

The Transition from High School to University Economics

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Abstract

To promote economic literacy and ensure the long-term health of the economics discipline, it is important to address the sharp decline in the size and diversity of the economics student population. Administrative data from the University Admissions Centre (UAC) provides information about how students transition from high school to university economics. These pathways suggest that interventions to increase the number and diversity of students studying economics in Year 12 can strengthen the pipeline of students into university economics. Interventions to improve the economic literacy of Year 12 economics students who are less socially advantaged are important to encourage more diversity in university economics; in contrast, female students appear to need less academic support and may instead benefit more from tailored interventions that pique their interest in and confidence with economics. More advocacy of economics should also increase its uptake at university, particularly among students already studying economics and/or a STEM subject in Year 12 and higher performers.

Introduction

The size and diversity of the economics student population has declined sharply in recent decades (Dwyer 2017 and Livermore and Major 2020). Addressing this decline is important for promoting economic literacy in the wider community and ensuring the long-term health of the economics

discipline. And as many of those who study economics determine public policy, there are wider social benefits when these decision-makers are broadly representative of society (Brainard 2017). Consequently, in 2016, the Reserve Bank established a public education program to support economics educators and students, both at the high school and tertiary level. This article looks at how students

transition from high school to university and identifies the characteristics of those who choose to study economics at university (and those who do not). Using these data it proposes interventions to improve engagement with economics and economic literacy, particularly among groups that are important for the program’s diversity objectives, to help encourage a larger and more diverse pool of students to study economics at university.

The public education program provides economics content for students and educators, professional development activities for educators and a pool of Bank speakers (Ambassadors) to deliver economic talks and events for students around Australia. The program’s content and events have 2 broad aims: literacy and advocacy. The literacy aspects of the program primarily aim to improve students’ and teachers’ understanding of economic concepts and provide information about conditions in the Australian and global economies. The advocacy part of the program aims to influence students’ decision-making about further study and/or a career in economics. It highlights the relevance of economics as an area of study that can lead to a diverse range of career paths.

To date, the research and liaison activities which inform the Bank’s education program have looked at students studying economics at high school separately from those studying it at university. However, these populations are not independent because a secondary education is a prerequisite for entry into university. Students’ exposure to economics is a fluid journey with multiple entry and exit points (Figure 1). Moreover, it is the transition between different parts of the journey where the

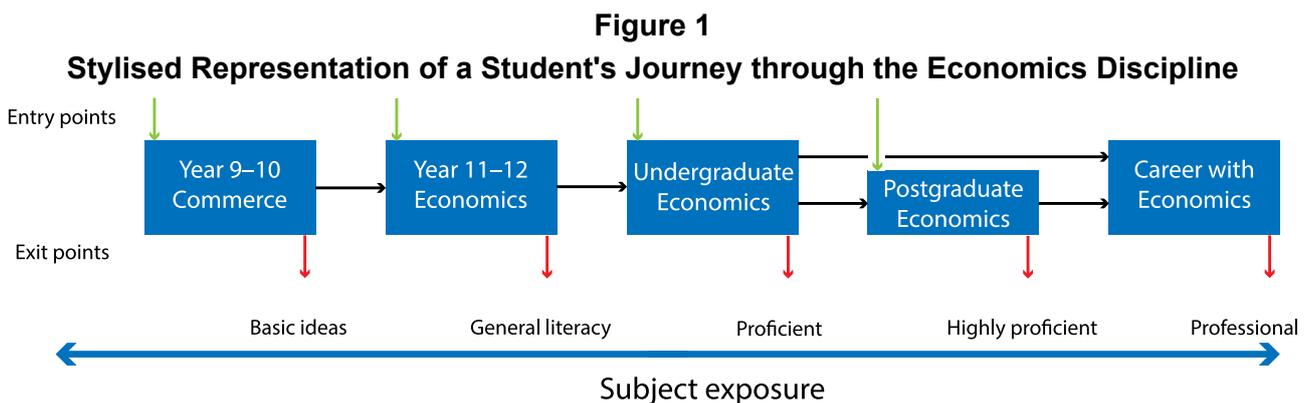
Bank’s education program can have the greatest impact, because it can influence a specific decision students must make on whether to enter, exit or continue in the discipline.

