), our research takes a long-term perspective. While most studies examine labour market outcomes within six months to five years of graduation (see, for example, Li et al., 2017; Tomaszewski et al., 2021; Carroll and Li, 2022; Zajac et al., 2023), this report extends the analysis to a much longer time horizon.[2] Our analysis provides new insights into whether socio-economic backgrounds continue to shape career trajectories well beyond tertiary education.

The remainder of this report is structured as follows. Section 4 reviews the literature. Section 5 discusses the data, variables, and empirical methods. Detailed research results are presented in Section 6, followed by a discussion of the main findings in Section 7. Section 8 concludes the study.

[2] As shown in Section 5.1, the average age of university graduates in our HILDA sample is around 41. If a typical Australian graduate enters the workforce at around 22 years of age, they may have up to 19 years of work experience in the labour market by the age of 41.

4. Background

Much of the Australian research on educational equity has focused on access to higher education and academic achievement, with comparatively less attention paid to how field of study shapes long-term labour market outcomes. Early findings from the Longitudinal Study of Australian Youth (LSAY) indicated that students from low socio-economic status (SES) backgrounds were significantly less likely to complete university than their more advantaged peers (Lim, 2015). Mahuteau et al. (2015) identified similar performance gaps between Indigenous and non-Indigenous students at age 15, although these disparities largely disappeared once prior academic ability was accounted for. Other studies presented more mixed results: Win and Miller (2005) and Li and Dockery (2015) found that low SES students sometimes outperformed their high SES peers after controlling for earlier achievement. In contrast, Li et al. (2022) reported that equity group students, including those from low SES, Indigenous, or non-English-speaking backgrounds (NESB), continued to experience poorer university outcomes compared to non-equity students. Moreover, Zając et al. (2024) draws attention to the role of mental health, noting that disadvantaged students are more likely to experience psychological distress, which is associated with higher attrition and more difficulty accessing and succeeding in high-return fields. These challenges compound existing structural inequalities and further constrain the long-term benefits of higher education for disadvantaged groups.

Complementing these findings, Cobb-Clark and Nguyen (2012), using Youth in Focus survey data linked to administrative records on parental income support, found that 20-year-olds from NESB immigrant families outperformed their ESB and Australian-born peers in Year 12 completion, Australian Tertiary Admission Rank (ATAR) scores, and university enrolment. Similarly, Nguyen et al. (2020) reported that NESB children achieved higher NAPLAN (National Assessment Program – Literacy and Numeracy) scores through Year 9, attributing these gains to greater time spent on education-related activities, an investment that significantly enhanced academic performance.

However, the translation of academic success into labour market outcomes for equity group students is less consistent. Coates and Edwards (2009) found that although Indigenous graduates initially experienced lower full-time employment rates, these gaps closed within five years. Edwards and Coates (2011) reported minimal early differences by SES, though longer-term tracking revealed slightly lower full-time employment for low SES graduates. Li (2014) found similar overall employment and wage levels for Indigenous and non-Indigenous graduates but noted a pronounced earnings gap at the lower end of the distribution. Follow-up studies by Li et al. (2016, 2017) showed that low SES and regional graduates often had comparable or even better outcomes than their peers, while NESB graduates consistently fared worse. Carroll and Li (2022) reported that graduates from low SES, NESB, or disability backgrounds were less likely to be employed six months post-graduation but were more likely to pursue further study. Tomaszewski et al. (2021) found that low SES graduates experienced lower occupational status and job security up to five years after graduation, despite similar wages.

Nguyen et al. (2025) extended this literature by linking 2011 Census data to administrative records to track the educational and earnings trajectories of Australian-born children of immigrants. Their analysis showed that second-generation NESB immigrants, particularly those with parents from select Asian countries, achieved strong academic outcomes and were more likely to complete university degrees in high-return fields such as commerce, health, science, and engineering. Although they initially earned less than peers with Australian-born parents at ages 21–22, this gap closed by 23–24 and reversed by 26–27, with NESB children out-earning their peers by 28–29. In contrast, children of ESB immigrants exhibited weaker academic performance and experienced a growing earnings disadvantage over the same period. Zajac et al. (2023) found that graduates from more advantaged social backgrounds experienced stronger income growth and reduced reliance on unemployment benefits over their first ten years compared to those from disadvantaged backgrounds. However, there was strong heterogeneity in outcomes across disadvantaged groups.

Despite the richness of these findings, most studies fail to account for field of study, an important mechanism through which social backgrounds shape labour market outcomes. Australian estimates suggested that field of study explained approximately 12% of the variation in graduate earnings, exceeding the impact of university attended (Koshy et al., 2016). If students from advantaged backgrounds disproportionately enrol in high-return fields, intergenerational inequality may be reproduced. Conversely, if disadvantaged students deliberately select such fields as a strategic response to limited opportunities, their observed labour market outcomes may already reflect these compensatory efforts. In either case, neglecting field of study risks obscuring the full extent of social stratification in post-university outcomes.

There is international evidence showing that field-of-study choices are stratified by socio-economic origin. In the United States of America, Goyette and Mullen (2006) found that low SES students were more likely to choose vocational majors, while higher SES peers favoured arts and sciences. Ma (2009) reported similar patterns, with disadvantaged students favouring career-oriented fields such as health, business, or technical studies, and avoiding the humanities. Conversely, Niu (2017) found that low SES students were underrepresented in Science, Technology, Engineering, and Mathematics (STEM) fields and that native English speakers were more likely to enrol in STEM, while family immigration background had no clear effect. In Italy, Triventi et al. (2017) observed that socio-economically advantaged students disproportionately enrolled in elite fields associated with upper-class occupations.

Australian evidence on social stratification in field-of-study selection is more limited but growing. Fullarton and Ainley (2000) found that Year 12 students from low SES backgrounds were less likely to choose mathematics, science, or languages and more likely to select arts, technology, or health and physical education. More recently, Livermore and Major (2021) showed that students from higher SES backgrounds were more likely to choose economics, even after controlling for subject perceptions. These patterns are consequential given the well-established link between field of study and graduate earnings and career trajectories (Koshy et al., 2016; Hägglund, 2024).

Recent research has begun to examine the intersection of childhood disadvantages, field of study, and labour market trajectories. Tomaszewski et al. (2018, 2020) used Australian data to show that low SES, Indigenous, and NESB students were

underrepresented in high-return disciplines such as STEM, law, and commerce and overrepresented in lower-return fields. These disparities persisted even after controlling for academic performance, pointing to unequal access to information, social capital, career guidance, and financial resources. Further work by Tomaszewski et al. (2019) and Zając et al. (2023) highlighted that disadvantaged students continued to face divergent labour market trajectories even after graduation and despite holding comparable qualifications. This reinforces the role of field of study as a key axis of stratification, one that could either reinforce or reduce early-life disadvantage. Moreover, Duta et al. (2021) found that graduates from lower social-class origins who tended to follow more diverse and unstable career trajectories were less likely to access top-level occupations in their twenties and were more likely to enter and remain in lower-status positions compared to their more advantaged peers. Differences in degree class, field of study, and university type only partly explained these disparities.

Nguyen et al. (2025) further noted that compared to children of Australian-born parents, children of NESB immigrant parents exhibited distinct educational patterns, underscoring the importance of examining not just university access but also the specific fields students enter. Using data from Poland, Zając et al. (2023) showed that not all STEM degrees yield strong economic returns, particularly for students from disadvantaged backgrounds. Moreover, Zając et al. (2025) documented persistent gender pay gaps within STEM fields in Poland, reinforcing the importance of intersectional analyses that consider gender alongside socio-economic and cultural background. Additional complexities arise when considering postgraduate education. Tani (2022) found that NESB PhD graduates in STEM were less likely to receive a wage premium unless they are native English speakers, suggesting persistent employer biases linked to linguistic background.

Within Australian equity research, field of study is a significant but under-studied factor in shaping graduate earnings and job quality. If students from disadvantaged backgrounds are disproportionately channelled into lower-return disciplines, the expansion of higher education may inadvertently reinforce, rather than reduce, existing social inequalities. Importantly, students from disadvantaged backgrounds are not a homogeneous group, so their labour market outcomes may vary significantly across dimensions such as socio-economic status, Indigenous identity, and language background. Ignoring these differential effects risks leading to poorly targeted or ineffective policy interventions. Drawing on nationally representative data from the HILDA Survey, this study investigates how multidimensional aspects of socio-economic backgrounds influence university field-of-study choices and, in turn, shape post-university labour market outcomes in Australia.

5. Methods

5.1 Analytical sample

This report uses data from the HILDA Survey, which is an annual panel survey of Australian households launched in 2001.[3] The advantages of the HILDA Survey include its longitudinal design, national representativeness, and large sample size, with more than 17,000 Australians in over 7,500 households being followed each year. It includes comprehensive economic and socio-demographic information, such as socio-economic status, labour market dynamics, health and wellbeing, and family life. Therefore, data from the HILDA Survey allow us to conduct a detailed analysis of the long-term effects of socio-economic backgrounds on university subject choice and subsequent labour market performance.

The HILDA dataset provides detailed education data, including information on 15 tertiary fields of study in waves 12, 16, and 20 for individuals with post-school qualifications. These fields of study are: (1) Natural and Physical Sciences, (2) Information Technology, (3) Engineering and Related Technologies, (4) Architecture and Building, (5) Agriculture, Environment, and Related Studies, (6) Medicine, (7) Nursing, (8) Other Health-Related (for example, Pharmacy, Dental Studies, Rehabilitation Therapies, Optical Science, Veterinary Studies), (9) Education, (10) Management and Commerce (for example, Accounting, Business, Sales and Marketing, Banking and Finance, Office Studies), (11) Law, (12) Society and Culture (for example, Economics, Political Science, Social Work, History, Psychology, Languages, Religion, Sport), (13) Creative Arts, (14) Food, Hospitality, and Personal Services, and (15) Others.

The HILDA Survey also includes multiple indicators of socio-economic background. We focus on the following measures across multiple dimensions:

1. **Aboriginal or Torres Strait Islander origin (Indigenous)**: Indigenous status is a binary variable that takes the value of one if the HILDA respondent self-identified as Aboriginal, Torres Strait Islander, or both, and the value of zero otherwise.
2. **Non-English-speaking background (NESB)**: NESB is a binary variable that takes the value of one if English was the first language that the respondent learnt as a child and a value of zero otherwise.
3. **Low socio-economic status (SES) in childhood**: We define SES based on the occupational information of the parents (when the respondent was 14 years old), following Tomaszewski et al. (2021). Individuals with at least one of the parents employed in a managerial or professional occupation are classified as “high SES” and the rest as “low SES”.
4. **Father unemployed for six months or more during childhood**: This is a binary variable that is equal to one if the respondent’s father was unemployed for six months or more during the respondent's childhood, and zero otherwise.[4]

[3] Waves 1 to 23 of the HILDA Survey are currently available, corresponding to the years 2001 to 2023.
[4] In the HILDA Survey, no question was asked about maternal unemployment during the respondent’s childhood.

