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What Is Driving Participation and Diversity Trends in Economics? A Survey of High School Students

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What Is Driving Participation and Diversity Trends in Economics? A Survey of High School Students

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Abstract

There has been a stark decline in the size and diversity of the Year 12 Economics student population in Australia since the early 1990s. This paper addresses 3 key questions to uncover what is driving these trends at Australia's high schools. First, which school and individual characteristics are most strongly associated with choosing Economics? Second, what are students' perceptions of Economics? And third, what differences in perceptions of Economics exist by sex and socio-economic background? We utilise unit record data from a Reserve Bank of Australia commissioned survey of over 4,800 students in Years 10 to 12 (15 to 18 year olds) and administrative school-level data on high schools in New South Wales. The RBA-led survey provides a unique primary source of data on high school students' perceptions of Economics that is novel to the Australian and international literature.

We find that high school students typically have positive perceptions of economics as a field; however, the perceptions of Economics as a subject tend to be negative. Males and students from a higher socio-economic background have more favourable perceptions of Economics than other students, which is reflected in a higher likelihood of them choosing to study Economics. Controlling for a greater perceived understanding of what Economics is about does appear to reduce some of the sex and socio-economic differences in perceptions, but a gap remains. In particular, it remains that females have less interest in Economics and a less clear idea of 'whether they would be good at it' or what the subsequent career opportunities may be. Furthermore, students from a lower socio-economic background are less likely to feel 'they could do well in Economics if they put their mind to it', and less likely to report that teachers at their school promote the study of Economics. And both females and students from a lower socio-economic background are more likely to believe that 'it is a risk to study Economics because I don't know what it's about', and have more favourable perceptions of Business Studies. The results shed light on the scope for interventions to promote participation and diversity in the study of Economics.

JEL Classification Number: I24

Keywords: economics, education, student survey, diversity

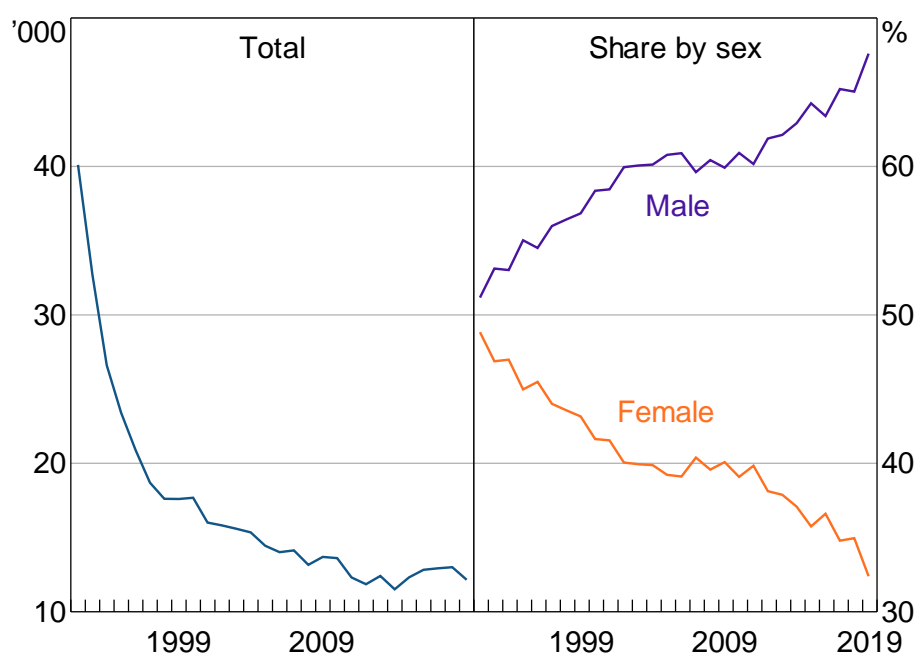
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1. Introduction

There has been a dramatic decline in Australia's Year 12 Economics enrolments of around 70 per cent over the past 3 decades (Figure 1). Alongside the decline in numbers, the gender balance has diminished from roughly equal numbers of male and female students in the early 1990s, to males outnumbering females two-to-one in recent years. In the state of New South Wales, for which more detailed data are available, the shares of students from low socio-economic backgrounds and regional locations have also fallen substantially (Figure 2).

Figure 1: Economics Enrolments in Australia
Year 12



Note: Data from New South Wales, Queensland and Western Australia included from 1992, South Australia included from 1993 and Victoria included from 1995

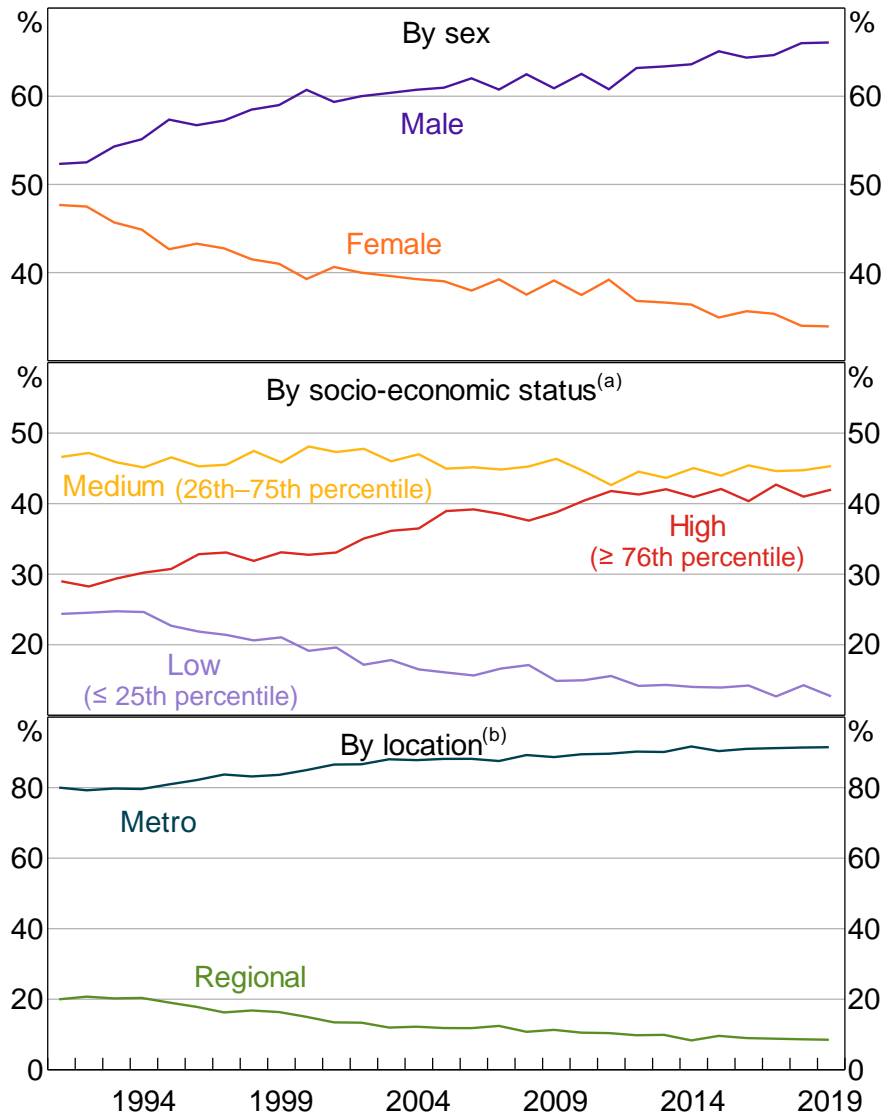
Sources: NSW Education Standards Authority; Queensland Curriculum and Assessment Authority; RBA; SACE Board of South Australia; School Curriculum and Standards Authority; Victorian Curriculum and Assessment Authority

