

Curtin Business School
The John Curtin Institute of Public Policy

**Equity Policy and Participation in
Australian Higher Education**

Paul Malcolm Koshy

**This thesis is presented for the Degree of
Doctor of Philosophy of
Curtin University**

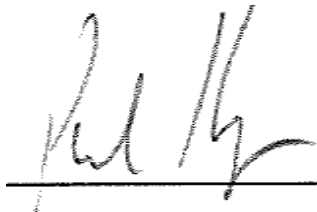
September 2018

DECLARATION

This thesis is comprised of research publications and an exegesis which constitute an original doctoral research program by publication.

The six refereed papers included (five refereed journal articles and a refereed book chapter) were commenced and completed during the candidate's enrolment. Each publication has a signed author statement indicating the unique contributions of the candidate, and where co-authors are involved, their contribution is outlined and acknowledged. The copyright associated with each paper is duly noted.

To the best of my knowledge and belief this thesis contains no material previously published by any person except where due acknowledgement has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

A handwritten signature in black ink, appearing to read 'Paul Koshy', is written over a solid horizontal line.

Paul Malcolm Koshy

5/09/2018

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ABSTRACT

This thesis analyses key issues in Australian higher education equity policy in view of recent policy settings and empirical research on the determinants of undergraduate higher education participation. Equity policy is defined to include government initiatives to promote higher education participation amongst groups who have been historically disadvantaged in their access ('equity student groups') and the categorisation and measurement tools used to identify students belonging to these groups.

The thesis constitutes this exegesis and six published papers, including five peer reviewed journal articles and a refereed book chapter. This work addresses three critical issues:

*First, it provides an analysis of **recent trends in Australian higher education participation and equity policy**, including an analysis of the rationale for intervention, recent trends in equity outcomes in higher education and the identification and measurement of equity status in Australia. The thesis contributes to the literature in this area by examining recent changes in equity policy in their historical context.*

*Second, the thesis examines the **determinants of higher education participation**, with particular emphasis on the transition from school to higher education. Research undertaken in this thesis using Australian longitudinal data extends the literature in this area by examining the determinants of parental expectations of higher education participation among school-aged children and the identification of disadvantage in higher education participation.*

*Third, the thesis uses evidence on the development of equity policy and empirical work on participation to **analyse the implications for equity policy**, including the identification of equity status at the individual level, the impact of the recent expansion in higher education on student choice and academic quality, and the role of jurisdictional and institutional differences in framing equity policy.*

ACKNOWLEDGEMENTS

I would like to thank a number of people who supported the writing of this thesis.

Professor John Phillimore and Associate Professor Mike Dockery have been instrumental in its completion, both as supervisors and co-authors of papers. I would also like to thank the Chair of my committee, Professor Alan Fenna, for his advice and contributions, as well as the staff and students of The John Curtin Institute of Public Policy, in particular Leza Duplock, for their assistance and collegiality over the years. I would like to acknowledge the support of Ninti One in the form of a 2016-17 research scholarship.

As well as John and Mike, this thesis includes papers with two other co-authors, Richard Seymour and Tim Pitman, whose contributions and overall insights into higher education research and policy were much appreciated.

Special thanks should go to my employer for much of the time this thesis was being written, the National Centre for Student Equity in Higher Education (NCSEHE), and the NCSEHE's Director, Professor Sue Trinidad. Sue has been very supportive of this work, especially in its latter stages, and provided me with great opportunities to conduct research in this area. The NCSEHE has made an invaluable contribution to equity policy and practice in Australia. Sue and the NCSEHE staff should be justifiably proud of what has been achieved during its time at Curtin.

I would like to acknowledge two mentors who encouraged my work over the years: Thorsten Stromback, who gave me my first position at the Centre for Labour Market Research, where my interest in education economics and policy first developed; and the late Peter Kenyon, who as a generalist in economics showed me the value of investigating policy and social issues using the tools of economic analysis.

Thanks also to my Curtin colleagues, (Professor) Helen Cabalu and Andrew McLean, and to Dr Byron Ramsey.

Finally, I would like to thank my parents and family for their support and encouragement over the years – a critical factor in any person's life course, educational or otherwise.

COMPENDIUM OF PAPERS

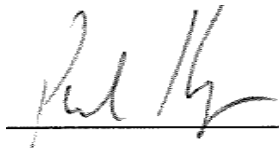
The core of this thesis is six refereed papers written over the course of enrolment. Full papers are available in **Appendix C: Published Papers**.

- [1] **Koshy, P.** (2011), “Targets for low SES participation in Australian higher education: Geographical measures and state boundaries”, *Contemporary Issues in Business & Government*, Vol. 17, No 2, pp. 45–62.
- [2] Pitman, T., **Koshy, P.** and Phillimore, J. (2015), “Does accelerating access to higher education lower its quality? The Australian experience”, *Higher Education Research & Development*, Vol. 34, Issue. 3, pp. 609–623.
- [3] Dockery, A.M., Seymour, R. and **Koshy, P.** (2016), “Promoting low socioeconomic participation in higher education: A comparison of area-based and individual measures”, *Studies in Higher Education*, Vol. 41, Issue. 9, pp. 1692–1714.
- [4] **Koshy, P.**, Seymour, R. and Dockery, A.M. (2016), “Are there institutional differences in the earnings of Australian higher education graduates?”, *Economic Analysis and Policy*, Vol. 51, September, pp. 1–11.
- [5] **Koshy, P.** (2016a), “Equity policy in Australian higher education: Past, present and prospective”, in Hill, M., Hudson, A., Mckendry, S., Raven, N., Saunders, D., Storan, J. and Ward, T. (eds.) *Closing the Gap: Bridges for Access and Lifelong Learning*, Forum for Access and Continuing Education: London, pp. 277–302. [Refereed Book Chapter].
- [6] **Koshy, P.**, Dockery, A.M. and Seymour, R. (2017), “Parental expectations for young people’s participation in higher education in Australia”, *Studies in Higher Education*, DOI: 10.1080/03075079.2017.1363730

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A handwritten signature in black ink, appearing to read 'Paul Koshy', is written above a solid horizontal line.

Paul Malcolm Koshy

5/09/2018

STATEMENT OF CONTRIBUTION OF OTHERS

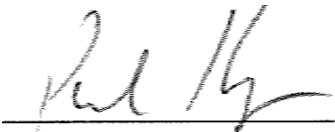
The publications in this thesis can be mapped to the three thesis components as per the table below, which contains an endorsed summary of the contributions of others below. Detailed author statements for each paper in **Appendix B: Authorship Statements**.

Table A: Research Program Objective and Contribution of Others

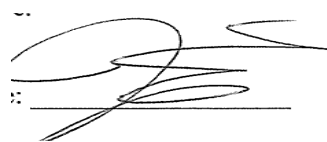
Research Objectives	Contribution of Others
RO1: Analyse recent trends in Australian higher education and equity policy	<p>The candidate's primary research and presentation of this work occurs in single-authored publication [5] Koshy (2016a), as well as extra-dissertation publications such as Koshy (2016b; 2016c; and 2016d).</p>
RO2: Analyse the determinants of undergraduate higher education participation in Australia	<p>The candidate's primary research and presentation of this work occurs in publications with Dockery and Seymour – [3] Dockery, Seymour and Koshy (2016) and [6] Koshy, Dockery and Seymour (2017).</p> <p>The contribution of co-authors was primarily in regard to: (i) Data management of HILDA unit records in STATA (Seymour); in conjunction with the candidate, selection of variables for inclusion in model development (Seymour and Dockery); estimation of statistical models in STATA (Seymour); and selection of final models (Seymour and Dockery).</p> <p>The conceptualisation of each paper, underlying literature review to justify dataset and variable selection and drafting and finalisation of each paper was undertaken primarily by the candidate with advice from Dockery as co-supervisor.</p>
RO3: Analyse the implications for higher education equity policy of recent evidence on participation and equity	<p>The candidate's primary research and presentation of this work includes analysis in in [1] Koshy (2011) and [5] Koshy (2016a) and in papers with Dockery and Seymour – [3] Dockery, Seymour and Koshy (2016), [4] Koshy, Seymour and Dockery (2016) – the contribution of co-authors was as described above in RO2.</p> <p>The candidate's contributions to [2] Pitman, Koshy and Phillimore (2015) drew on his knowledge gained from research in this area and presented elsewhere.</p>

I hereby approve of the above statement of contribution of others to the research program of this thesis.

Candidate: I, Paul Malcolm Koshy, endorse this statement of contribution of others.

Signature:  Date: 5/09/2018

Co-Supervisor: I, Anthony John Phillimore, endorse this statement of contribution of others.

Signature:  Date: 5/09/2018

Co-Supervisor: I, Alfred Michael Dockery, endorse this statement of contribution of others.

Signature:  Date: 5/09/2018

OTHER WORKS CITED IN THIS THESIS

In addition to the official papers, other relevant, non-refereed works undertaken just prior to or during the course of enrolment are referenced in this exegesis:

Koshy, P. (2015a) “Measuring Disadvantage in Higher Education in Australia”, A paper presented at the 2015 Further and Continuing Education (FACE) Conference, Cardiff, Wales, July 1 –3.

Koshy, P. (2015b) “Access and Participation in Australian Higher Education: Recent Trends and Developments”, A paper presented at the 2015 Global Access to Post-Secondary (GAPS) Education Conference, Kuala Lumpur, Malaysia, October 5 –8.

Koshy, P., (2016b), *Student Equity Performance in Australian Higher Education: 2008 to 2015*. National Centre for Student Equity in Higher Education, Curtin University: Perth, available at: https://www.ncsehe.edu.au/wp-content/uploads/2016/08/Student-Equity-Performance-in-Australian-Higher-Education-2008-to-2015_FINAL.pdf [Briefing Note]

Koshy, P. (2016c), “Twenty-Five Years of Measuring Disadvantage in Australian Higher Education,” A paper presented at the 25th European Access Network (EAN) Conference, Retrospective for Perspective, May 29–31. University College, Dublin, Ireland. [Non-refereed international conference paper]

Koshy, P. (2016d), “Promoting Equity in Higher Education: The Measurement and Reporting of Disadvantage in Australia”, *GAPS Think Piece No. 12*, Global Access to Post-Compulsory (GAPS) Education: London, available at: http://www.gaps-education.org/wp-content/uploads/2016/07/GAPS_Think_Piece_12.pdf [Overview]

Koshy, P. and Phillimore, J. (2013), “Commonwealth infrastructure funding for Australian universities: 2004 to 2011”, *Australian Universities’ Review*, Vol. 55, No. 2, pp. 99–103.

- Phillimore, J. and **Koshy, P.** (2010) *Implications of the Proposed Low SES Participation Target for Australian University Enrolments*, Report prepared for the Australian Technology Network of Universities, available at:
https://www.researchgate.net/publication/312595725_Implications_of_the_Proposed_Low_SES_Participation_Target_for_Australian_University_Enrolments [Report]
- Phillimore, J. and **Koshy, P.**, (2010b), “Meeting the Rudd Government’s Equity Targets for Universities: Three Scenarios”, *People and Place*, Vol. 18, No 1, pp. 1–18. [Refereed paper published prior to thesis commencement]
- Pitman, T. and **Koshy, P.** (2015), *A Framework for Measuring Equity Performance in Australian Higher Education*, Report to the Australian Department of Education and Training, National Centre for Student Equity in Higher Education, Curtin University: Perth. [Unreleased Report for Department of Education and Training].

1. INTRODUCTION

This thesis analyses key issues in Australian higher education equity policy in view of recent policy settings and empirical research on the determinants of undergraduate higher education participation.

Equity policy is defined to include government initiatives to promote higher education participation amongst groups who have been historically disadvantaged in their access ('equity student groups') and the categorisation and measurement tools used to identify students belonging to these groups.

1.1 Motivations for this Research

Increasing rates of educational attainment and participation are welcome if the demonstrated benefits of higher education participation are shared across the spectrum of Australian society where a growing majority of the population now have post-compulsory qualifications. However, it has been repeatedly shown that various forms of disadvantage or 'equity status' (e.g. low socioeconomic status; disability; Indigeneity) affect higher education participation ([3] Dockery, Seymour and Koshy, 2016), completion (Lim, 2014) and, to a lesser extent, graduate outcomes (Li, 2015).

Australia has seen an extensive policy apparatus put in place to characterise, identify and address equity status. This is known as equity policy, which has been carried out in relation to identified equity student groups, including students from low socioeconomic backgrounds ('low SES' students), Indigenous students, students with disability, students from non-English speaking backgrounds, female students in non-traditional areas, and students from remote and regional areas.

This approach commenced with the 1990 policy release, *A Fair Chance for All* (Department of Employment, Education and Training, (DEET, 1990). Thus, the reforms of the last decade have taken place as part of the long-term development of policy initiatives to address equity issues.

The primary motivation for this thesis came out of research undertaken for the Australian Technology Network (ATN) in 2009-10, (Phillimore and Koshy, 2010), in response to

the Rudd Labor Government's 2009 policy release, *Transforming Australia's Higher Education System* (DEEWR, 2009a), and its proposed national target for low SES student participation in Australian higher education. The Rudd policy included a target for a low SES student participation rate equal to 20 per cent of undergraduate domestic enrolments in higher education by 2020. This represented a substantial increase from the 16.2 per cent low SES share in 2007 (Koshy and Phillimore, 2009), a low SES share of enrolment which had been essentially static over two decades. This target itself was part of a broader push to raise higher education attainment by 25 to 34 year olds in the Australian population to 40 per cent by 2025 ([1] Koshy, 2011).

The scope of this policy extended beyond the target. In addition to establishing the low SES goal, *Transforming Australia's Higher Education System* embraced the implementation of the demand driven funding system in undergraduate higher education in Australia, whereby universities were granted discretion to provide course offers in view of perceived demand in a given year across most courses. The Rudd Government also provided an additional source of funding for universities through a \$5.4 billion funding package for higher education, including the establishment of the *Higher Education Participation and Partnerships Program* (HEPPP) to support student outreach and retention programs (Department of Education, 2016).

The demand driven funding system has underpinned a big increase in undergraduate domestic enrolments in Australia from 567,466 students in 2008 to 773,737 students in 2015, a rise of 34.7 per cent over this period, with growth tapering in recent years partly due to the resultant saturation and ultimately, the reimposition of some place caps in 2017. Equity student group enrolments saw signs of encouraging, but mixed, outcomes in this change. The most targeted group under the policies introduced by the Rudd Government – low SES students – saw enrolments expand faster than overall growth in the system to 2015 (50.4 per cent vs 34.7 per cent overall), while other groups saw slower growth, notably the regional student (33.1 per cent) and remote student (21.5 per cent) groups – an outcome that has been the subject of a recent general review of regional education (the 'Halsey Review'; Halsey, 2017).

1.2 Research Objectives and Research Program

This thesis has three research objectives arising out of this expansion in both higher education places and equity policy. They are:

- RO1** To analyse recent trends in Australian higher education participation and equity policy. This includes an analysis of Australia's current equity measurement system and policy settings.
- RO2** To analyse the determinants of undergraduate higher education participation in Australia. The thesis presents evidence on this, with particular emphasis on the empirical literature on transition from school to higher education. This includes an identification and assessment of socioeconomic and other factors affecting higher education aspiration and participation.
- RO3** To analyse the implications for higher education equity policy of recent evidence on participation and equity, with specific reference to issues of (i) the measurement of equity status; (ii) the impact on quality of the expansion of higher education; and (iii) jurisdictional and institutional differences.

In addition to this exegesis, the thesis is comprised of a series of six refereed papers which report research relevant to these three research objectives, as described in Table B, with their abstracts reported in Section 1.3.

Table B: Research Program Objective and Relevant Papers

Research Objective	Paper
<p>RO1: Analyse recent trends in Australian higher education and equity policy</p>	<p>[5] Koshy, P. (2016a), “Equity policy in Australian higher education: Past, present and prospective”, in Hill, M., Hudson, A., Mckendry, S., Raven, N., Saunders, D., Storan, J. and Ward, T. (eds.) <i>Closing the Gap: Bridges for Access and Lifelong Learning</i>, Forum for Access and Continuing Education: London, pp. 277–302. [Refereed Book Chapter]</p>
<p>RO2: Analyse the determinants of undergraduate higher education participation in Australia</p>	<p>[3] Dockery, A.M., Seymour, R. and Koshy, P. (2016), “Promoting low socio-economic participation in higher education: A comparison of area-based and individual measures”, <i>Studies in Higher Education</i>, Vol. 41, Issue. 9, pp. 1692–1714.</p> <p>[6] Koshy, P., Dockery, A.M. and Seymour, R. (2017), “Parental expectations for young people’s participation in higher education in Australia”, <i>Studies in Higher Education</i>, DOI: 10.1080/03075079.2017.1363730</p>
<p>RO3: Analyse the implications for higher education equity policy of recent evidence on participation and equity</p>	<p>[1] Koshy, P. (2011), “Targets for low SES participation in Australian higher education: Geographical measures and state boundaries”, <i>Contemporary Issues in Business & Government</i>, Vol. 17, No 2, pp. 45-62.</p> <p>[2] Pitman, T., Koshy, P. and Phillimore, J. (2015), “Does accelerating access to higher education lower its quality? The Australian experience”, <i>Higher Education Research & Development</i>, Vol. 34, Issue. 3, pp. 609–623.</p> <p>[3] Dockery, A.M., Seymour, R. and Koshy, P. (2016), “Promoting low socio-economic participation in higher education: A comparison of area-based and individual measures”, <i>Studies in Higher Education</i>, Vol. 41, Issue. 9, pp. 1692–1714.</p> <p>[4] Koshy, P., Seymour, R. and Dockery, A.M. (2016), “Are there institutional differences in the earnings of Australian higher education graduates?” <i>Economic Analysis and Policy</i>, Vol. 51, Sept., pp. 1–11.</p> <p>[5] Koshy, P. (2016a), “Equity policy in Australian higher education: Past, present and prospective”, in Hill, M., Hudson, A., Mckendry, S., Raven, N., Saunders, D., Storan, J. and Ward, T. (eds.) <i>Closing the Gap: Bridges for Access and Lifelong Learning</i>, Forum for Access and Continuing Education: London, pp. 277–302.</p>

1.3 Papers in this Thesis (Abstracts)

The core of this thesis is six refereed papers written over the course of enrolment:

- [1] **Koshy, P.** (2011), “Targets for low SES participation in Australian higher education: Geographical measures and state boundaries”, *Contemporary Issues in Business & Government*, Vol. 17, No 2, pp. 45–62.

This paper examines the measurement of the socioeconomic status of Australian higher education students in relation to the Rudd/Gillard Government’s establishment of enrolment targets for higher education providers in regard to students from low socioeconomic status (“low SES”) backgrounds. In particular, it discusses area measures of socioeconomic status – where a student’s status is determined by the postcode or collection district of the student’s permanent residence. In doing so, the paper outlines issues with the relevance of current area measures which use a national benchmark, particularly in the context of geographical constraints on the draw-pool of Australian higher education providers, where students attend institutions in their own state or territory. The paper introduces a new area measure which uses the individual state or territory as a reference point, as opposed to the current national reference point. This is assessed in relation to existing area measures and the recently announced funding policy by the Gillard Government.

- [2] Pitman, T., **Koshy, P.** and Phillimore, J. (2015), “Does accelerating access to higher education lower its quality? The Australian experience”, *Higher Education Research & Development*, Vol. 34, Issue. 3, pp. 609–623.

In the pursuit of mass higher education, fears are often expressed that the quality of higher education suffers as access is increased. This quantitative study considers three proxies of educational quality: (1) prior academic achievement of the student, (2) attrition and retention rates and (3) progression rates, to establish whether educational quality suffers when supply is significantly increased. The period of analysis (2009–2011) saw just such an increase in higher education places in Australia, as universities prepared for the removal of all caps on undergraduate domestic student places in 2012. Our analysis reveals that, whilst widening access results in more students with lower levels of academic achievement entering higher education, this does not necessarily equate to a

lowering of educational quality. Furthermore, although on average student progression rates dropped slightly, retention rates actually increased in the majority of universities, suggesting high levels of student perseverance. In addition, there were already wide variations in attrition and progression rates between universities, and the changes observed between 2009 and 2011 did not lead to substantial alterations.

- [3] Dockery, A.M., Seymour, R. and **Koshy, P.** (2016), “Promoting low socioeconomic participation in higher education: A comparison of area-based and individual measures”, *Studies in Higher Education*, Vol. 41, Issue. 9, pp. 1692–1714.

As with other countries, Australia has been grappling with the identification, measurement and impact of disadvantage in higher education. In particular, the measurement of socioeconomic status (SES) has been of central concern. The immediate solution in Australia has been the introduction of an ‘area’ measure in which students’ SES is categorised on the basis of census data for their neighbourhoods rather than on individual or household data. This paper assesses the veracity of the area measure in capturing individual SES for school-aged entrants, using a longitudinal data set, the Household, Income and Labour Dynamics in Australia (HILDA) Survey, to construct individual measures of SES and a national ranking of sample individuals on the basis of probability of attending a higher education institution. The results demonstrate the tendency for area measures to misclassify individuals’ higher education opportunity and the associated potential for perverse policy outcomes.

- [4] **Koshy, P.**, Seymour, R. and Dockery, A.M. (2016), “Are there institutional differences in the earnings of Australian higher education graduates?”, *Economic Analysis and Policy*, Vol. 51, September, pp. 1–11.

This paper examines the issue of the effects of university quality, as proxied by institutional groupings, on the earnings outcomes of graduates. It uses data from The Household, Income and Labour Dynamics in Australia (HILDA) survey to examine the impact of a variety of factors on the earnings of university qualified persons. The paper reports strong evidence for large and significant field of study and industry effects on the earnings of university graduates. There is no significant evidence for the

existence of an institutional effect in Australia, save for a minor effect in relation to regional universities which diminishes in the presence of control variables for regional location of workers. However, splitting the sample along gender lines sees significant negative earnings premiums for females in universities outside the Group of Eight and Australian Technology Network, with no such effects among males.

- [5] **Koshy, P.** (2016a), “Equity policy in Australian higher education: Past, present and prospective”, in Hill, M., Hudson, A., Mckendry, S., Raven, N., Saunders, D., Storan, J. and Ward, T. (eds.) *Closing the Gap: Bridges for Access and Lifelong Learning*, Forum for Access and Continuing Education: London, pp. 277–302. [Refereed Book Chapter].

This chapter outlines recent developments in the definition, measurement and reporting of disadvantage or ‘equity status’ in Australian higher education. Australia’s policy response to disadvantage has settled around national target setting in relation to institutional participation and population attainment goals in higher education. The chapter examines policy outcomes as a result, with a brief discussion of the prospects for future directions in equity policy.

- [6] **Koshy, P.,** Dockery, A.M. and Seymour, R. (2017), “Parental expectations for young people’s participation in higher education in Australia”, *Studies in Higher Education*, DOI: 10.1080/03075079.2017.1363730

This paper examines factors affecting parental expectations of higher education prospects for their children using Australian household survey data. We find that a variety of factors influence parental expectations, of which parents’ assessment of their children’s academic performance is the strongest. Factors known to impact upon actual higher education participation, such as parental education and remoteness, are already evident in parental expectations, but with limited evidence of expectations being shaped by financial constraints. We also find evidence of a ‘same-gender’ effect, with mothers exhibiting higher expectations for higher education for their daughters. This may be in part due to significantly lower expectations held by fathers with sub-bachelor qualifications. These factors contribute to higher expectations overall for girls entering university. The research points to the importance of interventions commencing in early childhood, and accounting

for key household background characteristics when designing, implementing and evaluating programs for widening participation in higher education.

1.4 Structure of Exegesis

This exegesis outlines the contribution of this body of research as part of an integrated overview and review of the literature. In doing so, it addresses each of the ROs in turn. Therefore, following this introduction, Section 2 outlines the background to participation and equity policy in Australian higher education. Section 3 discusses the determinants of higher education participation – including the candidate’s contributions to the literature. Section 4 provides an analysis of the implications arising from the evidence on equity policy formation and higher education participation for the conduct of equity policy. Section 5 provides a summary of the contributions of the thesis.

2. EQUITY POLICY IN AUSTRALIAN HIGHER EDUCATION

2.1 Introduction

Disadvantage as it relates to higher education participation may stem from a range of social, economic, geographical or health factors, with students having one or more of these characteristics being identified as students with equity status or equity group students. The identification of equity status in higher education has seen the emergence of policy responses in terms of both measuring equity status in the student population and the development of programs designed to reduce disadvantages that such students experience in access, participation, completion and post-graduation outcomes. These policy responses have been accompanied by a growing effort by researchers and policy makers to formulate an empirical evidence base with which to inform equity policy.

In Australia, higher education equity policy has been motivated by at least two factors. First, there has been a social justice motivation, involving a commitment to ensuring that the perceived benefits of university attainment are spread to equity group students. Second, there has been a more system-based motivation, in which the policy goal of increased rates of higher education participation that are needed to develop a more highly skilled community, is considered to require greater rates of participation by previously under-represented groups. Attracting and retaining these groups in higher education has required additional support from governments and higher education institutions.

2.2 Higher Education Participation in Australia

Australia has seen a rapid expansion in higher education over the past three decades. In 1989, only 7.9 per cent of the Australian adult population aged 15 to 64 had at least a bachelor degree qualification, with 12.3 per cent of 25 to 34 year olds having attained this qualification. By 2008, these figures had risen to 21.9 per cent and 31.9 per cent respectively. In that year, the Rudd Labor Government, as part of its reform agenda for higher education, established a target of 40 per cent of 25 to 34 year olds having at least a bachelor degree by 2020, a target which was looking in sight by 2014, with 37.2 per cent having attained this qualification level.

This rise in attainment is a product of Australia’s recent expansion in higher education numbers (and also migration into Australia by degree holders). In 1989, domestic student numbers in Australia totalled 419,912. By 2015, 26 years later, total domestic student numbers had increased by 149.3 per cent to 1,046,835 students, with undergraduate numbers rising by 117.5 per cent from 355,574 to 773,737 students (see Table 1). Underpinning this expansion was an increase in higher education providers – 38 ‘Table A’ providers, listed under the *Higher Education Support Act (2003)*, since 1989, up from 20 universities in 1976 who enrolled 290,000 students ([2] Pitman, Koshy and Phillimore, 2015, p.610).

Table 1 Australian Higher Education Enrolments, Domestic Students, Headcount, 1989 to 2015

	1989	1998	2008	2015	% Growth, 1989-2015
Undergraduate	355,674	473,770	567,466	773,737	117.5%
Postgraduate	60,808	117,435	185,992	244,517	302.1%
Enabling/Non-Award	3,480	8,465	18,474	22,420	544.3%
Total	419,912	599,670	771,932	1,046,835	149.3%

Source: Based on Koshy (2016c), Table 1, p. 3; and Department of Education and Training for 2015. update.

Australia’s experience in higher education has been typical of that seen elsewhere across the developed world, effectively seeing a transition from ‘elite’ to ‘mass’, and ultimately, ‘universal’ higher education of the type originally described in the US and Europe by Trow (1970; 1974) and reported on in broader historical terms in the Australian case in DEET (1993).

Australia has relatively high rates of participation and attainment in higher education in comparison with countries at a similar level of economic development. This essentially sees higher education attainment in such countries approach universal levels of 50 per cent (Trow, 2007). For instance, a comparison of higher education attainment rates (bachelor’s degree or higher) among 25 to 34 year olds sees Australia ranked ninth in the Organisation of Economic Cooperation and Development (OECD) countries with 37 per cent compared with the OECD average of 30 per cent. More generally, Clancey and Goastellec (2007) find that Australia ranks near the top of the OECD group on the basis of a participation indicator they construct.

2.3 The Impact of Higher Education Participation

Higher education participation is associated with important positive outcomes across the economic and social domains of an individual's life course. Outcomes for higher education graduates, be they economic, cultural or social, are markedly more positive in comparison with the rest of the population, including higher earnings, better health outcomes and greater returns to society.

As Schofer and Meyer (2005) note in their examination of the twentieth century expansion in global higher education:

The older view [that higher education served to create 'a limited set of national elites'] seems quaint and outdated in the face of the contemporary orthodoxy: that education creates generalized human capital that benefits both individuals and society. (p. 902)

The authors ascribe this transformation to several key factors, including the expansion in secondary education systems, higher levels of economic development and internationalisation, and the rise of democratisation and development planning in which a new set of elites emerged around 'schooled knowledge' (Schofer and Meyer, 2005, p. 917).

In this world, structured education became substantially more rewarding to its participants. This was outlined theoretically by Becker (1964) and empirically by Mincer (1974) in the development of the human capital model which explains differences in earnings primarily in terms of years of education and work experience, with earnings increasing with increases in either.

Thus, the most obvious benefit of higher education is in enhanced employment and salary prospects for the individual. This is seen in recent studies in Australia. For instance, Wilkins (2015) uses data from the Household, Income and Labour Dynamics in Australia (HILDA) study to examine earnings patterns for full-time employees aged between 25 and 59 in view of their educational backgrounds. In the base model, the results of which are reported in Table 2 below, Wilkins controls for level of education and experience, as well as factors such as age, place of birth, state of residence, population density of region of residence and proficiency in English. He then compares earnings of people with

various levels of education with those who left school in Year 11 or earlier. In this analysis, graduates with master's or doctoral degrees see the highest earnings premiums, at around 52.1 per cent for males and 44.6 per cent for females. Earnings premiums diminish with reduced levels of education; however bachelor's degree recipients still see premiums of 45.5 per cent and 33.5 per cent for males and females respectively.

By contrast, Year 12 graduates see an earnings premium for one additional year of schooling of around 21.7 per cent for males and 15.9 per cent for females. In effect, the earnings attributable to more years of education, including higher education, follow the patterns predicted by the human capital model.

Table 2 Earnings Premium Compared to “Year 11 and Below” Earnings, By Highest Level of Attainment, HILDA Sample 2012, (Base Model), %

Highest Level of Educational Attainment	Males	Females
Master's Degree/Doctorate	52.1	44.6
Graduate Certificate/Diploma	49.2	36.7
Bachelor's Degree	45.4	33.5
Diploma/Advanced Diploma	31.6	10.3
Vocational Education and Training (VET) Certificate 3 or 4	20.2	1.4*
Year 12	21.7	15.9

Source: Data sourced from Wilkins (2015), Table 7.4, p.72.