5. **Living in a single-parent family at age 14**: This is a dummy variable that equals one if either the respondent's father or mother was deceased or did not live with the respondent when they were 14 years old, and zero otherwise.

In addition, information on several important employment and earnings outcomes is also available. Our analysis examines the following labour market outcomes of graduates employed at the time of the HILDA Survey:

1. whether employed on a full-time basis
2. whether employed on a permanent or ongoing basis
3. whether employed in a managerial or professional occupation
4. gross weekly earnings (all earnings are standardised to 2020 AUD, with figures from waves 12 and 16 adjusted using the Consumer Price Index)
5. job satisfaction (on a scale of 0–10, where 0 refers to “totally dissatisfied” and 10 to “totally satisfied”).

In line with the purpose of this report, we construct the analytical sample as follows:

1. Because information on fields of study is only available in waves 12, 16, and 20 of the HILDA Survey, our analysis is restricted to these three waves, which contain 23,182, 23,507, and 22,954 observations, respectively.[5]
2. We focus on individuals who have completed a university degree and provided information on their field of study, resulting in 3,991, 4,398, and 4,726 observations in waves 12, 16, and 20, respectively.
3. We limit the sample to individuals aged 20–65, reducing the number of observations to 3,607, 3,881, and 4,091.
4. We exclude those who were not in the labour force (approximately 12.2%) and those who were unemployed (around 2.5%) at the time of the survey, resulting in 3,036, 3,312, and 3,506 observations.
5. We exclude individuals with missing data on key variables used in the analysis (as summarised in Tables 1 and 2 below).

The final analytical sample comprises 9,810 observations for 4,910 individuals, including 3,020 observations from wave 12, 3,299 from wave 16, and 3,491 from wave 20.

Table 1 presents the breakdown of the analytical sample by socio-economic backgrounds, revealing considerable variation in the representation of different groups within the HILDA data. Of the 9,810 observations in the final sample, only 112 (approximately 1%) identify as Aboriginal, Torres Strait Islander, or both. A total of 1,389 observations (14%) are from NESB, while the remaining 8,421 (86%) are from those with an English-speaking background. One-third of the sample experienced low SES during childhood, and 11% report that their father was unemployed for six months or more while they were growing up. Finally, 356 individuals (about 4%) lived in a single-parent household at age 14.

[5] In 2011, a general top-up sample was added to improve the representativeness of the HILDA Survey, increasing the sample size to 23,415 in wave 11. The number of observations remains relatively stable across waves 12, 16, and 20, even after applying successive sample restrictions. Given this consistency, sample attrition seems not likely to pose a significant concern in this analysis.

Table 1: Breakdown of the analytical sample by socio-economic background

Variable	Group	Observations	Proportion (%)
Socio-economic background			
Indigenous	Yes	112	1.14
	No	9698	98.86
NESB	Yes	1389	14.16
	No	8421	85.84
Low SES in childhood	Yes	3285	33.49
	No	6525	66.51
Father unemployed for 6+ months	Yes	1087	11.08
	No	8723	88.92
Single-parent family	Yes	356	3.63
	No	9454	96.37

Source of data: HILDA waves 12, 16, and 20.

Table 2 presents summary statistics for the workers in our analytical sample. The average age is 41 years, with women comprising 57% of the sample and men 43%. On average, respondents have 2.2 siblings, and 74% were born in Australia. Regarding marital status, 77% are married, 17% have never been married, and the remaining 7% are divorced, separated, or widowed. The average household size is three, and approximately 77% of the individuals in the sample reside in a major Australian city.

Table 2: Descriptive statistics of individuals in the analytical sample

Variable	Mean	Std. dev.
Demographic characteristics		
Age (years)	40.67	11.61
Female	0.57	
Number of siblings	2.23	1.60
Born in Australia	0.74	
Married (including in a de facto relationship)	0.77	
Divorced, separated, or widowed	0.07	
Never married	0.17	
Household size	2.98	1.33
Living in a major city	0.77	
Labour market outcomes		
Full-time employment	0.71	
Permanent or ongoing employment	0.66	
Having a managerial or professional job	0.77	
Weekly earnings (2020 AUD)	1642.02	1309.09
Job satisfaction	7.66	1.46
Observations	9810	

Source of data: HILDA waves 12, 16, and 20. Standard deviations are presented for continuous variables.

In terms of labour market performance, approximately 71% of the workers in our sample are employed full-time, and 66% have a permanent or ongoing job. The majority of university graduates (around 77%) work in managerial or professional occupations.

Their average gross weekly earnings are $1,642. Finally, on a scale of 0–10, the average score for job satisfaction is 7.7, reflecting the typical left-skew observed in worker-related well-being measures (Green, 2010).[6]

5.2 Empirical methods

We will use different approaches to answer the three research questions.

Question (1): What are the patterns in graduates' fields of study and their subsequent labour market performance?

To answer this question, we will use cross-tabulations. This descriptive analysis will provide insights into the stylised facts about patterns in subject choice and labour market outcomes after graduation.

Question (2): How do multidimensional socio-economic backgrounds influence the choice of fields of study in tertiary education?

We specify the following linear probability model (LPM) to analyse individuals' choice of fields of study:

$$Field_i = \alpha + Disadvatanges_i'\beta + X_i'\gamma + \epsilon_i \quad (1)$$

where $Field_i$ represents one of the following two dummy variables: (1) whether the field of study is high-paying, and (2) whether the field of study is low-paying.[7] These two dummy variables are created based on the earnings information in HILDA waves 12, 16, and 20. $Disadvatanges_i$ is a vector of variables representing multidimensional socio-economic backgrounds, including (1) Aboriginal or Torres Strait Islander origin, (2) NESB, (3) low SES in childhood, (4) father unemployed for six months or more when growing up, and (5) living in a single-parent family at age 14. X_i denotes the vector of control variables including dummy variables for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Equation (1) is estimated using ordinary least squares (OLS) regressions; the estimated coefficients of the variables of interest represent their marginal effects and are therefore straightforward to interpret.[8] The equation is estimated using the cross-sectional sample of 4910 workers.[9] The estimated vector β in Equation (1) indicates the role of multidimensional socio-economic backgrounds in an individual's choice of fields of study at university.

[6] Appendix Table A1 presents summary statistics on labour market outcomes categorised by multidimensional socio-economic backgrounds, showing the crude relationship between different forms of early-life background characteristics and post-university labour market performance.
[7] The definitions of these two binary variables are discussed in detail in Section 6.1. Although the 15 fields of education (as described in Section 5.1) are categorical, we choose not to use a multinomial logit model. This is because its estimates are relative to one field (the base group) and are not straightforward to interpret.
[8] Estimates from a linear probability model (LPM) are generally similar to marginal effects obtained from a probit or logit model. As noted in Angrist and Pischke (2009, p.107), "The upshot of this discussion is that while a nonlinear model may affect the CEF for LDVs more closely than a linear model, when it comes to marginal effects this probably matters little. This optimistic conclusion is not a theorem, but as in the empirical example here, it seems to be fairly robustly true."
[9] We did not carry out a panel data analysis because there was little within-person variation in tertiary fields of study across waves 12, 16, and 20 of HILDA.

Question (3): How does the choice of university fields of study contribute to differences in employment and earnings outcomes among Australians from different socio-economic backgrounds?

We first examine how multidimensional socio-economic backgrounds are associated with post-graduation labour market outcomes using the following linear specification:

$$Outcome_{it} = \alpha_1 + Disadvatanges_i'\beta_1 + X_{it}'\gamma_1 + \mu_i + \epsilon_{it} \quad (2)$$

In Equation (2), $Outcome_{it}$ represents one of the following five dependent variables: (1) whether employed full-time, (2) whether employed on a permanent or ongoing basis, (3) whether employed in a managerial or professional occupation, (4) logarithmic weekly earnings, and (5) job satisfaction (standardised to have a mean of zero and a standard deviation of one). The control variables, denoted by X_{it}, include age, age squared, gender, dummies for marital status, whether born in Australia, whether living in a major city, and dummies for state of residence and HILDA waves. Individual heterogeneity, μ_i, captures the impact of the unobserved time-invariant factors specific to each individual. In our panel data of 9,810 observations for 4,910 workers, we have repeated measures of labour market outcomes for most of the workers. Therefore, Equation (2) is estimated using random effects (RE) panel regressions.[10] To account for serial correlation across HILDA waves, standard errors are adjusted for clustering at the individual level. The estimated vector of β_1 then shows the effects of childhood socio-economic backgrounds on post-university labour market performance.

To examine how fields of study mediate the relationship between socio-economic backgrounds and employment and earnings outcomes, we estimate the following equation using RE panel regressions:

$$Outcome_{it} = \alpha_2 + Disadvatanges_i'\beta_2 + Field_i'\lambda + X_{it}\gamma_2 + \mu_i + \epsilon_{it} \quad (3)$$

Compared to Equation (2), Equation (3) further includes the vector of $Field_i$ as an additional set of explanatory variables, which denotes the 15 detailed fields of study described in Section 5.1. A comparison of the estimated vectors of β_1 and β_2 is informative about how the choice of academic specialisation at university has contributed to the differences in labour market outcomes among Australians from different socio-economic backgrounds.

[10] We do not use fixed effects (FE) panel regressions because $Disadvatanges_i$, the vector representing multidimensional socio-economic backgrounds, remain unchanged during adulthood. Therefore, the vector of β_1 would not be identified in a FE model.