A new administrative dataset from the University Admissions Centre (UAC) sheds light on how students studying economics (or not) at high school transition to studying economics (or not) at university. It includes data on students’ performance and study choices in Year 12, students’ preferences for university courses and demography. These data help to build a profile of the students who populate the pipeline from high school into university economics. They also provide insights into why some students choose not to study economics at university, especially among those who express some interest in doing so.

University admissions data

Gaining admission into university

Understanding the data that describe the transition of Year 12 students from high school to university requires some background on the university admissions process. UAC is responsible for processing most admissions to undergraduate courses at participating institutions (which are mainly universities located in NSW and the ACT). For Year 12 students, admission is primarily based on a student’s results in the Higher School Certificate (HSC), which are used to calculate their Australian Tertiary Admissions Rank (ATAR). The ATAR is a number between 0.00 and 99.95 that measures a student’s position relative to all of the students in their age group. For example, an ATAR of



80.00 means that a student is ranked 20 percentage points below the top of their age group (University Admissions Centre 2021).

Admission to most university courses is determined by a student achieving a minimum selection rank, which equals the student’s ATAR plus any adjustment factors for which the student is eligible.^[1] Students submit a set of ordered preferences for university courses to UAC. For a given preference, if a student’s selection rank is above a threshold set by the institution and there are places available in the course, an offer is made to the student. Once an offer is made, no further preferences are considered for that student.^[2] After students have accepted an offer, they can approach the university to enrol in the course. At the end of the admissions process, UAC publishes the lowest selection rank that was required for entry into each course, known as the ‘cut-off’.^[3]

UAC has combined the administrative data collected during the admissions process (depicted in Figure 2) with students’ study patterns in Year 12, performance in the HSC and demography to form a rich dataset tracking how students transition from high school to university.^[4]

Which university courses are economics courses?

Unlike high school where students study discrete well-defined subjects, university students undertake courses which often cover a diverse range of individual subjects or subject matter. So how does the UAC dataset capture whether a student is studying economics at university? Ideally, it would capture any student who completes a threshold level of economics, such as a major. A major in economics can be undertaken in a number of courses. However, measuring the students taking an economics major is not possible in these data

because universities only provide UAC with the course in which applicants enrol. Instead, the proxy for an economics major in this dataset is the dedicated economics courses offered by universities. Furthermore, our dataset also includes information on enrolments in the related courses of commerce, finance and business (hereafter referred to as commerce) in which students can take an economics major.

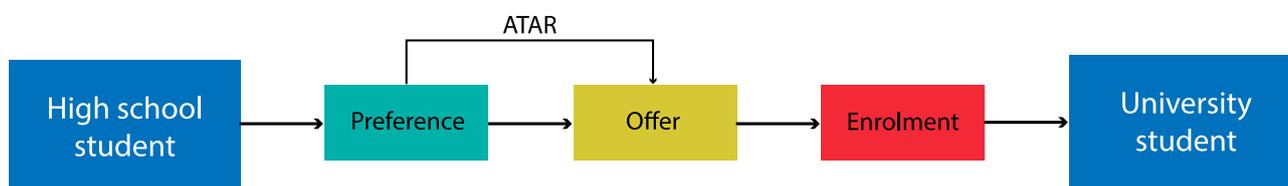
Breaking down the transition from high school economics to university economics

University preferences, offers and enrolments

Based on the admissions process, students can have 4 types of interactions with a particular university course. Their interaction reflects the furthest stage of the enrolment process that they reached: did not preference a course; did preference a course; offered a place in a course (but did not enrol); and enrolled in a course.^[5] These categories form a hierarchy that can proxy for a student’s interest in a university course.

We find that interest in economics at university is low, even for those who studied it in Year 12. Almost two-thirds of Year 12 economics students, and around 95 per cent of other Year 12 students, applying to UAC *did not* preference an economics course for university (Graph 1). Low interest in economics courses could be because universities offer relatively few dedicated economics courses, economics courses are seen as more specialised than other courses, or because there is low engagement with economics. Interest in university commerce courses is much higher than for economics, especially among Year 12 economics students (Graph 2). This could be because commerce courses have broad scope, are offered at

Figure 2
Transitioning from High School into a University Course



a wider range of universities than economics courses and are perceived to make graduates highly employable.