Note: All estimates are mean effects. * Estimate is not statistically significant at the 10% level.

Wei (2010) shows that these benefits have been persistent in Australia. Using data from the Australian Bureau of Statistics (ABS) Census between 1981 and 2006, and controlling for a variety of factors including experience, he shows that the measured *rate of return* to bachelor degree participation – the return from the earnings premium enjoyed by graduates compared with the direct (e.g. fees) and indirect (e.g. loss of income) costs of study – was 15.3 per cent for male university graduates and 17.8 per cent for female graduates in 2006. The partial decline in the rate of return since 1981 (19.3 per cent for males, 19 per cent for females) was attributable to the expansion in graduates over this period and improvements in employment outcomes for non-graduates (Wei, 2010, p. 10). Wei's results are confirmed by Daly and Lewis (2010), who find that a decline took place for economics, law and business graduates between 1986 and 2006, while Daly et al. (2015) observe an overall decline in the rate of return to undergraduate degrees.

In addition to an overall wage premium, degree holders also enjoy better employment outcomes. In a review of Australian studies, Borland (2000) notes that "...all studies find that the probability of unemployment is inversely related to education attainment" (p.4), with persons with a degree or above having an unemployment rate less than half that of those with only a school education.

However, the benefits to individuals associated with higher education participation extend beyond higher incomes alone and include better health outcomes and improvements in marriage prospects and household and family planning outcomes (Hartog and Oosterbeek, 1998; Haveman and Wolfe, 1984). These arise because higher education graduates have higher incomes in general, but also greater access to knowledge and resources to foster health and wellbeing.

A further indication of the impact of higher education attainment on health can be seen in studies of life expectancy. For Australia, Clarke and Leigh (2011) examine life expectancy gaps using measures of income, educational and neighbourhood or area socioeconomic status. They find that respondents aged 20 (both males and females) and with more than 12 years of schooling, which are overwhelmingly those with bachelor degrees or greater, can expect to live an additional 4.6 years or so more than those with less than 12 years. This effect is stronger than the area measure of socioeconomic status but not as strong as the income effect of around 6.15 years (p. 352).

Importantly, there are also significant public benefits from higher education participation. The overall returns to higher education – through higher wages and a greater chance of employment as a result of increased productivity – are substantial when viewed from this perspective. Assessments of the impact of universities typically find that their important social contributions occur through the elevated earnings of their graduates, relative to alternatives. For instance, Cabalu, Kenyon and Koshy (2000), in an analysis of the economic impact of higher education in Australia determine that human capital impacts accounted for \$9.26 billion, or 42 per cent of total impact, in an analysis including the direct expenditure at universities and spillovers from research.

As participation in higher education increases to near universal levels, and the benefits of participation relative to non-participation remain even in moderated form, higher education participation has become the important point of entry for success in the labour market and society. Trow (2007, p. 253) observes, 'the best jobs and opportunities (and,

generally, the economic rewards in life) come to be reserved for people who have completed a university degree.’ In turn, the large cohort of potential applicants in such a system, means that the number of students (and their relative share of enrolment) who come from equity backgrounds increases, as does the policy challenge in relation to the distribution of opportunity within higher education.

2.4 Higher Education Equity Policy in Australia

Equity policy includes those policy measures concerned with the identification and amelioration of disadvantage in its many forms and at various stages of the enrolment cycle: initial access, participation, completion and post-graduation.

While Australia has a considerable history of expanding equitable access to higher education through the introduction and expansion of public funding of places at universities, the creation of new universities, and the use of scholarships to support students ([5] Koshy, 2016a), it is only in recent decades that formal equity policy measures have been instituted.

The evolution of the equity policy response in Australia has reflected the long-term and systematic nature of equity status’s impact on participation. In a national study sponsored by the Australian Vice-Chancellors’ Committee (AVCC), Anderson et al. (1980) were able to observe, in remarks which still hold today, that:

We have seen that the social composition of students in higher education has been relatively stable over several decades despite the changes which have taken place during that time: changes which have seen a great expansion of universities and colleges, a rising retention rate to 12th year in secondary school, a growth in general affluence of the population and the introduction of egalitarian measures. (p. 199)

This observation followed the rapid expansion in higher education in post-war Australia, funded by the Commonwealth. For instance, in response to the 1957 Murray Committee recommendations on resourcing, higher education enrolments in Australia saw annual growth of 13 per cent in each year between 1958 and 1960. Further expansion and widening of participation resulted from the 1961 Martin Committee recommendations

which extended resourcing to colleges of advanced education and teachers colleges in an expanded system of advanced education. This expansion was accompanied by a number of measures to promote equitable access to higher education, notably the Commonwealth Scholarship Scheme (CSS), a means-tested, merit-based scholarship awarded to around 17 per cent of students (DEET, 1993, p. 19).

The increasing role of the Commonwealth culminated in the decision by the Whitlam Labor Government to assume 'full financial responsibility for the nation's institutions of higher education' from 1974 (DEET, 1993, p. 7). The Commonwealth at this time also abolished tuition fees in higher and advanced education and introduced the Tertiary Education Assistance Scheme (TEAS) in place of the CSS. The impact of these two policies was to increase participation in higher education among previously underrepresented groups, notably mature age students (students over the age of 25) and women, with participation among women over the age of 30 doubling between 1975 and 1980 (DEET, 1993, p. 21).

However, as Martin (2016) points out, the removal of financial barriers in large part served to demonstrate that more comprehensive initiatives were required in order to widen participation in Australia. This is in large part attributed to the rigidity of Australian institutions and the resulting 'few accompanying changes in admission criteria to allow for a less academically prepared clientele' (p.22).

As a response, the Hawke Labor Government conducted a further expansion in Australian higher education, commencing with the introduction in 1988 of *Higher Education: a policy statement*, the White Paper issued by John Dawkins, the Minister for Employment, Education and Training (Dawkins, 1988).

The 'Dawkins reforms' were wide-ranging and included the removal of the administrative distinction between 'universities' and 'colleges of advanced education' (the 'binary divide'); the introduction of student income contingent loans – the Higher Education Contribution Scheme (HECS) – which allowed students to commence paying off tuition debt once they started earning salaries at or above the median wage level; and an expansion in higher education places (Department of Employment and Training, 2015).

These initiatives were couched in the 'equity discussion', with HECS in particular being viewed as an important equity policy tool as it expedited the expansion of the higher

education system through direct revenue collection from students if and when they accrued income gains from their degrees (Chapman and Ryan, 2005; Chapman and Tulip, 2010). The White Paper established the grounds for equity policy to be formally introduced into this broad policy mix with the observation that ‘while growth alone will facilitate the achievement of greater equity in higher education, growth alone will not be sufficient’ (Dawkins, 1988, p. 21).

The extension of the Dawkins’ reforms to addressing equity concerns commenced with the release of *A Fair Chance for All*, an Australian Government report which identified disadvantaged or equity groups in Australia (DEET, 1990), followed by the 1994 *Review of Equity and General Performance Indicators in Higher Education* (‘The Martin Review’) (Martin, 1994), which established a system for identifying and tracking ‘equity group’ students through Australian higher education institutions. The Review identified the following key equity groups in Australia (*current terms in brackets*):

- People from Socioeconomically Disadvantaged Backgrounds (*Low SES students*);
- People with Disability (*Students with Disability*);
- Indigenous People (*Indigenous Students*);
- People from Rural and Isolated (Remote) Areas (*Regional and Remote Students*);
- Women (*Women in Non-Traditional Areas – WINTA*); and
- People from Non-English Speaking Backgrounds (*Students from Non-English Speaking Backgrounds – NESB*).

Historically, participation trends among students from equity groups have been relatively stable, oscillating around the averages shown for 2003 and 2007 in Table 3, which indicate rates of participation well below their equivalent population shares.

The low SES student share of undergraduate enrolment has historically hovered between 16.2 per cent and 16.5 per cent, a finding consistent with international studies of higher education systems internationally (Shavit et al., 2007). Similarly, students with disability are drawn from a population equal to around 8 per cent of the Australian total, yet accounted for 3.9 per cent of undergraduates in 2003, rising to 6.2 per cent in 2015.

Table 3: Student Equity Enrolment Proportions, Undergraduates, Table A Providers, 2007-2015

Student Equity Groups	2003	2007	2010	2012	2015	Reference Share** (2006)
Low SES	16.5%	16.2%	16.7%	17.3%	18.2%	25%
Students with Disability	3.9%	4.4%	4.8%	5.2%	6.2%	8%
Indigenous	1.3%	1.3%	1.4%	1.4%	1.6%	2.3%*
WINTA*	19.8%	19.4%	18.6%	18.0%	17.8%	N/A
Regional	20.7%	19.1%	19.1%	19.1%	18.8%	25.4%*
Remote	1.2%	1.0%	1.0%	0.9%	0.9%	2.4%*
NESB	3.1%	3.2%	3.1%	3.4%	3.7%	3.7%*

Source: Based on Koshy (2016c), Table 5, p. 6; Update for 2015 from Koshy (2016b).

Notes: *The WINTA estimate for 2007 is from 2008, the closest year available and represents a share of total enrolment. **National reference share calculated from reported state and territory population reference shares using 2006 population weights, with the exception of WINTA which is calculated on the basis of course enrolment.

The recent increase in overall higher education participation, and equity student participation in particular, has been driven primarily by reforms introduced by the Rudd (2007 to 2010; 2013) and Gillard (2010 to 2013) Labor Governments, following recommendations of the 2008 *Review of Australian Higher Education* (the ‘Bradley Report’) (Bradley, 2008) and the Rudd Government’s response in 2009, *Transforming Australia’s Higher Education System* (DEEWR, 2009a).

Equity policy was a central consideration of these reforms, with the *Review of Australian Higher Education* observing in a comparison with a group of countries such as the United States, Canada and the United Kingdom, that:

Although, superficially, the Australian record appears no worse than these countries, some have significantly improved participation rates in recent years, while Australia’s participation rates have remained relatively static. (Bradley, 2008, p. 35)

This observation and the Review’s focus on equity provided an impetus for a higher education policy framework that was connected to equity policy in important ways. It saw the introduction of the demand driven funding system in Australian higher education which, in effect, removed the ‘caps’ on undergraduate places that had seen the Commonwealth exert direct control over enrolments in the system over the course of its time as the primary public funding source for higher education, [2] Pitman, Koshy and

Phillimore (2015). This action provided institutions with the capacity to expand access to higher education places, increasing equity student participation (DEEWR, 2009a).

The introduction of the demand driven funding system contributed to increased opportunity for equity students, a push bolstered by Labor's introduction of important equity initiatives, including the establishment of a target for low SES share of undergraduate enrolments of 20 per cent by 2020 and the creation of the \$1 billion *Higher Education Participation and Partnerships Program* (HEPPP) and *National Priorities Pool* (NPP) equity policy initiatives (Department of Education, 2016). HEPPP was primarily designed to allow institutions to build capacity and infrastructure for student outreach (NCSEHE, 2013, 2014).

These reforms have largely been endorsed by successive governments. While the Abbott Coalition Government (from 2013) did not officially pursue the low SES target, it retained the HEPPP and NPP and endorsed equity as a central component of higher education policy, as outlined in its 2016 discussion paper, *Driving Innovation, Fairness and Excellence in Australian Higher Education* (Birmingham, 2016).

In December 2017, the Turnbull Coalition Government sought to re-impose caps on student numbers as part of a rollback of the demand driven funding system. This has been attributed to emerging budgetary pressures and concerns about the perceived and projected lower completion rates for the less academically prepared students (Norton and Cherastidham, 2018), as well as to the shift towards academic preparedness and performance becoming more dominant factors in the propensity to enter higher education in place of socioeconomic or equity status (Marks, 2017). However, there are no indications that this represents a permanent shift away from the demand driven approach.

Importantly, the Turnbull Government has also re-aligned the funding targets for HEPPP and NPP. Commencing in 2018, HEPPP will be split into two components: an *Access and Participation Fund* which will provide universities with \$985 per low SES student; and additional performance funding of \$13.3 million per annum which will be distributed to individual institutions on the basis of the success rates of their low SES and Indigenous students. In conjunction with the HEPPP restructure, the NPP will see funding of \$9.5 million per annum provided for evaluative research and to sponsor collaboration in outreach programs among universities (DET, 2017b).

2.4 Summation

The historic expansion of higher education in Australia, coupled with the observed benefits of higher education participation, has focused attention on widening access and participation to disadvantaged groups of students.

The policy focus on equity has resulted in the development of equity policy indicators in Australia, following the recommendations of *A Fair Chance for All*. This has allowed policymakers to track the progress of the system in enrolling students from groups who are identified as being disadvantaged. The equity status collection system, including that relating to equity students, forms the core of reporting in the Australian system, with outcomes for equity students in terms of access, participation and retention being characterised at the institutional, regional and state and territory level as a result (Koshy, 2016b).

In conjunction with reporting, equity policy in Australia has seen the creation of major policy initiatives, including the expansion in places and introduction of HECS in the 1980s and recent measures such as the demand driven funding system and specific equity programs such as HEPPP and the NPP.

The papers in this thesis examine the relevance of Australia's approach to equity policy in view of these developments.

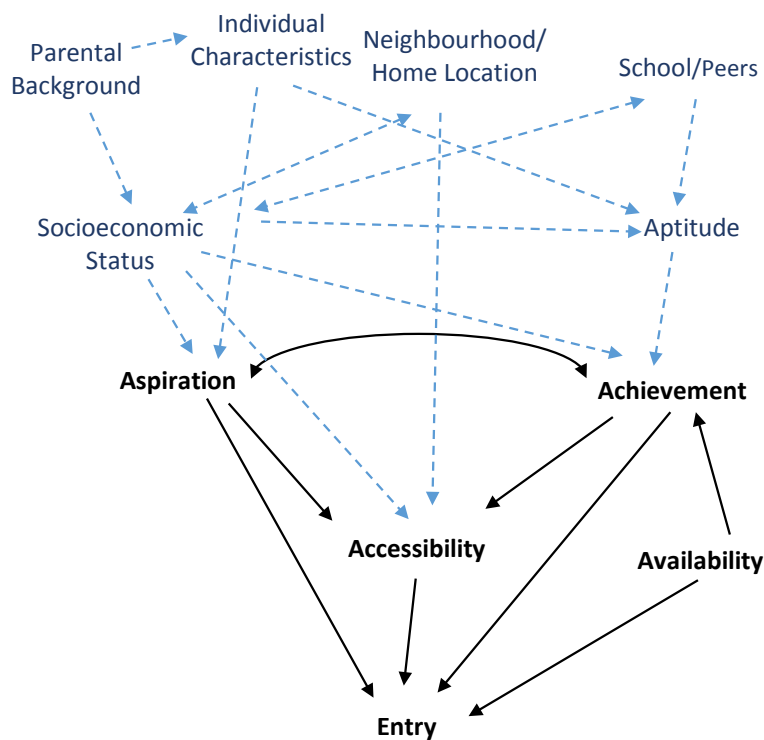
3. THE DETERMINANTS OF HIGHER EDUCATION PARTICIPATION

3.1 A Model of Higher Education Participation

Any examination of the role of equity policy in higher education participation needs to draw on evidence on the key set of factors affecting participation and the extent to which they can be affected by policy change.

The dynamics driving participation are represented in Figure 1 below with an individual's characteristics (e.g. gender, academic aptitude, vocational interests) interacting with parental and family background to determine equity status, in conjunction with the influence of neighbourhood and peers, to affect the probability of entering higher education. Entry into higher education can be thought of as the product of four factors: aspiration, achievement, accessibility, and availability ([6] Koshy, Dockery and Seymour, 2017).

Figure 1 A Representative Model of Individual Higher Education Participation – Equity and Systemic Factors



Source: Based on [6] Koshy, Dockery and Seymour (2017).

The four factors combine to shape the size and characteristics of entry classes in higher education. They can be summarised as follows:

Aspiration represents the motivational aspect of an individual's participation in higher education study, reflecting as it does a host of factors, including individual characteristics such as gender and academic aptitude and socioeconomic factors and influences from families, peers, schools and neighbourhoods.

Achievement is a condition which characterises higher education as a 'matching market' and mandates that prospective students should be able to demonstrate suitable academic progress that warrants entry into higher education study, both in terms of general measures of achievement, but also often in relation to discipline-specific prerequisite study.

Accessibility characterises such a system as being 'open' to as many suitably qualified candidates as possible on the basis of a number of central features, including transparency and consistency in applications processes and suitable levels of resourcing to enable students to both navigate their institutions and courses but also meet the financial obligations of attending university.

Availability describes the capacity of a higher education system to provide a suitable number of places across a broad spectrum of academic disciplines with a clear pathway between application and acceptance for prospective students.

In turn, these factors capture a wide range of influences, both socioeconomic (e.g. gender, household structure etc.), which influence participation outcomes. Entry into higher education depends upon them and the responding policy structure underpinning educational institutions – designated in grey and with dashed lines in Figure 1.

Because societies everywhere are hierarchically structured to some extent, their institutions reflect the underlying processes which determine and reinforce this structure in ways which are difficult to define precisely but which are multi-dimensional (see Blackmore et al., 2009; Graetz, 1995, for a discussion of this point).

3.2 Empirical Evidence on Higher Education Participation

In studies of higher education participation, a person's equity status – shaped as it is by family income and educational background, location and connection to social and educational institutions such as schools – interacts with academic ability (itself a partial product of these processes) to determine the likelihood of them entering university.

The foundation of this work is the 'status attainment model', encountered in empirical studies such as the 'Wisconsin Model' which followed Blau and Duncan's (1967) examination of occupational stratification in the United States. The Wisconsin model was based on a longitudinal sample of high school seniors which included data on higher education aspirations, parental income and occupation, and tracked students through college and workforce.

In effect, the status attainment model uses measures of socioeconomic status to explain differences in higher education participation – in the first instance, looking at parental educational and occupational background as explanatory variables. This has led to the development of definitions of socioeconomic status. For instance, Haller and Haller (2009) argue that socioeconomic status is comprised of four different 'content dimensions' – political; economic; social; and informational. Blakemore et al. (2009) adopt ideas from social epidemiology, with socioeconomic status being defined by a family's access to, and control over, social and economic resources (p. 121). In empirical work, the most commonly observed variables used to capture these effects are parental education and occupation, and information on peer and neighbourhood characteristics and cultural factors (Lim and Gimici, 2011). Parental controls have been used in recent Australian studies (see for instance: Hayden and Carpenter, 1990; Marks et al., 2000; Le and Miller, 2005; Cardak and Ryan, 2009).

The empirical status attainment model thus linked socioeconomic and family background factors to school performance as explanators of higher education aspiration and attainment (see for instance, Sewell and Shah, 1967; Sewell, Haller and Portes, 1969; Hauser, 1972; Sewell and Hauser, 1975).

A key finding of the work that followed on social determinants, is the strong socioeconomic gradient present in participation in, and completion of, higher education:

For example, when our sample is divided into quarters on a socioeconomic status index, we find that a student in the high socioeconomic status category has a 2.5 times greater chance of continuing his or her education beyond high school than one in the low socioeconomic status category. The high status student has approximately a 4 to 1 advantage in entering college, a 6 to 1 advantage in college graduation, and a 9 to 1 advantage in graduate or professional education. In the middle socioeconomic status categories the rates are consistently between these extremes: the lower the socioeconomic status category, the lower the educational attainment. (Sewell and Hauser, 1972, p.853)

This advantage held even after controlling for academic ability. Among the top quartile of academic performers in the Wisconsin study, students from the bottom socioeconomic (income) quartile were half as likely to attend university compared with those from the top quartile. This gradient between socioeconomic status and educational achievement is well established in the international literature (for instance, see Sirin, 2005), with similar findings observed in Australia (Homel et al., 2012). The studies discussed below confirm that this finding still holds. In a cross-country study, the OECD (2015) finds that adults aged 25 to 34 are three times as likely to complete tertiary education if their parents have attained a tertiary degree in comparison with those whose parents have only completed secondary school and/or started a tertiary qualification.

Australian and international studies of higher education participation have identified important determinants of participation in higher education. These can be broadly classified into two categories: 'Background, Achievement and Aspiration' and 'Accessibility and Availability'.

3.3 Empirical Evidence on Participation: Background, Achievement and Aspiration

The literature shows that factors relating to background, achievement and aspiration influence a person's readiness to access higher education.

Parental Background: The evidence from studies examining transition into university suggests that parental educational background factors are critical in shaping both aptitude and aspiration for higher education study (Centre for the Study of Higher Education, 2008; DEEWR, 2009b).

Chesters and Watson (2013) analyse data from three Australian data sources (the 1987-88 National Social Science Survey (NSSS); HILDA; and LSAY) from 1987 to 2005 and conclude that while the expansion in Australian higher education has somewhat reduced the level of inequality in higher education access, parental educational background continued to be highly significant in explaining transitions to higher education.

Considine and Zappala (2002) examine academic outcomes for 15 year olds and reach the key finding that even within a sub-sample of low SES households, status as indicated by parental educational background was an important predictor of student achievement and that educational background is more important than economic factors in explaining outcomes.

In an examination of parental expectations of their children's higher education participation, [6] Koshy, Dockery and Seymour (2017), find that parental educational background continues to be a strong driver of educational expectation among parents. The effect is particularly strong in relation to mother's education, with the children of female degree holders being 1.5 times more likely to enter higher education relative to those whose mother has no post-secondary qualification. Vocational Education and Training (VET) participation among fathers is shown to reduce expectations about their children's prospective higher education participation. A similar pattern is seen for occupational status, where children whose father is in the highest occupational skill category (Level 1) are twice as likely to enter university compared to those whose father is in the lowest category (Level 5).

Household Structure: Household structure is an important determinant of higher education participation. For instance, [6] Koshy, Dockery and Seymour (2017) demonstrate evidence to indicate that potential school-aged university entrants from single parent households are at a significant disadvantage compared to those from couple households, with only 29 per cent commencing university before age 20 compared to 40 per cent of their peers in couple households. Also of note is that the effect of parental educational background in single parent households was significant – with children of a parent with a degree being three times more likely to enter university than those without, a stronger measured effect than that seen in couple households.

In a recent paper, [3] Dockery, Seymour and Koshy (2016) use HILDA data to construct an individual based measure of the observed probability of 17 year olds entering higher education on the basis of individual and family background characteristics.

Their analysis includes the identification of more pronounced effects in single parent households, for instance, a stronger negative effect for gender with the probability of 17 year old males entering university around 53 per cent lower than females, compared with 43 per cent lower in the couple model.

Neighbourhood: Neighbourhood effects are often difficult to disentangle from household and school effects. Johnston et al. (2014) notes that even a strong observed neighbourhood effect needs to be treated with caution as the ‘socioeconomic status of a neighbourhood is an important characteristic in explaining variations in student outcomes, but residential turnover, the composition of households and the multicultural nature of the neighbourhood also play a role’ (see ‘Key Messages’, Johnston et al., 2014). However, in recent decades there has been evidence from the census to indicate a divergence in outcomes across neighbourhoods (Gregory, 1996). Vinson (2007) demonstrates how the effects of low educational and income outcomes in a neighbourhood can coalesce to produce a ‘disabling social climate’ (p. ix). In a follow up to this research, Vinson and Rawsthorne (2015) describe a ‘web of disadvantage’ whereby the interconnection of vulnerabilities in a community acts to reinforce the disadvantage associated with any one vulnerability.

Schools: Several studies in Australia have identified the underperformance of low SES students at school (either due to aptitude or opportunity, or a combination of both) as the key factor in their reduced participation in higher education (Marks et al., 2000;

Rothman, 2003; Cardak and Ryan, 2009). Research by Li and Dockery (2015) on academic achievement at an Australian university, finds that while the entrance rank of a student (the Australian Tertiary Admission Rank – ATAR) was a strong determinant of university performance, reported school effects – due to type, resourcing or measured socioeconomic status – were negligible. From this, the authors conclude that ATAR scores of low socioeconomic students are likely to underrepresent their ability relative to those seen for students from higher socioeconomic backgrounds. A recent study of higher education cohorts from 2005 and 2006 in Australia, finds that ‘mode of study’, ‘age’ and ATAR are considerably more important in explaining completion rates in Australian higher education than socioeconomic status, using the ABS’s *Socio-Economic Index for Areas* (SEIFA) measure (Department of Education and Training, 2017, p. 8).

An important observation in the literature is that these advantages are self-reinforcing over a person’s schooling. For instance, studies examining the relationship of educational performance and socioeconomic status inevitably observe the existence of a *socioeconomic gradient* in academic achievement (see below for a discussion), with students from higher socioeconomic strata achieving at substantially higher rates than those from lower strata. In a Canadian study of school academic performance, Caro, McDonald and Willms (2009) import the notion of a *cumulative advantage process*, whereby this process ‘explains growing inequality when current levels of accumulation...’ (in this case, educational achievement) ‘...directly affect future levels of accumulation’ (p.561). Importantly, this advantage necessarily translates into enhanced prospects for transition to post-compulsory education.

One implication of the above work is that educational disadvantage manifests itself much earlier than at the post-compulsory level, with one policy response being that resources should be devoted to addressing inequality through early intervention efforts from pre-primary onwards (Heckman, 2000; and for Australia, Gonski et al., 2011).

Gender: Since the 1980s, a standard result in most models of higher education access is that of a higher likelihood of females entering higher education relative to males. The reasons for this are multi-faceted and are often attributed to the general expansion in Australian higher education and changes in overall education policy (Bell, 2016).

Le and Miller (2004) examine trends in post-school education as a result of these and related institutional changes in the 1960s, 1970s and 1980s, such as those aimed at

reducing gender discrimination – the Equal Pay for Equal Work decision of 1969, the Equal Pay for Work of Equal Value decision of 1972 and introduction of the *Sex Discrimination Act (1984)*. They undertake a cohort analysis of individuals born in 1961 and 1970 to examine school retention and completion and find that increases in female participation were not attributable to direct changes in workforce measures but were likely attributable to the advantages associated with higher education participation such as increased levels of income.

Strong institutional policy arrangements and social trends, together with an appreciation of the historic disadvantages women face in accessing higher education and later, the labour market, play an important role in shaping expectations for female participation in higher education. In their examination of parental expectations, [6] Koshy, Dockery and Seymour (2017) find strong evidence of two gender effects:

Gender variables are significant, both in relation to the responder and child. In the mother sub-sample of the couples model, there is a 10.4 per cent increase in the probability of a definitive expectation of higher education attendance where it is asked of female child, with no similar effect existing (either way) for males. A similar story exists in the single parent household sample, again, where most of the respondents are female. These findings coupled with a 7.2 per cent effect of the child being female indicate that parents, particularly mothers, view girls as having greater opportunities in higher education than in other post-compulsory settings, a finding that confirms the observations from data in the LSAC by Yu and Daraganova (2014). ([6] Koshy, Dockery and Seymour, 2017, p. 11)

Indigeneity: Indigenous participation in higher education in Australia has been increasing over time, with the Indigenous share of undergraduate enrolments increasing from 1.3 per cent in 2003 to 1.6 per cent in 2015. However, it still remains considerably below the Australian Indigenous population share among 15 to 64 year olds of around 2.3 per cent over the past decade (Table 3 above reports the 2006 census estimate), which the 2012 *Review of Higher Education Access and Outcomes for Aboriginal and Torres Strait Islander People* (the Behrendt Review) identified as the long-term benchmark for Indigenous higher education participation (Behrendt et al., 2012). The lower level of Indigenous participation in Australia reflects, as elsewhere, the compounding nature of disadvantage, with Indigenous Australians more likely to come from low SES backgrounds and to live in regional or remote areas than the general population (Koshy,

2016b; Gale and Parker, 2013). In addition, they also see reduced levels of achievement in school (Behrendt et al., 2012).

Ethnicity (Non-English Speaking Background): Generally, people from non-English speaking backgrounds currently have rates of higher education participation which approach, and in some areas, exceed those of the general population (Koshy, 2016b). A number of factors are behind this result, principally culture-specific factors. In an examination of school participation and eventual transition to post-compulsory education, Figlio et al. (2016) attribute cultural attitudes among migrants, such as ‘long term orientation’ as key explanators for differences in educational performances between migrant groups and also in comparison with the domestic born population. There is evidence for such differences in Australian higher education. For instance, in a La Trobe University sample of the 2010 Australasian Survey of Student Engagement, only 3 per cent of exiting NESB students cited ‘boredom’ as a reason for leaving a course, while 28 per cent of ESB (English-speaking background) students cited it (Mestan, 2016, p. 133).

Disability: People with disability have been historically under-represented in Australian higher education, with an enrolment share of around 6.2 per cent compared with a general population share of 8 per cent in 2015, as per Table 3 above. This reflects the impact disability has on the propensity to enter higher education (Brett, 2016). For instance, [3] Dockery, Seymour and Koshy (2016) find that 17 year olds reporting a disability are 57 per cent less likely to access higher education by age 20 than others. In addition, Kilpatrick et al. (2016) report that in addition to lower rates of access, students with disability are retained at lower rates than the general student population and have slightly lower rates of success, as measured by their reported academic performance (proportion of subjects passed), (p. 24).

Aptitude: In education studies, aptitude is most comprehensively addressed in twin studies which enable effects attributable to genetic background to be distinguished from home environment (i.e. fraternal versus identical twins and shared versus non-shared home environment). Marks (2017) summarises the evidence on genetic heritability and school performance in Australia, noting that around 75 per cent to 80 per cent of variation in Australia-wide NAPLAN (National Assessment Program – Language and Numeracy) test scores is due to genetic variation. Marks (2017) makes the further observation that there is a tendency for genetic heritability to increase in importance as children progress through the education system. In studies, such as Caro, McDonald and Willms (2009),

which do not control for genetic heritability, this may account for the strong socioeconomic gradient observed in school performance over time. In looking at educational attainment in Australia, Le et al. (2011) find that around half of the variability of educational attainment in Australia was explained by genetic factors.

Secondary Academic Achievement: The impact of this confluence of background factors on student achievement at the secondary level is well documented and viewed as being critical to higher education participation.

Marjoribanks (2003) uses data from the Longitudinal Surveys of Australian Youth (LSAY) to model attainment in view of a series of background factors over time. He finds that 'academic performance at the beginning of secondary schooling has an important impact on the formation of adolescents' education aspirations' (p. 241). Current academic performance is also critical to parental aspiration formation, with parental expectation of higher education participation among their children primarily determined by their perceptions of a child's academic achievement, a finding echoing studies of US data (see for instance, Goldenberg et al., 2001 and Zhang et al., 2011). Several studies, such as Spera et al. (2009) and Buchmann and Dalton (2002) have noted that the direction of this cause and effect is uncertain, and most likely multi-directional, as academic progress is both a driver and product of parental aspiration.