6. Findings

6.1 Patterns in fields of study and labour market outcomes

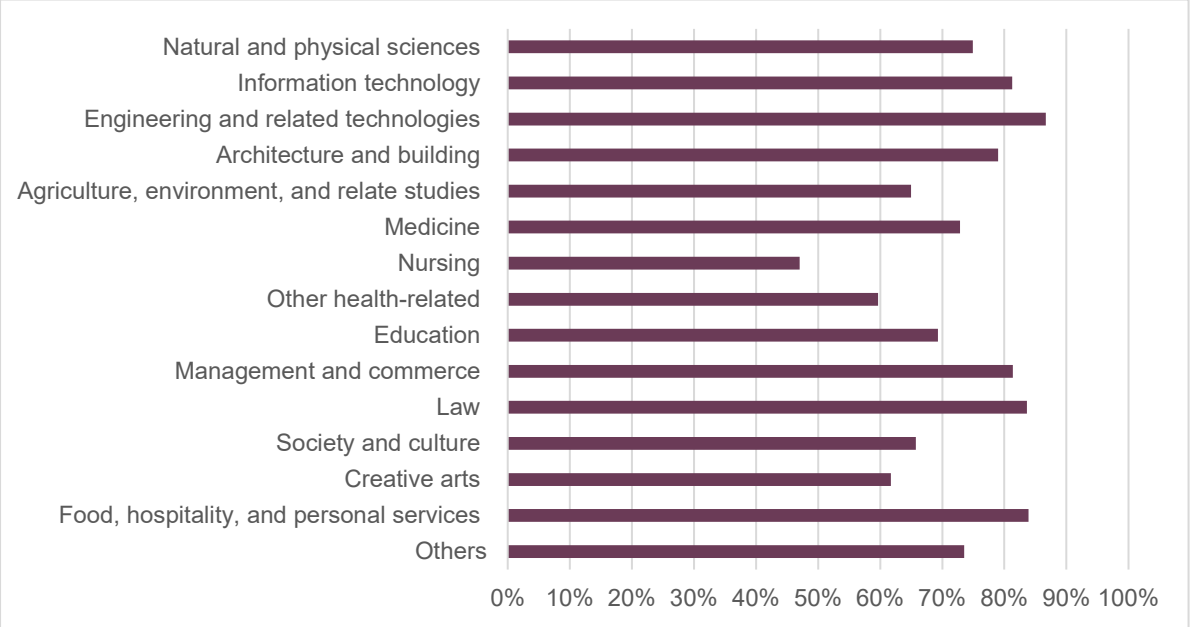
This section uses cross-tabulations to provide stylised facts about the patterns in subject choice at university and the corresponding labour market outcomes.[11]

6.1.1 Labour market outcomes by field of study

As described in Section 5.1, we examine five key labour market outcomes: (1) full-time employment status, (2) permanent or ongoing employment, (3) employment in managerial or professional occupations, (4) gross weekly earnings, and (5) job satisfaction. In this section, we analyse whether each of these outcomes varies by tertiary field of study.

In Section 5.1, Table 2 indicated that about 71% of Australian graduates are in full-time employment. Figure 1 shows that full-time employment rates vary across the 15 different fields of study. Five fields have rates above 80%, including Engineering and Related Technologies (87%), Food, Hospitality, and Personal Services (84%), Law (84%), Management and Commerce (81%), and Information Technology (81%). In contrast, fields such as Nursing (47%) and Other Health-Related (60%) have the two lowest rates of full-time employment. These lower figures in health-related occupations may reflect standard employment patterns within the sector.

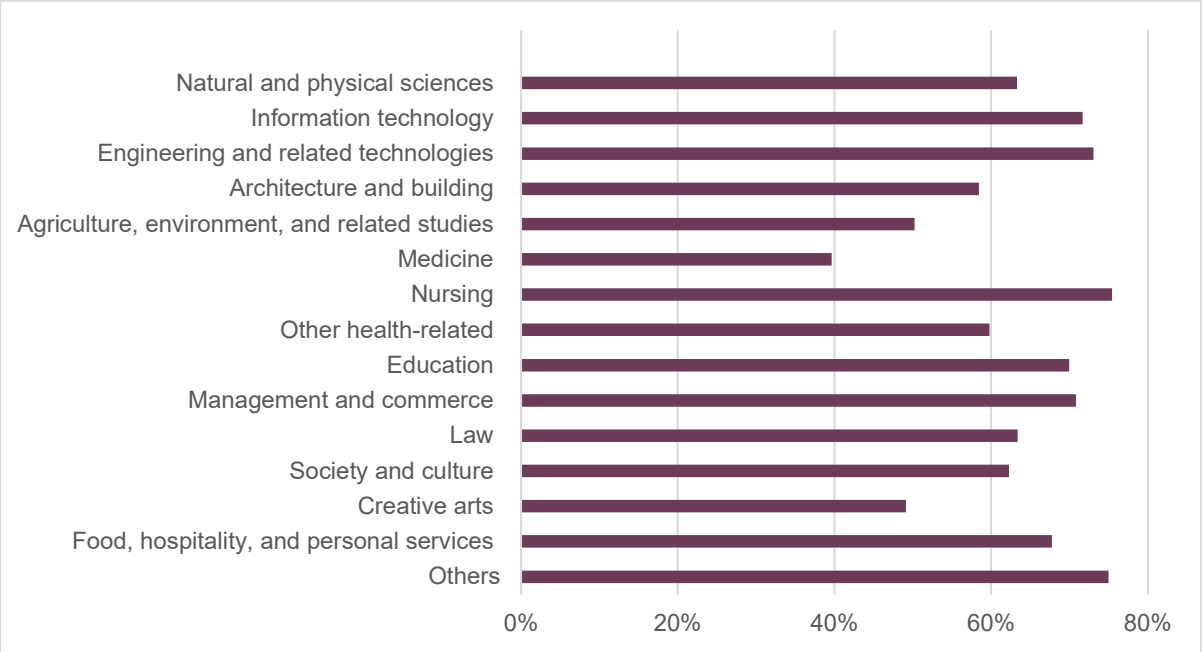
Figure 1: Proportion of full-time employment by field of study



[11] As explained in Section 5.1, data on university fields of study are available in waves 12, 16, and 20 of the HILDA Survey.

Similarly, while approximately two-thirds of workers in our sample have a permanent or ongoing job (see Table 2), there are notable differences across fields of study. As shown in Figure 2, graduates from the following fields have above-average rates of permanent employment: Nursing (75%), Engineering and Related Technologies (73%), Information Technology (72%), Management and Commerce (71%), Education (70%), and Food, Hospitality, and Personal Services (68%). In contrast, Medicine (40%) and Creative Arts (49%) have the lowest rates of permanent or ongoing employment.

Figure 2: Proportion of permanent or ongoing employment by field of study



Next, we examine the rate of employment in managerial or professional occupations. Figure 3 shows a significant degree of variation by academic specialisation at university. For example, graduates in Medicine have the highest rate of managerial or professional employment (92%), while those in Food, Hospitality, and Personal Services have the lowest (34%). These figures are very different from the sample average of 77%.[12]

Figure 4 shows the large differences in average earnings across fields of study among tertiary graduates. Australians with degrees in Medicine and Engineering and Related Technologies earn the highest gross weekly wages ($2,537 and $2,139, respectively), both significantly above the sample average of $1,642 per week. In contrast, graduates in Food, Hospitality, and Personal Services earn an average of $1,241 per week, while those with degrees in Creative Arts have the lowest earnings, averaging $1,072 per week.

[12] It is important to note that the three variables analysed in Figures 1–3 capture different aspects of labour market performance. For example, while graduates in Food, Hospitality, and Personal Services have one of the highest full-time employment rates, they are the least likely to be employed in managerial or professional occupations. Similarly, while graduates in Nursing have the lowest probability of securing full-time employment, they are ten percentage points more likely than the sample average to have a permanent or ongoing job.

Figure 3: Proportion of having a managerial or professional job by field of study

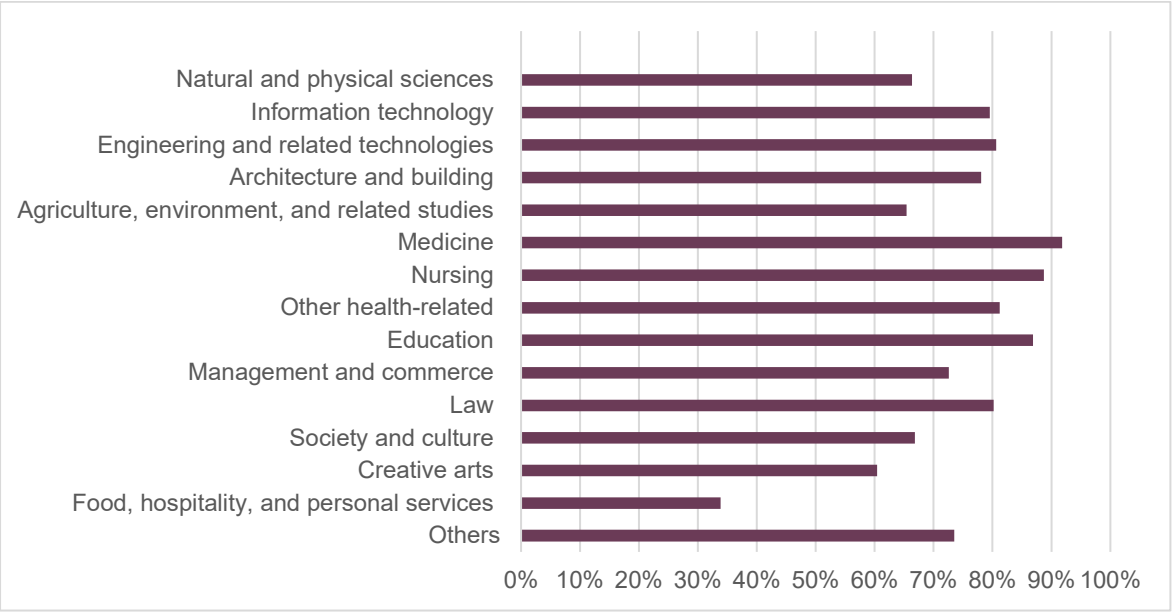
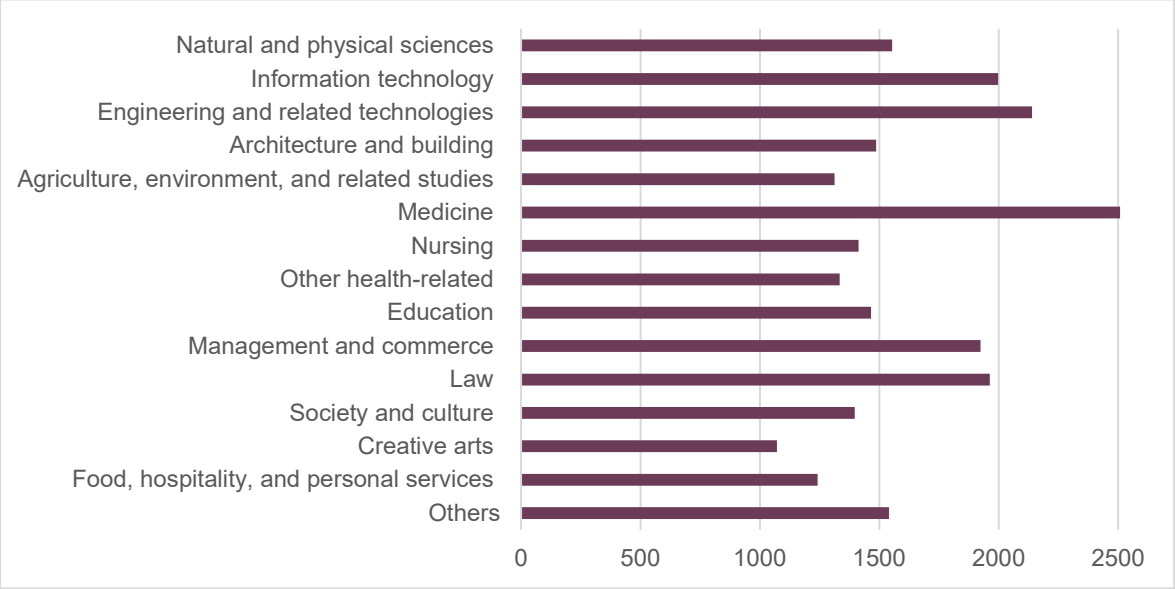
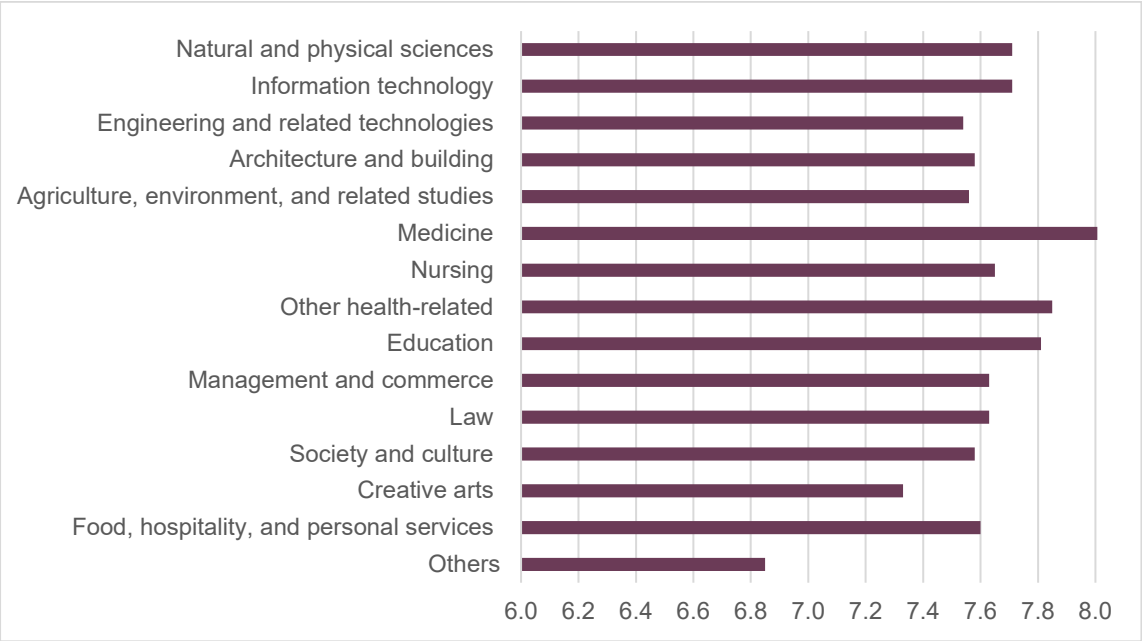