The size and diversity of the Economics student population matters for both students and broader society. Economics at the high school level provides a basic level of economic literacy. While there is no one definition of economic literacy, it encompasses an ability to apply economics skills and frameworks to explain or debate much of the world in which we live – from understanding opportunity costs in our personal decisions, through to forming a view about the efficacy of economic policies. In New South Wales, and most other Australian states, the main opportunity high school students have to learn basic economic literacy is through the Year 11 and 12 Economics syllabus (Board of Studies New South Wales 2009).¹ The syllabus teaches fundamental macroeconomic and microeconomic frameworks and concepts, equipping students to engage with current economic

¹ We distinguish between Economics (the Year 11 and 12 subject) and economics (the field) throughout the paper by capitalising the former.

issues. Other subjects touch on some Economics concepts, but arguably do not provide a generalised foundation of economic literacy.²

Figure 2: Share of Economics Enrolments in NSW
Year 12



Notes: (a) Based on the socio-economic status of each school's location
(b) Metro includes schools in major cities; regional includes regional, remote and offshore schools
Sources: NSW Education Standards Authority; RBA

² For example in New South Wales, the Year 11 and 12 Business Studies syllabus touches on exchange rates and interest rates in the context of businesses' financial management strategies, and economic conditions as a factor affecting consumer choice (Board of Studies New South Wales 2010). Standard Mathematics covers financial mathematics skills, which cross over with economic concepts, such as interest rates (NSW Education Standards Authority 2017). In Years 7 to 10, students may have an introduction to economics through the Commerce elective (NSW Education Standards Authority 2019); this is an avenue by which students may gain basic economic literacy, though the economics component has only become a core part of the elective since 2019.

While there have been numerous studies of financial literacy relating to an individual's personal finances (e.g. Lusardi 2019), there is little evidence pertaining to economic literacy. In the Australian context, the Household, Income and Labour Dynamics in Australia (HILDA) Survey provides a financial literacy test that covers concepts that can also be considered as part of economic literacy (in particular, interest rates, inflation and money illusion). Using this test, only around half of Australian adults would be considered 'financially literate' (Preston 2020). This may be indicative of economic literacy more broadly. There is some evidence of adults declaring a desire for greater economic literacy; in a survey of UK residents, while nearly two-thirds of respondents had not studied any economics, three-quarters thought that economics should form part of the school curriculum (Lait 2017). Indeed, in the follow-up 2019 study, around half of the respondents wanted to increase their understanding of economics of the real world and know more about economics to help them make decisions in elections and referendums (Lait 2019).

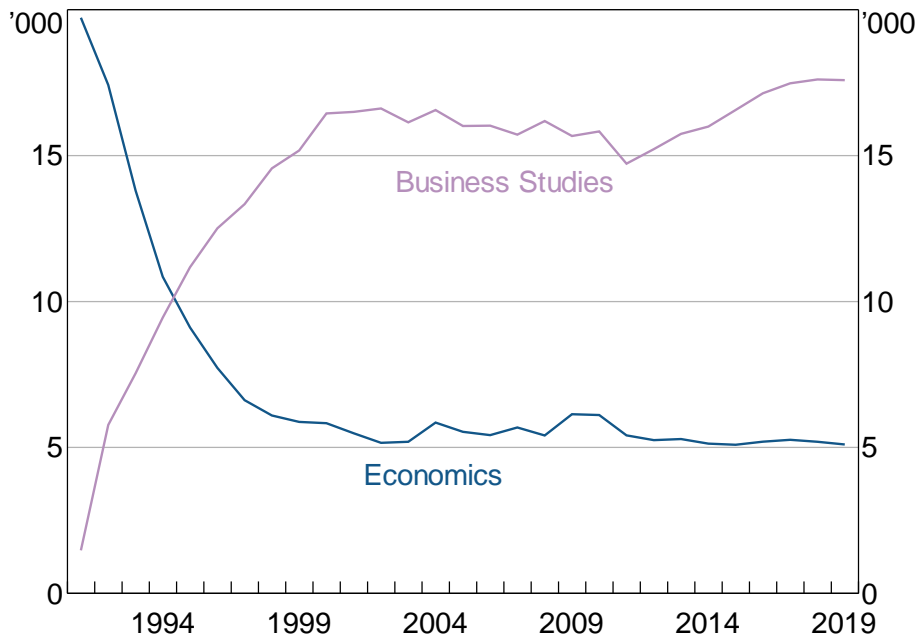
As studying Economics is often the start of a pathway to a career in economics, the diversity of the student body ultimately shapes the discipline. Declining participation (relative to other subjects) and widening diversity gaps have also been observed for economics enrolments at Australian universities (Dwyer 2018). With economists playing an integral role in determining economic policies, there are wider social benefits when the pipeline of future economists is broadly representative of society. For example, May, McGarvey and Whaples (2014) find that male and female economists have different views on economic outcomes and policies, lending support to the notion that gender diversity amongst policymakers may be an important aspect in expanding the menu of public policy choices.