Achievement outcomes have a strong gradient in relation to socioeconomic status. In a review of the impact of socioeconomic status, Considine and Zappala (2002, p. 92) cite core findings from the literature to show that children from low SES backgrounds:

- have lower levels of literacy, numeracy and comprehension;
- have lower retention rates (children from low SES families are more likely to leave school early);
- have lower higher education participation rates (children from low SES families are less likely to attend university);
- exhibit higher levels of problematic school behaviour (for instance truancy);
- are less likely to study specialised maths and science subjects;
- are more likely to have difficulties with their studies and display negative attitudes to school; and
- have less successful school-to-labour market transitions.

The key factors contributing to this are: parental education background, family structure, school type, gender and ethnicity, and geographical location.

In a more recent study, Cardak and Ryan (2009) find that conditional on school performance – in the case of their study, the ‘ENTER’ score achieved by Australian students – socioeconomic background was less important in determining entry into university. Rather, differences in entry among students from various socioeconomic backgrounds were attributable to differences in school achievement shaped by their backgrounds, with Cardak and Ryan finding that much of this effect was apparent by Year 9. The obvious policy implication is that enhancing higher education participation requires a focus on primary and secondary school outcomes (p. 444). Croll and Atwood (2013) find similar evidence using UK data, with educational preparedness being the dominant determinant of higher education aspiration and attainment, with some small component of the participation gap likely explained by reduced aspirations among students from low SES backgrounds.

Parental and Student Aspiration: Socioeconomic endowment plays a prominent role in the formation of higher education aspiration. In a recent Australian study, Gemici et al. (2014) conclude that young people whose parents express a preference for them to attend university are eleven times more likely to do so.

Parental aspiration varies with socioeconomic factors and this reflects an important series of drivers behind parental aspirations themselves. It is in turn motivated by the set of factors identified in the status attainment model. The application of this model to aspiration, first developed in Alexander and Eckland (1975), has been used to examine the impact of parental and family background on aspiration and participation.

Khattab (2015) makes an important distinction between *aspiration* and *expectation*, with aspiration best thought of as being moderated by factors such as current academic achievement and other issues affecting perceptions of the attainability of higher education (e.g. regional location or cost of tuition and attendance). These in turn shape expectation.

The primary determinant of parental aspiration and expectation is parental educational attainment. For instance, Spera et al. (2009) study ethnicity and schooling effects (‘school climate’) on parental aspiration and find that across all studied ethnic sub-groups a strong

correlation exists between parental educational level and aspiration, with a considerably stronger effect seen at higher levels of parental education.

Importantly, higher education participation has become the dominant preference for post-school activity for young people. [6] Koshy, Dockery and Seymour (2017) examine parent responses to a question in the survey on their educational expectations for each child, using data from the HILDA longitudinal data set, obtained via the ‘education, skills and abilities’ module in the 2012 wave of the survey. They find that parental expectations of higher education participation by their children are high in Australia, with 60 per cent of respondents from couple parent households and 53 per cent of respondents from single parent households seeing a positive prospect for their child to enter higher education.

Parental aspiration and family background are critical in driving student aspirations (Marjoribanks, 2003; Alloway and Dalley-Trim, 2009; Khattab, 2015). Importantly, Gore et al. (2015) examine longitudinal evidence on student educational and occupational aspiration and find that ‘the aspirations of younger students were similar in many respects to those of older students’ (p. 171), with strong evidence for further attention to be paid to outreach work in primary education.

3.4 Empirical Evidence on Participation: Accessibility and Availability

Factors pertaining to accessibility and availability result in divergent opportunities for engagement with higher education. Here, accessibility is considered to mean those facets of higher education participation which facilitate the transition to university for able students. This includes knowledge of higher education entry and participation requirements; student economic resources; and other factors, notably geographical location and local youth labour markets.

Availability refers to the supply of places and courses within higher education and how discipline choices and institutional structures affect overall participation.

Knowledge of Higher Education Options: Aside from student achievement and parental educational background, accessibility is the critical factor in higher education participation – the ability of students to access information about entry into higher education as well as the resources required to participate.

Cupitt and Costello (2014) examine the literature around ‘pathways into university’ for school students, and use a model of progression into higher education developed by Robinson and Bornholdt (2007) to classify the broad group of factors affecting participation, including family environment, community, friends and peers and the educational institutions and services such as schools. The student’s decision to enter higher education is shaped by the social environment in which they live and which in large part determines their attainment aspirations and the types of knowledge and information students have available to them.

The nature of the advantage enjoyed by some students in terms of accessibility is reflected in both the quantity and quality of information students can draw upon. Gore et al. (2015) find that university aspirants are more likely to use a wider range of information sources in forming their decision to enter higher education compared with non-aspirants.

Further, students whose parents have higher education experience have the additional advantage of access to knowledge about the life course benefits of participation. This is a point raised by Bourdieu (1986) in a criticism of human capital theory, where he points out that ‘scholastic yield from educational action depends on the cultural capital previously invested by the family’ (p.242). He identifies three forms of capital which shape educational choice: economic, cultural and social. Economic capital is associated with wealth which can be used to sponsor educational participation. Cultural capital refers to those cultural practices that are either: ‘embodied’ – personalised cultural developments which are transferred through culture such as academic practice; ‘objectified’ – cultural practices transferred through objects such as books or instruments; or ‘institutionalised’ – including cultural capital implicit in the construction of higher education institutions. Social capital refers to social networks which allow for the ready translation of status or ‘credit’, be it economic or cultural.

Restricted access to these forms of capital ensures the reproduction of socioeconomic and sociocultural advantage in society through class, gender and ethnic identities, at the individual and institutional level with the effect of entrenching inequality (Burke, 2012, pp. 40-41). More broadly, social capital has been linked to human capital formation (Coleman, 1988) Other themes within sociology, such as work relating to social networks and disadvantage (Putnam, 1995; Portes, 1998) and Sen’s (1985) ‘capability approach’,

emphasise the role that social capital plays in shaping the ability of individuals and communities to gain a sense of ‘agency’ regarding social and economic opportunity. These advantages in turn facilitate access to information on higher education entry and participation.

Accessibility and Economic Resources: In addition to expanded access to information about university entry, students from equity backgrounds are at a disadvantage due to the diminished economic resources available to their families, both to pay for the direct costs of education and in tuition support.

In addition, contemporary developments in the application of social theory to higher education participation centre around the maintenance of social position, most notably outlined in the relative risk aversion (RRA) theory which posits that participation in further education is governed by a desire to at least retain social position rather than advance it (Breen and Goldthorpe, 1997), with households with greater socioeconomic standing having both higher expectations and increased capacity to participate in higher education. As Liu (2011) notes, in a meritocratic society characterised by high levels of education and achievement, ‘social status becomes increasingly dependent upon an individual’s level of education’ (p. 383). This intensifies the pressures identified by RRA theory.

As RRA theory suggests, the gradient in household socioeconomic endowment and risk aversion, leads to even more pronounced disadvantage. A growing international literature suggests that family financial resources, especially long-term financial resources, enable families to invest considerable amounts into the education of their children. Recent studies in the United States find that financial assets and liabilities are predictors of higher education participation (Zhan and Sherridan, 2011; Huang et al., 2010). They point to two aspects of financial stability which impact on participation – financial asset ownership and home ownership – with the impact of both operating over the relative long-term, well before students consider higher education. Differences in household wealth in the US are shown to impact on higher education participation rates in the most prominent area of US income disparity, while ‘differences in economic resources are associated with a substantial portion of the Black-White gaps in college attendance and graduation’ (Zhan and Sherridan, 2011, p. 2173).

Evidence from Australian studies suggests accessibility is affected by financial disadvantage in different ways to the US. Generally, while income and wealth disadvantage is associated with reduced opportunity, this is not present to the extent seen in US studies. In this regard, the long-term policy response in Australia may have had a significant impact. This centres on the income-contingent loans system for higher education, HECS-HELP, which given fee levels over the past decade is not viewed as being prohibitive to higher education access (Chapman and Tulip, 2010). Although there is evidence of a strong socioeconomic gradient in terms of HECS-HELP repayments, reflecting differences in the earnings of students upon graduation (Birch and Miller, 2007b), HECS-HELP has largely removed the impact of family resources as a decisive factor affecting access and participation in undergraduate programs, although this observation needs to be caveated by the introduction of full fees at the postgraduate level.

In addition, Australia's system of student support, through payments such as AUSTUDY or the Youth Allowance, provides income support to students on a means tested basis. Ryan (2013) finds that participation among people who are eligible for the Youth Allowance is not noticeably greater than a group similar to them in terms of family background (but not family income) who are ineligible to receive the benefit, although receipt of the benefit is positively associated with completion in both university and vocational courses (Ryan, 2013, p. 43). However, recent evidence suggests that student income support is still viewed as being a critical issue in terms of both initial access and ongoing participation. Bexley et al. (2013), in a study of student finances, find that 76.6 per cent of low SES undergraduates agree with the statement 'My financial situation is often a source of worry for me' compared with 65.2 per cent of middle and high SES undergraduates (p.90). The key finding from Cardak and Ryan (2009) implies that access to higher education is less affected by financial considerations (fees, living costs) than academic performance in the general population.

However, there is evidence that disadvantage due to low levels of economic resources may interact with family structure to accentuate disadvantage. For instance, [3] Dockery, Seymour and Koshy (2016) find evidence for a stronger interaction between household structure and wealth in single parent households, with young people from single parent families who grow up in public housing being shown to be significantly disadvantaged, but with no comparable effect being observed in couple parent households or overall.

Geography: Geography has a prominent role in shaping aspirations for, and access to, higher education courses and qualifications. Broadly, these impacts can be classified in terms of ‘remoteness’ from higher education infrastructure and disadvantage that is pervasive through a local community.

Regionality and remoteness from universities compounds existing disadvantage in higher education participation. In an analysis of regional patterns of higher education participation, the Department of Education, Employment and Workplace Relations (2010, p.13) uses data from the 2006 ABS census to show that among 19 to 21 year olds, university participation rates in regional areas (19.3 per cent) are slightly lower than those seen in outer metropolitan regions (22.9 per cent), but almost half that of inner metropolitan areas (37.4 per cent).

This divergence in participation across regions is attributable to the composition of local workforces on the basis of educational attainment (i.e., the other factors discussed in this section), with educational disadvantage being more prevalent in regional areas. A recurrent concern of policymakers is the impact of distance to higher education institutions in regional and remote areas, where relocation and living costs are greater, and impact more significantly (for a discussion, see: Kilpatrick and Abbott-Chapman, 2002; Alloway and Dalley-Trim, 2009; Abbott-Chapman, 2011; Wilks and Wilson, 2012). Regional students appear to face such costs at higher rates than urban students. For instance, Birch and Miller (2007a) report on students taking a ‘gap year’ – a practice in part until recently associated with establishing eligibility for Commonwealth income support – and show that 14.95 per cent of regional students take a gap year compared to just 5.35 per cent of students from metropolitan regions.

Another cited reason is the increased distance to campus faced by regional students. In an instructive study of household data from Canada, Frenette (2006) examines the interaction between socioeconomic status (as proxied by family income) and distance from university. He finds that for all students ‘within commuting distance’ (0 to 40km from the nearest campus), students from the bottom income tier (the third for three tiers) were just over half (54 per cent) as likely to attend university. However, among students who were ‘possibly outside commuting distance’ (40 to 80km) and ‘outside commuting distance’ (more than 80km), students from the bottom income tier were only 20 per cent as likely to go to university as those from the first tier.

Although less work has been done in Australia on campus proximity, Edwards and Marks (2008), in a submission to the Bradley Review find that higher education participation rates in Victorian regions are higher for those regions closer to university campuses. However, as observed in Koshy and Phillimore (2013), during the early stages of the demand driven funding system in Australia more than half of the regional student population attended universities without regional campuses, with Koshy (2016a) noting a continued increase since then.

The results from Australian studies indicate that academic performance and subject choice are more prominent drivers of relocation and participation than geographical isolation (Jones, 2002; Blakers, Maclachlan and Karmel, 2003; Cardak and Ryan, 2009). In their assessment of the impact of socioeconomic status on participation in regional areas, the Department of Education, Employment and Workplace Relations (2010) emphasises that difference in educational, occupational and economic status are important in explaining differences between regional and inner metropolitan participation rates, in conjunction with the presence of greater levels of university infrastructure in Australian cities (Koshy and Phillimore, 2013).

Youth Labour Markets and Social Structure: One key observation is the contribution of changes to the structure of the workforce and social institutions in Australia over the past three decades. The most prominent of these is the ongoing deterioration in the youth labour market in Australia since the early 1980s. Lewis and Koshy (1999) find that the key factor in the rise in school participation from 1980 to 1997 was the deterioration in full-time employment participation among 15 to 19 year olds, falling from 39.5 per cent in 1980 to 15.6 per cent in 1997. In effect, post-compulsory options to education moved from being attractive options to becoming nearly mandatory for entry into the workforce. A number of commentators have studied how these changes in labour markets have exacerbated inequality in Australia (see for instance, Borland, 2016). More generally, Gewitz, Ball and Bowe (1995) cite similar changes in the UK in their discussion of how market based reforms in the general economy as well as education have worked in concert to exacerbate inequality in higher education access.

Availability: Discipline and Institutional Factors: In post-war Australia, the availability of places in higher education was centrally managed by the Commonwealth, with places being restricted on the basis of perceived workforce demands. This led to the ongoing

debate about the desirability of both an expansion in places and support mechanisms to ensure wider participation in Australian higher education.

However, the advent of the demand driven funding system between 2010 and 2012 effectively placed control over university places with institutions, albeit with the Commonwealth ultimately having control over system enrolments (Kemp and Norton, 2014).

As a consequence, in the past decade, the discussion around the availability of university places shifted from a system perspective to looking at institutional structures, particularly in view of the introduction of HEPPP and the institutional compact reporting system under which universities were held accountable for equity student enrolments.

This discussion was tied to the previously more general discussion about overall participation and attainment. One element to this discussion is the divergence in rates of equity student participation across academic disciplines, with equity students traditionally being under-represented in disciplines such as medicine and law.

Access to disciplines is also closely related to the institutions that offer them. The impact that institutions have on the availability of higher education to potential students reflects the collection of background factors which impact on higher education participation and attainment. The distribution of privilege within society is uneven and therefore, access to institutions that confer lifetime benefits is also uneven. As with all elite systems, higher education institutions can confer and reinforce perceptions of advantage in society over time:

Leading universities attract leading students and high achieving staff in an ongoing process of status exchange. The universities draw institutional status from the presence of these valued persons, and apply individual status back to them. (Marginson, 2011, p.31)

Higher education institutions perpetuate disadvantage insofar as entry into higher education is supported by substantial 'investments' made on behalf of, and strong encouragement for, new entrants, by their parents.

The expansion in Australian university places, partly driven by equity considerations outlined in major policy documents such as *A Fair Chance for All*, and broader social and economic motivations discussed by Trow (2007) and Schofer and Meyer (2005), has initiated a debate around whether academic quality may be (negatively) affected by an increase in equity student participation. This has been accompanied by discussion around the impact of equity initiatives on the discipline and institutional structures of Australian higher education. These issues are discussed further in Section 4 below.

3.5 Summation

The key observation from the literature on higher education participation, both in general, and with specific reference to Australia, is that observed variation in the rate of participation is driven by a range of background factors, including parental educational background, gender and geographical location, which are likely to operate in concert to affect pre-tertiary educational outcomes and therefore reduce later educational participation.

There is evidence that financial and social barriers to higher education participation in the immediate lead up to the age of university entry are less important in Australia than they may be elsewhere. However, there is evidence that some major inhibitors are still at play, with other factors – geography and distance from campus, Indigeneity, and social isolation – shaping participation.

Encouragingly, there is evidence that Australian government policy measures such as the introduction of HECS-HELP, the ongoing expansion in higher education places, and the introduction of specific measures such as HEPPP, have substantially ameliorated identified disadvantage in the system.

4. THE CONDUCT OF EQUITY POLICY

One of the hallmarks of the shift in Australian higher education to a demand driven funding system has been the impetus towards the increased use of education-related data sets to further policy goals, including equity policy.

A strong evidence base is required to not only evaluate proposals for continuing further public funding of higher education, but also to ensure that the benefits of direct initiatives promoting higher education participation are spread across the community fairly and are not unduly affected by historic disadvantage. As Leigh (2013) puts it, ‘transparency leads to a race to the top’, a finding which he emphasises has particular relevance to Australian higher education in the demand driven era. The Productivity Commission’s *National Education Evidence Base* inquiry report (Productivity Commission, 2016) outlines the benefits and opportunities for further integration and use of education-based data sets in Australia, supported by the release of the *Public Data Policy Statement* on the use of public data (Turnbull, 2015).

Recent research on higher education participation and equity status has sought to analyse key aspects of the future conduct of policy. This section examines three such issues which this thesis addresses.

The first of these of these is the way equity status is defined, measured and reported in a taxonomy of defined ‘equity groups’. The foundation of equity policy relies on the connection between research on participation and the identification of students who are disadvantaged and the application of measures to address disadvantage. Defining and assigning equity status to students is thus of primary importance.

Second, from a system perspective, an important emerging issue is to determine whether the most important recent policy change – the introduction of the demand driven student funding system – has increased the number of equity students in the system at the expense of alternatives such as VET and also negatively impacted on both the quality of, and returns to, undertaking a higher education degree.

Finally, differences in equity participation by jurisdiction (state and territory) and institutional grouping create challenges for equity measurement and policy. The discussion here reports on research findings relating to both these aspects.

4.1 The Measurement of Equity Status

Australia's current system for reporting on disadvantage was established by the 1994 Martin Review's recommendations on the identification of equity group students in Australian higher education which remains largely in place today. As [5] Koshy (2016c) observes, 'perhaps the ultimate testament to the durability of *A Fair Chance for All* is the continued use of the core groups identified' (p. 6).

The Martin Review led to the linking of equity data collection to overall student enrolment reporting via the Higher Education Information Management System (HEIMS), Australia's online portal and database facility for higher education institutional reporting. Australia reports across all these categories under its higher education equity policy framework, with Table 4 below reporting current definitions for these groups.

In HEIMS, students are assigned a given equity status on the basis of their current address of enrolment. Equity group identification in Australia uses a combination of self-reporting and geographic identification on the basis of a student's permanent residential address. Disability, Indigeneity and NESB status are all self-reported under this system, with WINTA students classified on the basis of enrolling discipline. Low SES, Regional and Remote students are classified on the basis of their residential location. Regional and remote status are currently assigned using the Australian Statistical Geography Standard (ASGS). Low SES status, as outlined in Table 4, is assigned using the student's permanent address and census information for its statistical area 1 (SA1) of location.

The identification of these groups is in keeping with international practice. In a recent survey of 50 countries, Atherton, Dumangane and Whitty (2016, p.26) observe, that while data is less consistent outside the developed group of nations, 36 collected data on *Socioeconomic background*, around 33 collected data on *Learners from rural backgrounds*, with lower levels of reporting for *Disability* (31 countries), *Ethnicity* (29), *People who speak a particular language* (20) and *Indigenous Groups* (16).

The collection of equity information on domestic higher education students in Australia, allows for the construction of key baseline figures of their performance within the system:

- **Access rate:** Equity group share of ‘new commencements’ in the Australian system;
- **Participation rate:** Equity group share of total enrolment; and
- **Participation ratio:** Participation rate of a given equity group as a ratio of the participation rate of all students.

As an extension to these measures, other performance measures are collected for both equity group student and the general student population:

- **Retention rate:** Percentage of first year students retained at an institution in the second year (institutional retention) or in the higher education system as a whole (system retention);
- **Success rate:** Equivalent full-time student load (EFTSL) passed/EFTSL certified (passed, failed or withdrawn); and
- **Attainment Rate:** Share of award course completions by equity students.

Australia has also added external collection instruments which can be integrated with HEIMS to track equity outcomes. Principal among these is the Australian Graduate Survey (AGS), comprised of the Graduate Outcomes Survey (GOS) which collects data on employment and earnings outcomes from a sample of graduating students in their first year after receipt of their degree and the successor to the Graduate Destination Survey (GDS) (Graduate Careers Australia, 2015). However, Australia’s system of equity measurement and reporting continues to be focused more on access and participation than on completions and post-graduation outcomes (Harvey, Burnheim and Brett, 2016; Pitman and Koshy, 2015).

Table 4 Method of Identification and Definition of Australian Higher Education Student Equity Groups, 2016

Student Equity Group	Method of Identification	Definition	Target Population Share*
Students from low socioeconomic backgrounds (Low SES students)	Postcode/ABS statistical area (SA1) area of student's enrolling address	SES is assigned to students on the basis of the SES of the geographical location in which they reside, as identified by postcode or, as now, by SA1 classification. All SA1 areas are ranked on the basis of ABS estimates of the SEIFA of education and occupation calculated using census data. Low SES students come from the bottom 25 per cent of Australian SA1s (with a postcode backup) in a national ranking.	25%
Students with disability	Self-reported	Students who self-report a disability to their higher education provider, either at the time of their enrolment or during the course of their studies. Major disability classifications are: hearing, learning, mobility, visual, medical and other.	8%
Indigenous students	Self-reported	Students who self-report as Indigenous to their higher education provider, either at the time of their enrolment or during the course of their studies.	2.3%
Students from regional areas	Postcode/SA1 area of student's enrolling address	Regional students are defined as having a home address in an SA1/postcode area that is classified as regional using historical Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) classifications and the Australian Statistical Geography Standard (ASGS).	25.4%
Students from remote areas	Postcode/SA1 area of student's enrolling address	Remote students are defined as having a permanent home address in an SA1/postcode area that is classified as remote using historical MCEETYA classifications and the ASGS.	2.4%
Women in non-traditional areas of study (WINTA)	Enrolment in identified major	Female students who are enrolled in the Natural and Physical Sciences; Information Technology; Engineering and Related Technologies; Architecture and Building; Agriculture, Environmental and Related Studies; and Economics and Econometrics.	50%
Students from non-English speaking backgrounds (NESB)	Self-reported	Students from a non-English speaking background who have been resident in Australia for less than 10 years.	3.7%

Source: Based on Koshy (2016a), p.279. **Note:*** ABS 2006 Census Reference Share.

The Identification of Equity Status Using Area Measures

Equity group identification in Australia is split between self-identification (disability, Indigeneity and NESB) and identification through area measures (low SES, regional and remote). While there are noted under-reporting and definitional problems with self-identification, principally due to the complexities around medical diagnosis, self-identity, stigma and agency, particularly in regard to disability (see Brett, 2016) and Indigeneity (Drew et al., 2015), the use of area measures to identify SES, especially low SES, has prompted the greatest level of policy focus in recent years.

Australia uses an area measure to define socioeconomic status (specifically, 'low SES status'), through the use of students' residential area. In doing so, Australia follows the UK and several European countries in defining disadvantage on the basis of neighbourhood (Atherton, Dumangane and Whitty, 2016).

Low SES students in Australia are defined according to the socioeconomic status of their neighbourhood, with ABS census data used to characterise postcode areas, collection districts and statistical areas (SAs) using the ABS's SEIFA index. The low SES population is defined as belonging to areas located in the bottom 25 per cent of population on such measures, as indicated in Table 4.

Thus, in Australia, the use of an area measure sees SES designated using the SEIFA (EOI) index for the statistical area 1 (SA1) in which a student resides. In contrast to the UK, where the area measure, POLAR (participation of local areas), classifies students on the level of higher education participation in their local area, the SEIFA is constructed using area averages from the census (using principal component analysis to calculate weights) for variables including: three variables on education attainment – percentage of population having attained Year 11 completion; percentage of population having attained training certificates; and percentage of population having attained degrees; a variable characterising the percentage of population currently attending university or tertiary institution (advanced); the percentage of population unemployed; the percentage of population in ABS occupational categories 1, 2, 4 and 5, where 1 is the highest and 5 the lowest, in a ranking of occupations on the basis of the 'range and complexity of tasks performed' in the occupation (ABS, 2011, p. 14).

Students located in an SA1 area in the bottom 25 per cent of all Australian areas on the basis of an Australia-wide ranking of SA1s using SEIFA scores are classified as low SES

students. While reporting in quartiles (Australia) or even quintiles is common, this choice has historically been somewhat arbitrary, a point picked up on by Coelli (2010) who shows that educational disadvantage (using a variety of measures from different sources) is not dramatically different between the lowest and second lowest quartile in the Australian population.

The central characteristic of area measures is the trade-off inherent in their construction. [1] Koshy (2011, pp. 46-47) outlines three critical issues or criteria for the measurement of socioeconomic status in higher education systems:

- *Variable Efficacy*: How can an index be constructed to best capture the impact of a diverse range of factors, including income, occupation and educational attainment within households?
- *Level of Identification*: Should individual household measures be used, or does a geographical score such as the postcode in which a student resides suffice as a measure?
- *Reference Population*: In a national higher education system with strong levels of state-specific segmentation in higher education, should we use the population of the state or nation in assigning an SES ranking to an individual student?

Addressing these three elements individually:

Variable Efficacy: Generally, the choice of variables to define equity status, or more commonly, socioeconomic status, is well established. For instance, the construction of SEIFA (EOI) as a proxy for socioeconomic status is, in and of itself, viewed as reasonable given the findings from research into dimensionality of social disadvantage (McMillan and Western, 2000; Baker and Adhikari, 2006; Koshy, 2016b; [4] Dockery, Koshy and Seymour, 2016).

Level of Identification: In terms of the level of identification, the trade-off inherent in the choice between collecting data on equity status at the individual or area level is one between accuracy and cost, with more relevant information at the individual level coming at a higher cost, not only in terms of cost of collection but also indirect costs associated with privacy and intrusion at the point of enrolment.

This is not to say that area measures are necessarily invalid. The original rationale for the use of areas measures in socioeconomic status was work in the 1980s, largely discussed in Linke, Oretel and Kelsey (1985) which compared university enrolment patterns with census based measures of occupational and educational status and found that area measures were a reasonable proxy for disadvantage at the individual level.

However, there is a trade-off between the cost of collecting and reporting information at the individual student level and the benefits of a more granulated picture of equity disadvantage. A number of studies have identified a substantial misclassification of individual students under the area measure, including Ainley and Long (1995a and 1995b); Marks et al. (2000); Lim and Gimici (2011) and [3] Dockery, Seymour and Koshy (2016), which flows from the underlying heterogeneity of populations even within relatively confined geographical spaces (ABS, 2012). More broadly in equity status identification, this is particularly true where outcomes are the consequence of compounding elements of disadvantage for an individual.

Reference Population: Another issue pertinent to use of the area measure is its collection at a single point in time. This can distort the true nature of a student's socioeconomic status if their location in an area is transitory, quite aside from any misclassification due to heterogeneity of households in a given area. There is some evidence to suggest that this is an issue within the Australian reporting system. The Australian Council for Educational Research (ACER) reports that domestic Australian students are relatively mobile in terms of residential location (ACER, 2013). Using ABS census data between 2006 and 2011, they find that a lower percentage of higher education students would be classified as low SES – 13.2 per cent compared to 18.2 per cent – as a result of relocation.

An additional consideration is misclassification due to students relocating to pursue further studies, in effect altering their socioeconomic or regional status in the process (Department of Education, Employment and Workplace Relations, 2009, p. 2), an outcome which has prompted a recent Australian Government policy in the area definition of low SES and regional and remote status, following work by Cardak et al. (2017). They compare the number of low SES students in domestic undergraduate higher education in Australia using two area measures – the standard reporting measure using 'current' address and a measure they construct using 'first' address, that is the student's enrolling address. This has the impact of *increasing* the proportion of students from low SES backgrounds from 16.1 per cent to 17.3 per cent on the basis that students from low

SES areas eventually move closer to university and reside in higher SES areas over the course of their studies and therefore see a change in classification.

Due to the above features of their construction, the use of the SEIFA area measure has been viewed as contentious in Australian equity policy (McMillan and Western, 2000; [3] Dockery, Koshy and Seymour, 2016; Martin, 2016). A recurrent criticism of the area based approach is that it has great potential to misclassify students on the basis of heterogeneity of local populations.

This is referred to as the ‘ecological fallacy’, whereby students’ underlying characteristics do not necessarily correspond to the average characteristics of people in their local area, with low SES students in middle or high SES areas potentially being mis-classified (and vice versa). This is a noted policy challenge in countries using area measures for equity reporting, such as the UK, Ireland and Australia (Harrison and McCaig, 2015).

However, an important consideration in making an assessment of the use of area measures is raised by Lim and Gemici (2011) who note that while area measures are useful for monitoring overall performance (access, participation and outcomes), they are not suitable for programs aimed at individuals. Harvey et al. (2016) argue that overall, the trade-offs inherent in using area measures to characterise clusters of students have proven beneficial for equity policy formulation and management in Australia (Harvey, Burnheim and Brett, 2016).

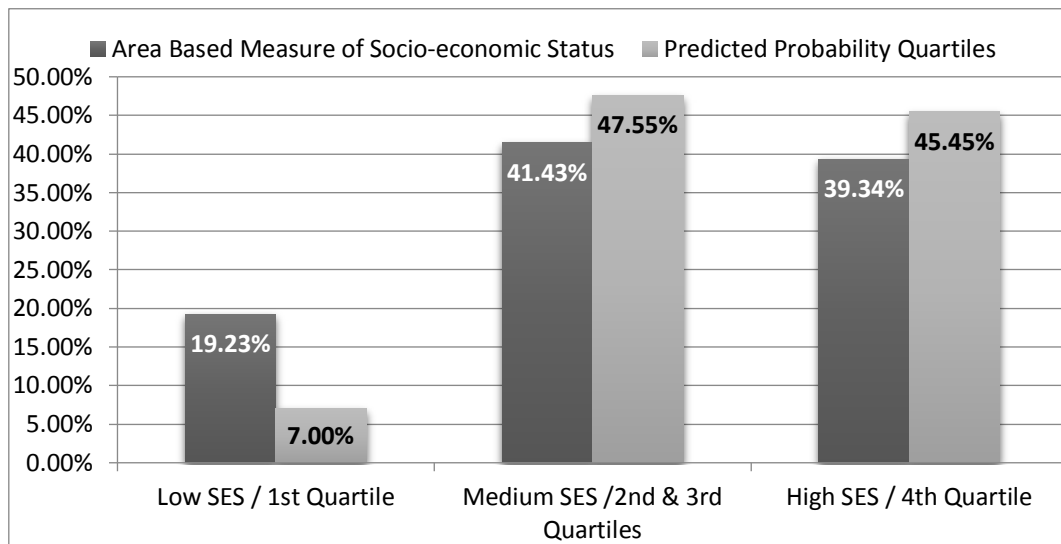
Individual Measures of Equity Status

Given the renewed policy focus on program interventions under HEPPP, the increasing desire among policymakers for better systems of evaluation ([5] Koshy, 2016a), and the recognised problems of area-based measures, the prospect of identifying individual measures of equity status is attractive in principle. In a study using HILDA data, [3] Dockery, Seymour and Koshy (2016) characterise individuals (17 year old secondary students) on the basis of their probability of entering university.