Figure 4: Weekly earnings by field of study



Finally, we examine the patterns in job satisfaction across academic disciplines, measured on a scale of 0–10. As shown in Figure 5, Australian graduates with a degree in Medicine report the highest levels of job satisfaction, while those in the Others category are the least satisfied with their job. The levels of job satisfaction among graduates from the remaining 13 fields of study appear to be relatively consistent.

Figure 5: Job satisfaction by field of study



6.1.2 Fields of study and socio-economic backgrounds

Overall, Figures 1–5 indicate that fields of study are associated with different career outcomes. To better understand the differences in labour market performance between different groups, a key research question emerges: Do individuals from different socio-economic backgrounds in early life choose different fields of study at university when compared to their non-disadvantaged peers? To explore this, we conduct a detailed analysis of the distribution of fields of study among graduates.

We begin by examining the overall distribution of fields of study. Figure 6 shows the distributions for all graduates, as well as by birth cohort. Our analysis shows that the most popular fields of study are Management and Commerce (20%), Education (15%), and Society and Culture (14%); these together account for about half of all tertiary degrees awarded. In contrast, the three least popular fields are Food, Hospitality, and Personal Services (0.7%), Agriculture, Environment, and Related Studies (2%), and Others (0.5%). In addition, around 17% of graduates studied STEM-related fields (Natural and Physical Sciences, Information Technology, and Engineering and Related Technologies).

Figure 6: Distribution of fields of study in university

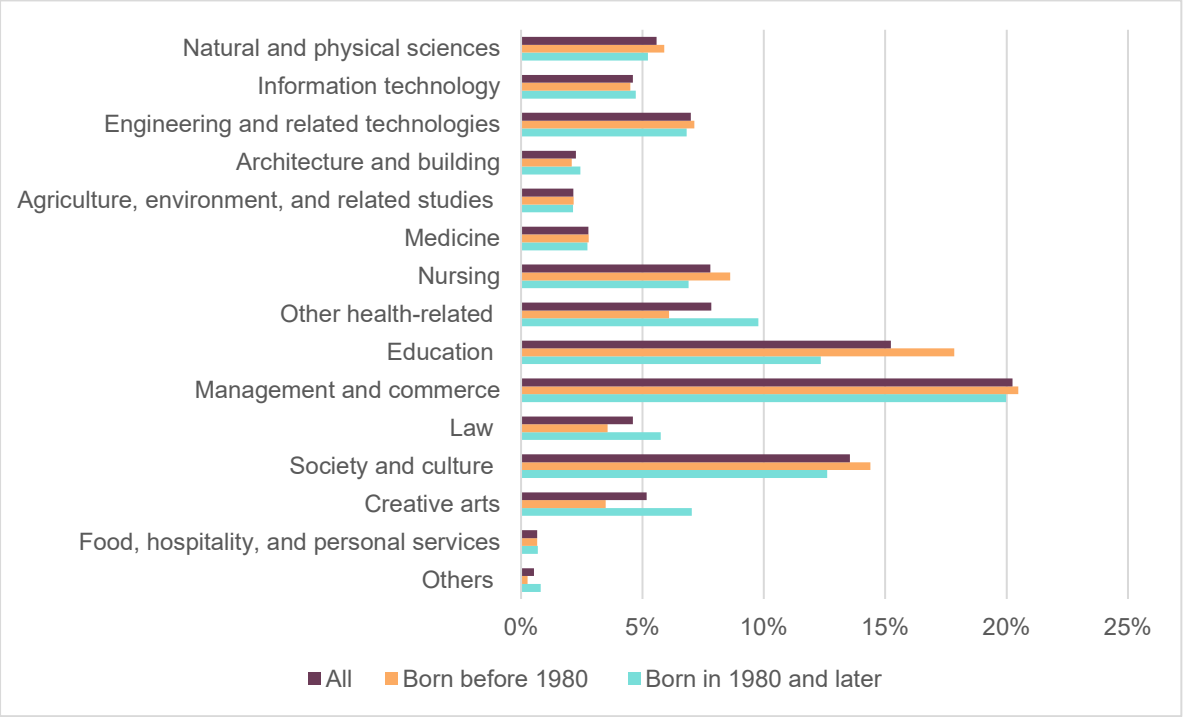


Figure 6 also provides a comparison of the distribution of fields of study between two birth cohorts: those born before 1980 and those born in 1980 or later.[13] The results show some shifts in preferences for fields of study. In particular, individuals born in 1980 or later are less likely to pursue degrees in Education, Society and Culture, and Nursing, while they show a greater inclination towards Creative Arts, Law, and Other Health-Related disciplines. Meanwhile, preferences for the other nine fields, including Agriculture, Environment and Related Studies and Medicine, remain broadly consistent between the two birth cohorts. In particular, the proportion of graduates in STEM-related fields has remained stable between the younger and older cohorts.

To better illustrate the patterns in subject choice, we divide the 15 fields of study into three groups—high-paying, middle-paying, and low-paying—each containing five fields. This classification is based on the gross weekly earnings data shown in Figure 4. Grouping the fields in this way helps to address the issue of small sample sizes for certain disadvantaged groups, which make up a relatively small proportion of our analysis sample.[14] These three categorised groups are:

(1) **High-paying fields of study**: Information Technology; Engineering and Related Technologies; Medicine; Management and Commerce; and Law.

(2) **Middle-paying fields of study**: Natural and Physical Sciences; Architecture and Building; Education; Nursing; and Others.

[13] We choose 1980 as the cut-off point so that we have about 50% of the sample on each side of it.
[14] With the detailed breakdown of 15 fields, some categories may have too few observations for a meaningful analysis. Nevertheless, the distribution of the 15 detailed fields of study by socio-economic background is shown in Appendix Table 2.

(3) **Low-paying fields of study**: Agriculture, Environment, and Related Studies; Society and Culture; Other Health-Related; Creative Arts; and Food, Hospitality, and Personal Services.

We then conduct a cross-tabulation analysis between these categorised fields of education and each of the five measures of socio-economic backgrounds described in Section 5.1. The results, summarised in Figures 7–11, show the following patterns.

First, except for NESB individuals, graduates from disadvantaged backgrounds are less likely to pursue high-paying fields of study. This trend is evident across several indicators of childhood socio-economic backgrounds, including Indigenous status, low SES in childhood, having a father who was unemployed for six months or more during childhood, and living in a single-parent family at age 14. The gap is most pronounced between Indigenous and non-Indigenous graduates, with 31% of Indigenous graduates entering high-paying fields compared to 39% of their non-Indigenous counterparts.

Second, NESB individuals are significantly more likely to choose high-paying fields of study than their ESB counterparts (58% vs. 36%). They are also less likely to choose low-paying fields of study (22% vs. 31%). This trend may be due to the high proportion of NESB individuals who are migrants, many of whom come from relatively affluent families, have received an above-average education, or both. These family factors may have influenced their academic and occupational preferences and choices.

Overall, the patterns in Figures 7–11 suggest that different socio-economic backgrounds may be linked to university subject choice in different ways, which will be explored in more detail in the next section using multivariate regression analysis.