Nevertheless, studying economics at school is still an important pathway for doing so at university. On average, around 10 per cent of Year 12 economics students enrolled in a dedicated economics course at university while 30 per cent enrolled in a commerce course. For both course types these rates of enrolment are much higher than for students who did not study Year 12 economics. Students who study economics in Year 12 also demonstrate more of an interest in studying economics or commerce at university than other Year 12 students by receiving an offer to enrol in it or including it as a preference.

Importance of Year 12 economics students for the university pipeline

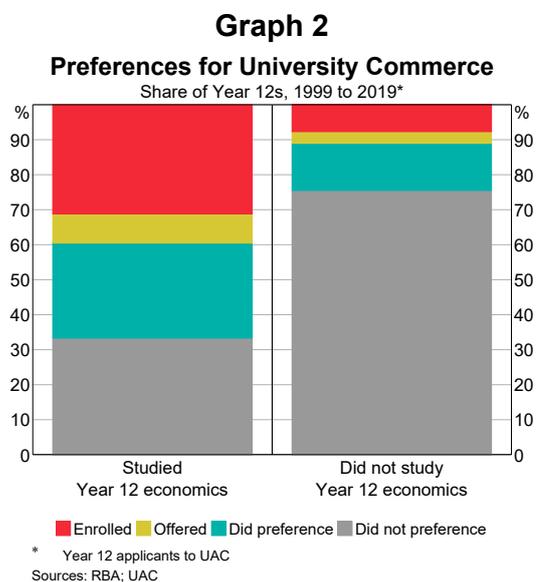
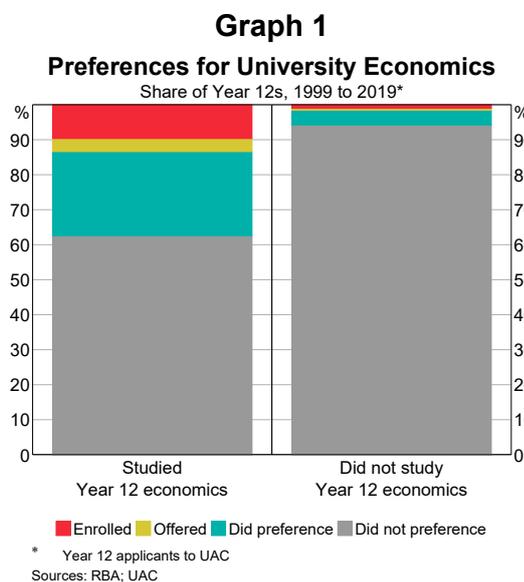
Although students who studied economics in Year 12 have a much higher rate of enrolment in university economics than other Year 12 students, it is important to consider the pathway of *all* Year 12s who go on to enrol in university economics. This is because Year 12 economics students make up only a very small (and declining) share of the students who apply to university through UAC each year, and because studying economics at high school is not a prerequisite for doing so at university.

Despite being a small group, Year 12 economics students make an important contribution to the

pipeline of students enrolling in economics and commerce courses. Around 60 per cent of high school students who enrol in university economics studied economics in Year 12 (Graph 3). Of the high school students who enrol in commerce courses, around 35 per cent studied economics in Year 12.

Outside of economics, STEM (Science Technology Engineering Mathematics) students made up most of the remaining pool of students who enrol in economics at university (Graph 3).^[6] In total, around 90 per cent of high school students who enrol in university economics studied a STEM subject in Year 12 and/or economics. (A similarly high share is found for those who enrolled in commerce courses.)

Graph 4 shows enrolments in university courses over time. Studying economics in Year 12 has become more common among university economics students over the past 20 years or so and has been matched by a corresponding decline in the share of students who studied a STEM subject, but not economics, in Year 12. In contrast, the share of students who did not study either a STEM subject or economics in Year 12 is little changed in economics courses, but has increased significantly in commerce and other university courses (Graph 4). Together these data highlight that Year 12 economics students are increasingly important for the pipeline into university economics and also the particular challenge that



the economics discipline faces in attracting students from the broader student population.