This study includes a broad range of ‘equity’ variables which characterise an individual student in ways not obtainable using area measures, including information on Indigeneity, disability and household composition, in addition to the range of socioeconomic variables present in areas measures.

A student’s equity status is determined by ranking the sample into quartiles on the basis of this calculation. This is compared with a ranking using the then area measure (SEIFA postcode) for SES status (as outlined in Section 4 below), which is the standard measure for defining socioeconomic disadvantage in Australia. Using the postcode measure, the percentage of university students viewed as being low SES is 19.23 per cent. In contrast, the estimate using the paper’s individual-based assignment of status is much lower at around 7 per cent, with a further result being the under-classification of middle and high SES students (see Figure 2).

Figure 2 The Proportions of University Enrolments by Area Based Measure of Socio-Economic Status and Predicted Probability Quartiles



Note: Based on Figure 4 in [3] Dockery, Seymour and Koshy (2016).

This comparison is indicative only, as estimates of equity status using regression techniques tend to be self-referential, with construction of individual measures of higher educational disadvantage typically requiring calculation using methodologies, such as the principal components methodology.

However, the significant discrepancy in the allocation of participants to the lowest quartile on the basis of predicted probability of participation versus the area measure is noteworthy.

This is due in part to the inherent misclassification using area measures, but also the inclusion of measures of other types of equity status (e.g. gender, Indigeneity, regionality

and disability) which are known to have compounding impacts on the probability of participation ([3] Dockery, Seymour and Koshy, 2016; James, 2002). As Harvey, Burnheim and Brett (2016, p. 13) note, ‘...compound disadvantage is not simply a reflection of people falling into multiple categories, but a state in which disadvantage is seriously compounded by each new factor.’

The use of student-level data, allowing for the inclusion of the compounding effects of multiple disadvantage, has potential to allow for a more precise identification and policy response.

4.2 The Impact of Higher Education Expansion on Quality

The widening of higher education participation, both in terms of the historic increase in access to higher education, as well as the specific focus on equity status and access, has increased attention on the possibility of a ‘quality-quantity trade-off’ as a result of the acceleration in access to higher education following the introduction of the demand driven funding system ([2] Pitman, Koshy and Phillimore, 2015). This relates to two inter-related criticisms, namely that the increases in enrolments have been to the detriment of individual students (entering university instead of VET for instance), but also to the system overall due to concerns around quality.

Student Choice

The expansion in higher education in Australia was accompanied by an historic decline in the full-time youth labour market, coupled with public policy initiatives to mandate secondary completion and promote tertiary participation. Thus, post-school choices for students have increasingly been between university and VET participation instead of direct labour market participation (Lewis and Koshy, 1999).

As noted in Section 3, [6] Koshy, Dockery and Seymour (2017) find that around 60 per cent of parent respondents expect their children to attend university. This is in comparison with a current higher education attainment rate for 25 to 34 year olds of around 37 per cent.

The movement towards higher education is borne out in a comparison of university and VET enrolment rates. Brett (2018) points out that by 2016, 41.2 per cent of 19 and 20 year olds were enrolled in university, compared with just 10.1 per cent in the VET sector

(including tertiary and further education – TAFE). Higher education accounted for around 80 per cent of all tertiary students in this cohort, up from around 67 per cent of all students in 2006.

This dominance is characterised by considerably stronger levels of enrolment in higher education among high SES and urban backgrounds by age 25. For instance, 2014 data on education and work from the ABS shows that the level of enrolment in higher education in the lowest SES decile is 17.3 per cent, compared to 19.8 per cent in the second lowest decile and 27.2 per cent in the fifth SES decile (Lamb et al., 2015, p. 75).

Karmel, Roberts and Lim (2014) model changes in the probability of undertaking both higher education and apprenticeship qualifications between 1995 and 2006 and find that over that period the growth in higher education enrolments came from individuals from middle and high SES backgrounds whereas apprenticeship increases were attributable to increased participation from low SES students.

Importantly, this is also characterised by a split in participation along gender lines. As the estimated returns to VET (Certificate III and IV) in Table 2 above show, there is a considerable strong premium attached to VET participation for males – around 20 per cent compared to Year 11 leavers, compared with a near 45 per cent premium for those holding a bachelor’s degree. However, the female premium to VET (Certificate III and IV) graduates is only one per cent over with those with only Year 11, compared with around 33.5 per cent return for holding a bachelor’s degree.

From this, it can be observed that substitution of VET for higher education is potentially more damaging for women than men, and the relative gender imbalances in VET (male dominated) and higher education (female dominated) tend to bear this out. The considerable premiums still available to university graduates also raise the question of whether increases in higher education among equity students may ‘crowd out’ participation in VET courses in the post-demand driven funding system environment.

Academic Quality

A focus on quality in Australian higher education has accompanied both the historic expansion in domestic enrolments, including the commensurate increase in equity student enrolment, over the past three decades. Recent initiatives include the establishment of the Tertiary Education Quality and Standards Agency (TEQSA) in 2011 – to register and

provide quality assessments and accreditation for higher education providers and courses – and the linkage to quality assessments under TEQSA to institutional performance objectives by the Commonwealth (Gale and Parker, 2013). Concerns around ensuring quality have increased in recent years due to two compounding forces: the shift to mass higher education in the OECD and the introduction of the demand driven funding system in Australia, [2] Pitman, Koshy and Phillimore (2015).

In view of the shift to higher education, the demand driven funding system has been publicly targeted as potentially promoting participation at the expense of quality (Hare, 2013); with the nexus between widening participation and reduced levels of prior achievement required to enter university being identified with a reduction in quality. As [2] Pitman, Koshy and Phillimore (2015) note in an analysis of university enrolments by ATAR percentile, the data bears out these sentiments to some extent, with the proportion of students receiving an ATAR rank of 50 or less rising from 1.74 per cent in 2006 to 3.66 per cent in 2011. Karmel, Roberts and Lim (2014) find that the expansion in higher education to 2012 resulted in a decline in the average academic preparedness of the incoming cohort, as students who traditionally enter VET courses opted for university.

In view of this observed pattern, [2] Pitman, Koshy and Phillimore (2015) find that standard proxies for quality, namely institutional attrition and progression rates, suggest a muted impact of rising student numbers prior to 2011 on both indicators, with the sector's progression rate declining by -1.21 per cent between 2008 and 2011 compared with growth in enrolment of 18.6 per cent.

A criticism of this approach is that it abstracts from institutional capacity to adjust course requirements in order to maintain first year progression – in effect maintaining progression though the dilution of academic standards – and that course completion, which is less exposed than first year progression to such manipulation, is likely to be a better indicator of the impact of the demand driven funding system on academic quality. Work along these lines undertaken by DET (2017a) tends to reinforce the results seen in the analysis of progression rates in [2] Pitman, Koshy and Phillimore (2015), with four year completion rates for commencing domestic bachelor degree population in Table A and B provider institutions declining from 47.4 per cent in 2005 to 44.2 per cent in 2012.

This fall in completion rates provides partial evidence to suggest that accreditation through TEQSA has, at least in part, been successful in maintaining academic standards

in higher education, as rising non-completion rates would be expected given increases in the number of less academically prepared students entering the system. Potentially more significant is the variation in completion rates between institutions, despite TEQSA monitoring. For example, DET (2017b) shows that attrition and completion rates vary significantly across the sector, with the adjusted attrition rate varies from 3.7 per cent to 37.7 per cent across Table A providers (p.74). However, it is not clear that such variation has widened under the demand driven system, as [2] Pitman, Koshy and Phillimore (2015) showed it has been evident for some time.

Given the uncertainty around the impact of higher education expansion on student choice, academic quality and patterns of dispersion, research efforts have emerged around the determination of the economic returns to university qualifications, with a particular emphasis on how returns differ in view student choice of discipline and institution attended.

Another consideration, the relationship between inter-generational income mobility and human capital accumulation is outside the scope of this thesis and is somewhat hampered by the relatively recent starting points for major longitudinal collections including – importantly, in Australia – HILDA, which commenced in 2001.

However, given HILDA's recent collection of information on higher education participation (Watson and Wooden, 2010), two aspects of equity status can be examined in regard to the impact of status on earnings.

First, the outcomes from university attendance typically reflect either the value of engaging with elite institutions or at a granulated level, elite individual disciplines. In view of the impact of equity status, the human capital model has been extended to examine the inter-relationship between status and skill accumulation – in effect, the relationship between equity status and human capital accumulation through discipline and institution specific effects.

The evidence on discipline-specific premiums is well established. Preston (1997), in an overview of human capital studies in Australia, finds evidence of variations in earnings among Australian graduates, with engineering, law and business graduates out-earning graduates in the education, arts and nursing disciplines. This is confirmed by a recent

study by [4] Koshy, Seymour and Dockery (2016), who observe that the choice of discipline is one of the key determinants of income outcomes.

How does equity status impact on academic discipline participation and returns? In the case of low SES students – the equity group most extensively studied – graduates appear to perform as well as the general population of students at university, as noted in Linke, Oertel and Kelsey (1985). A recent study by Li and Dockery (2015) finds no evidence of differences in academic performance after they control for prior academic achievement, a finding confirmed in the UK by Chowdry et al. (2013). To some extent, these results reflect the lower level of participation of low SES students in higher education, with those students reaching higher education being better equipped to navigate and succeed in it.

Against this effect, is an observation by Richardson, Bennett and Roberts (2016) in their analysis of outcomes reported in the Graduate Destination Survey (GDS), that low SES students in Australia tend to cluster in relatively few disciplines such as education and medicine and related studies (primarily nursing). Generally, they find that ‘graduates from many disadvantaged groups were clustered within the sub-fields of broad disciplines that are arguably regarded as lower status (and which are less well paid), such as nursing and teaching’ (p.5). Li et al. (2016) confirm this finding in a study of universities in one Australian state using GDS data and also including administrative data on student performance, with low SES students generally tracking outcomes for other graduates. However, they point out that this is likely due to selection factors, whereby low SES students with higher levels of human capital are more likely to complete their degrees and enter the workforce (p. 16).

This point is somewhat amplified in work by Edwards and Coates (2011) who look at graduate outcomes beyond the initial year. They find that after three years, graduates from disadvantaged backgrounds were less likely to be in full-time employment or occupy managerial positions, suggesting that low SES status impacts on graduate outcomes irrespective of academic discipline.

This raises some important questions around student choice and academic quality, with equity students tending to face more constrained subject choices, which in conjunction with other aspects of disadvantage, such as reduced academic preparation and access to social networks for work experience or job search, can interact to reduce their overall outcomes.

4.3 Jurisdictional and Institutional Differences

Analysing trends in Australian higher education system necessitates a consideration of the system's structure and the impact it has on the efficacy of equity policy. Higher education is stratified in a number of ways in Australia, but the most prominent division occurs at the jurisdictional (state and territory) level and between institutional groupings.

Jurisdictional Differences

The Australian higher education system is defined by state and territory boundaries, with 85.5 per cent of all applicants in 2014 applying to an institution in their home state (Koshy, 2016c), with inter-state applicants typically being high performing students seeking admission into nationally competitive courses, such as Medicine, which accounted for 20.5 per cent of all inter-state applicants in 2014 with only 1.9 per cent of the student load.

This segregation along jurisdictional lines reflects the development of metropolitan-based institutions throughout Australia's history as well as individual state-based secondary systems, each with their own curriculum and assessment infrastructure. For this reason, comparisons between students at the national level is often difficult, although this is somewhat ameliorated through the use of the ATAR which ranks students in each jurisdiction on an ascending scale between 35.0 and 100. Despite this, given the distinct educational structure across jurisdictions in Australia, each state and territory in Australia is a microcosm of the national (hierarchical) structure, with institutions ranked accordingly.

Regional differences are often overlooked in a federal system which emphasises the collection of equity macro indicators, working against the benefits of such an exercise, namely monitoring performance in a given jurisdiction and benchmarking between jurisdictions. This is apparent in Australia's area measure of socioeconomic status, when examining the demographics of individual states and territories. Because Australia's target setting emphasised the national target of 20 per cent low SES enrolment, discussion of university performance was usually centred on the national goal. However, the measure of low SES characterised students using a national ranking to determine the bottom 25 per cent (bottom quartile) of areas using the SEIFA census measure. As institutions in Australia draw their undergraduate enrolments from state areas this tends to ignore regional-specific challenges, as shown in Table 5.

Table 5 Equity Group Reference Values, Percentage from Relevant Population, per cent^a

State/Territory	Low SES	Indigenous	Regional	Remote	NESB
New South Wales	23.5%	2.23%	23.32%	0.60%	4.66%
Victoria	19.9%	0.63%	24.41%	0.10%	4.30%
Queensland	30.5%	3.16%	29.37%	3.61%	2.35%
Western Australia	19.8%	2.78%	21.57%	6.98%	3.21%
South Australia	35.7%	1.76%	23.73%	3.74%	2.50%
Tasmania	54.1%	3.65%	57.04%	2.31%	1.09%
Northern Territory	26.4%	23.65%	56.09%	43.91%	1.94%
Australian Capital Territory	0.0%	1.33%	0.11%	0.00%	3.62%

Source: Based on Koshy (2016c), Table 7, p. 10.

Note: (a) "Equity Reference Values" show the percentage of people from the various equity groups in the general population (aged 15-64) of each State and Territory using 2006 ABS census data. Equity group references for Disability are 8 per cent and for WINTA are 50 per cent across all states and territories.

By way of example, using the old postcode measure, on the basis of the national ranking, zero per cent of the population in the Australian Capital Territory (ACT) were classified as low SES (i.e. no low SES postcodes on a national ranking) compared to Tasmania, where 54.1 per cent of the population were classified as low SES (see Table 5).

Policymakers eventually sought to address this issue through the introduction of state and territory based measures ([1] Koshy, 2011), an institutional count of students receiving income assistance from government (DEWR, 2011) and ultimately, the use of the smaller SA1 area measure.

However, this became a critical issue with the Rudd Government's commitment to a national low SES target of 20 per cent enrolment share by 2020, with individual compacts for each institution being developed and aligned with this goal (Phillimore and Koshy, 2010b). Given that 85 per cent of domestic undergraduates in Australia attend a university in their 'home state' (Koshy, 2016), this raises the question of which low SES benchmark should be used in assessing institutional performance of low SES enrolment – the local state or territory or the nation as a whole (Phillimore and Koshy, 2010b; Koshy, 2011). For these reasons, Phillimore and Koshy (2010; 2010b) advocate the use of the low SES population estimates at the state and territory level to adjust national targets in order to allow institutional outcomes to reflect the number of low SES students in their jurisdiction in national ranking.

Institutional Differences

Equally important, is another sort of federation, namely the historic grouping of Australian institutions – each with its own self-described missions and mix of activities between research and teaching. As the Commonwealth has increased its funding and hold over universities, it has also exerted pressure on the system in terms of the way institutions are defined, managed and resourced.

Most recently this has occurred under the *Higher Education Support Act* (2004). This outlines administrative powers of the Commonwealth for 137 providers, classified into four groupings: Table A providers – the 38 major institutions who account for 93.4 per cent of enrolments; Table B providers – three private institutions (Bond University, The University of Notre Dame, and MCD University of Divinity); Table C providers – two private provider campuses based in Adelaide, Carnegie Mellon University and University College London (UCL); and Non-University Higher Education Providers (NUHEPs) – 94 smaller institutions who have an enrolling capacity in higher education.

The Table A providers account for the vast majority of enrolments within the system, even after place deregulation in 2012. This is due to their historic dominance and because Non-University Higher Education Providers are currently excluded from receiving public funding or offering HECS-supported places.

In addition, Table A provider institutions are organised into four formal groupings:

- *The Group of Eight (Go8)*: Australia's older, research intensive universities, who are typically clustered in the top 200 in international rankings, including the Australian National University (ANU) and The University of Melbourne.
- *The Australian Technology Network (ATN)*: Newer universities which were formed out of existing institutes of technology, including: Curtin University and the University of Technology, Sydney (UTS).
- *The Innovative Research Universities (IRU)*: Universities established in the 1960s and 1970s such as Murdoch University and Flinders University; and
- *Regional Universities Network (RUN)*: New universities with campuses in regional areas such as Southern Cross University and the University of New England.

In addition, there are 12 Table A providers who are ‘unaligned’ universities, who constitute a mix of institutions including: Macquarie University, Deakin University and the Australian Catholic University (ACU).

A comparison of participation rates across these institutional groupings shows how their geography, student intake and individual missions affect their share of equity student enrolments ([5] Koshy, 2016a). Newer institutions in groups such as IRU and RUN tend to have higher numbers of low SES students, due to a combination of their geographic location and history (see Table 6). The Go8 institutions, who are generally located at the centre of Australia’s capital cities and attract students with higher ATARs, have lower levels of low SES participation (11 per cent in 2014). This is certainly a feature of systems in the UK (Raffe and Croxford, 2015) and the US (Hoxby, 2009) and to some extent, all university systems.

Table 6: Equity Group Participation Rates, Table A Providers, by Institutional Groupings, 2014

	Low SES	Disability	Indigenous	Regional	Remote	NESB
National	17.9%	5.8%	1.6%	18.9%	0.9%	3.6%
Go8	11.0%	5.3%	0.8%	11.0%	0.6%	4.3%
ATN	16.4%	4.7%	1.2%	10.6%	0.8%	4.7%
IRU	21.7%	6.4%	2.4%	20.4%	1.6%	3.1%
RUN	29.8%	7.2%	2.7%	51.6%	1.9%	1.3%
Unaligned	18.6%	5.9%	1.6%	19.4%	0.6%	3.4%

Source: Based on Koshy (2016c), Table 8, p. 12.

Similar compounding patterns can be observed elsewhere, notably in regional and remote enrolments where the largely metropolitan-based universities of the Go8 and ATN are again under-represented in comparison with the rest of the sector. This also is observed in outcomes data such as attrition and completion results (see the above discussion on academic quality).

The stratification of Australian higher education institutions reported above is along the lines of institutional age, student intake and research intensity, in a manner similar to that seen in the UK (Raffe and Croxford, 2015) and US (Dale and Krueger, 2002; Hoxby, 2009). The most prominent grouping, the Go8, consists of five original state universities (all founded before 1911), the ANU founded in 1946 as a flagship research university, and two universities founded before 1959 who have global reputations – the University of

New South Wales (UNSW) and Monash University. In the most prominent global ranking of universities, ShanghaiRanking Consultancy's (2018) *Academic Ranking of World Universities*, in 2018 six of the Go8 institutions appear in the global top 100, while a further two are in the top 150. Only one other Australian institution, Curtin University, ranks in the top 200, but in the '151-200' band below all Go8 institutions.

There is a view that entry into study for a degree from a Go8 university is both a symbol of status and excellence – in part driven by their historic dominance of elite degrees in medicine, law and the physical sciences – with the implication being that their graduates will enjoy better employment prospects and higher salaries. This expectation is often explicitly tied to discussions about student quality, particularly in hierarchical higher education systems (Black and Smith, 2006) and in the case of Australia, the discussion surrounding quality in the aftermath of the introduction of the demand driven funding system ([2] Pitman, Koshy and Phillimore, 2015; Kemp and Norton, 2014).

However, after controlling for other factors related to discipline studied, institutional effects appear to be muted. Recent studies on graduate salaries do not find evidence for an institutional grouping effect. Birch, Li and Miller (2009) look at graduate starting salaries (GDS data) and find evidence of a very minimal impact on starting salaries. Carroll (2014) uses global ranking measures as a proxy for university quality and finds evidence for minimal institutional impacts, separate from course selection effects.

Finally, [4] Koshy, Seymour and Dockery (2016), in a study of earnings among Australian university graduates, use university groupings in Australia to proxy perceived academic rank and find these not to be significant for most of the sample. The general conclusion from their analysis is that:

...the overall finding on university effects suggest that institutional differences are relatively muted and may be attributable to regional location and therefore participation in regional labour markets or the unobserved family backgrounds of HILDA participants, which in turn may drive outcomes at the higher education level. To the extent these factors are determining wage differentials across institutional groups it does appear that there is evidence to suggest that institutional effects are limited, with field of study impacts predominating. ([4] Koshy, Seymour and Dockery, 2016, p.9)

This may be due to a ‘form of convergence in the reputations of Australian higher education institutions’ (p.9) as the Go8’s domination of elite courses recedes. However, there is evidence for an institutional effect among regional universities – specifically, the RUN (Regional Universities Network) universities – with graduates from this group experiencing reduced earnings compared with other universities.

4.4 Summation

The research on higher education participation and equity policy in this thesis has provided evidence on the crucial impact on the multi-dimensional nature of equity status in Australia and how this potentially plays out in view of jurisdictional and institutional differences across Australia.

The measurement of equity status is the key starting point of discussion around policy alternatives. Research in [3] Dockery, Seymour and Koshy (2016) highlights the compounding nature of disadvantage in dramatically reducing opportunities for people from equity groups, while also creating challenges for policymakers in identifying the nature of this disadvantage where broad area measures and equity group definitions are used to classify students. The possibility of the increased use of individual-level data to define equity status among students may go some way to ameliorating this problem.

The impact of equity status plays out in an Australian higher education system that has undergone a marked expansion recently, one which has called into question the ability of the system to maintain historic levels of academic quality while providing students with adequate choices ([2] Pitman, Koshy and Phillimore, 2015), both within and outside higher education.

This occurs in the context of marked differences across jurisdictions and institutional groupings in terms of measured disadvantage and access ([1] Koshy, 2011; [5] Koshy, 2016a). There is some evidence to suggest that differences in graduate outcomes are less pronounced across institutional groupings than at the discipline level ([4] Koshy, Seymour and Dockery, 2016), although the extent to which this applies to the equity student population needs to be examined further, particularly in view of continuing geographical disparity, be it at the neighbourhood, regional or state and territory level.

The heterogeneity in institutional make-up and jurisdictional contexts means that higher education policy and data collection needs to be framed in view of the national targets which reflect these factors. Phillimore and Koshy (2010) explore how this issue can be addressed in the case of low SES participation through the introduction of differential targets across universities to reflect their history, mission and geographical location. This calls for the recognition that uniform targeting across all institutions needs to be adjusted to take into account jurisdictional and institutional differences.

5. SUMMARY OF CONTRIBUTIONS OF THE THESIS

Australia has seen a marked expansion in higher education enrolments in recent years, with a renewed emphasis on equity policy measures aimed at outreach and retention through programs such as HEPPP. This has seen increases in the participation rates of most equity groups, with the exception of the regional and remote student groups ([5] Koshy, 2016a).

This thesis reports on a research program examining three aspects of this challenge in identifying and addressing disadvantage in Australian higher education. In doing so, it makes distinctive contributions to the literature.

5.1 RO1: Analyse recent trends in Australian higher education and equity policy

The thesis research program makes two distinctive contributions to the literature on recent developments in higher education policy and its impact on equity trends and reporting in Australia.

First, in [5] Koshy (2016a), an overview of recent history in equity reporting is provided with an analysis of the link to recent policy developments under the Rudd and Gillard governments, including the introduction of the demand driven funding system, establishment of a target for low SES participation (20% by 2020), the creation of HEPPP and the surrounding debate around the measurement of socioeconomic status in view of these initiatives.

In [5] Koshy (2016a), as well as in related work, a second contribution has been made in terms of the development of a reporting system on equity outcomes by state and territory jurisdiction and institutional grouping, the latter of which has not been typically reported in higher education equity analysis in Australia. In [1] Koshy (2011), an analysis of the central equity policy funding initiative of recent years, HEPPP funding, is undertaken in view of these and specifically, national versus state and territory rankings of areas (postcodes) using SEIFA as a measure of socioeconomic disadvantage.

5.2 RO2: Analyse the determinants of undergraduate higher education participation in Australia

The design, implementation and successful impact of equity policy relies on evidence on fundamental factors behind differential rates in higher education across equity groups and the general population.

The research in this thesis makes two distinct contributions to an understanding of the determinants of undergraduate participation in Australian higher education.

In [6] Koshy, Dockery and Seymour (2017), an important aspect of aspiration is examined, namely the determinants of parental expectation of higher education participation. This paper uses unique data from the HILDA longitudinal data set to explain parental response to a question in the survey on this issue. An important finding from this paper is that traditional notions of educational disadvantage are observable in parents' views on the educational progress of their children, with educational attainment, occupational status, household composition and regional location being significant in shaping expectations. The key implication of this finding is that disadvantage associated with non-participation is reflected in parental aspiration.

Second, the construction of a model to explain higher education participation in [3] Dockery, Seymour and Koshy (2016) provides a demonstration of the use of empirical data to characterise educational disadvantage due to equity status using individual-level data. This paper has already been widely cited in publications ranging from ACIL Allen Consulting's (2017) evaluation of the HEPPP system to the review of socioeconomic status measurement in Marks (2017).

5.3 RO3: Analyse the implications for higher education equity policy of recent evidence on participation and equity

The weight of research in higher education indicates that there is considerable evidence to suggest the existence of persistent disadvantage in higher education, as seen in the reporting of current indicators (Koshy, 2016b) or in studies examining the determinants of participation (for instance, [3] Dockery, Seymour and Koshy, 2016). The thesis makes distinct contributions to an understanding of three aspects of equity policy formation: the identification of equity status; the impact of the expansion in the system (and increases in

equity student numbers) on student choice and academic quality; and the role of jurisdictional (state and territory) and institutional differences in framing equity policy.

Australian equity policy continues to see an emphasis on equity student identification through the equity groups identified by the 1994 Martin Review, as overviewed in [5] Koshy (2016a). This thesis discusses issues with the identification of equity status, using the use of area measures for identifying socioeconomic disadvantage as an example in [1] Koshy (2011) and [3] Dockery, Seymour and Koshy (2016). These papers address three issues with the area measure: variable efficacy, level of identification and reference population, which have application to other equity group definitions where group characteristics are used to define individual disadvantage.

A second contribution of the thesis is that of an examination of student choice and academic quality. Despite the level of identified disadvantage, higher education has emerged as the preferred destination for school students, with [6] Koshy, Dockery and Seymour (2017) finding that around 60 per cent of parent respondents expect their children to attend university. This is in comparison with a current higher education attainment rate for 25 to 34 year olds of around 37 per cent and has emerged in the era of the demand driven system for university places. Higher education has now become the default preference for school students, raising the prospect of a misallocation of funding where student choices are compromised and from a system-wide perspective, concerns about reduction in academic quality.

Early evidence on the impact on quality comes from [2] Pitman, Koshy and Phillimore (2015), who observe that four year completion rates for commencing domestic bachelor degree population in Table A and B providers only declining from 47.4 per cent in 2005 to 44.2 per cent in 2012, suggesting both a reasonable level of change in student completion rates in view of expanding demand but also that the quality of a university degree is not being compromised. A caveat to this finding is the observed wide distribution of attrition and completion rates across institutions.

Finally, differences across jurisdictions and institutions groupings, impact on the effectiveness of national equity policy. For instance, in examining the issues around jurisdiction, [1] Koshy (2011) outlines differences in the policy settings that are required using either national or state-based measures of socioeconomic status in Australia for low SES student enrolment targets. The paper demonstrates that differences across states and

territories need to be accounted when establishing equity targets due to the geographical stratification of Australian higher education. For instance, if setting targets for low SES students, policymakers have to allow for their minimal presence in the ACT and majority presence in Tasmania – around zero and 54.1 per cent respectively, using the 2006 SEIFA definition – and the reality that most institutions in Australia continue to draw domestic undergraduates from their own state or territory.

Institutional differences are also important. A number of commentators such as Marginson (2011) have increasingly focused on perceptions of institutional quality and hierarchy in shaping outcomes in a mass system of higher education. This is in contrast to traditional analysis of the transmission of advantage through educational attainment through occupation and related discipline (Anderson et al., 1980; Linke, Oertel and Kelsey, 1985).

There is a wide distribution of participation by equity student groups across such groupings, with the Go8 institutions notably having systematically lower levels of equity student enrolment [5] Koshy (2016a). A natural question to ask is whether this is due to the choice of institution or discipline, or both, and whether this is of policy concern? Evidence for answering this question is provided by [4] Koshy, Seymour and Dockery (2016), who examine the key drivers of salary outcomes for a wide cross-section of Australian society using data from HILDA which includes data on institution attended. While occupational effects are a dominant explanation for variation in post-graduation salaries, university attended, as proxied by university grouping categories, is found to be not significant for most of the sample with only minor effects observed among graduates from regional universities in Australia.

This finding is encouraging from the view of equity and access to higher education. It suggests that even if the greatest expansion of equity enrolments is concentrated in ‘traditional’ equity enrolling (i.e. non-Go8) institutions, this will still have an equalising effect overall. In effect, this suggests that equity participation can be examined at a whole-of-system level rather than through a lens of distribution across institutional groupings.