Figure 7: Distribution of categorised fields of study by Indigenous status

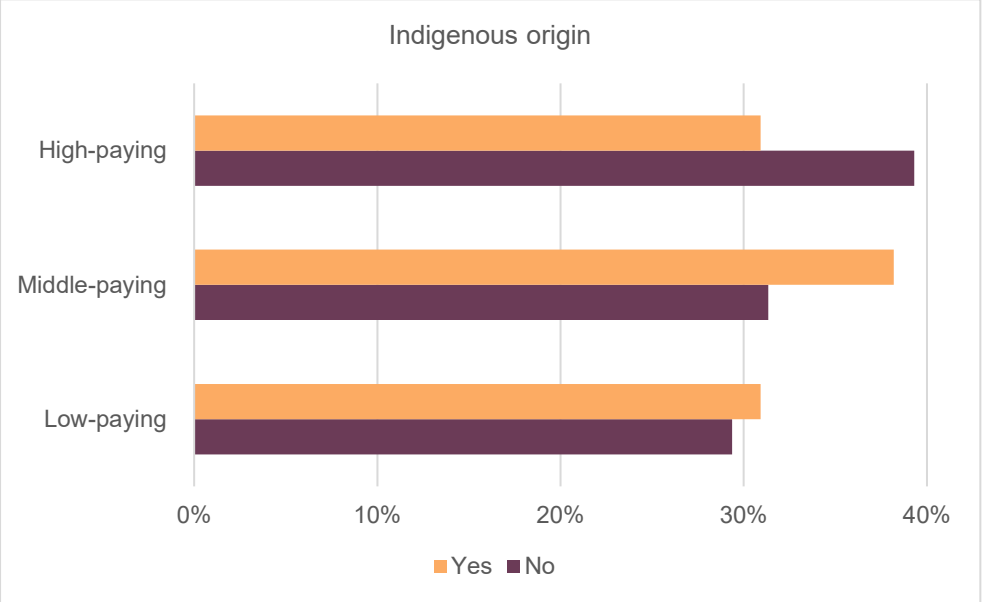


Figure 8: Distribution of categorised fields of study by NESB

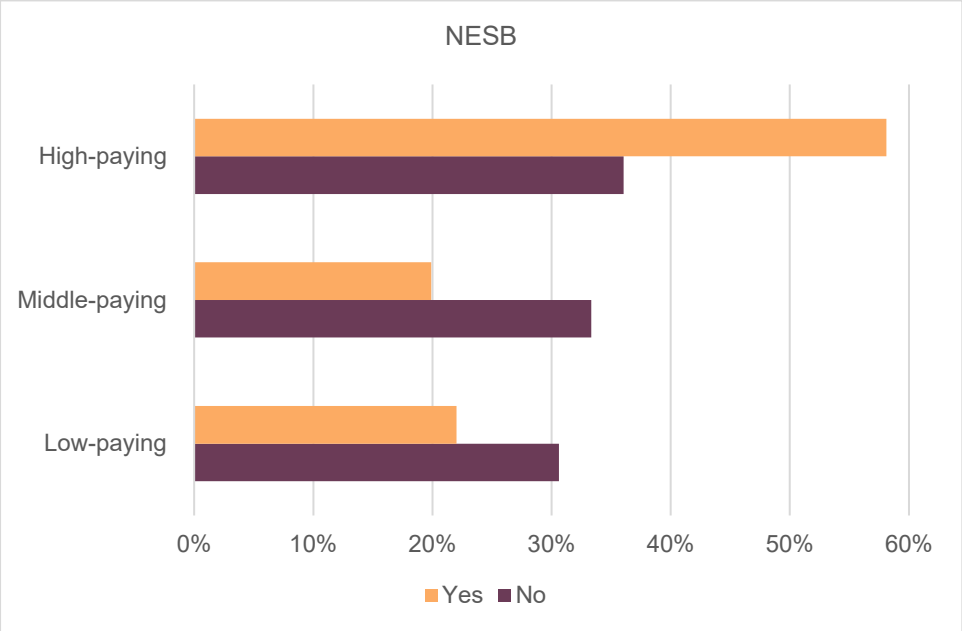


Figure 9: Distribution of categorised fields of study by childhood SES

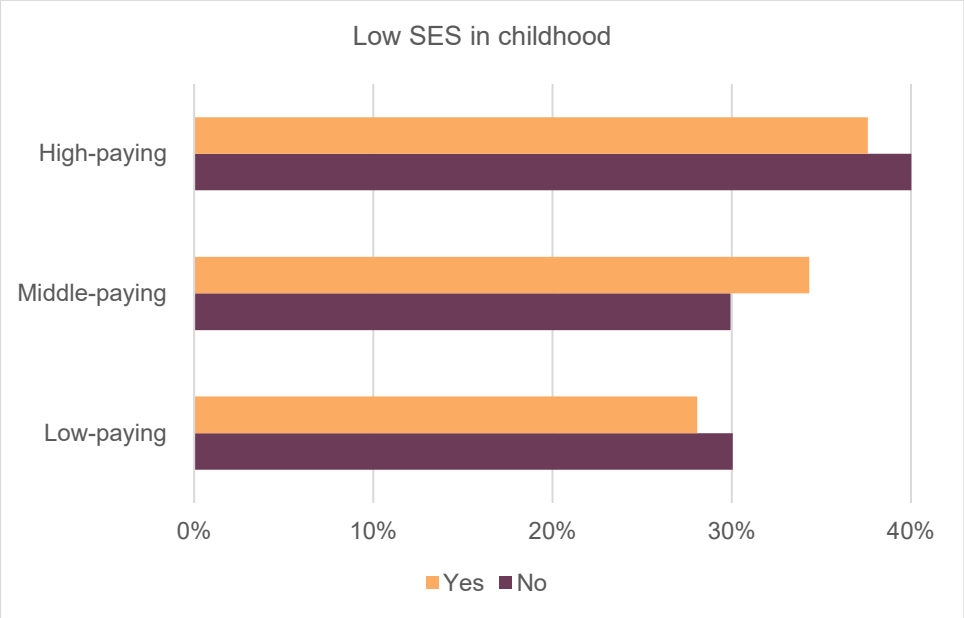


Figure 10: Distribution of categorised fields of study by father's unemployment experience

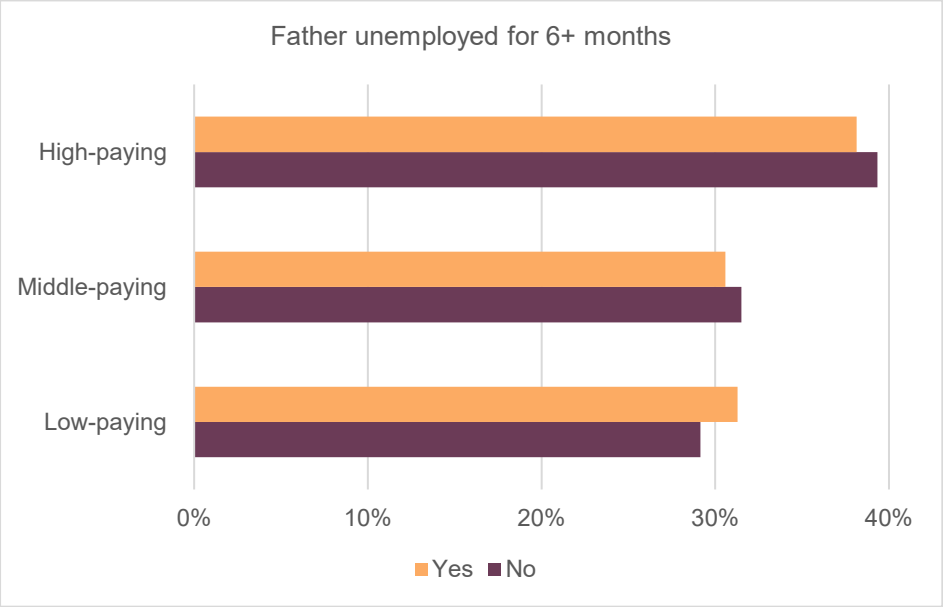
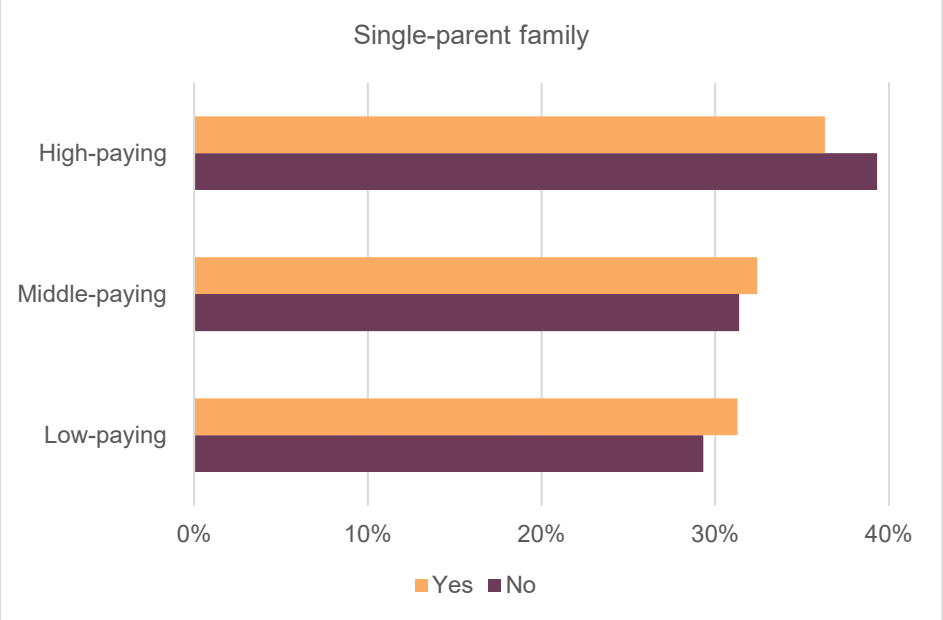


Figure 11: Distribution of categorised fields of study by whether living in a single-parent family at age 14



6.2 Socio-economic backgrounds and the choice of fields of study

This section addresses our second research question: How do multidimensional socio-economic backgrounds influence the choice of tertiary fields of study? As discussed in Section 5.2, we estimate a linear probability model (LPM) as specified in Equation (1). The dependent variables are two binary indicators defined in Section 6.1: (1) whether the field of study chosen is high-paying and (2) whether it is low-paying. The main explanatory variables are five dummy indicators representing different dimensions of socio-economic backgrounds. The control variables include dummies for year of birth, gender, whether the individual was born in Australia, number of siblings, residential location (major city or not), as well as state of residence and HILDA wave dummies. To account for heteroskedasticity of unknown form, we report Huber-White robust standard errors. The analysis is conducted for the full sample and separately for earlier and later birth cohorts. The results for high-paying and low-paying field choices are presented in Tables 3 and 4, respectively.

Table 3: Probability of choosing a high-paying field of study

	All	Born before 1980	Born in 1980 or later
Indigenous	–0.026 (0.058)	–0.110 (0.075)	0.045 (0.087)
NESB	0.156*** (0.027)	0.117*** (0.035)	0.206*** (0.047)
Low SES in childhood	–0.013 (0.014)	–0.003 (0.019)	–0.029 (0.021)
Father unemployed for 6+ months	–0.011 (0.021)	0.021 (0.031)	–0.040 (0.029)
Single-parent family	–0.035 (0.035)	–0.019 (0.046)	–0.046 (0.055)
Control variables	Yes	Yes	Yes
Observations	4910	2578	2332

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

As shown in Table 3, of the five indicators of socio-economic backgrounds, NESB is the only significant predictor of selecting a high-paying field of study. Specifically, NESB students are 16 percentage points more likely to choose a high-paying subject than their ESB counterparts, and this estimate is statistically significant at the 1% level. Moreover, the proportion of NESB Australians in high-paying academic fields is higher in the younger birth cohort than in the older cohort. The estimates for the other four indicators of childhood socio-economic backgrounds are generally small, negative, and not statistically significant.