Qualitative evidence from the RBA's liaison with educators indicates that a number of factors may explain the decline in Economics enrolments. First, too few educators are equipped to teach Economics and too little relevant Australian economics content is available, providing school leaders with limited incentive to offer (or promote) the subject. Second, it has been reported that many students do not select Economics because they do not understand what it is and how it might be relevant to them. Indeed, until the COVID-19 pandemic, there had been a lengthy period in which Australian households were not exposed to a major economic contraction or the extensive economic reforms that were a feature of national debate in the 1980s and early 1990s, drawing less attention to the relevance of economics to everyday life. Third, the introduction of Business Studies to the New South Wales Higher School Certificate (HSC) in the early 1990s saw a large number of students take up the subject instead of Economics, with reports that Business Studies, which is more vocationally orientated, is perceived as being easier to learn and more helpful for employment (Figure 3).

Through this liaison, educators have provided valuable qualitative insights into some of the broad constraints on Economics enrolments. However, a comprehensive survey of students themselves was needed to gain quantitative evidence of the student demand-side factors contributing to the decline in Economics enrolments, and particularly the diversity trends. As such, the RBA commissioned a survey to ask students about how and why they choose subjects, as well as what is influencing their preference for Economics (in particular their perceptions of Economics).

The RBA-led survey also helps us fill a gap in the literature. It contains a unique primary source of data with which to examine the drivers of falling participation and diversity in economics.

Figure 3: Economics and Business Studies Enrolments in NSW
Year 12



Sources: NSW Education Standards Authority; RBA

Surveys (which vary in scale) of university students have found perceptions of economics to be largely negative (see Webber and Mearman (2012)). For students at Australian universities at least, economics is generally viewed as abstract, difficult, dull and boring, not relevant to the real world, lacking an ethical dimension, and not obviously associated with a high-profile profession or clear career path (Lewis and Norris 1997; Ward, Crosling and Marangos 2000; Azzalini and Hopkins 2002). At issue is the extent to which these perceptions are representative of high school students and have bearing on their subject selection.

Furthermore, while there are many studies that examine aspects of the relationship between students' characteristics and subject or careers choices, the fields of study are broadly defined. Economics is rarely separately identified. For example, studies (some of high school students and others of university students) have utilised large-scale datasets to draw associations between study choices and student characteristics. (For key Australian examples, see use of the Longitudinal Survey of Australian Youth by Fullarton and Ainley (2000), Fullarton *et al* (2003) and Thomson (2005)). Relatedly, there are many studies that seek to explore subject selection as part of a student's decision-making process when choosing a career. They have little to say, though, about choosing economics – either as a subject or a career (see Alloway *et al* (2004); Gore *et al* (2017); Jung and Young (2019)).

Consequently, despite there being a large body of literature that draws on surveys of students at different stages of their learning, no published research in Australia or internationally has drawn on surveys of high school students' perceptions of economics, or what determines their decision to study (or not study) economics in senior high school. This paper addresses 3 key questions:

1. Which school and individual characteristics are most strongly associated with choosing Economics?

2. What are students' perceptions of Economics?
3. What differences in perceptions of Economics exist by sex and socio-economic background?

The remainder of this paper is structured as follows. Section 2 describes the unit record survey data and administrative data that are used to estimate the model specifications that address our key questions. Section 3 describes each specification and the corresponding results, progressively controlling for more explanatory factors, shedding light on the scope for interventions and further avenues for research discussed in Section 4.

2. Data

2.1 Survey

The RBA collaborated with Ipsos to undertake the 'High School Students' Subject Selection Survey' of Year 10, 11 and 12 students in New South Wales in 2019. We chose to survey schools in New South Wales, rather than other states, as a rich set of school-level data is already available to the RBA about students in this state to supplement the analysis. There are also extensive permissions processes and logistical challenges that vary across the state education systems, which made it infeasible to survey multiple states in a timely way.

The overarching aim was to ensure that we generated a representative sample of the New South Wales Year 10, 11 and 12 student population for our analysis. The sampling frame (or relevant population) consisted of 770 schools in New South Wales after excluding institutions deemed out of scope or without approval to approach.³

The sample population was stratified at the school level to attain a sample with representative coverage of the government and non-government sectors, and metro and regional locations. A total of 51 schools completed the survey between July and September 2019.⁴ The schools fall within 8 strata, covering school sector (government or non-government), school type (co-ed, all girls or all boys) and location (metro or regional) (Table 1).

3 Schools deemed out of scope included distance education providers, TAFE (an Australian vocational education and training provider), international school campuses and schools without enrolment figures. Approvals were not obtained from the Catholic education office for all dioceses, and therefore 19 schools had to be excluded from the population.

4 All 770 schools in the sampling frame were given the opportunity to participate in the survey (i.e. were sent a pre-approach letter, followed by a recruitment phone call). A total of 90 schools were recruited, with 51 completing the survey. Fourteen schools expressed a willingness to participate but were unable to do so within the allocated fieldwork periods and 25 schools declined to participate post-recruitment. The most common reasons for declining post-recruitment included being unable to find a teacher to facilitate the research, or students being bound by other commitments that prevented completion within the specified fieldwork period.

Table 1: Sample of Schools

By stratum

	Population		Sample	
	Number	Percentage	Number	Percentage
Metro government all boys	20	3	1	2
Metro government co-ed	211	27	11	22
Metro government all girls	23	3	3	6
Metro non-government all boys	36	5	1	2
Metro non-government co-ed	165	21	16	31
Metro non-government all girls	44	6	1	2
Regional government	190	25	14	27
Regional non-government	81	11	4	8
Total	770	100	51	100

Sources: NSW Education Standards Authority; RBA

Each participating school was asked to administer the survey to as many Year 10, 11 and 12 students as they were willing. Schools were more willing to administer the survey to Year 10 students, compared with the senior years (Table 2). A total of 4,826 students completed the survey. The survey was completed in class by students on computers or devices under the supervision of a teacher.⁵ Responses identified as being from potential 'skimmers' (i.e. students who completed the survey in an implausibly short time) were excluded, yielding a final sample of 4,698 responses. The characteristics of the sample are broadly representative of the New South Wales (NSW) student population in terms of sex, school sector and geographical area (see Appendix A).⁶ Of Year 11 and 12 students in the sample, 10 per cent study Economics, consistent with the state-wide figures.