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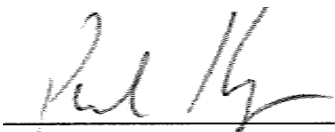
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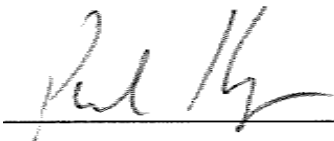
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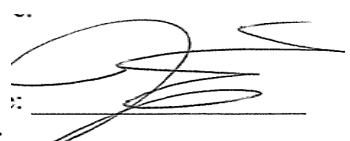
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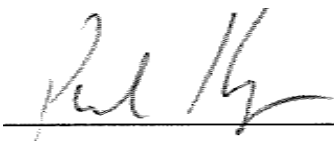
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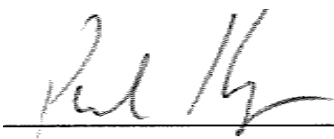
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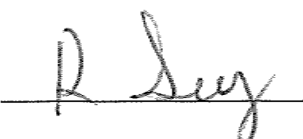
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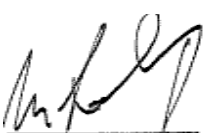
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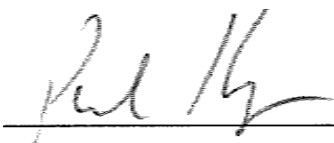
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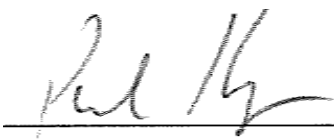
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- [1] **Koshy, P.** (2011), “Targets for low SES participation in Australian higher education: Geographical measures and state boundaries”, *Contemporary Issues in Business & Government*, Vol 17, No 2, pp. 45–62.

Targets for Low SES Participation in Australian Higher Education: Geographical Measures and State Boundaries

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Abstract

This paper examines the measurement of the socio-economic status of Australian higher education students in relation to the Rudd/Gillard Government's establishment of enrolment targets for higher education providers in regard to students from low socio-economic status ("low SES") backgrounds. In particular, it discusses area measures of socio-economic status – where a student's status is determined by the postcode or collection district of the student's permanent residence. In doing so, the paper outlines issues with the relevance of current area measures which use a national benchmark, particularly in the context of geographical constraints on the draw-pool of Australian higher education providers, where students attend institutions in their own state or territory. The paper introduces a new area measure which uses the individual state or territory as a reference point, as opposed to the current national reference point. This is assessed in relation to existing area measures and the recently announced funding policy by the Gillard Government.

Introduction

In 2008 the Rudd Government established a key target for the Australian higher education sector to raise participation rates such that 40 per cent of 25 to 34 year olds will have attained a bachelor's degree or higher by 2025. Attaining this goal will require a higher education participation rate of 40 per cent over time. To provide some context for this target, in 1980, only 20 per cent of all young people were enrolled in higher education by age nineteen. This proportion rose to 38 per cent by 2000 (Rothman, 2003). However, enrolment does not correspond to final attainment, with overall attainment levels for 25 to 34 year olds being around 32 per cent (Bradley, 2008). On the basis of this historical trend, and recent participation rates of around 38 per cent, the underlying participation target of 40 per cent appears to be within reach, provided completion rates can be raised.

However, one concern is that participation in higher education by students from low socio-economic status ("low SES") households – defined as the bottom 25 per cent of all households using ABS measures of socio-economic status – has lagged behind that of the overall population. For instance, in 1980, only 16 per cent of people aged 19 from low SES status households were enrolled in a higher education institution, 80 per cent of the overall enrolment rate of 20 per cent. By 2000, this rate of participation had risen considerably to 28 per cent, compared to the overall participation rate of 38 per cent (Rothman, 2003).

As part of the push for the overall 40 per cent target, the Rudd (now Gillard) Government sought to establish participation targets for the low SES population, where these targets are developed in terms of university enrolment participation levels (i.e., per cent of total enrolment). The government has embraced the target of increasing the participation rate of low SES students to 20 per cent of domestic undergraduate higher education enrolments in 2025, up from 16.1 per cent of this population in 2008.¹ This latter goal encompasses a wide range of policy responses, including additional funding for universities under the Higher Education Participation and Partnerships Program (HEPPP), whereby explicit targets for low SES enrolment will be set at the institutional level.

A critical issue in this policy debate is the measure defining low SES status, with the search for a yardstick still subject to ongoing determination in policy circles, albeit with a preliminary measure developed for the purposes of the HEPPP. The inexact and protean nature of measuring low SES status is recognised in the recently released *Guidelines for Higher Education Participation and Partnerships Program*, under which funding will be distributed to universities as part of the 'participation component' of the funding, allocated on the basis of their low SES enrolment (Commonwealth of Australia, 2010a). In this document, it is stated that funding will be determined in part by a "measure of low SES as determined by the Minister."²

Clearly, the choice of participation measure for low SES students ("A" above) will have an impact on the level of funding available to individual institutions. The measure preferred until recently by the Department of Education, Employment and Workforce Relations (DEEWR) is the area or so-called 'postcode measure' which uses the Australian Bureau of Statistics (ABS) SEIFA Education and Occupation Index to classify Australian postcodes (ABS, 2007) according to socio-economic status. Typically, postcodes are marked as "High SES" (top 25 per cent), "Medium SES" (middle 50 per cent) or "Low SES" (bottom 25 per cent) on the basis of the average SEIFA index measure across households in the postcode, with rankings occurring in direct relation to all relevant postcodes across Australia. The term 'postcode measure' is somewhat generic as it also encapsulates 'collection district' measures, which tend to cover no more than 300 households and are generally considered to represent a more refined geographical measure.

However, regardless of the use of postcodes or collection district measures, there has been considerable debate about the relative merits of using a geographically assigned measure of low SES status. This discussion centres on two broad themes, the first of which can be termed *variable efficacy*, that is, how can an index be constructed to

best capture the impact of a diverse range of factors, including income, occupation and educational attainment within households? The second pertains to the *level of identification* question, that is, should individual household measures be used, or does a geographical score such as the postcode measure suffice?

In this paper, another factor is discussed and evaluated for consideration in the policy process, regardless of the final version of the SEIFA index used or type of identification (whether personal or geographical) adopted. This is the chosen reference population in any such categorisation. At present, the SEIFA scores for area measures such as postcodes, are ranked in relation to the overall population across Australia. We term this the 'national postcode' measure. A corollary of this is that different states and territories have different proportions of low SES populations in their state or territory, which are then captured as the bottom 25 per cent of the national population. However, the low SES student population can also be determined with a reference point of the individual state or territory populations. In this instance, 'low SES' postcodes can be measured relative to those postcodes in the bottom 25 per cent of a *given state or territory's population* using the SEIFA index measure. We term this the 'state postcode' measure.

The above discussion applies to both postcode and collection district measures, both of which are calculated by DEEWR in its annual data collections from higher education providers. We focus on the postcode measure only because DEEWR do not release collection district data on low SES measures, other than those reported in their recent policy release. These are discussed in conjunction with our discussion of the national and state postcode measures.

Australian Geography and the Postcode Measure

The choice of a postcode ranking at the national level necessarily has implications for the distribution of low SES postcodes across the states and territories, where the SEIFA and its components are themselves distributed unevenly. From the Commonwealth's perspective, a national ranking of postcodes by SEIFA makes sense where participation levels in higher education are independent of geography, that is, where similarly disadvantaged students have access to education opportunities nationwide.

However, it is a feature of Australian higher education that the undergraduate 'draw pools' for most institutions are located in their own jurisdiction. Table 1 shows higher education enrolments by the state/territory location of permanent home address (total institutional enrolment for each state or territory in columns). This indicates that the vast majority (93 per cent or more) of all Australian undergraduate enrolments at higher education institutions are sourced from the home state of their institution.

The institutions in the mainland states have relatively modest levels of inter-state enrolment and have home state enrolment shares of 93.6 per cent or greater. Partial exceptions to this rule include Tasmania, the Australian Capital Territory (ACT) and the Northern Territory (NT), which tend to draw students from the larger states as

well. However, the University of Tasmania still sources the overwhelming majority (87.8 per cent) of its students from Tasmania, while the NT and ACT have relatively small higher education populations. The ACT also contains the Australian National University (ANU), which has the highest rate of inter-state enrolment in Australia.

Table 1: Source of Domestic Undergraduate Students in Each State and Territory, Table A Providers Only, By State or Territory of Permanent Residence, 2008

	NSW	VIC	QLD	WA	SA	TAS	NT	ACT
NSW	93.7%	2.1%	3.6%	0.8%	0.9%	3.7%	5.1%	25.4%
VIC	2.0%	95.4%	0.9%	0.6%	2.1%	5.3%	10.0%	3.1%
QLD	2.1%	0.7%	94.2%	0.6%	0.3%	1.7%	10.9%	1.1%
WA	0.3%	0.4%	0.3%	97.2%	0.2%	0.6%	7.3%	0.4%
SA	0.4%	0.5%	0.2%	0.4%	95.6%	0.7%	12.5%	0.3%
TAS	0.2%	0.5%	0.2%	0.1%	0.2%	87.7%	0.4%	0.5%
NT	0.1%	0.2%	0.3%	0.2%	0.6%	0.1%	53.3%	0.3%
ACT	1.2%	0.2%	0.3%	0.1%	0.1%	0.2%	0.5%	68.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Note: State and Territory Shares of Institutional Enrolments in the column, for instance, 93.7% of all students attending an institution in NSW in 2008 cite their permanent residence as being in that state. Bold figures indicate own state or territory share of enrolment.

Australia has a relatively unintegrated higher education market in comparison with other OECD countries. For instance, figures from the US Department of Education (2009) indicate that enrolment patterns in the US are considerably less state-centric, but not dramatically so. Around 80 per cent of the college freshmen intake (first year students) at US institutions are comprised of students attending an institution in their 'home state'. Hoxby (2009: 2) attributes the integration of the higher education sector in the US to the falling cost of collecting information for both students and institutions and, to a lesser extent, reduced cost of long-distance travel and communication. These trends have manifested themselves in terms of an integrated market, and one which is less constrained by geography than perceptions of quality, as indicated by institutional resources and the student peer group.

A similar process to that seen in the US over the past couple of decades may begin to take shape in Australia after 2012, when institutional quotas are removed. However, at present it appears that the Australian market is more accurately delineated along geographic and regional lines. Given this paucity of inter-state enrolments in Australian higher education, institutions in states with relatively moderate levels of low SES students can be disadvantaged under the national measure if only because their opportunity to attract suitable applicants is limited by the definition of low SES. This is also, in part, attached to the broader policy question about participation by students who are regionally or remotely located (Commonwealth of Australia, 2010b). Again,

funding allocated at the Commonwealth level should reflect where students access educational opportunities.

Clearly, the use of the national comparison makes it more likely that institutions in certain states and territories will naturally enrol larger number of low SES students than others by dint of geography. Table 2 indicates that this is the case. It reproduces author calculations from Phillimore and Koshy (2010) on the percentage share of each state's population that is classified as low SES on a national basis relative to its share of low SES enrolment at the undergraduate level.

Table 2: Low SES Population and University Participation Comparisons, 2008

State/Territory	Low SES: Share of state population per cent	Low SES: Share of university enrolment per cent	Effort- opportunity ratio
New South Wales (NSW)	23.5%	16.8%	0.71
Victoria (VIC)	19.9%	13.8%	0.69
Queensland (QLD)	30.5%	19.4%	0.63
South Australia (SA)	35.7%	20.6%	0.58
Western Australia (WA)	19.8%	11.2%	0.57
Tasmania	54.1%	31.3%	0.58
Northern Territory (NT)	26.4%	15.4%	0.59
Australian Capital Territory (ACT)	0.0%	4.7%	—
Australia	25%	16.3%	0.65

Source: Phillimore and Koshy (2010: 7).

Using a national comparison, the distribution of low SES students across the Australian states varies markedly, ranging from zero per cent in the ACT, which has no postcodes ranked in the bottom 25 per cent in Australia using SEIFA, through to Tasmania where over half (54.1 per cent) of the state's population reside in a low SES postcode.

The order of states and territories in terms of low SES enrolment directly matches its order in terms of low SES population, whereby The University of Tasmania has low SES students equal to 31.3 per cent of its total enrolment and the ACT has 4.7 per cent, in keeping with its non-existent low SES population, at least under the national low SES measure. For this reason, the level of low SES enrolment alone may not indicate success or otherwise in encouraging participation; rather, some additional allowance needs to be made for the number of low SES applicants from which a university can draw upon. Table 2 reports one such potential adjustment.

The ratio of low SES enrolment to population share, as measured by the "effort-opportunity ratio" in the final column indicates that the smaller states and territories have broadly similar patterns of enrolment after allowing for their relative population shares, whereas New South Wales (NSW), Victoria (VIC) and Queensland (QLD) have relatively higher shares of enrolment compared to their low SES populations.

Given the relatively closed nature of Australian higher education in terms of inter-state movements, the choice of population becomes important in determining policy. Table 3 reports postcode³ counts and population shares under the standard ("National low SES") measure of low SES and the alternative "State Low SES" measure.

Table 3: The "Low SES Postcode" Count Under National and State Measures

	National Low SES			State Low SES			Number of Postcodes
	<i>Count</i>	<i>%</i>	<i>Per cent of population</i>	<i>Count</i>	<i>%</i>	<i>Per cent of population</i>	<i>Count</i>
NSW	188	31.2	23.5	196	32.6	25.0	602
VIC	124	19.3	19.9	156	24.2	25.0	644
QLD	168	39.4	30.5	147	34.5	25.0	426
SA	104	31.5	35.7	66	20.0	25.0	330
WA	80	25.1	19.8	85	26.6	25.0	319
TAS	59	55.1	54.1	21	19.6	25.0	107
NT	8	30.8	26.4	7	26.9	25.0	26
ACT	0	0.0	0.0	3	12.5	25.0	24
Australia	731	29.5	25.0	681	27.5	25.0	2,478

Source: DEEWR (2010) confidential data request.

The national measure sees 731 or 29.5 of the 2,478 postcodes in Australia classified as low SES, containing 25 per cent of the Australian population. As discussed above, population shares in the national low SES bracket vary dramatically between states and territories. By comparison, under the state low SES measure, each state or territory's low SES population is calculated to include only 25 per cent of its population. This shift to a state-by-state analysis has the overall effect of reducing the number of postcodes which are classified as low SES, down from 731 to 681, although the overall percentage of the population which is classified as low SES remains stable across Australia at 25 per cent. However, marked variations are noticeable across individual states. For instance, the number of Tasmanian postcodes classified as low SES falls from 59 to 21, with the population covered by these halving from 54.1 to 25 per cent. Queensland also sees a marked reduction in the estimate of its low SES population, with this falling from 30.5 to 25 per cent. At the extreme end of the scale, the ACT sees its low SES population rise from zero per cent under the national measure to 25 per cent under the "State Low SES" measure.

Low SES Participation under National and State Postcode Measures

In broad policy terms, the reference point for identifying low SES postcodes affects estimates of the number of low SES students. DEEWR provides a classification under both measures. Table 4 contains a table reporting outcomes for all 38 higher education institutions classified as Table A Providers. The State Low SES measure has the immediate impact of reducing the number of enrolled students

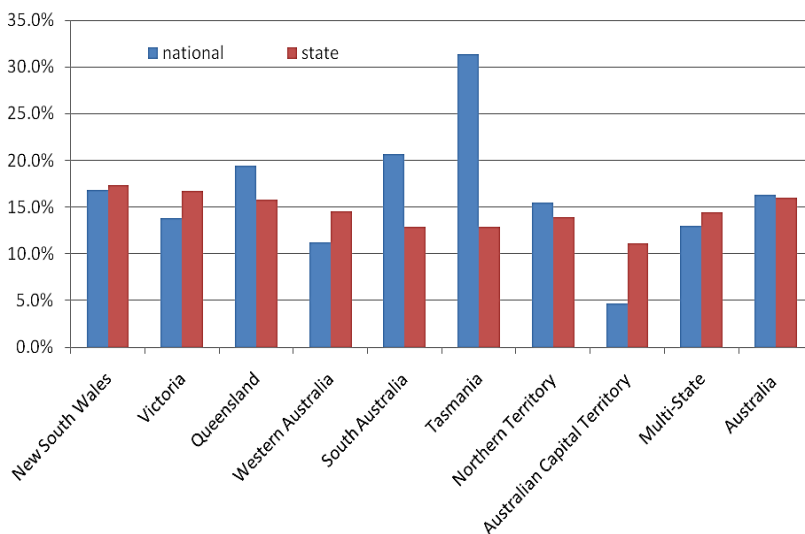
defined as coming from low SES backgrounds from 86,581 (16.3 per cent of the total) to 84,949 (16 per cent of the total), a decline of 1.9 per cent.

Table 4: Domestic Undergraduate Enrolments and Low SES Participation under the National and State Postcode Measures

Institution	All Students	National Low SES		State Low SES	
		No.	%	No.	%
Charles Sturt University	19,597	4,539	23.2	4,804	24.5
Macquarie University	13,774	818	5.9	854	6.2
Southern Cross University	9,021	2,149	23.8	2,198	24.4
The University of New England	11,001	2,877	26.2	2,973	27.0
The University of New South Wales	21,871	1,878	8.6	1,900	8.7
The University of Newcastle	17,064	4,580	26.8	4,791	28.1
The University of Sydney	25,113	1,921	7.6	1,963	7.8
University of Technology, Sydney	17,036	1,778	10.4	1,811	10.6
University of Western Sydney	24,587	5,414	22.0	5,473	22.3
University of Wollongong	10,987	2,609	23.7	2,714	24.7
Deakin University	20,922	2,873	13.7	3,267	15.6
La Trobe University	17,413	3,283	18.9	4,080	23.4
Monash University	26,259	3,241	12.3	3,739	14.2
RMIT University	16,949	2,320	13.7	2,998	17.7
Swinburne University of Technology	8,407	853	10.1	1,057	12.6
The University of Melbourne	20,813	1,528	7.3	1,925	9.2
University of Ballarat	3,890	824	21.2	969	24.9
Victoria University	11,791	2,514	21.3	3,133	26.6
Central Queensland University	7,937	3,706	46.7	2,284	28.8
Griffith University	22,152	3,301	14.9	3,054	13.8
James Cook University	9,368	1,936	20.7	1,592	17.0
Queensland University of Technology	26,283	3,622	13.8	3,047	11.6
The University of Queensland	23,294	3,489	15.0	2,947	12.7
University of Southern Queensland	11,478	3,714	32.4	3,163	27.6
University of the Sunshine Coast	4,453	599	13.5	503	11.3
Curtin University of Technology	17,561	1,972	11.2	2,612	14.9
Edith Cowan University	13,207	1,518	11.5	1,950	14.8
Murdoch University	9,474	1,633	17.2	2,113	22.3
The University of Western Australia	12,107	725	6.0	943	7.8
The Flinders University of South Australia	9,929	2,076	20.9	957	9.6
The University of Adelaide	11,358	1,603	14.1	1,044	9.2
University of South Australia	17,683	4,362	24.7	3,029	17.1
University of Tasmania	12,107	3,795	31.3	1,564	12.9
Batchelor Institute	398	175	44.0	160	40.2
Charles Darwin University	4,071	519	12.7	461	11.3
The Australian National University	7,667	334	4.4	706	9.2
University of Canberra	6,427	330	5.1	860	13.4
Australian Catholic University	9,054	1,173	13.0	1,311	14.5
Australia	532,503	86,581	16.3	84,949	16.0

Figure 1 below outlines estimates of low SES student numbers across the states and territories under each measure, for 2008, the latest year for which final data are available. The decline in low SES student numbers is felt particularly in Tasmania (58.8 per cent), South Australia (37.4 per cent) and Queensland (18.5 per cent), all of whom have shares of the low SES population exceeding 25 per cent under the national measure. State and territories seeing marked increases in the level of low SES enrolment under the state measure include the ACT (135 per cent), where the Australian National University and the University of Canberra benefit from a local applicant pool with 25 per cent of students classified as low SES as opposed to no low SES students under the national measure, and Western Australia and Victoria who benefit from a similar, albeit reduced, re-distribution. Australia's most populous state, New South Wales, sees only a minor change in the number of low SES enrolments.

Figure 1: Low SES Participation under the National and State Postcode Measures – Outcomes by State

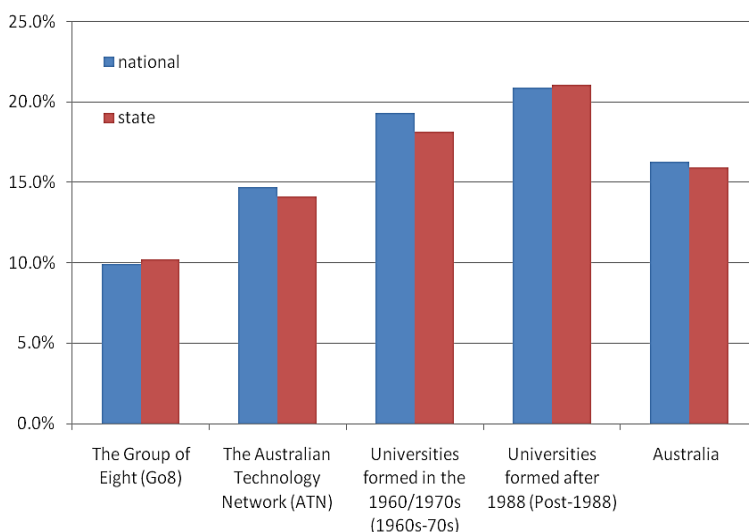


One benefit of the State Low SES measure is that the current level of 'effort', at least in terms of performance relative to the number of low SES students in a given state, is readily discernible where this is equalised to 25 per cent in each instance. On this basis, the larger states tend to have higher rates of participation by low SES students in comparison with the national average, with Queensland approaching the average under the state definition of a low SES postcode.

Figure 2 presents the outcomes under both classifications of SES status for broad institutional groupings identified in the Bradley Report (Bradley, 2008). The redistribution in low SES student numbers evident across state and territory lines also

manifests itself across these institutional groupings, although to a less pronounced effect as the groupings are national in nature. The only beneficiaries under the move to the State Low SES measure are universities in the Group of Eight (Go8) who see a three per cent increase in the number of enrolments classified as low SES, with the Australian Technology Network (ATN) (a four per cent decline) and universities formed in the 1960s-70s (a 6.1 per cent decline) both seeing lower levels of reported low SES participation under the state measure.

Figure 2: Low SES Participation under the National and State Postcode Measures – Outcomes by Institutional Grouping



Note: The 1960s-70s group also includes the University of Tasmania which was established in 1890.

Policy Implications of the National and State Postcode Measures

The choice of geographic area for comparing postcode measures has implications for policy, particularly the way in which funding under the HEPPP is determined. By way of example, Table 5 below reports a notional allocation of the Participation funding for 2010 on the basis of ‘A’ only, where this is defined under both the National Low SES and State Low SES measures and with notional shares of the national total calculated on the basis of findings reported in Table 4.⁴ Also reported is the dollar variation seen between both measures.

Generally, the shift from nationally based to state-based measures for postcode status has implications for funding under the HEPPP. Several institutions see quite marked reversals in their allocations, with Flinders and Tasmania see reductions of

over 50 per cent, while the ANU and University of Canberra see a doubling of funding as their low SES student shares increase under the state measure.

Table 5: Low SES Participation under the National and State Postcode Measures – Implications for HEPPP Financing under a Hypothetical Example

Institution	National Low SES		State Low SES		Variation	
	Share %	2010 Funding	Share %	2010 Funding	Funding	%
Charles Sturt University	5.2	\$2,217,448	5.7	\$2,391,997	\$174,549	7.9
Macquarie University	0.9	\$399,619	1.0	\$425,222	\$25,602	6.4
Southern Cross University	2.5	\$1,049,856	2.6	\$1,094,423	\$44,567	4.2
The University of New England	3.3	\$1,405,507	3.5	\$1,480,309	\$74,802	5.3
The University of New South Wales	2.2	\$917,464	2.2	\$946,044	\$28,580	3.1
The University of Newcastle	5.3	\$2,237,478	5.6	\$2,385,524	\$148,046	6.6
The University of Sydney	2.2	\$938,471	2.3	\$977,412	\$38,942	4.1
University of Technology, Sydney	2.1	\$868,610	2.1	\$901,729	\$33,119	3.8
University of Western Sydney	6.3	\$2,644,914	6.4	\$2,725,104	\$80,190	3.0
University of Wollongong	3.0	\$1,274,581	3.2	\$1,351,349	\$76,768	6.0
Deakin University	3.3	\$1,403,553	3.8	\$1,626,697	\$223,144	15.9
La Trobe University	3.8	\$1,603,851	4.8	\$2,031,504	\$427,653	26.7
Monash University	3.7	\$1,583,333	4.4	\$1,861,714	\$278,381	17.6
RMIT University	2.7	\$1,133,395	3.5	\$1,492,757	\$359,362	31.7
Swinburne University of Technology	1.0	\$416,718	1.2	\$526,299	\$109,581	26.3
The University of Melbourne	1.8	\$746,477	2.3	\$958,492	\$212,014	28.4
University of Ballarat	1.0	\$402,551	1.1	\$482,482	\$79,932	19.9
Victoria University	2.9	\$1,228,170	3.7	\$1,559,976	\$331,806	27.0
Central Queensland University	4.3	\$1,810,501	2.7	\$1,137,244	-\$673,257	-37.2
Griffith University	3.8	\$1,612,645	3.6	\$1,520,641	-\$92,004	-5.7
James Cook University	2.2	\$945,798	1.9	\$792,685	-\$153,113	-16.2
Queensland University of Technology	4.2	\$1,769,464	3.6	\$1,517,155	-\$252,309	-14.3
The University of Queensland	4.0	\$1,704,489	3.5	\$1,467,364	-\$237,126	-13.9
University of Southern Queensland	4.3	\$1,814,409	3.7	\$1,574,914	-\$239,495	-13.2
University of the Sunshine Coast	0.7	\$292,631	0.6	\$250,453	-\$42,178	-14.4
Curtin University of Technology	2.3	\$963,386	3.1	\$1,300,561	\$337,175	35.0
Edith Cowan University	1.8	\$741,592	2.3	\$970,940	\$229,348	30.9
Murdoch University	1.9	\$797,773	2.5	\$1,052,100	\$254,327	31.9
The University of Western Australia	0.8	\$354,186	1.1	\$469,536	\$115,351	32.6
The Flinders University of South Australia	2.4	\$1,014,193	1.1	\$476,507	-\$537,686	-53.0
The University of Adelaide	1.9	\$783,117	1.2	\$519,826	-\$263,291	-33.6
University of South Australia	5.0	\$2,130,978	3.6	\$1,508,193	-\$622,785	-29.2
University of Tasmania	4.4	\$1,853,980	1.8	\$778,743	-\$1,075,237	-58.0
Batchelor Institute	0.2	\$85,493	0.2	\$79,667	-\$5,826	-6.8
Charles Darwin University	0.6	\$253,548	0.5	\$229,540	-\$24,008	-9.5
The Australian National University	0.4	\$163,170	0.8	\$351,530	\$188,360	115.4
University of Canberra	0.4	\$161,216	1.0	\$428,209	\$266,994	165.6
Australian Catholic University	1.4	\$573,048	1.5	\$652,770	\$79,722	13.9
Australia	100.0	\$42,297,613	100.0	\$42,297,613	-	-

These changes translate into movements in allocations between the states and territories and institutional groupings, as shown in Table 6, with Tasmania seeing a reduction of around 58 per cent in funding while the ACT sees an increase of 140.4 per cent.

Table 6: Low SES Participation under the National and State Postcode Measures – Implications for HEPPP Financing under a Hypothetical Example for the States and Territories and Institutional Groupings

	National Low SES		State Low SES		Variation	
	Share %	2010 Funding	Share %	2010 Funding	\$	%
State						
New South Wales	33.0	\$13,953,947	35	\$14,679,113	\$725,165	5.2
Victoria	20.1	\$8,518,049	25	\$10,539,922	\$2,021,874	23.7
Queensland	23.5	\$9,949,937	20	\$8,260,455	-\$1,689,482	-17.0
Western Australia	6.8	\$2,856,937	9	\$3,793,137	\$936,200	32.8
South Australia	9.3	\$3,928,288	6	\$2,504,526	-\$1,423,762	-36.2
Tasmania	4.4	\$1,853,980	2	\$778,743	-\$1,075,237	-58.0
Northern Territory	0.8	\$339,041	1	\$309,207	-\$29,834	-8.8
Australian Capital Territory	0.8	\$324,385	2	\$779,739	\$455,354	140.4
Multi-State	1.4	\$573,048	2	\$652,770	\$79,722	13.9
Institutional Grouping						
The Group of Eight (Go8)	17.0	\$7,190,707	18	\$7,551,918	\$361,212	5.0
The Australian Technology Network (ATN)	16.2	\$6,865,833	16	\$6,720,396	-\$145,437	-2.1
Universities formed in the 1960/1970s (1960s-70s)	34.4	\$14,548,980	33	\$13,921,282	-\$627,698	-4.3
Universities formed after 1988 (Post-1988)	32.4	\$13,692,094	33	\$14,104,018	\$411,923	3.0
Australia	100.0	\$42,297,613	100	\$42,297,613	-	-

The 2010 HEPPP Funding Policy

The Commonwealth's recently announced guidelines on funding for the HEPPP provides further details on the preliminary measure. Funding of \$378.68 million for the Participation Component of the program is available over four years from 2010 to 2013. The total funding allocated for Participation in 2010 was \$42.297 million, almost doubling to \$83.6 million in 2011, before increasing further to over \$126 million in each of 2012 and 2013.

The allocation of this funding will be determined by the formula: $C = (2A + B)/3$, where "C" is the "Indicator of undergraduates from low SES backgrounds", comprised of: "A", the total number of domestic undergraduate students enrolled at a *provider* who have a home addresses in the lowest quartile of a "measure of low SES as determined by the Minister" and "B", the number of domestic undergraduate students

who meet relevant income support payment criteria in relation to a number of payment types, including: the Dependent Youth Allowance, Austudy, the Pensioner Education Supplement and the ABSTUDY Living Allowance.

In the lead-up to the 2010 federal election, the Gillard Government announced a preliminary determination for the distribution of the first tranche of funding under the HEPPP (DEEWR, 2010). The status of this determination is uncertain at the time of writing, given the outcome of the August 2010 election. Nevertheless, the implications for policy are instructive. In this determination, the formula allocation formula (" $C = (2A + B)/3$ ") used a proxy for C of a SEIFA index measure for the ABS collection district of the student, where determination of SES status was arrived at in a national comparison, that is, low SES status was assigned to students coming from the bottom 25 per cent of collection districts across Australia.⁵

As Table 7 reports, for all Table A providers, DEEWR provides data on the percentage of total undergraduate domestic enrolment classified as low SES on the basis of their permanent residence (the "A" measure) using the collection district measure, as well as the number of students at each provider who are counted under "B" in the calculation formula –, that is, those students who receive some form of income assistance from the Commonwealth. These are combined using the above formula to produce an estimate of "C" for each institution. This is reported in the final column of Table 7 below. By way of comparison, we also include in the second and third columns of Table 7, estimates of the low SES area measure using both the national and state postcode measures. These estimates are directly comparable with the collection district measure reported by DEEWR.