Table 4: Probability of choosing a low-paying field of study

	All	Born before 1980	Born in 1980 or later
Indigenous	0.006 (0.064)	0.038 (0.093)	–0.026 (0.087)
NESB	–0.107** (0.025)	–0.073** (0.032)	–0.149*** (0.043)
Low SES in childhood	–0.017 (0.014)	–0.020 (0.018)	–0.012 (0.021)
Father unemployed for 6+ months	0.012 (0.021)	–0.027 (0.029)	0.049 (0.030)
Single-parent family	0.035 (0.036)	0.002 (0.046)	0.069 (0.056)
Control variables	Yes	Yes	Yes
Observations	4910	2578	2332

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

Table 4 shows a similar pattern in the choice of low-paying subjects. NESB Australians are 11 percentage points less likely to be enrolled in a low-paying academic discipline than their ESB counterparts. This difference is more pronounced for the younger cohort (15 percentage points) than for the older cohort (7 percentage points). In contrast, there is little evidence of systematic sorting into low-paying fields of students from the other four socio-economic backgrounds, as the estimated differences are small in magnitude and not statistically significant.

As a robustness check, we generate an ordinal variable to represent the three broad categories of fields of study. Specifically, this variable is assigned values of 3, 2, and 1, corresponding to high-paying, middle-paying, and low-paying fields, respectively. We then estimate an ordered probit model to account for the ordinal nature of the dependent variable, using the same set of explanatory variables as in Tables 3 and 4. The estimated coefficients, presented in Table 5, are consistent with the results in Tables 3 and 4. Compared to ESB students, NESB students are more likely to choose a high-paying field and less likely to choose a low-paying one. In contrast, the estimates for the other four indicators of socio-economic backgrounds are generally smaller in magnitude and not statistically significant at the 5% level. Overall, of the five measures of socio-economic backgrounds, coming from a NESB is the only significant predictor of university field of study.

Table 5: Ordered probit model estimates for the choice of fields of study

	All	Born before 1980	Born in 1980 or later
Indigenous	–0.034 (0.144)	–0.205 (0.197)	0.108 (0.211)
NESB	0.408*** (0.071)	0.294*** (0.091)	0.563*** (0.122)
Low SES in childhood	0.003 (0.035)	0.022 (0.047)	–0.024 (0.052)
Father unemployed for 6+ months	–0.037 (0.053)	0.068 (0.077)	–0.129* (0.073)
Single-parent family	–0.102 (0.088)	–0.037 (0.113)	–0.166 (0.140)
Control variables	Yes	Yes	Yes
Observations	4910	2578	2332

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

6.3 Socio-economic backgrounds, fields of study, and labour market outcomes

This section analyses how university fields of study have contributed to the differences in the employment and earnings trajectories of Australians from different socio-economic backgrounds.

Tables 6–10 present the results of the random effects (RE) panel estimations for the five labour market outcomes that we focus on in this study. In the tables, standard errors are adjusted for clustering at the individual level to account for serial correlation in labour market outcomes across different waves of HILDA. Each table contains three columns of estimates, using different sets of control variables. Column (i) reports the RE estimates for the measures of socio-economic backgrounds without controlling for any covariates. These results indicate the raw differences in employment and earnings outcomes between disadvantaged and non-disadvantaged groups. In column (ii), we additionally control for demographic covariates including age, age squared, gender, dummies for marital status, whether born in Australia, whether living in a major city, and dummies for state of residence and HILDA waves. A comparison of the results in columns (i) and (ii) indicates the extent to which differences in labour market outcomes (if any) can be explained by the differences in the observed demographic characteristics of graduates. Finally, in column (iii), we further incorporate the 15 detailed fields of study into the RE panel estimations. The estimates then show how labour market outcomes would differ if disadvantaged and non-disadvantaged groups had studied the same subjects at university. The differences between columns (ii) and (iii) highlight the extent to which fields of study contribute to the differences in the labour market performance of Australians from different socio-economic backgrounds.

Table 6: Probability of full-time employment

	(i)	(ii)	(iii)
Indigenous	0.053 (0.047)	0.047 (0.045)	0.056 (0.044)
NESB	0.006 (0.016)	–0.027 (0.021)	–0.043** (0.020)
Low SES in childhood	–0.009 (0.012)	0.001 (0.011)	0.003 (0.011)
Father unemployed for 6+ months	–0.005 (0.018)	0.003 (0.017)	0.001 (0.017)
Single-parent family	0.017 (0.029)	0.007 (0.027)	0.008 (0.026)
Control variables	No	Yes	Yes
Field of study	No	No	Yes
Individuals	4910	4910	4910
Observations	9810	9810	9810

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

The results of the RE estimations for the probability of full-time employment are presented in Table 6. Column (i) shows that there are no statistically significant differences in full-time employment rates between Australians from disadvantaged and non-disadvantaged backgrounds. This finding does not change after we control for demographic variables in column (ii). A previous study by Edwards and Coates (2011) found that graduates from disadvantaged backgrounds were more likely to work full-time and less likely to work part-time within three to five years of completing university. However, our results for full-time employment, as shown in columns (i) and (ii) of Table 5, suggest that this difference does not persist in the longer term. These findings align well with the conclusions of Coates and Edwards (2009) and Li (2014) that Australian graduates from disadvantaged and non-disadvantaged backgrounds had similar short-term employment outcomes in the labour market. The results here are also consistent with those reported in Tomaszewski et al. (2019) that differences in labour market outcomes between equity and non-equity graduates were frequently statistically insignificant or tended to diminish over time.

In column (iii) of Table 6, the coefficient on NESB becomes statistically significant at the 5% level after controlling for differences in university fields of study. This suggests that, if NESB and ESB Australians had studied the same academic disciplines, the probability of full-time employment would be 4.3 percentage points lower for NESB workers than for their ESB counterparts. This estimate is slightly larger in magnitude than the one reported in column (ii) (–0.027). The difference in estimates between columns (ii) and (iii) suggests that NESB individuals may have mitigated some of their disadvantage in securing full-time employment by choosing more rewarding fields of study. Through their academic specialisation, NESB graduates appear to have improved their prospects for full-time employment relative to what they might otherwise have experienced. In

contrast, there is no similar pattern observed for graduates from the other four socio-economic backgrounds.

Table 7: Probability of permanent or ongoing employment

	(i)	(ii)	(iii)
Indigenous	–0.008 (0.056)	–0.022 (0.058)	–0.021 (0.059)
NESB	–0.023 (0.017)	–0.038 (0.024)	–0.051** (0.023)
Low SES in childhood	0.027** (0.013)	0.033*** (0.013)	0.027** (0.012)
Father unemployed for 6+ months	–0.025 (0.019)	–0.024 (0.019)	–0.023 (0.018)
Single-parent family	0.031 (0.031)	0.035 (0.031)	0.037 (0.030)
Control variables	No	Yes	Yes
Field of study	No	No	Yes
Individuals	4910	4910	4910
Observations	9810	9810	9810

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

The estimated effects of socio-economic backgrounds on permanent or ongoing employment are shown in Table 7. Among the five indicators of socio-economic backgrounds, only low SES in childhood is significantly associated with permanent or ongoing employment. Specifically, workers from a low SES background are about 3 percentage points more likely to have a permanent or ongoing job than those from a higher SES background. In addition, the negative estimate for NESB is not statistically significant in columns (i) and (ii), but becomes significant at the 5% level in column (iii). If NESB and ESB Australians had pursued the same fields of study, NESB workers would have been 5.1 percentage points less likely to have a permanent or ongoing job. Given that the estimate in column (ii) is slightly smaller than that in column (iii), this suggests that NESB Australians may have reduced some of their disadvantage in obtaining permanent or ongoing employment through their choice of fields of study at university.

Table 8: Probability of having a managerial or professional job

	(i)	(ii)	(iii)
Indigenous	0.028 (0.051)	0.019 (0.052)	0.018 (0.053)
NESB	–0.140*** (0.018)	–0.128*** (0.024)	–0.143*** (0.023)
Low SES in childhood	–0.035*** (0.012)	–0.038*** (0.011)	–0.039*** (0.012)
Father unemployed for 6+ months	–0.044 (0.017)	0.009 (0.017)	0.010 (0.016)
Single-parent family	–0.047 (0.031)	–0.050 (0.030)	–0.041 (0.030)
Control variables	No	Yes	Yes
Field of study	No	No	Yes
Individuals	4910	4910	4910
Observations	9810	9810	9810

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

Next, we discuss the estimated effects of socio-economic backgrounds on the likelihood of being employed in managerial or professional occupations. Table 8 shows that NESB graduates are around 14 percentage points less likely to be employed in these occupations. This result remains robust after controlling for fields of study and demographic covariates. The fact that NESB graduates are less likely to be in a managerial position even when holding the same qualification may reflect a glass ceiling effect for them. The estimates for low SES in childhood are also statistically significant but to a lesser extent. Specifically, workers from low SES backgrounds are about four percentage points less likely to be in managerial or professional occupations compared to their higher SES counterparts. This is in line with the findings of Tomaszewski et al. (2021), which indicated that low SES graduates faced disadvantages in terms of occupational status despite their tertiary education. Table 8 shows no significant correlations for the other three indicators of socio-economic backgrounds.