Enrolment gaps

A student who did not enrol in an economics course at university may have not done so because they did not obtain the necessary selection rank (a 'performance gap'), or because they were not interested enough in the subject (an 'interest gap'), or both. Taken together, these two drivers make up an (unobservable) 'enrolment gap'. The two drivers are likely to be correlated: a student who is interested in a subject is more likely to work harder and so perform better; conversely, a student who

performs (or expects to perform) well in a subject is more likely to feel successful enough to pursue further study in it.

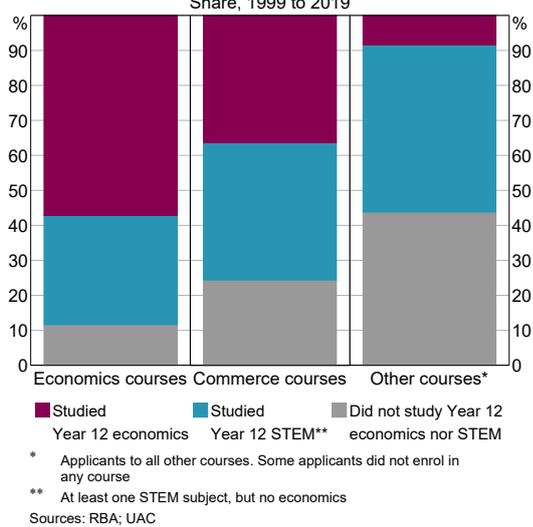
Performance gaps and interest gaps could both be reduced by a suitable education intervention, such as the literacy and advocacy aspects of the RBA's education program. Interventions targeting literacy are more likely to narrow performance gaps, while advocacy could boost interest, and therefore performance indirectly. Both forms of intervention could spur a student who would not otherwise have done so to enrol in a university economics course.

Year 12 economics students

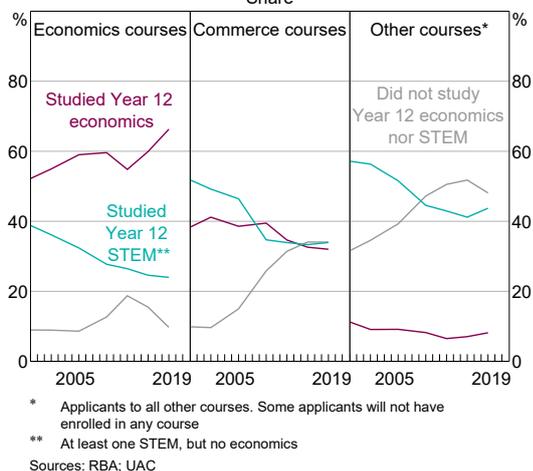
Year 12 economics students who scored highly enough to receive a place in a university economics course, but did not enrol, only had an interest gap to close. This includes all of the students who were offered a place in an economics course, but chose not to enrol, as well as any others who scored highly enough to receive an offer (and may or may not have included an economics course among their preferences). Interventions targeting economics advocacy and careers, as opposed to those that target economic literacy, are likely to be most helpful for this group. For students who did not score highly enough to receive a place in an economics course, the enrolment gap contains a performance and possibly an interest component. All interventions are helpful for this group, though the enrolment gap is likely to be larger in absolute terms and progress may be required on both fronts. Closing the performance gap is more challenging than closing the interest gap, since economics is only one of the high school subjects that contributes to a student's ATAR.

Graph 5 shows performance outcomes for Year 12 economics students, based on their preference for an economics course. The dashed line represents the cut-off for enrolment into economics courses, weighted by enrolments in each course. Students who showed an interest in university economics (did preference, offered or enrolled) performed better than their peers (did not preference), in both Year 12 economics and the ATAR.