The first observation that can be made about estimates of low SES participation under the DEEWR release is that definitions which track individual student data imply relatively low levels of participation – 12.7 per cent for all Table A providers – regardless of the area measure used. This implies a count for students of low SES status which is around 25 per cent below that seen using one of the postcode measures and around 20 per cent using DEEWR's preferred measure of assigning SEIFA-determined SES status by collection district, where around 15.2 per cent of all students are assessed as coming from low SES backgrounds. This confirms the intuition that more precise area measures tend to provide a truer indication of low SES status when compared with individual measures. The collection district measure is ordered on a national basis and so doesn't tend to diverge markedly from the results identified below using the national postcode measure. DEEWR has not released collection district data so a comparison between a state and national ranking is not possible, as reported for postcode data.

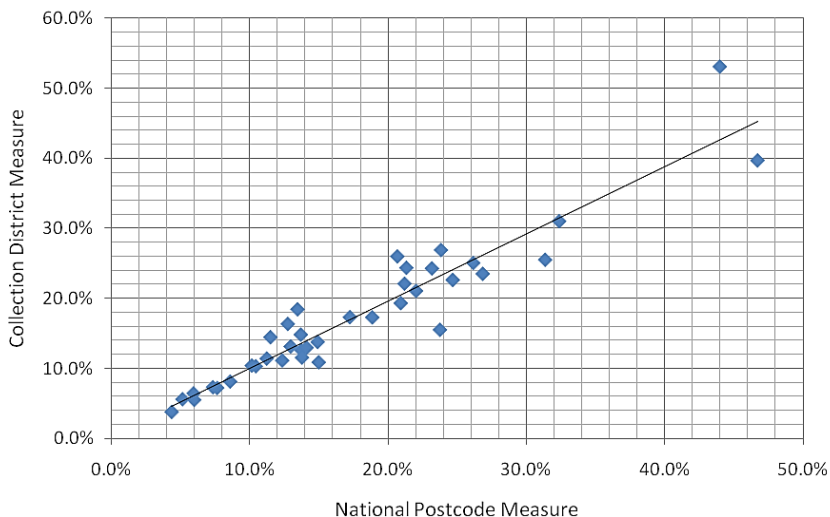
By and large, the collection district measures tend to track the national postcode measure very closely, albeit reporting low SES participation at a reduced rate (15.2 to 16.4 per cent), although this also reflects the fact that the collection district measure is based on first half 2009 data). Nevertheless, Figure 3 shows how close the 'fit' is, as it reports a plot of the 'national' postcode and collection district measures against one another for the 38 Table A providers.

Table 7: Low SES Student Enrolment: Per Cent of Domestic Enrolment, 2008-09

Institution	Area ("A") Measures		DEEWR Assessment for HEPPP 2010 Allocation		
	National Postcode Measure (%)	State Postcode Measure (%)	"A"	"B"	"C"
			Collection District Measure (%)	Students Receiving C'wealth Payment (%)	Allocation Formula: $C = (2A + B)/3$ (%)
Charles Sturt University	23.2	24.5	24.2	10.2	19.6
Macquarie University	5.9	6.2	6.4	9.1	7.3
Southern Cross University	23.8	24.4	26.8	19.4	24.4
The University of New England	26.2	27.0	25.0	11.6	20.6
The University of New South Wales	8.6	8.7	8.1	11.0	9.0
The University of Newcastle	26.8	28.1	23.5	14.7	20.5
The University of Sydney	7.6	7.8	7.1	11.5	8.6
University of Technology, Sydney	10.4	10.6	10.3	12.8	11.1
University of Western Sydney	22.0	22.3	21.0	15.1	19.1
University of Wollongong	23.7	24.7	15.5	11.6	14.2
Deakin University	13.7	15.6	12.6	13.4	12.9
La Trobe University	18.9	23.4	17.2	16.1	16.9
Monash University	12.3	14.2	11.1	10.8	11.0
RMIT University	13.7	17.7	14.8	18.8	16.1
Swinburne University of Technology	10.1	12.6	10.3	12.9	11.2
The University of Melbourne	7.3	9.2	7.3	11.3	8.6
University of Ballarat	21.2	24.9	22.0	19.8	21.3
Victoria University	21.3	26.6	24.3	18.8	22.5
Central Queensland University	46.7	28.8	39.6	10.1	29.8
Griffith University	14.9	13.8	13.7	14.1	13.8
James Cook University	20.7	17.0	25.9	13.5	21.8
Queensland University of Technology	13.8	11.6	11.5	10.0	11.0
The University of Queensland	15.0	12.7	10.8	9.2	10.3
University of Southern Queensland	32.4	27.6	31.0	11.2	24.4
University of the Sunshine Coast	13.5	11.3	18.4	19.5	18.7
Curtin University of Technology	11.2	14.9	11.4	10.9	11.2
Edith Cowan University	11.5	14.8	14.4	11.1	13.3
Murdoch University	17.2	22.3	17.3	11.6	15.4
The University of Western Australia	6.0	7.8	5.5	6.1	5.7
The Flinders University of South Australia	20.9	9.6	19.3	17.2	18.6
The University of Adelaide	14.1	9.2	12.9	11.8	12.5
University of South Australia	24.7	17.1	22.6	15.2	20.1
University of Tasmania	31.3	12.9	25.5	16.4	22.4
Batchelor Institute	44.0	40.2	53.0	168.2	91.6
Charles Darwin University	12.7	11.3	16.3	10.1	14.2
The Australian National University	4.4	9.2	3.7	7.3	4.9
University of Canberra	5.1	13.4	5.5	8.8	6.6
Australian Catholic University	13.0	14.5	13.1	15.1	13.8
Australia	16.3	16.0	15.2	12.7	14.4

Note: The collection district measure uses data from the first half of 2009. As these data were not publicly available at the time of writing, the national and state postcode data are for 2008.

Figure 3: Low SES Participation: The ‘National’ Postcode and Collection District Measures Compared



It follows that the divergence between the state postcode measure and the collection district measure mirrors that identified above in its comparison with the national postcode measure. For instance, the Australian National University has a low SES participation rate of 3.7 per cent under the collection district measure compared to 4.4 per cent under the national postcode measure and 9.2 per cent under the state postcode measure. Its share of students receiving a Commonwealth payment is around 7.3 per cent.

Table 8 provides a point of comparison between the assessment for "C" under the current policy using as a proxy for "A" the collection district measure, ordered at the national level, with a similar assessment using the state postcode measure reported in Table 7 for "A". In both instances, "B" is measured using the DEEWR count of students per institution who receive a Commonwealth payment. All outcomes are reported as a percentage of 2008-09 domestic enrolment.

The first noticeable outcome is that the level of low SES enrolment increases from 14.4 per cent to 14.8 per cent, an increase of 0.4 percentage points. At the state and territory level this is driven by smaller changes among the larger states of between one and two percentage points, but with larger changes occurring in the smaller states and territories, largely in Tasmania (a reduction of 8.4 percentage points), South Australia (a reduction of 4 percentage points) and the Australian Capital Territory (a 4.4 percentage point gain). At the institutional grouping level, the movement between groups is smaller, with the Group of Eight (1 percentage point) and universities formed after 1988 (1.9 percentage points).

Table 8: Low SES Student Enrolment: DEEWR Assessments under Two Area Measures of Low SES Status, Per cent of Total Domestic Enrolment (2008-9), States and Territories and Institutional Groupings

	"B"		HEPPP Allocation Assessments 2010 Allocation ("C") – Low SES Share given Two Measures of "A"	
	Students Receiving C'wealth Payment (%)	Current: "A" = National Collection District Measure (%)	Proposed: "A" = State Postcode Measure (%)	Percentage Point Difference
State				
New South Wales	12.5	14.6	15.6	-1.0
Victoria	14.3	13.8	15.9	-2.1
Queensland	11.6	15.4	14.2	1.2
Western Australia	9.9	11.0	12.8	-1.8
South Australia	14.7	17.4	13.4	4.0
Tasmania	16.4	22.4	14.1	8.4
Northern Territory	22.1	20.1	16.4	3.7
Australian Capital Territory	8.0	5.7	10.1	-4.4
Multi-State	15.1	13.8	14.7	-0.9
Institutional Grouping				
The Group of Eight (Go8)	10.3	9.2	10.2	-1.0
The Australian Technology Network (ATN)	13.2	18.3	13.8	4.5
Universities formed in the 1960/1970s (1960s-70s)	13.7	11.1	16.6	-5.5
Universities formed after 1988 (Post-1988)	14.1	18.8	18.7	0.1
Australia	12.7	14.4	14.8	-0.4

Note: The calculation for "C" is $C = (2A+B)/3$, the reported values for "C" are where A is either the current measure – the national collection district measure or the proposed state postcode measure.

Table 9 outlines the funding implications of Table 8. This uses the estimated share of "C" reported in Table 10 and applies it to the DEEWR estimate of the total student population as in First Semester, 2009 (not the 2008 estimate reported in Table 4) to derive an institutional share of funding available in the first year of the HEPPP under the policy prescription using collection district data and the state postcode measure developed in this paper. Table 9 reports the findings on allocations between the states and territories and institutional groupings under both measures.

The key finding from this comparison is that the state postcode measure has a similar impact on funding allocation under the HEPPP when compared with the collection district measure as it did with the national postcode measure – Tasmanian institutions lose money, while those in the Australian Capital Territory gain funding, while the Group of Eight gains funding at the expense of the other institutional groupings.

Table 9: HEPPP Financing under the Proposed Policy and an Alternative State Postcode Measure – Implications for the States and Territories and Institutional Groupings

	Collection District		State Low SES		Variation	
	Share (%)	2010 Funding	Share (%)	2010 Funding	\$	%
State						
New South Wales	32.8%	\$13,860,443	34.1%	\$14,409,274	\$548,831	4.0%
Victoria	22.8%	\$ 9,646,246	25.6%	\$10,815,960	\$1,169,714	12.1%
Queensland	20.8%	\$8,797,613	18.7%	\$7,910,381	-\$887,231	-10.1%
Western Australia	7.4%	\$3,127,560	8.4%	\$3,539,461	\$411,900	13.2%
South Australia	8.9%	\$3,754,095	6.7%	\$2,814,551	-\$939,544	-25.0%
Tasmania	3.4%	\$1,447,335	2.1%	\$ 882,416	-\$564,919	-39.0%
Northern Territory	1.1%	\$ 444,766	0.8%	\$352,358	-\$92,407	-20.8%
Australian Capital Territory	1.1%	\$ 451,014	1.8%	\$775,271	\$324,257	71.9%
Multi-State	1.8%	\$768,541	1.9%	\$797,940	\$29,399	3.8%
Institutional Grouping						
The Group of Eight (Go8)	18.3%	\$7,738,809	19.7%	\$8,337,896	\$599,087	7.7%
The Australian Technology Network (ATN)	16.9%	\$7,146,924	16.6%	\$7,037,741	-\$109,183	-1.5%
Universities formed in the 1960/1970s (1960s-70s)	32.4%	\$13,708,780	32.4%	\$13,684,528	-\$24,252	-0.2%
Universities formed after 1988 (Post-1988)	32.4%	\$13,703,100	31.3%	\$13,237,448	-\$465,651	-3.4%
Australia	100%	\$42,297,613	100%	\$42,297,613	-	-

Note: The funding outcome reported under the “State Low SES” estimate is note directly comparable with that in Table 8 as it includes a weighting for the individual measure of SES status.

Conclusions

Area measures of disadvantage are controversial due to concerns about their relevance for a subset of students, namely those low SES students who live in medium or high SES areas and vice versa.

Beyond this controversy, this paper highlights another disadvantage of area measures which pertains to their relevance in the context of geographical constraints on the draw-pool of Australian higher education providers. This disadvantages low SES students in relatively high-income states or territories, most obviously in the ACT where all postcodes are classified as medium or high SES. In this paper, we develop a new area measure using the individual state or territory as a reference point. This results in a relatively modest decline in the percentage of students classified as coming from low SES backgrounds, but has impacts across states and territories, particularly in Tasmania and South Australia (fewer low SES students) and the ACT (more low SES students).

The policy relevance of this argument is demonstrated in a comparison of this measure with a national postcode measure and the preferred variable used by DEEWR in its policy assessments, namely a measure based on collection district data. Typically, the postcode measures appear to assign low SES status to more students, compared to the finer collection district measure. However, the state postcode measure has a markedly different distribution from that of the national postcode and collection district measures across states and territories, and to some extent, institutional groupings. Data constraints prohibit the development of a state collection district measure, but that would no doubt reflect the pattern seen at the postcode level.

An assessment of the broader policy ramifications for area variable choice is demonstrated in a comparison of national collection district and state postcode measures in determining final definitions of DEEWR's policy variable for low SES status. While the overall outcome in terms of assignment of low SES status to students is similar under both measures, under the state postcode measure, status is determined by area SES status relative to the state or territory population, rather than the national population.

This result reflects the earlier finding on state postcodes – that they are better at determining outcomes for equity in areas where there are substantial geographical impediments to participation at inter-state institutions and therefore a local measure is more desirable.

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Notes

- 1 Preliminary data for 2009 indicate that low SES students now account for around 17 per cent of the total domestic undergraduate headcount of ‘Table A Providers’, the 38 universities who constitute the target group for this policy. These institutions are listed in Table 4 of this paper.
- 2 The funding formula is described in Section 1.60 (“Formula for distribution of Component A – Participation funds”).
- 3 The analysis excludes non-population postcodes, such as those attached to GPO box addresses.
- 4 This is for instructive purposes only. DEEWR has released preliminary measures of ‘B’ in the allocation formula, or the number of students receiving one or multiple Commonwealth income support payments. Although only one-third of this number is included in the allocation formula, it would serve to reduce the discrepancy between allocations using different measures of the area variable.
- 5 The initial determination uses first semester 2009 enrolment data to calculate low SES load, as opposed to the 2008 final data reported in this paper. The 2009 data had not been released at the time of writing.

- [2] Pitman, T., **Koshy, P.** and Phillimore, J. (2015), “Does accelerating access to higher education lower its quality? The Australian experience”, *Higher Education Research & Development*, Vol. 34, Issue. 3, pp. 609–623.

Does accelerating access to higher education lower its quality? The Australian experience

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In the pursuit of mass higher education, fears are often expressed that the quality of higher education suffers as access is increased. This quantitative study considers three proxies of educational quality: (1) prior academic achievement of the student, (2) attrition and retention rates and (3) progression rates, to establish whether educational quality suffers when supply is significantly increased. The period of analysis (2009–2011) saw just such an increase in higher education places in Australia, as universities prepared for the removal of all caps on undergraduate domestic student places in 2012. Our analysis reveals that, whilst widening access results in more students with lower levels of academic achievement entering higher education, this does not necessarily equate to a lowering of educational quality. Furthermore, although on average student progression rates dropped slightly, retention rates actually increased in the majority of universities, suggesting high levels of student perseverance. In addition, there were already wide variations in attrition and progression rates between universities, and the changes observed between 2009 and 2011 did not lead to substantial alterations.

Keywords: access; higher education; measuring quality; quality; retention; widening participation

Introduction

In the pursuit of mass higher education, fears are often expressed that ‘quantity’ increases at the expense of ‘quality’ (Hawkins & Neubauer, 2011). The case of the Australian higher education sector is salient, for in many respects it has led the way, internationally, in increasing access through both domestic and international channels. This paper examines the recent introduction of a demand-driven funding system (DDFS) for domestic enrolments in Australia to determine the impact of the subsequent expansion in domestic student numbers on overall domestic performance.

Following the dramatic expansion of the Australian higher education sector from the late 1980s onwards, national targets have regularly been set for increasing the access options of groups of students historically under-represented in universities (Bradley, Noonan, Nugent, & Scales, 2008; Martin, 1994). However, the introduction of new pathways for commencing students has regularly been cited as a potential threat to quality in higher education (Reid, Barker, & Murphy, 1995). The perceived tension between goals of access and those of quality are evident in other nations’ higher education sectors. For example, in the UK, the Government’s recent announcement that it would abolish the cap on student numbers altogether in the 2015–2016 academic year

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included the codicil that it '[reserved] the right to re-impose number controls on institutions that expand their student numbers at the expense of quality' (HM Treasury, 2013, p. 55).

In 2012, Australia abolished 'caps' on higher education places, in effect allowing universities to be funded for all students they enrolled rather than subjecting them to nationally determined quotas. Once again, this sparked comment that increased access would have detrimental effects on educational quality (Norrie, 2012). In preparation for the uncapping of places, Australian higher education went through what could be described as a 'lead-in' period, during which universities were allowed – and funded – to significantly increase enrolments in preparation for full uncapping. Australia's lead-in period spanned two academic years (2010 and 2011), during which universities were permitted to enrol an additional 10% of students. In reality, it started one year earlier (2009), as universities unofficially started to over-enrol in preparation for the anticipated changes. In this and the broader context, the lead-in period for the DDFS provides a useful insight into how universities respond when supply is significantly increased; in particular the effect it has on the quality of higher education, as measured by the academic ability of incoming students and the rates at which they progress through their courses.

Contextual background of higher education policy in Australia: from elite to mass, towards universal higher education

The Australian higher education system originated in the latter half of the nineteenth century. In 1913, the total number of students across six universities amounted to 4172 students, compared to an estimated national population in 1913 of around 4.8 million people (Australian Bureau of Statistics, 1915). By 1976, a further 12 universities had been created and approximately 290,000 domestic students were enrolled. In 1996, this figure had more than doubled to 580,906, following expansionist policies by governments of various political persuasions. Domestic enrolments expanded steadily, seeing a further increase to 733,352 in 2006, with total enrolments (boosted by a large increase in overseas students) rising to 984,146 in that year (Koshy, 2012). The impact of increased student participation has had a profound effect on Australian society. In the early 1970s, higher education attainment (defined as the completion of a bachelor's degree or higher) in Australia was less than 5% of the adult population. By 1997, overall attainment was 10%. This almost doubled to 19.6% in 2005 and continued to rise to 23.2% in 2011 (Australian Bureau of Statistics, 2007, 2011). Underpinned by this increase in participation, the Australian higher education sector has exceeded its own growth objectives and turned itself into a major national industry (Macintyre, 2013).

After the election of a Labor Government in 2007, several key initiatives were enacted to increase both overall participation in higher education and within that, greater representation of groups of students traditionally under-represented in universities; most notably students from low socio-economic status backgrounds, Indigenous students, students from regional areas, students with disabilities and women studying in non-traditional areas.

Following the Bradley Review in 2008 (Bradley et al., 2008), an overarching target was set of 40% of all 25–34-year olds in Australia holding a qualification at the bachelor's level or above by 2025. This review established a number of key policies in higher education, including key commitments in capital expenditure and spending on student

Table 1. Increase in domestic undergraduate enrolments in Australian universities.

	2006	2007	2008	2009	2010	2011
Total students	528,465	543,924	551,861	577,391	605,289	627,346
% Change	1.8	2.9	1.5	4.6	4.8	3.6
Commencing students	174,066	179,203	180,542	195,263	208,098	214,112
% Change	2.1	3.0	0.7	8.2	6.6	2.9

Source: Department of Industry Innovation Climate Change Science Research and Tertiary Education (2012).

income support, and eventually, the introduction of indexation of Commonwealth funding and staged removal of caps on student enrolments at the institutional level (Department of Education Employment and Workplace Relations, 2009).

These latter two initiatives were the core of what is commonly referred to as the 'DDFS', whereby the Australian higher education system transitioned from one developed around centrally determined discipline quotas to one driven by institutional policies and shifts in student demand. This move from a supply-side to a demand-side funding model saw an immediate impact on the enrolment behaviour of Australian universities. The new funding policy targeted domestic, undergraduate student enrolments and this is where the most significant growth occurred. Table 1 shows the number of students enrolled in these places between 2006 and 2011. In the first three years (i.e., prior to the policy change), growth averaged 2.1% for total student numbers and 1.9% for commencing students. In the second-half of the period (i.e., as universities prepared for the uncapping of places) growth more than doubled for overall student numbers (4.4%) and trebled for commencing students (5.9%).

Increasing access to Australian higher education: policy action generating rhetorical concern

As was the case with the initial expansion of the Australian higher education sector in the late 1980s, the move to the DDFS sparked concerns that access goals were potentially compromising quality. Commentary became politicised, occurring as it did in 2013, an election year. The then education minister, Senator Kim Carr, stated:

we have to make sure that across the system quality remains a priority. I am a very strong believer in equity, but I am also a believer in excellence ... So I need to consider whether it is appropriate here to re-examine the growth rates in the university system. (Carr, quoted in Hare, 2013, <http://www.theaustralian.com.au/higher-education/carr-flags-recapping-places/story-e6frgcjx-1226672572791>)

In response, the then opposition spokesperson for higher education, Christopher Pyne, confirmed that he shared the minister's concerns that education quality was being adversely affected by increasing student numbers. He further announced that were there to be a change in government he would review the DDFS (McDonald, 2013). With the change in government later the same year, new education minister Pyne launched the review, including as a term of reference 'whether there is evidence of any potential adverse impacts on the quality of teaching and of future graduates' (Department of Education, 2013). Concerns were also expressed within the higher education sector itself, with a spokesperson from the elite Group of Eight universities

saying ‘there are significant risks to the student, the higher education sector and government if the participation imperative is not augmented with consideration of a student’s ability to succeed’ (Healy, 2010).

In fact, as observed above, higher education student numbers had been steadily increasing for several decades. For this reason, it is important to make the distinction between *increasing* access and what we call from this point on, *accelerated* access, which we define as a rate of access significantly greater than the preceding short-term average. This is a somewhat subjective distinction: our point is that subjective understandings of quality in higher education have been driving political debate. Much higher education policy is informed by the ‘long shadow’ of narrowly focused numbers (Stobart, 2008). More worryingly, policy that is driven by ideology is sometimes defended incorrectly by numbers (Lingard, 2011). This paper assesses the extent to which concerns regarding higher education quality can be informed by the data.

Defining quality in higher education

The notion of ‘quality’ in higher education is relative, both to the user of the term and the circumstances in which it is invoked (Harvey & Green, 1993). Saarinen (2010) argues that in the past two decades, related discussions have shifted from expressing it as a matter of political substance to a matter of technical implementation. That is, we argue less about what it *is* but more about whether and how we might *measure* it. Measurement then becomes a function of quality *assurance*, or the process ‘of establishing stakeholder confidence that provision (input, process and outcomes) fulfils expectations and measures up to threshold minimum requirements’ (Harvey, as cited in OECD, 2008, p. 9).

In the Australian higher education sector, quality *input* is often measured by the prior academic scores of the enrolling student. The chief metric is the Australian Tertiary Admission Rank (ATAR), which ranges between zero and 99.95 (the top mark), and reports a student’s rank in terms of their composite academic grade average relative to all other students. Therefore, ATAR is a relative rank, not an absolute score.

Quality *process* is often measured by the ability of the student to progress throughout their studies, towards ultimate completion. Since the mid-1990s, the Australian government has measured retention and success data as proxies of the quality of educational processes (Martin, 1994). Retention measures the proportion of students who re-enrol in a subsequent year, excluding those who completed, whilst more recently, attrition rates have been used, that is, the percentage of students who ‘drop out’. The progression indicator (also referred to as ‘success’) measures the proportion of units passed within a year (measured in full-time student load) compared to the total units in which a student is enrolled (excluding units for which a final result is not available). Although not perfect, these indicators measure variables which are recognised internationally and provide a good coverage of what is valued in higher education (James, Baldwin, Coates, Krause, & McInnis, 2004).

The primary metric of quality *outcome* is the student completion rate (i.e., the number of students passing their degree). For the lead-in period of the DDFS, the focus here is on the input and process stages of quality assurance, as it was too early for new students in this period to have completed their degree. This paper, therefore, uses the ATAR as a measurement of quality input, and attrition and progression rates as measurements of quality processes. Measures of quality outcomes, such as completions, will be left to subsequent analysis.

Previous studies into causal relationships between increased access and educational quality in the Australian higher education sector

In 1995, Reid and colleagues (1995) published the results of their analysis of Australian universities' quality ratings and their standing on several measures of increased access to targeted equity groups. Their method involved measuring the allocation of performance-based funding based on both equity and quality indicators, arguing that if affirmative action was a compliance issue for the sector then a measure of quality should be the extent and form of that compliance. Instead, they found that equity 'was not ... a prominent variable in the quality equation and far from being synonymous with quality may have been seen by some as its antithesis' (Reid et al., 1995, p. 240). However, they also found that quality audit guidelines did not prescribe what universities should present in their quality submissions, allowing them to determine for themselves what evidence should be supplied in support of their claim to quality. Therefore, the inverse causal relationship between quality and equity/access prescribed by some universities was based largely on subjective, rather than quantitative, data. Further, this showed that the policy environment in which universities were being asked to provide evidence of educational quality was one that to some extent pre-judged access to education as a potential threat (Committee for Quality Assurance in Higher Education, 1994), without guidance as to what a neutral measure might look like.

Scholars have investigated the relationship between quality and access from an international student perspective, citing differences in social and academic culture, academic aptitude or preparation, as well as inadequate language fluency, as potential contributors to decreased academic performance. A study by Foster (2012) of business studies courses matched institutional student demographic information to final course marks in selected Australian universities. This study showed that both international students in general and those from a non-English speaking background (NESB) in particular, perform significantly worse than other students, even controlling for selection into courses. NESB status was a greater predictor of performance than international status in this regard, suggesting that literacy rather than cultural conditioning was a greater issue. However, the study also found that whilst the presence of international students overall led to a reduction in the class average mark at the tutorial level, the presence of NESB students led to an *increase* in the class average mark at the course level. However, this study examined a broader set of issues than just increases in access to higher education overall. Furthermore, the Foster study related to two universities only and a specific course (business studies).

A study by McKenzie and Schweitzer (2001) found that university entry scores were a significant predictor of a student's grade point average (GPA) at the end of the first semester of their course of study. Students with high university entry scores were likely to continue this high academic achievement in university. However, the researchers recommended that this result be interpreted with caution, as it explained less than half the variance in GPA in an analysis of fewer than 200 university students from only two faculties at one institution.

Finally, a review of research in this area, conducted by Palmer, Bexley, and James (2011), concluded that whilst there was a correlation between prior academic achievement and university success, its predictability varied across disciplines and was more accurate at the higher levels (i.e., high-achieving students) but less so for those with middle-to-low entrance ranks. This conclusion is of particular significance to this study, as the current focus of concern regarding quality of higher education is on middle- and low-ranked students.

The impact of accelerated access on the quality of educational inputs

When ATAR is used as a proxy of quality educational inputs, then we see evidence that the sector's preparation for the DDFS resulted in lower ranking students gaining admission. Table 2 shows the proportion of students accepting an offer to study at university, grouped by ATAR percentiles. From 2009, the overall number of acceptances from all percentile groups accelerated (in comparison to the previous three-year trend). This, therefore, included a greater number of students from the lower ATAR ranks enrolling in higher education. Furthermore, as the rate of increase accelerated, so too did the rate of proportional representation of these students. This is to be expected in view of classical models of shifts from elite to mass education (Trow, 1962, 1970, 1974). As in most countries, entry to Australian universities is based on principles of meritocracy and students with higher prior academic achievement have disproportionate higher education representation from the outset. The use of the term 'meritocracy' does not deny the fact that prior academic achievement is a function as much of social class as it is intellectual ability (OECD, 2012; Palmer, Bexley, & James, 2011). Indeed, meritocracy is a normative and social construct as well as being an objective measurement tool (Liu, 2011). However, the fact remains that in systems that adopt meritocratic selection processes, it is only when the system expands that students with lower (not low) academic grades gain access. As the rate of expansion accelerates, similarly there is evidence that proportional representation of lower ranked students accelerates.

It is interesting to observe, however, that in 2009, when the sector started deliberately over-enrolling in anticipation of the new policy, there was in fact a significant initial increase in the acceptances from students in the highest deciles. Students with ATARs above 90.00 increased their overall share of places from 26.71% to 26.78%. This rose even further in 2010 to 28.04%. This trend was also true of the second-highest decile. Conversely, acceptances from students in the second and third lowest deciles (from 50.05 to 70.00) initially dropped in 2009, before eventually rising. In 2011, students from the highest and two lowest deciles actually increased their overall share of acceptances compared to 2008, with those in the middle three deciles seeing decreases, all in the context of increasing enrolments throughout the system.

The data suggest that over time, the Australian higher education sector was not expanding at a rate sufficient to meet the demand from students of all levels of academic achievement in accordance with their preferences. The movement and steady share of

Table 2. Proportional enrolments by ATAR percentile.

ATAR percentiles	Proportion of all acceptances (%)					
	2006	2007	2008	2009	2010	2011
90.05 or more	27.70	27.90	26.71	26.78	28.04	27.12
80.05–90.00	26.60	26.13	25.13	25.50	25.62	24.98
70.05–80.00	23.12	22.71	22.45	22.67	21.46	20.66
60.05–70.00	14.91	15.72	16.98	15.57	14.98	15.81
50.05–60.00	5.93	5.78	6.68	6.64	6.59	7.77
50.00 or less	1.74	1.77	2.05	2.84	3.31	3.66

Source: Compiled from undergraduate applications, offers and acceptances data from the Department of Education (2013).

high-ATAR students suggest an easing in access to desired courses which was previously constrained under the centrally organised system of place allocation. Essentially, high-ATAR students are the most mobile students in the system (Birch & Miller, 2007) and the deregulation of places is one important factor in ensuring their continued share of enrolments remains steady during a period of expansion in Australian higher education.

In the Australian context, this is often referred to as ‘unmet demand’ and defined as students who apply to go to university but are not offered a place. Prior studies have indicated that unmet demand is more common in students with lower prior academic achievement (Marks, 2005). However, as the above analysis suggests, as supply expands it generates significant demand from higher as well as lower achieving students. When access to supply was accelerated, universities first addressed the demand from ‘elite’ students (expanding courses with high levels of competition for places) and only then moved to make offers of places to others. Therefore, depending on how ‘out-of-step’ supply is to demand at the time supply is increased, and depending on the rate of acceleration, improving access may initially result in an increase of ‘quality’ inputs.