Table 2: Sample of Schools

By year and Economics status

Students surveyed from Years(s)	School teaches Economics in Year 11 and 12		Sample total
	Yes	No	
Year 10	19	26	45
Year 11	16	18	34
Year 12	14	18	32

Source: RBA

⁵ The average time taken to complete the survey was 10 minutes.

⁶ The analysis uses an 'imputed sex' variable (male/female) for respondents who reported non-binary genders or preferred not to identify their gender, to be consistent with the enrolments data (which are in terms of male/female). While the student survey asked about gender, the sample size for non-binary genders or those who preferred not to identify their gender was too small to run separate analyses.

The questionnaire design was informed by focus groups with Year 10, 11 and 12 students to ensure that the factors contributing to subject selection, and the drivers and barriers to selecting Economics, were adequately represented and in appropriate language.⁷ For Year 10 students, questions related to their subject selection intentions for Year 11 and 12.⁸ Students in Year 11 and 12 were asked to reflect on the reasons for choosing the subjects they did.

2.2 Administrative enrolments data

To enrich the unit record survey data, and establish the relative importance of school characteristics, we draw on administrative data provided by the NSW Education Standards Authority (NESA) for 2019. These data provide Year 12 Economics enrolments, the size of the total Year 12 cohort, the number of Year 12 subjects taught, and information about each schools sector (government or non-government), school type (co-ed, all girls or all boys) and location (metro or regional). The measure of socio-economic status used in this paper is the 2019 Index of Community Socio-Educational Advantage (ICSEA) score for each school.⁹ (This score is derived from a number of variables including parental education and occupation, the school's location and proportion of Indigenous students.)

3. Empirical Approach and Results

3.1 Which school and individual characteristics are most strongly associated with choosing Economics?

To ascertain the school and individual characteristics that are most strongly associated with choosing Economics, we consider a number of model specifications (Table 3).

7 The hypotheses generated from previous RBA analysis and liaison were too expansive to explore in a questionnaire. Furthermore, it was possible that some factors had yet to emerge. Groups were also used to glean any specific language used by students.

8 At the time of completing the survey, however, about a third of Year 10 students had already selected their subjects and 85 per cent had already started the subject selection process.

9 ICSEA is sourced from the Australian Curriculum, Assessment and Reporting Authority (ACARA) My School data. The 2019 scores can be found at <<https://www.acara.edu.au/contact-us/acara-data-access>>.

Table 3: Model Specifications

Dependent variable	Data	Method	Interpretation of coefficients
$EconSchool_j = 1$ if school j has at least 1 Economics student; 0 otherwise	Year 12 enrolments for all NSW high schools; administrative data	Probit	The effect of school characteristics on the likelihood of a school teaching Economics, all else equal. May reflect factors from the supply side (school's inclination to offer Economics as a subject choice) and demand side (student's inclination to choose Economics).
$EconShare_j = \frac{Econ\ enrolments_j}{HSC\ enrolments_j}$ where $Econ\ enrolments_j$ is the number of Economics enrolments and $HSC\ enrolments_j$ is the total number of Year 12 students (awarded a HSC) $EconShare_j > 0$ if $EconSchool_j = 1$; $EconShare_j = 0$ if $EconSchool_j = 0$	Year 12 enrolments for all NSW high schools; administrative data	Heckman	The effect of school characteristics on the proportion of students taking Economics, all else equal. Reflects demand-side factors (student's inclination to choose Economics).
$EconStudent_{ij} = 1$ if student i from school j is an Economics student; 0 otherwise $EconStudent_{ij} = 0$ if $EconSchool_j = 0$	Year 11 and 12 students in all sampled schools; survey data (supplemented with administrative school-level details matched to the student record)	Heckprobit	The effect of individual and school characteristics on the likelihood of a student choosing Economics, all else equal. Reflects demand-side factors (student's inclination to choose Economics).

Utilising administrative data on all schools in NSW, we first examine the importance of school characteristics for whether or not a school teaches Economics (Table 4, column (1)). For a school to be teaching Economics, both supply and demand conditions must be met: (i) they offered Economics as a subject choice (i.e. they were not constrained by a teacher/resource shortage); and (ii) students selected Economics (i.e. enough students chose Economics to meet a minimum class size). As such, the coefficients in our first specification (column (1)) may reflect factors from both the school supply side and student demand side. We find that schools are significantly more likely to teach Economics if they have a higher socio-economic status, a larger Year 12 cohort, teach a larger variety of subjects, or are all boys. For example, a 100 point (i.e. 1 standard deviation) increase in ICSEA is associated with a 16 percentage point increase in the likelihood of studying Economics, holding all other variables at their means. All else equal, school sector (government versus non-government) and location (regional versus metro) are not significant factors in the likelihood of a school teaching Economics.

Table 4: Likelihood of Studying Economics

	(1) <i>EconSchool_j</i>	(2) <i>EconShare_j</i>	(3) <i>EconStudent_{ij}</i>	(4) <i>EconStudent_{ij}</i>	(5) <i>EconStudent_{ij}</i>	(6) <i>EconStudent_{ij}</i>
Male			0.10**	0.09***	0.07**	0.07***
Bilingual			0.03	0.03	0.02	0.02
Interest					0.06***	0.05***
Understanding					0.09***	0.08***
ATAR					0.04	0.04
Non-government	0.02	-3.42***	-0.16**	-0.15*	-0.11	-0.11
Regional	-0.02	-1.62	0.13	0.10	0.08	0.06
ICSEA (/100)	0.16***	8.01***	0.14*	0.16**	0.09	0.13*
All boys school	0.25***	6.51***	-0.11	-0.05	-0.20	-0.10*
All girls school	0.05	-2.53***	-0.08	-0.06	-0.22*	-0.17***
Subjects taught	0.01***	0.04				
Subjects taught (ordinal)			-0.06	-0.04	-0.07	-0.04*
Year 12 cohort size (/100)	0.15***					
Constant		-76.69***				
Observations	768	768	1,995	1,238	1,141	719
of which selected		316	1,238		719	
Year(s)	12	12	11 & 12	11 & 12	11 & 12	11 & 12
Method	Probit	Heckman	Heckprobit	Probit	Heckprobit	Probit
Wald χ^2		31.32***	0.46		1.57	
School-clustered standard errors			Yes	Yes	Yes	Yes
Pseudo R^2	0.50***			0.13***		0.31***
Log likelihood		1,255.49***	-863.48		-481.11	
Notes:	Column (2) displays coefficients, all other columns display marginal effects; Wald χ^2 is the chi-squared from a Wald test of independence of the outcome and selection equations ($H_0 : \rho = 0$); *, ** and *** denotes statistical significance at the 10, 5 and 1 per cent levels, respectively					
Sources:	Australian Curriculum, Assessment and Reporting Authority; NSW Education Standards Authority; RBA					