Graph 3
Enrolments in University Courses
Share, 1999 to 2019



Graph 4
Enrolments in University Courses
Share



Both the performance gap (Graph 6) and interest gap (Graph 7) varied by demography and in many cases were smaller for more socially advantaged groups. 'Socially advantaged' encompasses students from non-government (Independent and Catholic) schools, central Sydney schools and families whose parents had a university education.^[7] Economics students from government schools, males, and students from outside of central Sydney performed less well than other students and were also more likely to have a performance gap (Graph 6). The performance gap was largest among students from (non-selective) government schools. At the same time, Graph 7 shows that Year 12 economics students who showed an interest in university economics (and so had a smaller interest gap) were more likely to come from a socially advantaged background or be male.

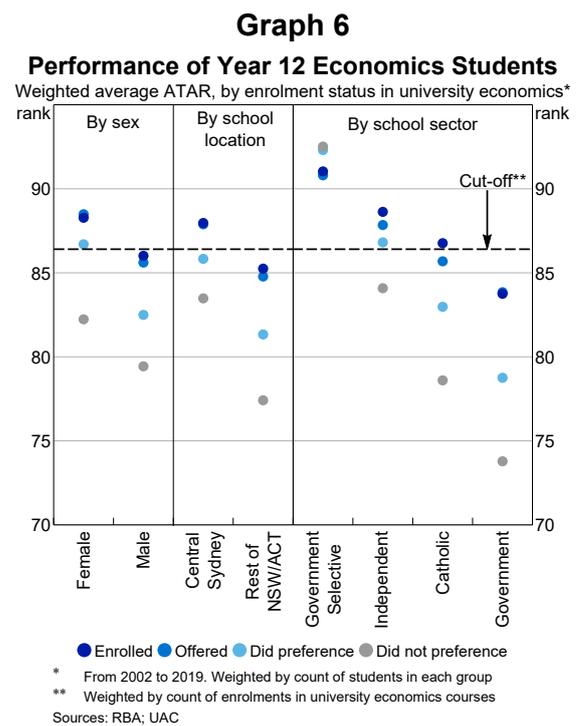
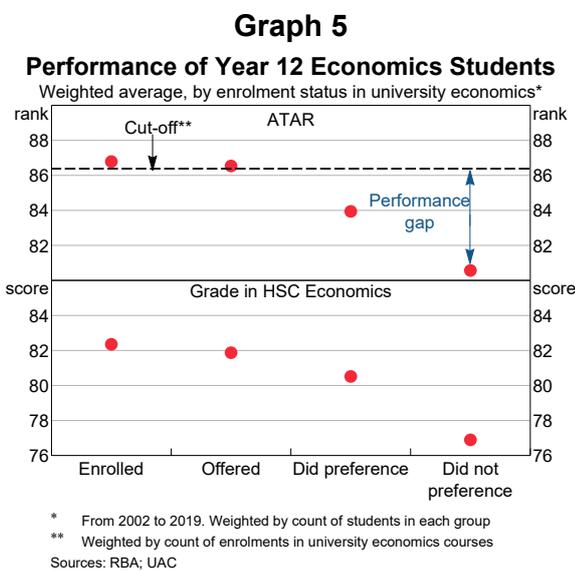
Despite showing less interest and a lower rate of enrolment into university economics, females consistently outperformed males (in Year 12 economics and overall) and as a result were much less likely to have a performance gap (Graph 6). Though this accords with the general performance of female students in the HSC, outperformance is larger for female economics students. This finding is perhaps surprising given the large decline in female students studying economics and a lack of confidence with economics observed among females in the RBA student survey (Livermore and Major 2020). A larger

interest gap among females than males (Graph 7) might have arisen because of factors such as females' (subjective) lack of confidence in their ability to do well in economics, higher perceived risks because of a lack information about economics and fewer clear perceptions of career opportunities from studying economics (Livermore and Major 2020).

Other Year 12 students

Similar to Year 12 economics students, other students in Year 12 who did not have a performance gap tended to come from a socially advantaged background and/or be female (Graph 8). Students who studied a STEM subject in Year 12 were also less likely to have a performance gap than Year 12s who did not study STEM or economics (Graph 8).