Another change was in the shift of acceptances by mature-age students. In fact, 2009 saw a dramatic increase in acceptances by students who were not applying directly from Year 12, rising again in 2010 before dipping slightly in 2011 (see Table 3). As non-school leavers, these students were generally applying on the basis of prior academic achievement other than an ATAR. The most common alternatives to Year 12 exams are other admission tests and prior tertiary studies; mostly vocational education and training (VET). In order to rank these students for selection, a proxy ATAR score was assigned to the mature-age applicant’s qualifications. Sometimes, the proxy ATAR was assigned by an external authority, such as students who sat alternative admissions tests moderated by the Australian Council for Educational Research (ACER). In many cases, however, each university assigned its own proxy ATAR in only varying degrees of cooperation and convergence with the rest of the sector. This was the case for many VET qualifications, which are usually given an ATAR that accords with the minimum entry requirements of the institution.

Therefore, although more Year 12 students with lower ATARs accepted offers during the lead-in period from 2009 to 2011, these Year 12 students made up fewer of the overall enrolling body of students. It would, therefore, not be correct to say that accelerated access universally leads to lower quality inputs. It also leads to more acceptances by high-quality inputs, as well as students using alternative pathways, who bring with them different definitions of quality.

Table 3. Proportional enrolments by mature-age students.

Year	Mature-age share of acceptances (%)
2008	36.7
2009	43.9
2010	47.6
2011	46.2

Source: Compiled from undergraduate applications, offers and acceptances data from the Department of Education (2013).

The impact of accelerated access on the quality of educational processes

Attrition rates

Higher education aggregate attrition rates actually fell in 2009, the year the commencing student intake accelerated the most. The rate of attrition then rose in 2010 before dropping again in 2011. It is, therefore, very difficult to ascribe a causal relationship between accelerated access and worsening attrition rates. The sector-level trend can, however, be further contextualised by looking at individual institutions, as given in Table 4. It reveals that more than half of the universities (19 out of 37) saw attrition rates actually decline (i.e., an improvement) over the lead-in period.

If the argument that accelerated expansion compromises quality processes is correct, then one might expect to see a direct relationship between the size of the enrolment increase (as measured by commencing student intake) and the rise in the corresponding attrition rate. However, this was not the case. Whilst the university with the most significant enrolment increase (Australian Catholic University) saw a 4.65% increase in its attrition rate, the second highest (Swinburne University of Technology) saw its attrition rate *decrease* by 6.60%. Changes in the attrition rate ranged from -18.31% to 21.88%. The university that saw the second-greatest improvement in its attrition rate (La Trobe University) increased its enrolments by more than 20%. Almost half the universities (17 out of 37) saw the change in enrolment and attrition rates move in opposite directions: that is, attrition rates increasing as enrolments decreased or vice versa. This was contrary to the assumption that accelerated expansion correlated with worsening quality processes.

The analysis also revealed that, during the two-year lead-in period, there was no consistent pattern in changes to attrition rates on the basis of either commencing cohort size, or historical levels of attrition. Universities enrolling smaller cohorts of commencing students experienced both positive and negative changes to attrition rates, as did those with the largest cohorts. Universities with historically low attrition rates (i.e., below 10%) were no more or less likely to see attrition rates worsen as a result of accelerating enrolments; the same was also true for universities with historically high attrition rates (i.e., above 20%). For example, Central Queensland University, with the highest attrition rate of all institutions in 2008 (27.7%), saw it decline slightly by 2011, despite increasing commencing enrolments by almost a third.

Significantly, Table 4 shows that both prior to, and after the lead-in period, there was significant variance across the sector. In 2008, attrition rates ranged from as low as 4.96 to as high as 27.70. In 2011, the range was 5.16–27.26. In other words, before the preparation for the DDFS led to the vocalisation of concern regarding the quality of the Australian higher education experience, the sector was already tolerating institutional attrition variances of over 450%.

Progression rates

The assumption that as commencing enrolments accelerate, progression rates will decline was partially borne out. Across the higher education sector, progression rates declined slightly from 2008 to 2011. However, the decline was disproportionate to the increase in enrolments – whilst these rose by more than 18%, progression rates dipped by only 1.21%. However, there was a correlation between accelerated enrolment and progression rate. Table 5 shows that 28 out of 37 universities experienced a decline in progression rate as they increased enrolments over the lead-in period and one

Table 4. Commencing student attrition rates.

University	Commencing student attrition rates		% Change from 2008 to 2011		Size of commencing cohort (2008)
	2008	2011	Enrolments	Attrition rate	
The University of Wollongong	8.00	9.75	24.24	21.88	3601
The University of Technology, Sydney	6.31	7.45	10.39	18.07	5084
The University of Newcastle	11.79	13.75	9.82	16.62	6303
The University of Adelaide	9.51	10.76	26.24	13.14	3555
The University of South Australia	15.58	16.61	2.20	6.61	5443
Flinders University	13.84	14.73	23.49	6.43	3402
Charles Sturt University	19.26	20.46	25.45	6.23	5529
The University of Canberra	14.26	15.05	41.26	5.54	2329
The University of New England	19.60	20.52	12.12	4.69	3433
Australian Catholic University	12.69	13.28	82.65	4.65	3129
The University of Western Sydney	11.39	11.88	11.60	4.30	9087
The University of Melbourne	4.96	5.16	5.62	4.03	5286
The University of Southern Queensland	22.34	23.13	20.65	3.54	3210
The University of the Sunshine Coast	20.46	21.07	38.73	2.98	1779
Curtin University of Technology	12.70	12.98	23.73	2.20	5566
Charles Darwin University	26.58	27.13	10.47	2.07	1595
Edith Cowan University	18.41	18.63	25.61	1.20	4607
Macquarie University	8.97	9.01	39.66	0.45	3901
Victoria University	15.05	14.98	22.21	-0.47	4134
Southern Cross University	22.39	22.25	-0.50	-0.63	3203
James Cook University	19.33	19.17	10.64	-0.83	3140
Murdoch University	17.38	17.18	16.24	-1.15	2894
Central Queensland University	27.70	27.26	31.11	-1.59	2552
The University of Western Australia	7.46	7.19	26.59	-3.62	3738
The University of Sydney	5.57	5.33	4.87	-4.31	8012
Griffith University	15.40	14.59	16.04	-5.26	7455
Monash University	7.28	6.85	15.15	-5.91	7256
Swinburne University of Technology	14.69	13.72	46.03	-6.60	2770
The University of Tasmania	18.66	17.33	5.56	-7.13	3762

(Continued)

Table 4. (Continued).

University	Commencing student attrition rates		% Change from 2008 to 2011		Size of commencing cohort (2008)
	2008	2011	Enrolments	Attrition rate	
The University of Queensland	9.04	8.27	13.05	-8.52	7404
RMIT University	11.56	10.50	12.44	-9.17	5677
Deakin University	12.69	11.45	20.45	-9.77	6343
The University of New South Wales	5.81	5.23	18.16	-9.98	6282
Queensland University of Technology	12.56	11.11	8.23	-11.54	8801
The University of Ballarat	19.82	17.33	19.62	-12.56	1539
La Trobe University	13.80	11.93	20.07	-13.55	5726
The Australian National University	6.50	5.31	-3.01	-18.31	2293
Sector averages	12.81	12.82	18.60	0.08	4590

Source: Compiled from attrition, progression and retention tables from the Department of Education (2013).

university experienced an improvement in progression as it decelerated its rate of enrolment. Only seven universities managed to increase both enrolment and progression rates between 2009 and 2011.

There was also a correlation between the rate of acceleration and the rate at which the progression rate declined. In total, 18 universities had enrolment growth above the sector's average of 18.6% and of those, 14 also experienced a decrease in their progression rate that was greater than the sector's average of -1.21%. The same held in reverse: seven of the 19 universities that had below-average enrolment growth between 2008 and 2011 also experienced below-average decreases in progression rates and five universities experienced increases in progression rates.

As with attrition rates, there was no discernable correlation between size of the commencing cohort and overall progression. The seven universities that increased both enrolment and progression rates were evenly spread in terms of size distribution, ranging from 1595 students to 8801 students. Likewise, there was no correlation between historical progression rates and performance after 2009. It is also noteworthy that the average decline in progression rate (-1.21%) was proportionately much lower than the average rate of enrolment increase (18.6%). As was the case with attrition rates, institutional progression rates varied widely both before, and after, the lead-in period. In 2008, they ranged from 75.78 to 92.50 and in 2011 the range was 75.25-92.07.

Conclusion

The data suggest that there is a correlation between increasing rates of access and a decline in some proxies for higher education quality. As Australian universities enrolled students at an accelerated rate from 2009 to 2012, they enrolled more students with lower ATARs. Furthermore, the overall rate of student progression declined slightly during the same period. However, these findings require significant qualification.

Table 5. Commencing student progression rates.

University	Commencing student progression rates		% Change from 2008 to 2011		Size of commencing cohort (2008)
	2008	2011	Enrolments	Progression	
Charles Darwin University	75.78	79.88	10.47	5.41	1595
Queensland University of Technology	84.57	86.79	8.23	2.63	8801
The Australian National University	90.39	92.07	-3.01	1.86	2293
Deakin University	83.08	84.45	20.45	1.65	6343
The University of New South Wales	90.49	91.59	18.16	1.22	6282
La Trobe University	84.42	84.93	20.07	0.60	5726
The University of Tasmania	83.98	84.44	5.56	0.55	3762
Central Queensland University	78.75	79.16	31.11	0.52	2552
RMIT University	84.75	84.74	12.44	-0.01	5677
The University of Sydney	90.46	90.44	4.87	-0.02	8012
Monash University	89.66	89.44	15.15	-0.25	7256
The University of Technology, Sydney	89.77	89.53	10.39	-0.27	5084
The University of Western Sydney	78.46	77.96	11.60	-0.64	9087
The University of Melbourne	92.50	91.80	5.62	-0.76	5286
Griffith University	84.98	84.21	16.04	-0.91	7455
The University of Ballarat	83.74	82.91	19.62	-0.99	1539
The University of New England	79.57	78.57	12.12	-1.26	3433
The University of Queensland	88.53	87.37	13.05	-1.31	7404
The University of Western Australia	88.12	86.88	26.59	-1.41	3738
The University of the Sunshine Coast	81.09	79.82	38.73	-1.57	1779
The University of Newcastle	84.73	83.38	9.82	-1.59	6303
The University of Canberra	81.73	80.34	41.26	-1.70	2329
Macquarie University	85.49	83.98	39.66	-1.77	3901
The University of Wollongong	91.00	89.23	24.24	-1.95	3601
Curtin University of Technology	84.01	82.31	23.73	-2.02	5566
The University of South Australia	85.51	83.65	2.20	-2.18	5443
Flinders University	85.79	83.46	23.49	-2.72	3402
James Cook University	82.79	80.42	10.64	-2.86	3140

(Continued)

Table 5. (Continued).

University	Commencing student progression rates		% Change from 2008 to 2011		Size of commencing cohort (2008)
	2008	2011	Enrolments	Progression	
Australian Catholic University	87.95	85.41	82.65	-2.89	3129
Victoria University	80.38	77.83	22.21	-3.17	4134
Murdoch University	78.56	75.59	16.24	-3.78	2894
Edith Cowan University	82.31	79.00	25.61	-4.02	4607
The University of Southern Queensland	78.74	75.25	20.65	-4.43	3210
Charles Sturt University	83.19	79.50	25.45	-4.44	5529
The University of Adelaide	86.46	81.73	26.24	-5.47	3555
Swinburne University of Technology	82.62	77.83	46.03	-5.80	2770
Southern Cross University	83.63	78.43	-0.50	-6.22	3203
Sector averages	85.38	84.35	18.60	-1.21	4590

Source: Compiled from attrition, progression and retention tables from the Department of Education (2013).

The data reveal a correlation between an increase in enrolments and a decrease in the ATARs of enrolling students. Furthermore, this correlation suggests causation: universities' meritocratic admission processes and their corresponding strong reliance on students' ATARs as evidence of the same, leaves little doubt that accelerated access is leading to more students with lower ATARs being admitted into Australian universities. But given that ATARs are a rank not a score, this is what would be expected in a situation where the overall supply of places has increased. Moreover, at the same time more students with high- and mid-range ATARs are also being admitted. Furthermore, the accelerated access is also leading to more (particularly mature-age) students using non-ATAR bases of admission. Given that almost as many commencing students no longer use ATARs to gain access to higher education as those that do, a review of the use of ATARs by policy-makers and politicians alike as *the* proxy for quality is overdue.

Despite the changes to the educational backgrounds of enrolling students, there is no evidence that admission processes are over-selecting students unprepared for university studies. The sector's overall attrition rate actually declined in most universities during the period of accelerated enrolments and at the institutional level, there was no discernible pattern regarding attrition rates and institutional profiles, in regards to the number of students admitted or historical trends. Whilst progression rates declined overall, the decline was minor, being less than 1.5%.

Progression and attrition rates are as much a function of university policy as they are of student aptitude. Another part of the debate regarding higher education quality centres on the pressure of the market to encourage, for example, 'soft marking' of students. In Australia, to date, most of the focus on this aspect of academic standards has been on international students, indicating the belief that as 'paying customers', they bring particular pressures to bear upon educational processes (Devos, 2003). The

move to demand-style funding models for higher education might cause some commentators to intensify scrutiny of the state as just such a customer. Whilst our research neither confirms nor refutes the possibility that institutional assessment processes have altered as a consequence of accelerated access, it does reveal the need for more research into this aspect of educational quality. For example, are higher attrition rates a sign that higher education quality is worsening (i.e., a failure to achieve quality outcomes) or improving (i.e., maintaining standards)?

Ultimately, concern regarding the potential detrimental effects of widening participation in higher education reveals how policy-makers justify the reversal of an unwelcome, inherited, policy via the deployment of a self-fulfilling prophecy. In the ‘equity versus quality’ debate, a focus on quality inputs means that, by definition, increasing the number of student places – where places are allocated on a meritocratic basis – will result in ‘lower quality’ higher education. For university entry, analysing entry scores is ‘the blackest of black statistical arts’ (Craven, 2012). Defining educational inputs as *the* metric for quality assurance creates a false consciousness whereby commentary and argument is inordinately focused on minor statistical shifts in scores and the real question – what is quality in higher education? – is overlooked. This ultimately devalues higher education institutions themselves, as it suggests their role is primarily one of certifying the prior educational achievement of the student rather than value-adding in meaningful ways. The quality of the student at graduation is far more important than their quality at commencement.

When the focus of quality measurement shifts to the educational process itself, there is little evidence that accelerating access has any significant detrimental effect on quality. The attrition and participation rates throughout the lead-in period indicate, if anything, high levels of student perseverance. Despite failing slightly more subjects, the students continued in their studies at almost the same rate. What the latest attention on higher education quality has highlighted is that for many years – and under the stewardship of political parties from both the left and the right – proxies of educational quality have varied significantly across institutions. Regardless of specific government policy pressure, some institutions have generally only accepted students ranked in the top 20th percentile of school leavers whilst others have accepted those in the top half.

A notable but hitherto under-recognised feature which has been revealed from the analysis here has been the wide range of attrition/retention and progression rates across the sector. Some universities regularly retain nine out of 10 students, whilst others lose on average a quarter of their commencing cohort each year. Significantly, these differences did not relate closely to subsequent variations between institutions in the growth rates of commencing students. More analysis of the factors explaining institutional variability in student attrition and progression rates is required.

It is also unclear to what extent the recent expressions of concern at the political level about possible ‘declining quality’ implications of the DDFS mask more traditional worries about the increased cost to the budget that has occurred as a result of the large increase in enrolments. Whilst it was always anticipated that a lifting of the caps on enrolments would entail more cost to government, the extent of the increase has been greater than initially budgeted. It is, therefore, perhaps unsurprising that both sides of politics have begun to question a key underlying assumption of the expanded system (i.e., that there are many more students with the potential to benefit from higher education than are currently being catered for) as a rationale for potentially cutting back government expenditure on higher education.

In summary, the claim that there is a clear quality–quantity trade-off as a result of acceleration in access to higher education remains unproven at best. If policy-makers continue to give preference to an ‘inputs’ definition of educational quality, then subsequent quality measurement processes will inevitably be described in terms of ‘decline’. However, for the reasons identified in this article, this does not actually mean that the quality of higher education is being compromised by goals of access and widening participation.

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Promoting low socio-economic participation in higher education: a comparison of area-based and individual measures

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As with other countries, Australia has been grappling with the identification, measurement and impact of disadvantage in higher education. In particular, the measurement of socio-economic status (SES) has been of central concern. The immediate solution in Australia has been the introduction of an ‘area’ measure in which students’ SES is categorised on the basis of census data for their neighbourhoods rather than on individual or household data. This paper assesses the veracity of the area measure in capturing individual SES for school-aged entrants, using a longitudinal data set, the Household, Income and Labour Dynamics in Australia (HILDA) Survey, to construct individual measures of SES and a national ranking of sample individuals on the basis of probability of attending a higher education institution. The results demonstrate the tendency for area measures to misclassify individuals’ higher education opportunity and the associated potential for perverse policy outcomes.

Keywords: widening participation; youth transition; socio-economic status; economics of education; entering university

Introduction

Australian policy-makers have long recognised the need for Australia to increase the proportion of its population gaining a university qualification. The *Review of Australian Higher Education* (the Bradley Review) completed in 2008 argued that achieving this would require increasing participation rates among groups identified as significantly under-represented in higher education, including students from low socio-economic status (SES) backgrounds. In accepting these recommendations, the Australian government imposed a quota under which universities were to source 20% of domestic undergraduate enrolments from the lowest 25% of households by SES measures before 2020, with individual institutions being set participation targets in view of the national target.

Some of the motivation behind the quota for low-SES households has been couched in terms of objectives of economic efficiency. However, it can be seen primarily as a policy designed to promote equity – to expand access to higher education to people who are otherwise disproportionately denied that opportunity given certain socio-economic characteristics that are not directly related to individual academic ability. Initially, the measurement of SES in Australia was based on the SES of the individual’s area of residence, as defined by a ranking of postcodes according to the Australian Bureau of

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Statistics' (ABS) Socio-economic Indexes for Areas (SEIFA) Index of Education and Occupation (DEEWR 2009, ii). The measure was later refined to incorporate an institutional count of student recipients of student income support payments through the social security system, but the preferred measure has since reverted to a pure area-based measure.

The current area measure of SES in Australia is not a direct measure of a young person's level of exclusion from education, but rather a proxy for SES adopted for the ease of implementing and monitoring the policy in the face of limited information. It is the efficacy of using an area-based measure as a proxy for disadvantage and of the quota as a means to achieve equity objectives that we explore in this paper.

Using data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, we first develop a model that provides direct estimates of the probability that a youth will go to university given the socio-economic characteristics of his or her family when the youth is 17 years of age. We use the results from this model to generate a family- or household-level measure of SES that is directly related to the educational opportunities of Australian youth. The correspondence between this direct measure and the area-based measure is investigated. We then explore the potential equity implications of the area-based SES quota under different assumptions regarding who it is from low-SES areas that enters university if the quota is met.

Policy background

In Australia, as in other countries, higher education is associated with superior outcomes across the range of life's domains. Higher levels of education have been associated with better employment prospects and higher earnings; better health and longevity and improved marriage prospects and family planning, among other outcomes (Clarke and Leigh 2011; Hartog and Oosterbeek 1998; Haveman and Wolfe 1984). The full extent to which such associations represent a causal effect of additional education is debatable, but there is no doubt that gaining a university qualification, on the whole, bestows significant advantages over persons with lesser levels of educational attainment.

In view of this, successive federal governments in Australia have sought to ensure that access to, and completion of, higher education is supported through a number of important measures. Equity policy in modern Australian higher education was first officially sanctioned in the 1988 Federal Government paper, *Higher Education: A Policy Statement*, released by the then Labor government Education minister John Dawkins. This outlined the basis for a reorganisation of higher education, including changes to funding arrangements and an expansion in higher education places. Notable policy initiatives flowing from this document included the removal of the 'binary divide' between universities and colleges of advanced education in Australia in terms of Commonwealth (federal) recognition and funding, and the introduction of the Higher Education Contribution Scheme (HECS), which enables students to have access to 'income contingent' loans for higher education fees – effectively loans which are repaid through the tax system when a student starts earning an income above a minimum threshold (see Chapman and Ryan 2005 for an overview of HECS).

In addition, the statement emphasised the role of equity policy in Australia and called for the 'development of a statement of national equity objectives in higher education' (54). This led to a report from the then Department of Employment, Education

and Training, *A Fair Chance for All* (DEET 1990), which outlined national objectives and targets for six identified equity groups:

- People from Socio-economically Disadvantaged Backgrounds (Low-SES students)
- Aboriginal and Torres Strait Islander People
- Women
- People from Non-English Speaking Backgrounds
- People with Disabilities
- People from Rural and Isolated Areas

This established the basis under which equity policy in Australian higher education has been conducted ever since, with high-level data collection on equity group access and participation informing objectives, targets and strategies across the sector.

The election of the Rudd Labor Government in 2008 saw Australia set an explicit target for higher education participation: 40% of 25–34 years olds should have a bachelor's or higher degree by 2025. At the time of the Rudd government's announcement, participation in higher education had already increased from 20% of young people in 1980 to nearly 38% by 2000 (Rothman 2003), although with levels of attainment lagging somewhat at 32% of 25–34 years olds completing a bachelor's degree at the time of the accompanying review of higher education (the *Bradley Review*). The underlying participation target of 40% appeared to be within reach, provided completion rates could be raised (Koshy 2011). However, as of the 2011 Census, somewhere between 32% and 35% of 25–34 years olds reported holding a bachelor's degree or above, suggesting the rise in attainment has since stalled somewhat.¹

A prominent area of concern was that participation in higher education by students from low-SES households had lagged that of the overall population. In 2008, low-SES students accounted for 16.1% of the domestic undergraduate higher education population. Commensurate with its overall strategy, the Rudd and (after June 2010) Gillard governments outlined an explicit target for higher education participation in relation to students from low-SES backgrounds, defined as the lowest 25% of households. The target stated that by 2020, 20% of all domestic undergraduate students in Australia would come from low-SES households, up from around 16% in 2008

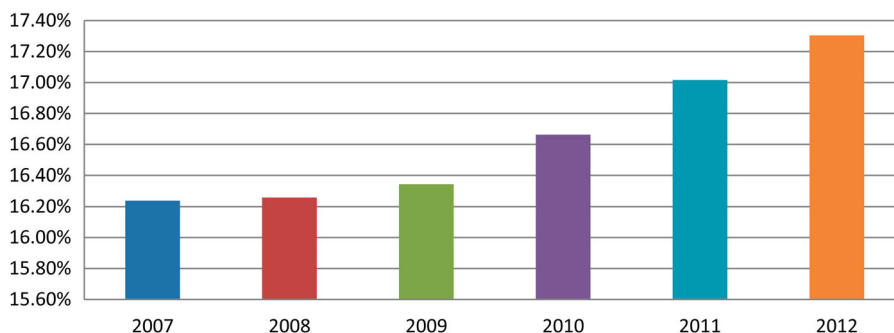


Figure 1. Australia domestic undergraduate low-SES enrolment/total enrolments: 2007–2012, Table A providers.

Source: Koshy (2013).

(Bradley 2008). Subsequent to this target being identified, the low-SES share of domestic undergraduate enrolments has increased, reaching 17.3% in 2012 (Figure 1). These shares are based on assigning students as low SES if they reside in one of the postcodes comprising the bottom 25% of the population by the SEIFA Index for Education and Occupation.

The Rudd and Gillard governments also sought to address the participation issue with a series of funding measures originally proposed in the *Bradley Review* (such as full indexation), in conjunction with continued deregulation of student places in higher education. The low SES participation target and that of other equity groups (people with disabilities, Indigenous and remote/regional) were explicitly addressed and enshrined in the *Higher Education Participation and Partnerships Program* (HEPPP), whereby funding support for equity enrolments is provided at the institutional level for the 38 Table A providers (Commonwealth of Australia 2010). The introduction of HEPPP has led to institutional enrolment performance being monitored. Currently, the Commonwealth assesses enrolment performance against equity group reference values for all equity groups.

The current higher education system in Australia

As a consequence of the Rudd–Gillard reforms, in recent years the Australian higher education system has been characterised by sustained growth. The system comprises 130 providers, classified into four groupings:

- The ‘Table A’ providers – the 38 major universities (37 public universities and the Australian Catholic University) which account for 93.4% of current undergraduate enrolment;
- ‘Table B’ providers – three smaller private institutions (Bond University, The University of Notre Dame and MCD University of Divinity);
- ‘Table C’ providers – two private provider campuses based in Adelaide: Carnegie Mellon University and University College London and
- ‘Other’ providers – 87 institutions which have an enrolling capacity in higher education.

Table 1 reports undergraduate enrolments across the system, grouping Table C and Other providers together. In 2012, the total undergraduate headcount enrolment was 679,595, of which around 93.4% was located in the Table A provider institutions, 1.7% in Table B and 5.0% in ‘Table C and Other’ institutions.

Since 2007, total growth in undergraduate enrolments across all providers was 23%, with marked growth over the period between 2009 and 2012 in anticipation, and the actual implementation, of the removal of caps on enrolments across the higher education system. Table A providers have seen a total growth of 20%, while Table C and Other providers have seen their enrolment double over this period (101.5%), in part due to the removal of caps, but also in response to their access to the HECS in the earlier part of the decade. As a result, the overall dominance of the sector by Table A providers has fallen from 95.7% in 2007 to 93.4% in 2012.

Figure 1 demonstrates the growth in low-SES enrolments since 2007, with an increase in the share of total domestic undergraduate enrolments from 16.2% in 2007 to 17.3% in 2012 among Table A providers, the target group of institutions under HEPPP. Growth in low-SES enrolments among Table A providers between

Table 1. Australian domestic undergraduate enrolment by provider type: enrolment and growth, 2007–2012.

	2007	2008	2009	2010	2011	2012	<i>2007–2012 growth</i>
Enrolment							
Table A	528,844	532,527	553,374	580,372	600,412	634,434	<i>105,590</i>
Table B	7019	7985	9302	10,233	11,147	11,473	<i>4454</i>
Table C and Other	16,718	21,374	25,340	29,020	31,507	33,688	<i>16,970</i>
Total	552,581	561,886	588,016	619,625	643,066	679,595	<i>127,014</i>
Enrolment growth							
Table A	–	0.7%	3.9%	4.9%	3.5%	5.7%	<i>20.0%</i>
Table B	–	13.8%	16.5%	10.0%	8.9%	2.9%	<i>63.5%</i>
Table C and Other	–	27.9%	18.6%	14.5%	8.6%	6.9%	<i>101.5%</i>
Total		1.7%	4.7%	5.4%	3.8%	5.7%	<i>23.0%</i>

Source: Koshy (2013).

2007 and 2012 has equalled 27.8%, slightly slower than overall system growth for low-SES students of 30.7%.

An important distinction can be made between an increase in the number of equity students within the higher education system and the extent to which the system's overall enrolment is becoming more representative. Tonks and Farr (2003) describe this as the difference between 'widening access' (equity students entering the system in increasing numbers) and 'widening participation' (equity students entering all universities and fields of study), essentially the extent to which equity students are increasing their enrolments in areas in which they are already adequately or over-represented.

A closer examination of low-SES participation in Australia suggests that this distinction is important, more so if the measurement of status is undertaken with less precision than is desirable. Table 2 reports on the low-SES student share of enrolment within Australia by major university groupings and for 'unaligned' universities, across all Table A providers.

The overall low-SES share of enrolment in 2012 was clearly not evenly distributed across the higher education sector. For instance, the Group of Eight, a collection of Australia's oldest and most research-intensive universities had a low-SES share of

Table 2. Low-SES student equity share of undergraduate enrolments, by institutional groupings, Table A providers, 2007–2012.

	2007	2008	2009	2010	2011	2012
National – Low SES	16.2%	16.3%	16.3%	16.7%	17.0%	17.3%
Group of Eight	10.1%	9.9%	9.8%	10.0%	10.6%	10.6%
Australian Technology Network (ATN) Group	14.5%	14.7%	14.8%	15.3%	15.4%	16.0%
Innovative Research Universities (IRU) Group	19.4%	19.4%	19.4%	19.7%	20.1%	20.5%
Regional Universities Network (RUN) Universities	28.7%	29.0%	29.3%	29.6%	29.8%	30.0%
Unaligned Universities	17.5%	17.6%	17.7%	17.9%	18.1%	18.2%

Source: Koshy (2013).

undergraduate enrolments of around 10.6%, compared with the national share of 17.3% and 30% among institutions in the Regional Universities Network (RUN). While all university groupings have seen a rising share of low-SES enrolments, the relative incidence of participation across the system has remained unchanged, with the Group of Eight institutions still seeing relatively low shares of enrolment, albeit from even lower levels in the latter part of the last decade.

In the context of the area measure, the policy appears to be increasing low SES participation, but this needs to be assessed independently in view of evidence on low SES participation as measured using individual or household data.

SES: concepts and links to education

Societies are inevitably characterised by some form of hierarchical stratification of the social standing of the members within them. Though SES is difficult to define in a concise way, it is widely recognised by sociologists as critical to the understanding of social processes and outcomes and as being a multidimensional concept (for instance, see Blakemore, Strazdins, and Gibbings 2009, Graetz 1995; Marks et al. 2000 for discussions).

Haller and Haller (2009) propose that SES comprises four different ‘content dimensions’ representing potential sources of differentials in power: political, economic, social and informational. More precisely, Blakemore, Strazdins, and Gibbings (2009, 121) follow the approach of a number of papers from the social epidemiology literature in viewing SES as access to and control over social and economic resources. More pertinently, SES is also characterised by strong feedback cycles which operate across generations and within social strata and, in turn, reinforce the power of status in educational institutions which then draw students from relatively narrow SES backgrounds. As Marginson (2011) observes:

Leading universities attract leading students and high achieving staff in an ongoing process of status exchange. The universities draw institutional status from the presence of these valued persons, and apply individual status back to them. (31)

For this reason, variables commonly used in empirical work to capture SES typically include parental, peer and neighbourhood measures of occupational status, education and income or wealth. In analyses of outcomes for children and youth, it is the parental or household values for these variables that are most relevant. The variables most often used to capture SES in modelling educational outcomes are parental occupation and/or education (Cardak and Ryan 2009; Le and Miller 2005; Marks et al. 2000).