To isolate the student demand side we examine variation in the proportion of students who take Economics (Economics enrolments as a share of the Year 12 cohort) within schools that offer Economics.¹⁰ We estimate a Heckman model to account for the selection effect of excluding schools where Economics is not offered. The size of the Year 12 cohort is used as an exclusion restriction. All else equal, larger schools are more likely to offer Economics, and we argue that the cohort size is unlikely to affect student demand for Economics. However, larger schools may offer a greater variety of subjects, which could affect student demand for Economics, so we include the number of subjects offered as an additional control in the selection and outcome equations. The Wald test of

10 The administrative data available do not allow us to identify schools where Economics was offered but not taught due to a lack of student demand. We instead take Economics being taught (at least one Economics student enrolled) as a proxy for Economics being offered.

independence of the selection and outcome equations confirms the significance of a selection effect (Table B1).

Isolating the student demand side, we find that higher socio-economic status is associated with increased demand for Economics amongst students (Table 4, column (2)); this suggests that the higher likelihood of Economics being taught at schools with higher socio-economic status (Table 4, column (1)) is not just attributable to school supply-side factors. Non-government schools experience lower demand for Economics relative to government schools, holding socio-economic status and other characteristics constant. Relative to co-ed schools, all boys schools are associated with greater student demand for Economics, and all girls schools are associated with less.

A key contribution of the student survey data is the ability to isolate the individual student characteristics from the schools' characteristics that relate to students' demand for Economics. We do this using the sample of students at schools that teach Economics, accounting for sample selection. We estimate a probit model with sample selection (heckprobit), using the size of the Year 12 cohort as an exclusion restriction (Table 4, columns (3) and (5)). The Year 12 cohort size in this model is a series of dummy variables representing size categories (rather than a continuous variable as used in the school-level estimation).¹¹ Standard errors are clustered by school accounting for the stratified approach to sampling.

The heckprobit estimation fails to reject the null hypothesis of independence of the selection and outcome equations; this is surprising given the significant selection effect identified using the administrative data on the population of schools (Table B1). This may reflect the lack of variation from using dummy variables rather than continuous variables when identifying the selection effect, or the smaller sample of schools included in the survey sample (particularly for Year 11 and 12 students; Table 2), rather than an absence of selection.¹² As a comparison, the model is estimated as a probit (without sample selection) using the sample of schools where Economics is taught (Table 4, columns (4) and (6)).

These estimates imply that males are more likely to choose Economics than females, even when controlling for school characteristics. This clarifies that the greater prominence of males in Economics (Figure 1) reflects differences by sex, and is not just a product of confounding school factors. We also control for bilingual status, as a proxy for ethnicity, though this is not significant. We find there is a greater likelihood of males and students from a higher socio-economic background studying Economics, even when controlling for other student characteristics (Table 4, columns (5) and (6)). For example, these results are robust to the inclusion of variables for perceived interest in Economics, perceived understanding of Economics, and whether they take into account how well a subject scales for the Australian Tertiary Admission Rank (ATAR).¹³

11 In matching the school-level information to the survey dataset, it was necessary for the HSC cohort size and number of subjects taught variables to be collapsed into 5 categories to prevent identification of individual schools in the dataset (a requirement of the ethics approval).

12 When we exclude the variable that controls for number of subjects, the results are qualitatively similar.

13 The importance placed on ATAR scaling relates to students' responses to what they consider when selecting subjects in general; see Livermore and Major (2020) for more details on factors students consider when selecting subjects. The results are also robust to the inclusion of controls for the other subjects studied.

We find that when controlling for perceived understanding and interest in Economics, the marginal effects of being male are reduced slightly but remain significant. This provides some indication that only part of the reason that males are more likely to study Economics than females is because they tend to be more interested or have a better perceived understanding of Economics. Including these variables also renders the marginal effect of school sector insignificant. A further analysis of differences in student perceptions is explored in the following section.

Overall, we conclude that students' demand for Economics is strongly associated with socio-economic background and sex, confirming that the aggregate picture of diversity in enrolments is not driven by any confounding factors that might have been at play.

3.2 What are students' perceptions of Economics?

A novel feature of the survey data is students' perceptions of Economics, regardless of whether or not they chose it, shedding light on the reasons for lower participation and diversity in Economics enrolments. We asked students to consider a range of statements about Economics, and to indicate the extent to which they agree or disagree with each on a five-point Likert scale (from 'strongly disagree' to 'strongly agree').

What positive perceptions do students have about Economics? Students typically believe that economics can be used for social good, isn't all about money and that an economics degree leads to a wide range of career options (Table 5). They also *do not* tend to believe economics is more of a career for men. Students typically believe they could do well at Economics in Year 11 and 12 and that it scales well for the ATAR. They perceive that Economics provides skills for everyday life. Interestingly, these positive perceptions are in contrast to findings from surveys of Australian university students (Lewis and Norris 1997; Ward *et al* 2000; Azzalini and Hopkins 2002).

What negative perceptions do students have about Economics? Students generally do not perceive Economics as interesting and have little desire to know more about it. Economics is perceived as having a heavier workload than most other Year 11 and 12 subjects. And while Economics is seen as providing skills and tools for everyday life, students generally indicated they prefer to study Business Studies because they think it will be more useful for their future and more interesting. These results are in line with insights from liaison and the revealed preference for Business Studies over Economics in enrolment data. While students perceive an economics degree to lead to a wide range of career opportunities, students are less likely to have a clear understanding of Economics (the subject) or the careers available if they were to choose Economics (as a subject).