Students who took a STEM subject in Year 12 (but not economics) make a non-trivial contribution to the pipeline of students studying economics at university, though their decline in importance implies that an interest gap may have emerged among some types of STEM students where it did not exist before (Graph 4). Only a small share of STEM students ever show an interest in studying economics at university, comparable to the share of



interested students who do not study economics or STEM subjects (Graph 9). This does not necessarily mean that STEM students do not have the potential to show interest in economics. Rather, it probably just means that students taking STEM subjects are a large, multi-disciplined group who consider a wide range of options for university study.

Implications for the Bank’s public education interventions

Advocacy and literacy interventions each have a role to play in encouraging Year 12 students to consider economics at university. Aiming for a larger and more diverse cohort of Year 12 economics students is a key priority of the Bank’s public education program. Even though this pool of students has been diminishing, they have a higher rate of enrolment in university economics than do other students and make up a large and growing part of the pipeline from high school to university. Therefore, interventions that advocate Year 12 economics to younger students are valuable, especially as they may also lead to a narrowing in a student’s enrolment gap for university economics.

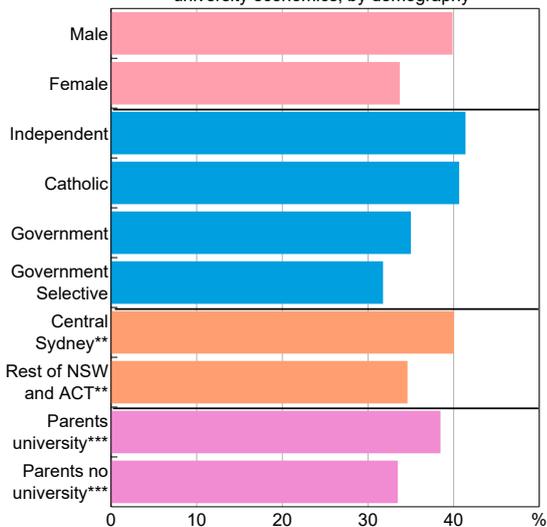
Literacy interventions are helpful for all Year 12 economics students, but are most relevant for

students with a performance gap. As a result, they are likely to be most effective when delivered to students who are important for increasing the diversity of the economics student population (aside from females), because these students are more likely to have a performance gap to overcome. Particular effort is required in this group

Graph 7

Preferences for University Economics

Share of Year 12 economics students interested in university economics, by demography*

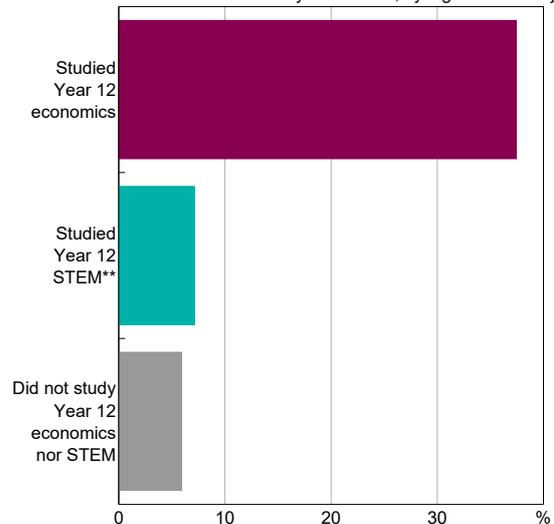


* Interest is defined as students who enrolled, were offered or did preference a university economics course. Between 1999-2019
 ** Location of high school
 *** At least one parent with a Bachelor’s degree or higher
 Sources: RBA; UAC