Table 9: Log weekly earnings

	(i)	(ii)	(iii)
Indigenous	0.160 (0.202)	0.078 (0.209)	0.061 (0.212)
NESB	–0.093 (0.074)	–0.198* (0.104)	–0.261** (0.102)
Low SES in childhood	0.057 (0.053)	0.103* (0.053)	0.085 (0.052)
Father unemployed for 6+ months	0.004 (0.075)	–0.013 (0.074)	–0.015 (0.073)
Single-parent family	0.224** (0.101)	0.239** (0.101)	0.248** (0.100)
Control variables	No	Yes	Yes
Field of study	No	No	Yes
Individuals	4910	4910	4910
Observations	9810	9810	9810

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

Table 9 displays the estimated effects of socio-economic backgrounds on the gross weekly earnings of Australian graduates, which is arguably one of the most important labour market outcomes. There are a few interesting findings. First, workers from single-parent families earn around 22% more than those from two-parent families when no covariates are controlled for. This earnings premium increases slightly when more control variables are included in columns (ii) and (iii). The earnings advantage observed for graduates from single-parent families may reflect a selection effect. Students from disadvantaged backgrounds encounter greater barriers to accessing higher education, and those who successfully complete tertiary study are likely to possess unobservable positive attributes that translate into superior labour market outcomes, as suggested by Li et al. (2017). Second, the earnings differential between NESB and ESB workers is statistically insignificant in column (i), but it becomes significantly larger after controlling for demographic covariates. Specifically, column (ii) shows that NESB workers earn 20% less than their ESB counterparts, which is lower than the short-term earnings differential of 26% reported in Li et al. (2017). Using population-wide linked administrative data from Australia, Zajac et al. (2023) similarly found that among students from disadvantaged social backgrounds, NESB graduates experience comparatively greater labour market disadvantages relative to their comparison group.[15]

In column (iii) of Table 9, after controlling for academic disciplines, the earnings gap between ESB and NESB graduates widens to 26%. These results suggest that NESB workers face persistent disadvantages in the labour market, even when they are more likely to be enrolled in prestigious fields of study. The earnings disadvantage faced by

[15] In the literature, Nguyen et al. (2025) also found that children of immigrant parents from NESB initially earn less than their counterparts with Australian-born parents at ages 21–22. However, this earnings gap narrows by ages 23–24 and reverses by 26–27, with the children of NESB fathers earning more than their counterparts by ages 28–29.

NESB workers have been partly disguised by the fact that they often graduate from high-paying fields of study. Finally, the other three measures of socio-economic backgrounds show little statistically significant relationship with weekly earnings.

Table 10: Job satisfaction

	(i)	(ii)	(iii)
Indigenous	–0.084 (0.144)	–0.069 (0.142)	–0.062 (0.140)
NESB	–0.132*** (0.036)	–0.071 (0.050)	–0.084* (0.050)
Low SES in childhood	0.015 (0.026)	0.004 (0.026)	–0.009 (0.026)
Father unemployed for 6+ months	–0.019 (0.037)	–0.008 (0.037)	–0.008 (0.037)
Single-parent family	–0.048 (0.066)	–0.052 (0.065)	–0.038 (0.065)
Control variables	No	Yes	Yes
Field of study	No	No	Yes
Individuals	4910	4910	4910
Observations	9810	9810	9810

*Notes: The control variables include dummies for year of birth, gender, whether born in Australia, number of siblings, whether living in a major city, and dummies for state of residence and HILDA waves. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.10.*

The last labour market outcome we analyse is job satisfaction. The results are presented in Table 10. Of the five measures of socio-economic backgrounds, NESB status is the only factor that is statistically significant. Column (i) shows that NESB workers report lower levels of job satisfaction than their ESB counterparts. Specifically, their job satisfaction index is 0.13 standard deviations lower. However, after controlling for field of study and other covariates, this difference decreases in column (iii) and remains marginally significant at the 10% level. As such, NESB graduates experience lower job satisfaction overall, even when compared with their counterparts in the same fields of tertiary study.

In summary, columns (i) and (ii) of Tables 6–10 show mixed long-term employment outcomes for the five groups who experienced different socio-economic backgrounds. Employment and earnings outcomes for Indigenous Australians are broadly comparable to those of non-Indigenous workers, aligning with the short-term findings reported by Li (2014) and Tomaszewski et al. (2019). Similarly, paternal unemployment during childhood has little impact on the five labour market outcomes considered. Furthermore, the results are similar for Australians who grew up in single-parent families, with the exception that their weekly earnings are higher than those of individuals from two-parent families. In addition, low SES in childhood has no statistically significant association with full-time employment, weekly earnings, or job satisfaction. However, it is positively associated with permanent or ongoing employment but negatively associated with managerial or professional employment. Tomaszewski et al. (2021), using data from the Australian Census Longitudinal Dataset (ACLD), examine the short-term labour market

outcomes of recent university graduates. They find that graduates from high SES backgrounds are more likely to secure employment in managerial or professional occupations than those from low SES backgrounds. However, they report no significant income differences between the two groups. These short-term findings align closely with our long-term results based on data from the HILDA Survey.

Furthermore, our results consistently show that NESB individuals face greater challenges in the labour market across several outcome domains, including managerial or professional employment, weekly earnings, and job satisfaction. This disadvantage persists despite their higher likelihood of enrolling in prestigious, higher-paying fields of study. In other words, the labour market disadvantage for NESB individuals would likely be even greater were it not for this “head start” associated with field of study. These findings suggest that, overall, Australians from NESB backgrounds encounter persistent and multifaceted barriers in the labour market, even after completing tertiary education and training. This raises the question: why does this disparity persist? As noted earlier, the lack of educational disadvantage among NESB individuals may partly reflect positive selection through Australia’s migration system, as well as cultural values that emphasise education and career achievement. However, their weaker labour market outcomes suggest the presence of substantial barriers post-graduation. For example, their underrepresentation in managerial roles may indicate a glass ceiling effect. Such outcomes may be driven by factors including structural racism, unconscious bias, and cultural mismatch in the workplace. While the current data do not allow us to identify the precise mechanisms at play, the evidence clearly highlights the need for further research to better understand and address the labour market disadvantages faced by NESB Australians.

A comparison of columns (ii) and (iii) in Tables 6–10 suggests that university subject choice plays a significant role in improving the employment and earnings outcomes of NESB graduates relative to the general population. Specifically, NESB graduates exhibit a reduced earnings gap relative to their ESB counterparts when field of education is controlled for in column (iii). These results align with the findings in Section 6.2, which show that NESB students are more likely to select high-paying fields of study and less likely to enrol in low-paying ones. Consequently, labour market disadvantages faced by NESB graduates may be obscured if academic specialisation is not accounted for. In contrast, field of study appears to have a limited role in explaining labour market disparities among individuals from the other four disadvantaged socio-economic backgrounds (namely, those of Indigenous origin, low childhood SES, a father with unemployment experience during childhood, and those who lived in a single-parent household at age 14).

7. Discussion

7.1 Patterns in graduates' fields of study and subsequent labour market performance

We identified significant patterns in the academic preferences of Australian graduates, revealing a concentration in a few key disciplines and notable shifts in preferences between those born before and after 1980. Specifically, the majority of graduates earned degrees in the fields of Management and Commerce, Education, and Society and Culture, which together accounted for almost half of all degrees awarded. Conversely, the least popular fields were Food, Hospitality, and Personal Services; Agriculture, Environment, and Related Studies; and Others, reflecting their limited appeal to students. We also observed that the younger generation (those born in 1980 or later) have moved away from traditional fields such as Education, Society and Culture, and Nursing, in favour of increasingly popular fields such as Creative Arts, Law, and Other Health-Related. In addition, our analysis showed a consistent preference for fields such as Medicine and Agriculture, Environment, and Related Studies across both birth cohorts, suggesting their continued appeal over time.

We documented significant crude differences in post-university labour market outcomes across different fields of study. For example, graduates in Engineering and Related Technologies and Food, Hospitality, and Personal Services had the highest rates of full-time employment, whereas those in Nursing and Other Health-Related fields had the lowest. Some disciplines appeared to offer more opportunities for full-time employment, while others may have offered greater flexibility in working arrangements, probably due to the nature of the profession or the current state of the labour market. Furthermore, fields such as Nursing and Engineering and Related Technologies were consistently above average in terms of permanent employment, suggesting more secure employment prospects in these fields. In contrast, graduates in fields such as Creative Arts and Agriculture, Environment, and Related Studies had below-average rates of permanent employment, indicating less job security for graduates in these fields.

There was also clear evidence of significant differences in the likelihood of securing a managerial or professional position across different fields of study. Around 92% of graduates in Medicine secured such positions, well above the average of 77% in our sample. In contrast, only 34% of graduates in Food, Hospitality, and Personal Services achieved comparable positions, suggesting more limited opportunities for career progression in these fields. These differences are likely to reflect both the specialised skills associated with certain disciplines and the segmentation of the labour market.

In addition, we observed substantial crude differences in gross earnings across fields of study. Graduates in Medicine and Engineering and Related Technologies had the highest weekly earnings, while those in Creative Arts and Food, Hospitality, and Personal Services had significantly lower earnings. The economic premiums associated with technical and health-related fields probably reflect the extensive training required and the high demand for professionals in these fields. Interestingly, job satisfaction did

not seem to be strongly correlated with earnings. While graduates in Medicine reported the highest levels of job satisfaction, those in the relatively low-paying fields such as Food, Hospitality, and Personal Services and Society and Culture were not significantly less satisfied. This suggests that non-monetary factors, such as personal fulfilment or work-life balance, may also play an important role in overall job satisfaction.

7.2 Influence of socio-economic backgrounds on the choice of fields of study in tertiary education

We found that, of the five indicators of socio-economic backgrounds, coming from a NESB was the most significant predictor of academic subject choice at university. NESB graduates were 16 percentage points more likely to choose high-paying fields of study than their ESB counterparts. Thus, NESB seem not to be disadvantaged until they finished their education. This association was both economically and statistically significant. This pattern was consistent across birth cohorts, with younger NESB Australians being relatively more likely to enrol in high-paying academic disciplines. In contrast, the other four measures of socio-economic backgrounds (namely, Indigenous origin, low SES in childhood, father's unemployment experience during childhood, and living in a single-parent family at age 14) showed smaller and statistically insignificant correlations with the likelihood of choosing a high-paying field of study. This lack of statistical significance suggests that these forms of socio-economic backgrounds may not strongly influence the choice of university subjects. These patterns are further supported by the results for the choice of low-paying fields of study.

These mixed results highlight the complex relationship between socio-economic backgrounds and Australians' choice of university subjects. The strong effect of being from a NESB highlights the potential role of other important factors such as a highly selective nature of the Australian migration system and cultural and linguistic factors in shaping educational preferences and decisions. This may reflect differences in parental expectations, community support systems, or access to resources that influence decision-making processes (Glick and White, 2004; Diaz, 2020). Such factors may provide NESB students with greater motivation or strategic insight to pursue fields with higher economic returns, potentially contributing to upward mobility.

This analysis improves our understanding of the factors that influence students' choice of fields of study by shedding light on the heterogeneous effects of childhood socio-economic backgrounds. The differences in subject choice between NESB Australians and other disadvantaged groups suggest that tailored policy interventions may be needed. For NESB and similar groups, their educational outcomes are not disadvantaged. For other disadvantaged groups, further research is needed to identify the barriers that hinder their access to and choice of high-paying academic disciplines. This would enable the development of targeted strategies to help overcome these challenges and promote more equitable access to rewarding educational pathways.