Table 5: Perceptions of Economics – Descriptive Statistics

Short label	Full survey statement ^(a)	Net balance ^(b) (%)	Strong net balance ^(c) (%)
Understanding	I have a good understanding of what Economics is	6***	-3***
Interesting	I find Economics interesting as a subject	0	-4***
Could do well	I think I could do well in Economics if I put my mind to it	42***	16***
Clear idea of how good	I have a clear idea of whether I would be good at Economics	16***	2**
Want to know more	I want to know more about Economics	11***	1
Risk because I don't know	It's a risk to study Economics because I don't know what it's about	9***	3***
Teachers promote	There are teachers at my school who promote the study of Economics	15***	2***
Business easier	I would prefer to study Business Studies over Economics because I think it's easier	11***	3***
Business more useful	I would prefer to study Business Studies over Economics because I think it will be more useful for my future	26***	10***
Business more interesting	I would prefer to study Business Studies over Economics because I think it's more interesting	22***	9***
Clear idea of careers	I have a clear idea of the careers available to me if I were to study Economics	5***	-2***
Wide range of careers	An economics degree leads to a wide range of career options ^(d)	44***	11***
More a career for men	Economics is a career option for men more than women ^(d)	-21***	-16***
Need intelligence	You need to be intelligent to study Economics	20***	3***
Need maths	You need to be good at Maths to study Economics	34***	8***
Heavier workload	Economics is a subject that has a heavier workload in comparison to most other Year 11 and 12 subjects	30***	9***
Scales well for ATAR	Economics is a subject that scales well for the ATAR	40***	11***
Important	It's important to know about Economics in today's society	55***	17***
Skills for everyday life	Studying Economics will teach me skills and tools I can use in my everyday life	45***	11***
Used for social good	Economics can be used for social good ^(d)	50***	13***
Not all about money	Economics is not all about money ^(d)	30***	7***

Notes: *, ** and *** denotes statistical significance at the 10, 5 and 1 per cent levels, respectively

(a) Statements relate to the study of Economics in Year 11 and 12, unless indicated otherwise

(b) Share of respondents selecting 'Tend to agree' or 'Strongly agree' minus the share of respondents selecting 'Tend to disagree' or 'Strongly disagree'

(c) Share of respondents selecting 'Strongly agree' minus the share of respondents selecting 'Strongly disagree'

(d) Statement related to economics in general

Source: RBA

3.3 What differences in perceptions of Economics exist by sex and socio-economic background?

To investigate what attitudes and beliefs may underpin the difference in likelihood of studying Economics by sex and socio-economic background, we consider a model with the dependent variable $Perception_{ij}$, which takes the values '1 – Strongly disagree', '2 – Tend to disagree', '3 – Neither agree nor disagree', '4 – Tend to agree' or '5 – Strongly agree' for each perception statement. We estimate an ordered probit model with school-level and student-level variables. These questions are asked to Year 10, 11 and 12 students.

We find that females were less likely than males to 'have a good understanding of what Economics is', 'find Economics interesting as a subject' or 'want to know more about Economics' (Table 6). For example, males are 4 percentage points more likely than females to strongly agree with the statement 'I have a good understanding of what Economics is', holding all other variables at their means. Females are also less likely than males to feel 'I could do well in Economics if I put my mind to it' or 'have a clear idea of whether I would be good at Economics', and more likely to believe that Economics is 'a risk to study because I don't know what it is about'. Furthermore, female students perceived that teachers were less likely to promote Economics as a subject. Females were also more likely than males to perceive Business Studies as easier, more useful and more interesting than Economics. In terms of career development, females were less likely to have clear or positive perceptions of career opportunities from studying economics. However, females were less likely to perceive 'economics is a career option for men more than women'. Importantly, these findings remained even when accounting for whether schools did or did not offer Economics in their schools.

Many of these trends were also present for students in schools with a lower socio-economic background (compared with higher socio-economic). In particular, students from a lower socio-economic background are less likely to feel 'I could do well in Economics if I put my mind to it' or 'I have a clear idea of whether I would be good at Economics'. Students from a lower socio-economic background were also less likely to 'have a good understanding of what Economics is', or have a clear perception of career opportunities from studying economics. These students are more likely to believe that 'it is a risk to study Economics because I don't know what it's about'.

The finding that students who are female (compared with male) and from a lower socio-economic background (compared with higher socio-economic) are less likely to 'have a good understanding of what Economics is' is one possible reason for differences in other perceptions about Economics. If this were the case, it would imply that interventions that increased understanding would be an efficient way to eliminate gaps in perceptions more broadly. To further investigate the relationship between understanding and perceptions, we re-estimate the regressions controlling for students' perceived understanding of Economics.

Table 6: Perceptions of Economics – Regression Results

Average marginal effects of ordered probit

	Understanding	Interesting	Could do well	Clear idea of how good	Want to know more	Risk because I don't know	Teachers promote	
Male	0.04***	0.05***	0.05***(a)	0.04***	0.04***(a)	-0.03***	0.03***(a)	
ICSEA (/100)	0.01***	-0.00	0.03***	0.01**(a)	-0.01	-0.03***	0.05***	
Bilingual	0.02***	0.05***	0.06***	0.02**	0.05***	0.01	0.02	
Non-govt	-0.02***	-0.00	0.02	0.00	-0.00	0.02***	-0.05**	
All boys school	0.02***	0.04***	0.09***	0.02	0.06***	-0.02	0.03	
All girls school	-0.01	-0.01	-0.01	-0.00	-0.01	0.00	-0.01	
Observations	3,897	3,708	3,812	3,463	3,998	3,839	3,547	
Pseudo R^2	0.014	0.017	0.020	0.011	0.012	0.007	0.018	
	Business easier	Business more useful	Business more interesting	Clear idea of careers	Wide range of careers	More a career for men		
Male	-0.03***	-0.05***	-0.05***	0.04***	0.02**(a)	0.02***		
ICSEA (/100)	-0.01	-0.03***	-0.02	0.01**(a)	0.01	-0.01***		
Bilingual	0.02**	0.01	-0.00	0.03***	0.03**	0.01*		
Non-govt	0.00	0.02	0.01	-0.02*	0.02	-0.01		
All boys school	-0.01	-0.00	-0.00	0.04***	0.05***	0.01		
All girls school	0.03***	0.01	0.02	0.01	0.01	0.00		
Observations	3,605	3,691	3,705	3,561	3,290	3,624		
Pseudo R^2	0.005	0.005	0.004	0.015	0.008	0.005		
	Need intelligence	Need maths	Heavier workload	Scales well for ATAR	Important	Skills for everyday life	Used for social good	Not all about money
Male	0.01	-0.00	-0.00	0.01	0.02	0.01	0.01	-0.01
ICSEA (/100)	0.00	-0.01	0.01	0.01	0.02*(a)	0.01	0.01	0.01
Bilingual	0.01**	0.03***	0.03***	0.04***	0.05***	0.02*	0.04***	0.04***
Non-govt	-0.01	-0.00	-0.00	0.00	0.01	0.03**	0.02	0.00
All boys school	0.00	-0.02	0.06***	0.06***	0.03*	0.04**	0.05***	0.02
All girls school	0.00	0.01	0.01	0.01	-0.01	0.00	-0.02	-0.01
Observations	3,749	3,649	3,028	2,796	3,812	3,698	3,525	3,479
Pseudo R^2	0.001	0.004	0.008	0.009	0.007	0.005	0.010	0.004