Graph 9

Preferences for University Economics

Share interested in university economics, by high school subject*

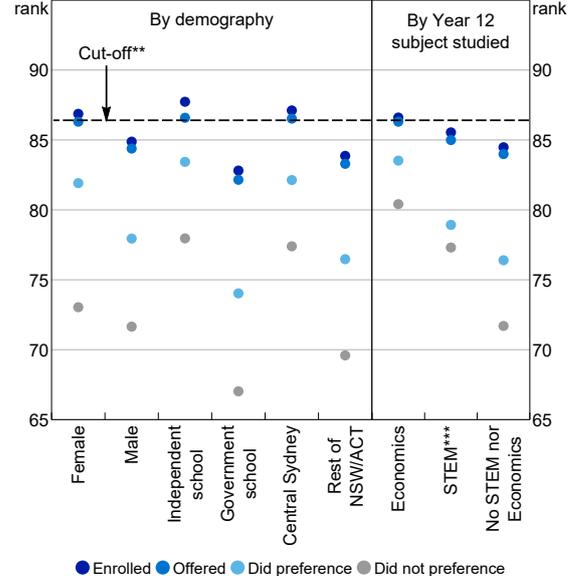


* Interest is defined as students who enrolled, were offered or did preference a university economics course. From 1999 to 2019
 ** At least one STEM subject, but no economics
 Sources: RBA; UAC

Graph 8

Performance of Year 12 Students

Weighted average ATAR, by enrolment status in university economics* rank



● Enrolled ● Offered ● Did preference ● Did not preference
 * From 2002 to 2019. Weighted by count of students in each group
 ** Weighted by count of enrolments in each university economics course
 *** At least one STEM, but no economics
 Sources: RBA; UAC

to both close the performance gap and encourage engagement with economics, and is central to increasing economic literacy in the wider community.

All Year 12 students may respond to advocacy interventions that encourage engagement with economics, especially those with a smaller overall gap to enrolment. A key area where the education program could address its diversity goal is by conducting more advocacy tailored specifically to females, as female students appear to need less academic support than males. For instance, this could involve leveraging our female Ambassadors as role models (Porter and Serra 2020, Li 2018). Those who take economics in Year 12 and those who come from socially advantaged backgrounds appear to have the smallest enrolment gap to overcome (in both performance and interest terms) and may be more responsive than others to advocacy interventions. As a result, advocacy to this

group is likely the easiest path to increasing total enrolment numbers – but not diversity.

Students who study STEM subjects (but not economics) may also be influenced by advocacy interventions. These could focus on raising awareness about economics, particularly among those who are currently not receiving information about it (Bayer, Bhanot and Lozano 2019, Chambers *et al* 2021). For instance, advocacy interventions could highlight economics as a career that pays well (Guttmann and Bishop 2018), offers opportunities to solve complex problems in a similar fashion to engineering and maths, and shapes policy that meaningfully affects society.

An awareness of the size and composition of enrolment gaps among students can help the Bank further develop its public education program to best serve specific groups of students, based both on their needs and on the strategic objectives of the program. ✖

Footnotes

- [*] The author is from the Information Department and would like to thank Helen Tam from the University Admissions Centre for her assistance in putting together the data used in this article.
- [1] For example, students may qualify for an adjustment to their ATAR if they have a disadvantage or perform well in a particular subject. While the selection rank determines admission to most university courses, there are some exceptions (such as university courses where an interview is also required). Some students may also apply for admission directly to universities, which is outside the UAC system.
- [2] Within an offer round. There are multiple rounds of offers and students are free to adjust their preferences throughout the admissions process. If a student adjusts their preferences between offer rounds, they may then receive multiple offers.
- [3] Institutions can choose which adjustment factors they allow for a particular course, so a student's selection rank will differ across courses and/or institutions. As a result, our dataset includes data on ATARs, rather than selection ranks, to allow for like-for-like comparison across courses and institutions.
- [4] These data are limited to high school students who finish Year 12 and apply to university through UAC. We cannot assess the profile of other students enrolling in university economics (including those who enrol outside of the UAC system). Partial data on UAC applicants that do not transition from high school straight into university suggests that the pipeline from high school is the most important group for university economics courses.
- [5] Students are considered to have included a university course as a preference if it was in their top 5 choices at some point during the admissions cycle.
- [6] STEM subjects include advanced mathematics (plus extensions 1 and 2), chemistry, physics, engineering studies, information processes and technology and software design and development.
- [7] The definition of central Sydney in the dataset encompasses all of the inner ring of Sydney and parts of the middle ring with a number of suburbs with high socio-economic status. Areas included are *City and Inner South, Eastern Suburbs, Inner South West, Inner West, North Sydney and Hornsby, Northern Beaches, Ryde* (at the Statistical Area 4 level).

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