7.3 Socio-economic backgrounds, choice of university fields of study, and post-university labour market outcomes

We found that long-term labour market outcomes varied by socio-economic background. Specifically, Indigenous Australians had similar long-term labour market outcomes to their non-Indigenous counterparts, which is consistent with the earlier findings of Li (2014) and Tomaszewski et al. (2019) for the short term. Graduates from single-parent families had higher weekly earnings than their peers from two-parent families, suggesting that tertiary education may have helped them to overcome some of the socio-economic disadvantages they experienced in childhood. However, this finding may be due to a selection effect. Students from single-parent families faced greater barriers to higher education. Those who gained access to and successfully completed tertiary education may have unobservable positive characteristics that translate into better employment outcomes, as discussed by Li et al. (2017).

Interesting patterns were observed for Australians with low SES in childhood. While low SES was not significantly associated with full-time employment, weekly earnings, or job satisfaction, it showed a positive association with permanent or ongoing employment. However, its association with holding managerial or professional occupations was negative, which is consistent with the findings of Tomaszewski et al. (2021) that low SES graduates were disadvantaged in terms of occupational status after graduation. Moreover, consistent with the findings of Zajac et al. (2023), our results indicate that NESB workers encountered significant challenges in the labour market, including a lower likelihood of obtaining a managerial or professional position and significantly lower weekly earnings when compared to their ESB counterparts. As our empirical analysis focused on long-term employment and earnings outcomes for those with tertiary qualifications, these findings for NESB workers highlight the persistent and multifaceted barriers they face in the labour market, even when they have educational qualifications comparable to or even better than those of their ESB counterparts.

Furthermore, the comparison between NESB and ESB Australians sheds some light on the role of field of study choice at university in influencing long-term labour market outcomes. Specifically, NESB graduates were found to have chosen high-paying fields while avoiding those with lower financial returns. In contrast, this pattern was not observed for Australians from the other four socio-economic backgrounds. It is possible that NESB individuals are a more select group, many of whom may come from better educated or wealthier households, which may have influenced their academic and career choices. While the choice of fields of study made by NESB individuals have helped improve their employment prospects and reduce the earning gaps relative to ESB workers, their labour market disadvantages are not completely eliminated.

These findings highlight the need for tailored policies for Australians who have experienced different socio-economic backgrounds in early life. For NESB workers, their labour market disadvantages need to be addressed even when they graduate from

high-paying fields of study. On the other hand, for groups such as Australians from low childhood SES backgrounds, it may be more effective to address barriers beyond the choice of university subjects in order to support their entry into managerial and professional occupations.

8. Conclusion

Using data from multiple waves of the HILDA Survey, this study empirically examined the long-term labour market outcomes of university graduates from different socio-economic backgrounds, with a particular focus on the role of subject choice at university.

Our analysis revealed a concentration of graduates in a few key fields, such as Management and Commerce, Education, and Society and Culture. We also found that younger cohorts have shifted away from traditional fields such as Education, Society and Culture, and Nursing, opting instead for degrees in Creative Arts, Law, and Other Health-Related. We also showed that the labour market outcomes of graduates varied according to their field of study. This variation underlines the important role that academic disciplines play in shaping long-term career trajectories, with some fields offering more robust employment opportunities, higher earnings, and greater job satisfaction than others.

We found that, of the five indicators of socio-economic backgrounds analysed, coming from a NESB was the only significant predictor of field-of-study choice. NESB students were more likely to choose high-paying fields and less likely to choose low-paying fields, suggesting that they are not disadvantaged in education. In contrast, the other four measures of socio-economic backgrounds (namely, Indigenous origin, low SES in childhood, father's unemployment experience during childhood, and living in a single-parent family at age 14) had negligible effects on the likelihood of choosing a high- or low-paying field of study.

Long-term labour market outcomes were found to be comparable across some equity groups. For example, Indigenous Australians had similar outcomes to their non-Indigenous counterparts. Similar results were found for those whose father was unemployed for six months or more during childhood. Graduates from single-parent families earned higher weekly wages than those from two-parent families. However, the results were more mixed for those with a low SES in childhood. While low SES was not significantly associated with full-time employment, weekly earnings, or job satisfaction, it showed a positive association with permanent or ongoing employment but a negative association with employment in managerial or professional occupations.

Of the five socio-economic backgrounds analysed, the challenges faced by NESB workers were the most pronounced. In comparison with their ESB counterparts, NESB workers were less likely to be in managerial or professional occupations and had significantly lower weekly earnings. The role of subject choice at university was particularly significant for NESB graduates. Their choice of high-paying fields helped to narrow the earnings gap and improve their employment prospects. However, this did not fully close the earnings gap between NESB and ESB graduates. For other disadvantaged groups, the influence of field of study appeared limited, possibly because their field-of-study choices did not differ substantially from those of their non-disadvantaged counterparts.

Our findings highlight the complex ways in which socio-economic backgrounds influence both academic pathways and labour market outcomes, with important implications for

promoting a more equitable and inclusive workforce in Australia. Based on these findings, we propose the following policy recommendations.

8.1 Recommendations

First, more and clear career guidance and access to information should be provided for students from disadvantaged backgrounds, including those from low socio-economic status families, Indigenous communities, and single-parent households. Tailored career counselling programs in both secondary schools and universities should provide clear, accessible information on employment prospects, such as job security, earning potential, and long-term career outcomes, across various fields of study. Strengthened partnerships between educational institutions and industry can support the development of timely, relevant resources to help students make informed decisions about their academic and career paths.

Second, targeted support is needed to increase the representation of disadvantaged students in high-return disciplines such as medicine and law. Financial and informational barriers can be addressed through scholarships, mentoring schemes, and preparatory or bridging programs. Universities should also consider contextualising admissions criteria to better account for applicants' background circumstances, thereby expanding access to competitive courses and reducing educational stratification by field. These initiatives can play a critical role in promoting social mobility.

Third, the persistent labour market disadvantages experienced by graduates from non-English-speaking backgrounds call for tailored employment support. Programs offering job search assistance, internship placements, and networking opportunities can help these graduates access managerial and professional roles. In parallel, employers should be encouraged to adopt inclusive hiring and promotion practices, such as anonymised recruitment processes and diversity training, to reduce bias and promote workplace equity.

Finally, to support long-term career progression for disadvantaged graduates, particularly those from low-SES backgrounds, policymakers should invest in post-university support mechanisms. This includes expanding access to mentoring, leadership development, and sponsorship programs designed to facilitate entry into senior roles. Such initiatives can help address structural barriers within the labour market and ensure that the benefits of higher education translate into sustained occupational success.

8.2 Limitations and future research

Despite its valuable contributions, this study has several limitations. First, although the analysis incorporates multiple indicators of socio-economic background available in the HILDA dataset, these measures may not fully reflect the complex and multidimensional nature of Australians' background characteristics. Future research should consider additional factors to build a more comprehensive understanding of the barriers faced by disadvantaged individuals in Australia.

Second, data on field of study are available only in waves 12, 16, and 20 of HILDA, which limits the sample size and may reduce statistical power, particularly for smaller subgroups such as Indigenous Australians. This constraint may hinder the detection of significant differences and contribute to non-significant findings. Greater access to linked administrative datasets would enable more comprehensive tracking of students' pathways through education and into the labour market, disaggregated by equity group. Such enhanced data capacity would support deeper insight into, and more effective responses to, educational and labour market inequities. Third, the study focuses primarily on employment and earnings outcomes, without addressing broader social or psychological dimensions that may be influenced by socio-economic background and field of study. Future research should examine outcomes such as mental health, well-being, and work-life balance to provide a more holistic understanding of the long-term impacts of early disadvantage.

Finally, while the quantitative analysis reveals important patterns and associations, the study would benefit from complementary qualitative research. Gaining insight into the motivations, aspirations, and decision-making processes of disadvantaged Australians would be invaluable for designing targeted policy interventions aimed at reducing inequality and promoting equitable access to educational and career opportunities.

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10. Appendix

Table A1 presents summary statistics on labour market outcomes by multidimensional socio-economic background.

Table A2 shows the distribution of 15 detailed fields of study by multidimensional socio-economic background.

Table A1: Labour market outcomes by socio-economic background

	Indigenous		NESB		Low SES in childhood		Father unemployed for 6+ months		Single-parent family	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Full-time employment (%)	73.21	71.45	72.50	71.30	71.05	71.68	70.65	71.57	72.19	71.44
Permanent or ongoing employment (%)	66.96	65.87	64.22	66.16	67.82	64.90	64.12	66.10	68.26	65.79
Having a managerial or professional job (%)	76.79	76.59	65.08	78.49	74.28	77.76	76.08	76.66	72.19	76.76
Weekly earnings (2020 AUD)	1,631.64	1,642.14	1,489.58	1,667.17	1,629.24	1,648.46	1,607.88	1,646.28	1,644.15	1,641.94
Job satisfaction	7.60	7.66	7.50	7.69	7.66	7.66	7.61	7.67	7.57	7.66

Note: Source of data: HILDA waves 12, 16, and 20.

Table A2: Distribution of 15 detailed fields of study by socio-economic background

	Indigenous		NESB		Low SES in childhood		Father unemployed for 6+ months		Single-parent family	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Natural and physical sciences (%)	7.27	5.56	3.84	5.87	5.46	5.64	4.68	5.70	6.70	5.54
Information technology (%)	5.45	4.59	10.65	3.59	4.24	4.78	4.32	4.64	6.15	4.54
Engineering and related technologies (%)	3.64	7.02	12.93	5.99	6.37	7.30	6.29	7.07	6.70	7.00
Architecture and building (%)	0.00	2.29	2.70	2.19	1.88	2.45	2.16	2.27	1.68	2.28
Agriculture, environment, and relate studies (%)	1.82	2.16	1.28	2.31	1.52	2.48	2.34	2.14	2.79	2.13
Medicine (%)	1.82	2.78	4.69	2.45	2.18	3.07	2.88	2.76	0.56	2.85
Nursing (%)	10.91	7.77	6.39	8.04	9.40	6.99	7.19	7.88	7.82	7.80
Other health-related (%)	5.45	7.87	5.26	8.27	7.16	8.19	7.91	7.83	4.47	7.97
Education (%)	20.00	15.18	6.96	16.62	17.04	14.32	16.19	15.11	16.20	15.20
Management and commerce (%)	12.73	20.33	25.71	19.33	21.47	19.63	20.50	20.21	16.76	20.38
Law (%)	7.27	4.57	4.12	4.68	3.34	5.24	4.14	4.66	6.15	4.54
Society and culture (%)	16.36	13.51	11.08	13.96	13.16	13.74	14.75	13.39	15.64	13.46
Creative arts (%)	7.27	5.15	2.56	5.61	5.52	5.00	5.22	5.17	7.82	5.07
Food, hospitality, and personal services (%)	0.00	0.68	1.85	0.48	0.73	0.64	1.08	0.62	0.56	0.68
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Source of data: HILDA waves 12, 16, and 20.