Notes: Calculated at '5 – Strongly agree'; results are robust to calculating at '1 – Strongly disagree'; *, ** and *** denotes statistical significance at the 10, 5 and 1 per cent levels, respectively; robust standard errors clustered at the school level

(a) 'Male' or 'ICSEA' effect is no longer statistically significant when controlling for perceived understanding of Economics

Sources: Australian Curriculum, Assessment and Reporting Authority; NSW Education Standards Authority; RBA

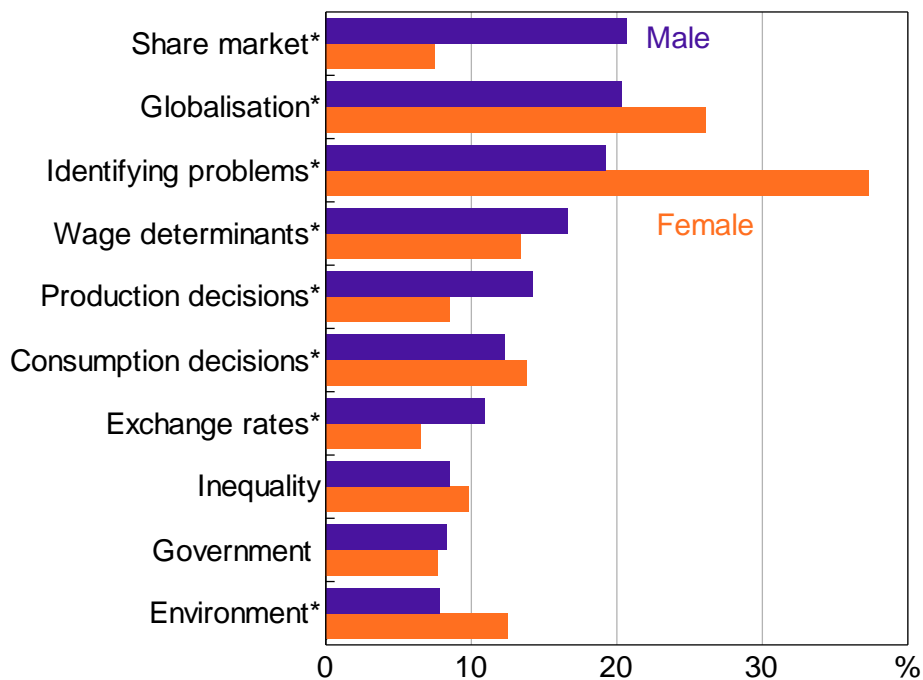
Some of the differences between sex and socio-economic background are no longer statistically significant once accounting for perceived understanding (see results with (a) superscript in Table 6). In particular, accounting for a lower perceived understanding of Economics eliminates the sex difference in the desire to 'want to know more about Economics', students' perceptions of teachers promoting Economics as a subject, and perceptions that 'an economics degree leads to a wide range of career options'. Similarly, controlling for a lower perceived understanding of Economics eliminates differences between students from different socio-economic backgrounds in clarity of career opportunities from studying economics.

There still remains, however, a gap to be closed. Females are less likely than males to 'have a clear idea of whether I would be good at Economics' or 'have a clear idea of the careers available to me if I were to study Economics', and students from a lower socio-economic background are less likely to feel 'I could do well in Economics if I put my mind to it'. It remains that females and students from a lower socio-economic background are more likely to believe that it is 'a risk to study Economics because I don't know what it's about' and have favourable perceptions of Business Studies. Furthermore, students from a lower socio-economic background are less likely to report that teachers at their school promote the study of Economics. And it also remains that males are more likely to find Economics interesting, controlling for a lower perceived understanding of Economics.

To shed light on whether the nature of the topics included in the Year 11 and 12 Economics syllabus appeal more to males than females, the survey gave students a list of Economics topics (based on the Economics syllabus) and asked them to select the 2 that were most interesting. The data reveal that females and males do differ in the topics they find most interesting (Figure 4). In particular, female students were more likely to cite 'identifying problems', whereas male students were more likely to cite the 'share market'.

Figure 4: Topics of Interest

Share of Year 10–12 students



Note: * denotes statistically significant difference at the 5 per cent level after controlling for school type, socio-economic status and language

Source: RBA

4. Discussion and Implications

This paper provides an evidence base for those engaged in Economics education – and the economics profession more broadly – to promote participation and diversity in the study of Economics. The results may also inform how educators and career advisors communicate with students about subject choices in general and Economics in particular.

High school students in our Australian survey typically have positive perceptions of economics as a field; they think that economics is used for social good and not just all about money. This implies that the core elements of economics have broad appeal. However, the perceptions of Economics as a Year 11 and 12 subject tend to be negative; for example, that Economics is not interesting, has a heavier workload than most other Year 11 and 12 subjects, and is less useful than Business Studies. A challenge in increasing overall enrolments in Economics is to build interest, relevance and understanding to motivate high school students to study Economics.

We find that socio-economic status is the key school characteristic associated with the likelihood of a student studying Economics, while sex is the key student-level characteristic. That is, students are more likely to study Economics if they are male or in a school with a higher socio-economic status. Differences in perceptions between both students of different socio-economic backgrounds and sexes reveal underlying attitudinal factors that are reflected in the divergent likelihood of studying Economics.

Importantly, females (compared with males) and students from a lower socio-economic background (compared with higher socio-economic) are less likely to perceive they 'have a good understanding of what Economics is'. A greater perceived understanding of what Economics is about also reduces some of the sex and socio-economic differences, such as the desire to know more about Economics, perceptions of teachers promoting Economics, and clarity of career opportunities. This implies that one possible intervention to address diversity deficits in Economics is to improve students' understanding of what Economics entails. Further research may test various informational interventions to establish which content and medium work best to improve perceived understanding of Economics.

Even controlling for perceived understanding, however, females are less likely to 'have a clear idea of whether I would be good at Economics' and students from a lower socio-economic background are less likely to feel 'I could do well in Economics if I put my mind to it'. Without data to control for actual academic ability, it is not clear whether these differences reflect accurate assessments of ability, opportunity to do well or a lack of confidence (for a given level of ability). Nevertheless, this result implies that interventions that only provide information (i.e. increase understanding of what Economics is) are not enough to equalise perceptions and participation in Economics. Further research, that disentangles actual ability to do well in Economics from perceived ability to do well, would shed light on the relative merits of interventions that focus on developing relevant skills and those that focus on boosting confidence in the skills already held.

We also find that males are more likely to find Economics interesting (even controlling for perceived understanding). This may reflect an inherent difference in interest in economics between the sexes. Or it may reflect that the nature of the topics included in the Year 11 and 12 Economics syllabus appeal more to males than females; we find evidence that specific topics of interest do differ between

the sexes. Further work may examine how well the Economics syllabus aligns with the interests of female students.

While this paper examines data for NSW students, future research may investigate perceptions of Economics according to the stage at which students are exposed to it (with the stage at which economics content is introduced to students varying by state, with some including it as a compulsory part of the junior high school curriculum). Further work may also evaluate the effectiveness of interventions at different stages of learning.

5. Conclusion

This paper has established novel quantitative evidence of the factors contributing to the decline in high school Economics enrolments and the accompanying fall in diversity of the Economics student population. This evidence base, and resulting interventions, are a stepping stone to promoting economic literacy amongst the population and cultivating a pipeline of future economists who are more representative of society.

Appendix A: Sample Characteristics

Table A1: Sample by Student Characteristics

	Students in:		
	Sample		Population
	Number	Proportion (%)	Proportion (%)
Year			
10	2,677	55	36
11	1,297	27	34
12	852	18	30
Sex			
Male	2,176	45	50
Female	2,443	51	50
Speaks another language other than English at home			
Yes	1,561	32	35
No	3,088	64	65
Studies Economics (Year 11 or 12 only)^(a)			
Yes	189	9	9
No	1,960	91	91
Total sample	4,826		
Total completes	4,698		

Notes: Categories do not sum to total where responses fall into an 'unknown' or 'prefer not to say' category

(a) Population proportion is based on Year 12 enrolments only

Sources: NSW Education Standards Authority; RBA

Table A2: Sample by School Characteristics

	Students in:		
	Sample		Population
	Number	Proportion (%)	Proportion (%)
School sector			
Government	2,705	56	59
Non-government	2,121	44	41
School type			
Co-ed	3,586	74	82
All boys	578	12	7
All girls	662	14	11
Selective type			
Selective	73	2	
Non-selective	4,753	98	
Area			
Metro	3,756	78	78
Regional	1,070	22	22
Index of Community Socio-Educational Advantage (ICSEA)			
Quartile 1 (lowest)	605	13	28
Quartile 2	1,373	28	22
Quartile 3	679	14	25
Quartile 4 (highest)	2,169	45	25
Total sample	4,826		
Total completes	4,698		

Note: Categories do not sum to total where responses fall into an 'unknown' or 'prefer not to say' category

Sources: Australian Curriculum, Assessment and Reporting Authority; NSW Education Standards Authority; RBA

Appendix B: Selection Model Results

Table B1: Likelihood of Studying Economics – Selection Models

	Coefficients					
	(2)		(3)		(5)	
	Selection <i>EconSchool_j</i>	Outcome <i>EconShare_j</i>	Selection <i>EconSchool_j</i>	Outcome <i>EconStudent_{ij}</i>	Selection <i>EconSchool_j</i>	Outcome <i>EconStudent_{ij}</i>
Male			0.06	0.46***	0.08	0.31**
Bilingual			0.10	0.15	0.07	0.07
Interest					-0.12*	0.27***
Understanding					0.10	0.37***
ATAR					0.11*	0.17
Non-government	-0.07	-3.42***	-0.24	-0.72**	0.10	-0.46
Regional	-0.10	-1.62	-0.35	0.59	-0.28	0.34
ICSEA (/100)	0.96***	8.01***	1.20*	0.64	0.93	0.39
All boys school	1.20***	6.51***	7.00***	-0.51	8.27***	-0.85
All girls school	0.12	-2.53***	-9.75***	-0.36	-11.87***	-0.95***
Subjects taught	0.03***	0.04				
Subjects taught (ordinal)			0.85**	-0.25	0.79*	-0.31*
Year 12 cohort size (/100)	0.67***					
Year 12 cohort size (dummies)						
Fewer than 27 students			-0.43		-0.68	
61–91 students			-0.84		-1.03	
92–134 students			3.39**		4.60***	
135 or more students			12.87***		15.93***	
Constant	-11.59***	-76.69***				
Observations	768		1,995		1,141	
Of which selected	316		1,238		719	
Year(s)	12		11 & 12		11 & 12	
Method	Heckman		Heckprobit		Heckprobit	
ρ			-0.40		-0.60	
Wald χ^2	31.32***		0.46		1.57	
School-clustered standard errors			Yes		Yes	
Log likelihood	-1,255.49***		-863.48		-481.11	

Notes: Wald χ^2 is the chi-squared from a Wald test of independence of the outcome and selection equations ($H_0: \rho = 0$); Log likelihood is the pseudolikelihood; *, ** and *** denotes statistical significance at the 10, 5 and 1 per cent levels, respectively

Sources: Australian Curriculum, Assessment and Reporting Authority; NSW Education Standards Authority; RBA

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