The association between parental SES and children’s educational outcomes is critical to social equity. Higher parental education will contribute to informational power directly and to other forms of influence through the impact of education on earnings, occupational prestige, social standing and possibly political and civil engagement. A steep gradient between parental SES and children’s educational achievement becomes a key mechanism through which SES is transmitted between generations, and through which children of low-SES backgrounds are consigned to lower opportunity in life.

Such gradients between parental SES and children’s educational success are well established in international educational research (Sirin 2005). They exist in Australia in respect to school achievement and completion and access to university (see

DEEWR 2009; Homel et al. 2012; Le and Miller 2005 for reviews). Based on an analysis of data from the 1995 Year 9 cohort of the *Longitudinal Surveys of Australian Youth*, Le and Miller find that family SES is important in determining university access, but that most of the effect lies in the Year 12 to university transition rather than the impact of socio-economic background on the probability of completing Year 12 (Le and Miller 2005, 162). This finding contradicted earlier research, suggesting that policies aimed at improving access to university for those from lower SES backgrounds should be aimed at addressing differences in school completion rates, but is consistent with a declining importance of differences in Year 12 completion rates as those rates have increased markedly, as noted by Marks et al. (2000). Le and Miller instead propose equity-based scholarships or university fee rebates to be the more appropriate policy instrument for reducing socio-economic imbalance in access to university (2005, 162).

However, noting that entrance to university is conditional not only upon completion of Year 12, but also on the achievement of adequate leaving grades (or 'ENTER' scores), Cardak and Ryan (2009) take issue with Le and Miller's (2005) policy conclusion. They find that conditional upon ENTER score, students are equally as likely to enter university irrespective of SES background (2009, 444). That is, the SES gradient in university access is attributable to differences in school achievement prior to the school-to-university transition. Moreover, they find that much of the SES effect has materialised by Year 9. In contrast to Le and Miller, Cardak and Ryan therefore argue that improving educational outcomes in primary school and the early years of high school is needed to address the SES imbalance in higher education participation (2009, 444).

The Australian government's postcode measure of SES

The announcement of the government's intention to increase the representation of students from low-SES backgrounds to 20% of domestic undergraduate enrolments by 2020 was made in the 2009–2010 Budget, with additional funding available to higher education institutions linked to progress against this target (DEEWR 2009). This required a means to determine whether or not enrolled students were from low-SES backgrounds. The measure adopted, as explained by DEEWR (2009, 1–2) was:

SES of higher education students is determined by the geographic area or postcode of the student's home. The Australian Bureau of Statistics (ABS) Socio-Economic Indexes for Areas (SEIFA) Index of Education and Occupation (IEO) is used to rank postcodes. The postcodes that comprise the bottom 25% of the population aged between 15 to 64 years at the date of the latest census, based on this ranking, are considered low SES postcodes. Students who have home locations in these low SES postcodes are counted as 'low SES' students.

In the remainder of the paper we assess the efficacy of this postcode-based measure. Before presenting our own empirical analyses, we canvass some existing literature relating to area-based measures generally and to the Australian government's measure specifically. It should be noted that following a review of the postcode measure, the Government has made a concerted effort to explore options for developing a superior measure of student SES background. A joint committee of the then Australian government's Department of Education, Employment and Workplace Relations (DEEWR), the ABS and the peak higher education representative body *Universities*

Australia supported the use of students' parental education levels, leading to a December 2008 ministerial directive to add these items into the student statistics collection, for reporting from 2010 (DEEWR 2009, 6). However, due to the administrative and cost burden of collecting parental education data, this option appears to no longer be considered viable and area measures continue to be the primary focus.

Area-based measures of socio-economic status

In an analysis of the low-SES target, Koshy (2011, 46–47) identifies three critical issues which shape the measurement of socio-economic status:

- *Variable efficacy*: How can an index be constructed to best capture the impact of a diverse range of factors, including income, occupation and educational attainment within households?
- *Level of identification*: Should individual household measures be used, or does a geographical score such as the postcode in which a student resides suffice as a measure?
- *Reference population*: In a national higher education system with strong levels of state-specific segmentation in higher education, should we use the population of the state or nation in assigning an SES ranking to an individual student?

The first of these criteria has been extensively determined by the ABS in its series on the SEIFA in the context of the use of area measures (see ABS 2012 for an overview), and studied in the higher and tertiary education context (Karmel and Lim 2013, *inter alia*).

In terms of the level of identification, accepting the conceptualisation of SES as being attributable to differentials in power between members of society provides a simple theoretical basis for deciding *a priori* upon the suitable level at which measurement should be generated. If SES represents the ability to call on resources and influence to generate desired outcomes, then SES should be measured only for units within which the resources and influence are used to achieve a common purpose. It makes sense to generate measures of SES for individuals since they draw on any benefits of their status as they see fit. It makes sense to generate measures of SES for an immediate family unit because, by and large, the resources and influence associated with higher status will be used to the benefit of those family members. Generally, the benefits of higher SES of any one parent within a family will also accrue to their spouse and dependent children.

Within a geographical area, however, those of relatively higher status and influence may have no interest in utilising their position for the good of neighbours of relatively lower standing. Hence area-based indices are not a measure of the SES of the areas, but an average of the SES of families or individuals within the area. Previous writers have noted the limitations of area-based measures of SES in this respect, and such measures are typically adopted only because of inadequate data availability at the individual or family level. Lim & Gemici (2011) and Marks et al. (2000) noted that the use of an area measure is likely to result in a substantial misclassification of individuals. Ainley and Long (1995a, 1995b) find generally inadequate correlations between area-based measures at the Census collection district level and ones based on parental characteristics, notably in rural areas: 'It is therefore recommended that where possible socio-economic status for students be estimated from data derived from individual students' reports' (1995a, 75).

A further form of misclassification can arise if the students' current residential address does not reflect their SES background. ACER (2013) found that university students are a relatively mobile population, and indeed many move for the purposes of their studies. In a comparison of students' 2011 addresses to their addresses 5 years earlier using Census data, ACER found that substantially fewer students would be assessed as low SES based on their prior address (13.2% as opposed to 18.2%). DEEWR also raised this issue, noting that students may report their 'term' addresses as their home location, which may not convey information about their origin (2009, 2).

Finally, the question of the appropriate reference population has been examined by Phillimore and Koshy (2010) and Koshy (2011) in view of the postcode-based measure used for the purposes of the equity target. Given that few students study at institutions outside their home state, Koshy (2011) argues that low SES would be better determined relative to state and territory benchmarks rather than a national benchmark.

Empirical analyses

A household-based measure of access to higher education

So one of the main limitations of using an area-based measure of SES as a proxy for disadvantage is that it makes inferences about the SES of an individual household based on the average SES of households in the area in which the household is located. This potential error for incorrectly identifying the SES of a particular household is known as ecological fallacy. Ecological fallacy is most likely to be an issue in areas where there is a high variance in the SES of households around the average SES of households in the area (Baker and Adhikari 2006).

To assess the efficacy of using an area-based measure, we construct a household-based measure of SES that is directly linked to access to higher education and compare this to the area-based measure. To derive a household-based measure of access to higher education, we use data from waves 1–11 of the HILDA Survey. The HILDA Survey commenced in 2001 (Wave 1), with 7682 households and 19,914 individuals. An additional 2153 households and 5477 individuals were added to Wave 11. The HILDA Survey collects information about economic and subjective well-being, labour market dynamics and family dynamics. Interviews are conducted annually with all adult members of each household (See <http://www.melbourneinstitute.com/hilda/> for further details).

To construct the household-level measure of SES, we estimate logit models of the probability that a youth will go to university conditional upon the socio-economic characteristics of his or her family when the youth is 17 years of age. The sample of 17-year olds is drawn from each of the first eight waves of the HILDA Survey. This allows us to observe whether or not each 17-year old went to university at some time up to and including the age of 20 years.² From these models, the predicted probability of a 17-year old entering university can be calculated given the socio-economic characteristics of the youth's family, and we take this predicted probability of entering university as the alternative measure of SES (hereafter 'household measure').

Separate models are estimated for 17-year olds from couple family households and those from lone-parent households, because some explanatory variables used in the model for two-parent households cannot be defined if there is only one parent. After controlling for missing data, the final samples contained 1135 17-year olds from couple family households and 396 17-year olds from lone-parent households.

A 17-year old was deemed to have gone to university if he or she commenced a bachelor's degree, bachelor's (Honours) degree, graduate certificate, graduate diploma, master's degree or doctoral degree between the age of 17 and 20, inclusive. For youth from couple households, the independent variables included whether the youth was an only child, gender, real family household disposable income, the region the family household was located in, type of school attended, if the family household were home-owners/purchasers or rented from a government housing authority or private landlord, disability status, mother's highest level of education, father's highest level of education and mother's and father's employment status and occupational skill level. The same variables are used in the model for youth from sole-parent households, except that the highest level of education, employment status and employed occupational skill level are only included for the sole parent. Note that the explanatory variables include the key variables of education and occupation from which the area-based SEIFA indices are calculated.

The occupational skill level for an employed person is based on ABS' Australian and New Zealand Standard Classification of Occupations (ANZSCO) occupational skill level. The ABS (2006) notes that the occupational skill level is a function of the range and complexity of the set of tasks performed in a particular occupation. The greater the range and complexity of tasks, the greater the skill level of an occupation. ANZSCO occupations are assigned to one of five skill levels, with skill level 1 being the highest skill level and skill level 5 being the lowest skill level. The skill level for a particular occupation is determined based on the level or amount of formal education and training; the amount of previous experience in a related occupation and the amount of on-the-job-training required to competently perform the set of tasks required for that occupation. Parental employment status is coded as a set of seven mutually exclusive dummy variables: the parent is out of the labour force, unemployed or employed in an occupation with one of five different skill levels.

A full description of the variables included in the models and their mean values can be found in the [Appendix](#). The individual, parental and household characteristics in the models are based on the characteristics when the individual was 17 years of age. The results of the models for youth from the couple family households and lone-parent households are reported in [Tables 3](#) and [4](#), respectively. These are presented in the form of odds ratios. To interpret these, take the coefficient in [Table 3](#) of 0.58 for youth from couple family households who attended a government school. This implies that the probability of those youth going to university is 42% less likely ($0.58 - 1.00 = -0.42$) than that for youth from the omitted category, that is, those who attended a Catholic or other non-government school. The coefficient of 0.57 on the variable 'male' indicates that 17-year-old males are estimated to be 43% less likely ($0.57 - 1.00 = -0.43$) than 17-year-old females to go to university. The results also suggest that the probability of a youth going to university increases markedly with parental education and the skill level of parents' occupation.

For the vast majority of youth from lone-parent families, that parent was the mother. These young people had a much lower likelihood of entering university: only 29% were observed to have commenced at university by age 20 compared with 40% of their peers who lived in a couple family at age 17. The results of the model for youth from lone-parent households also show a very strong effect of the parent having a degree. Youth whose sole parent's highest level of education is a degree were almost three times more likely to go to university than a youth whose sole parent has no post-school qualifications. Fewer coefficients are significant in the model for youth from sole-parent

Table 3. The results from the model of the probability of a 17-year old from a couple family household going to university.

Independent variable	Odds ratio	$p > z $
Only child	2.06*	0.053
Male	0.57***	0.000
Real household disposable income	1.00	0.514
Household located in:		
Major city	–	
Inner regional area	0.77	0.117
Outer regional area	0.71	0.148
Remote area	0.62	0.391
Attended a government school	0.58***	0.000
Household housing tenure		
Home-owner/purchaser	–	
Rents from a government housing authority	1.32	0.477
Rents from a private landlord	0.51**	0.012
Disabled	0.43***	0.001
Mother's labour force status:		
Employed and occupational skill level is level 1	–	
Employed and occupational skill level is level 2	0.70	0.176
Employed and occupational skill level is level 3	0.62	0.160
Employed and occupational skill level is level 4	0.94	0.772
Employed and occupational skill level is level 5	0.48**	0.012
Unemployed	1.07	0.885
Not in the labour force	0.74	0.197
Mother's highest level of education:		
No post-school qualifications	–	
Certificate	1.03	0.884
Diploma	1.85**	0.015
Degree	2.51***	0.000
Father's labour force status:		
Employed and occupational skill level is level 1	–	
Employed and occupational skill level is level 2	0.75	0.223
Employed and occupational skill level is level 3	0.58**	0.011
Employed and occupational skill level is level 4	0.45***	0.000
Employed and occupational skill level is level 5	0.50**	0.024
Unemployed	0.41	0.200
Not in the labour force	0.69	0.194
Father's highest level of education:		
No post-school qualifications	–	
Certificate	0.96	0.849
Diploma	1.73**	0.031
Degree	1.80***	0.007
Observations	1135	
Wald chi-square	206.1	0.000

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

families, reflecting the smaller sample. An exception is that the effect of living in a home rented from a government housing authority was significant for youth from lone-parent households, with them being 64% less likely to go to university compared with youth from lone-parent households that owned or were purchasing their home. This effect was not significant in the model for youth from couple families.

Table 4. The results from the model of the probability of a 17-year old from a lone-parent household going to university.

Independent variable	Odds ratio	$p > z $
Only child	0.85	0.657
Male	0.47***	0.003
Real household disposable income	1.00	0.610
Household located in:		
Major city	—	
Inner regional area	0.84	0.556
Outer regional area	0.60	0.308
Remote area	2.41	0.265
Attended a government school	0.54**	0.037
Household housing tenure		
Home-owner/purchaser	—	
Rents from a government housing authority	0.36**	0.025
Rents from a private landlord	0.72	0.258
Disabled	0.63	0.280
Parent's labour force status:		
Employed and occupational skill level is level 1	—	
Employed and occupational skill level is level 2	0.61	0.334
Employed and occupational skill level is level 3	0.68	0.550
Employed and occupational skill level is level 4	0.93	0.845
Employed and occupational skill level is level 5	1.16	0.733
Unemployed	0.54	0.289
Not in the labour force	0.49*	0.081
Parent's highest level of education:		
No post-school qualifications	—	
Certificate	0.80	0.513
Diploma	1.21	0.691
Degree	3.73***	0.000
Observations	396	
Wald chi-square	55.6	0.000

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

Using the coefficients from these two models, the predicted probability that each 17-year old in the sample will enter university can be calculated conditional upon their family background. Note that this probability is (a) based on youths' household-specific circumstances and (b) by construction, a direct measure of educational opportunity.

Comparing the two measures

The Australian Government Department of Education (2014) provided a concordance table which mapped every postcode to one of three rankings based on the SES area measure: low SES (bottom quartile of postcodes), medium SES (2nd or 3rd quartile) and high SES (top quartile). As the household's postcode is also available in the confidentialised HILDA data, it was possible to create a combined data set containing both the area and household measures of SES for each 17-year old and to investigate the concordance between the two measures.

The effectiveness of the area-based measure of SES as a proxy for disadvantage depends upon how accurately it identifies individuals with low access to higher

education. Of particular significance in the context of the low-SES quota is how accurately it identifies those individuals whose probability of going to university is in the lowest 25%. For youth in each of the three rankings based on the SES area measure (low, medium and high), the mean predicted probability of going to university is calculated and depicted by the darker bars in Figure 2. The predicted likelihood of entering university does increase accordingly: from 29.6% for youth from low-SES areas, to 34.4% for youth from medium-SES areas, to 51% for youth from high-SES areas. However, the gradient is slight. Most notably, there is a quite small difference (less than 5 percentage points) in the average predicted likelihood of entering university between the lowest and the middle 50% of youth as ranked by the area SES measure. This suggests that the area-based SES measure has limited discriminability in terms of higher education access across much of the distribution of young Australians.

As an indication of the discordance between the two measures, the lighter shaded bars show the same means when youth are ranked according to the household measure and mapped to the comparable three classifications of low (bottom quartile of youth by predicted likelihood), medium (2nd or 3rd quartile) and high (top quartile). The results would be the same if there was an exact concordance between the two measures. Instead, it can be seen that there is a very pronounced difference in the average likelihood of entering university for the bottom quartile (12.2%) and the middle two quartiles (33.6%). This suggests that the relatively flat distribution for the area-based measure is not due to limited variation in university access, but due to substantial misclassification.

Figure 3 shows the distribution across the quartiles of the household-based measure within each of the three area-based SES classifications (low SES, medium SES and high SES). Of the youth within the bottom 25% of households as classified by the area-based measure of SES, 13% are, by our reckoning, actually within the highest quartile of youth on the basis of their likelihood of going to university. One-third of these youth in low-SES postcodes are estimated to be in the top two quartiles in terms of the likelihood of entering university. That is, achievement of the quota for youth from low-SES areas will potentially discriminate in favour of a substantial proportion of youth who already have a better than average chance of entering university.

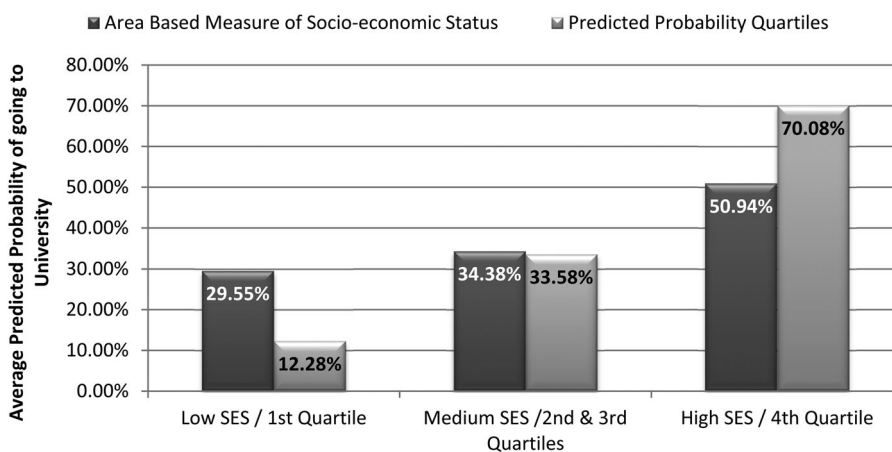


Figure 2. The mean predicted probability of a 17-year old going to university by area-based measure of SES and predicted probability quartiles.

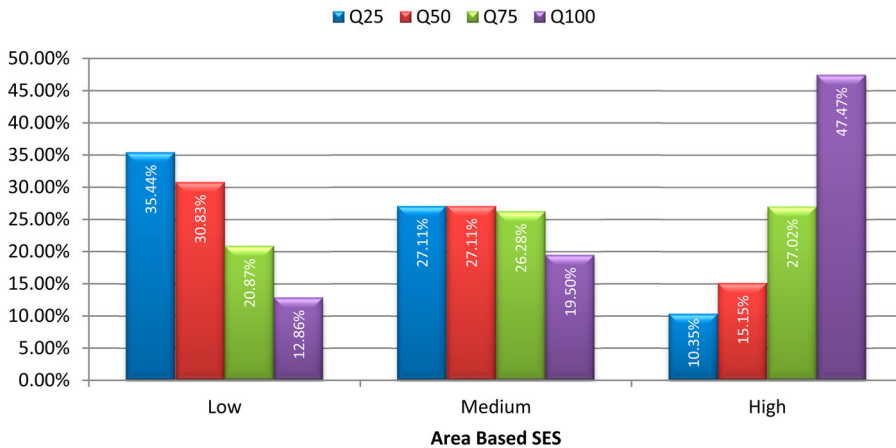


Figure 3. Quartiles of likelihood of entering university by area-based SES (%).

Equally, there is a significant representation of youth in the bottom quartile in terms of their predicted likelihood of entering university living in medium-SES postcodes (27%), and even in high-SES postcodes (10%). Hence, by our household measure, achievement of the quota would also potentially result in discrimination against a very substantial proportion of youth who already face the lowest access to higher education.

Of the lowest quartile of youth by our household measure – who face the lowest probability of getting into university and who, in principle, should be the target of the low-SES quota – only 38.1% live in postcodes classified as low SES and therefore stand to be favoured by the policy. The other 61.9% live in postcodes classified as medium or high SES and therefore stand to be disadvantaged by the quota.

We can also look at who did and did not eventually enter university. In Figure 4, the percentages shown are calculated within the student population; that is, the proportions among those youth who were observed to actually enter university. Among the 17-year olds from our sample who went to university, 19.2% were classified as low SES by the area-based measure. In contrast, only 7% of 17-year olds who enrolled in university were classified as low SES by the household-based measure. Obviously, this is an unfair test of the two methodologies, since our household measure is generated from these very data on who did and did not enter university. Nonetheless, it does reflect on the limitation of the area-based measure to correctly identify those with low access to higher education. Thus, the findings suggest that there is significant potential to overestimate the proportion of students from low-SES households enrolled in university using an area-based measure of SES.

Within our sample of 1531 youth, 572 (37.4%) were observed to enter university by age 20. As noted, 110 (19.23%) of these youth who entered university were from low-SES postcodes, which in fact is very close to the equity target of 20%. As one final demonstration of the potential for perverse effects from the imposition of the quota, we consider how the quota could be attained. To achieve the equity target within our sample would require three more students from low-SES postcodes to enter university at the expense of three students from medium- or high-SES postcodes. In the most extreme case of ‘skimming’, assume that the three students from low-SES postcodes who are promoted to university are those who did not go to university but

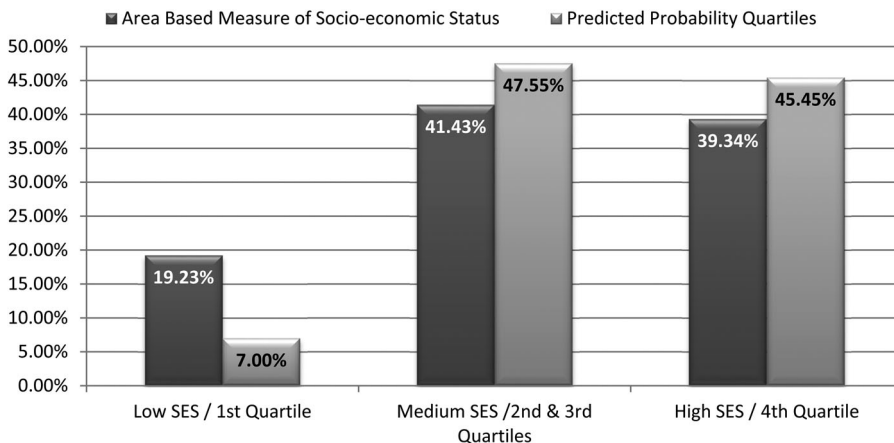


Figure 4. The proportions of university enrolments by area-based measure of SES and predicted probability quartiles.

had the highest predicted probability of doing so. Their average predicted probability of entering higher education is 81%. Assume they displace the three students from medium- to high-SES postcodes who did go to university, but who had the lowest predicted likelihood of doing so. The average predicted likelihood of entering university for those displaced students was just 8%. That is, the quota could be achieved by promoting youth who already had a very high probability of entering university at the expense of those who managed to get into university against very long odds. The numbers involved here are very small, and so the sample-based inferences must be considered to have very wide error margins. However, the figures presented earlier make it clear that neither a much larger sample nor a more substantive reallocation of enrolments³ would negate the basic story that the pursuit of the 20% quota, when based on a postcode measure of SES, is likely to favour those who already have a high probability of entering university at the expense of those facing relative exclusion from higher education.

Conclusion and discussion

Equity policy has emerged as a central feature of Australian higher education policy, and in recent years this has included the establishment, monitoring and funding of national targets for low-SES participation. Inevitably this invokes questions about the definition of SES, and how SES is measured and assigned to individual students becomes critical. Currently, the Australian government uses an area measure (postcode or SA1 area) to determine the SES of students, largely because of the absence of collections of socio-economic data at the student level. Higher education institutions in Australia are assessed on their performance against targets set on the basis of this measure. The main objective of this paper is to investigate the veracity of the area measure adopted and the potential implications for equity outcomes.

A number of previous papers have highlighted limitations of area-based measures of SES. First, we build on that literature by proposing an *a priori* basis for identifying the appropriate level at which SES should be measured: units within which resources and influence are shared for common goals. Second, we provide empirical indications of the magnitude of the problems associated with the area-based measure in question,

by contrasting the assignment of SES of young Australians under the government's area-based measure to that using a household-based measure of educational opportunity derived from the HILDA data. Of course, this household-based measure cannot be taken as a 'true' measure of SES. However, because it is derived at the appropriate household level and aligns directly to the policy objective (the probability of the youth going to university), we believe it is an appropriate yardstick against which to assess the implemented area measure.

The findings show that the area-based measure has considerable potential for misclassifying young people's educational opportunity. As one indication, among 17-year olds classified as being in the bottom quartile of SES by the area-based measure, around one-third actually have a better than average probability of entering university. Among the highest quartile of youth by the area-based SES measure, around one-quarter had a lower than average probability of going to university. In short, the use of an area-based measure of SES at the postcode level is not an effective method by which to identify those students who face relative exclusion from higher education.

Furthermore, the data demonstrate that the achievement of the 20% quota for low-SES students based on such a measure has the potential to generate perverse equity outcomes, in which students with a very low level of access to education are displaced from university by those who already had a very high probability of attending university. This is based on a theoretical simulation and the equity outcomes depend upon what actions institutions actually take to meet their targets under the quota. If increased enrolments from low-SES areas comprised youth from the sole-parent families and the couple households with low parental human capital stocks that disproportionately reside in those areas, then this would improve equity. Institutions have indeed responded with a wide variety of programmes to increase equity and access in recent years. However, the most straightforward approach to meeting the equity targets would be through outreach programmes to encourage enrolments from students attending high schools in those low-SES areas. This would primarily increase enrolments from those youth in the areas with the greatest likelihood of attending university, not those with the least opportunity. This increase in competition for limited university places by students coming from low-SES areas must displace some students from medium- to high-SES areas. Clearly, it is those marginal students from medium- to high-SES areas who are most likely to be displaced – the least advantaged rather than the most advantaged.

Given these considerations, the simulation presented is much more than just an academic curiosity. We believe that perverse equity outcomes – increased enrolment of students who already had high educational access at the expense of those with lower educational opportunity – are the very real and most probable outcome of the imposition of the low-SES quota. Approaches that align access and equity measures more directly with the sources of disadvantage are called for.

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Notes

1. Derived from Census data extracted from the ABS' online Table Builder facility. The figure is 31.7% if persons for whom level of education was not stated or inadequately described are included in the denominator as persons not having a degree, and 34.9% if those persons are excluded.
2. Some individuals may enter university after the age of 20; however, there is a direct trade-off between the number of years we allow to observe university entry and the number of waves from which 17-year olds can be included in the sample for estimation. The bulk of Australian first-year university students (70%) are aged 20 years or younger (Department of Education 2013), so we believe this is a robust measure of university access.
3. As noted, recent estimates suggest that around 17% of university students are from low-SES postcodes compared to 19.2% for our sample. The small difference is likely to reflect that our sample relates only to the younger student population.

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Appendix

Table A1. Australian domestic undergraduate enrolment by provider type: enrolment and growth, 2007–2012.

Variable	Description of variable	Mean	Omitted category
<i>Onlychild</i>	The 17-year old is an only child, with <i>Onlychild</i> = 1 if the 17-year old is an only child, otherwise <i>Onlychild</i> = 0.	0.045	Not applicable.
<i>Male</i>	The gender of the 17-year old, with <i>Male</i> = 1 if the 17-year old is male and <i>Male</i> = 0 if the 17-year old is female.	0.516	Female.
<i>Realthhdispincome</i>	The real household disposable income for the household.	\$101,301	Not applicable.
<i>Inregnl</i>	The household is located in an inner regional area of Australia. <i>Inregnl</i> = 1 if the household is located in an inner regional area, otherwise <i>Inregnl</i> = 0.	0.277	The household is located in a major city in Australia.
<i>Outregnl</i>	The household is located in an outer regional area of Australia. <i>Outregnl</i> = 1 if the household is located in an outer regional area, otherwise <i>Outregnl</i> = 0.	0.115	The household is located in a major city in Australia.
<i>Remote</i>	The household is located in a remote or very remote area of Australia. <i>Remote</i> = 1 if the household is located in a remote or very remote area, otherwise <i>Remote</i> = 0.	0.014	The household is located in a major city in Australia.
<i>Govschool</i>	The 17-year old attended a government school, with <i>Govschool</i> = 1 if the 17-year old attended a government school, otherwise <i>Govschool</i> = 0.	0.633	The 17-year old attended a Catholic or other non-government school.
<i>Rentgovhousing</i>	<i>Rentgovhousing</i> = 1 if the household rents from a government housing authority or a community or Cooperative housing group, otherwise <i>Rentgovhousing</i> = 0.	0.027	The household owns\is currently paying off mortgage on their home.
<i>Rentprvhousing</i>	<i>Rentprvhousing</i> = 1 if the household rents from a private landlord, otherwise <i>Rentprvhousing</i> = 0.	0.092	As above
<i>Disability</i>	<i>Disability</i> = 1 if the 17-year old has a long-term health condition, otherwise <i>Disability</i> = 0.	0.111	Not applicable.
<i>Mthempskilllevel2</i>	<i>Mthempskilllevel2</i> = 1 if the 17-year old's mother is employed and has an occupational skill level of 2, otherwise <i>Mthempskilllevel2</i> = 0.	0.102	The 17-year old's mother is employed and has an occupational skill level of 1.
<i>Mthempskilllevel3</i>	<i>Mthempskilllevel3</i> = 1 if the 17-year old's mother is employed and has an occupational skill level of 3, otherwise <i>Mthempskilllevel3</i> = 0.	0.063	As above.

(Continued)

Table A1. (Continued)

Variable	Description of variable	Mean	Omitted category
<i>Mthempskilllevel4</i>	<i>Mthempskilllevel4</i> = 1 if the 17-year old's mother is employed and has an occupational skill level of 4, otherwise <i>Mthempskilllevel4</i> = 0.	0.221	As above.
<i>Mthempskilllevel5</i>	<i>Mthempskilllevel5</i> = 1 if the 17-year old's mother is employed and has an occupational skill level of 5, otherwise <i>Mthempskilllevel5</i> = 0.	0.104	As above.
<i>Mthunemp</i>	<i>Mthunemp</i> = 1 if the 17-year old's mother is unemployed, otherwise <i>Mthunemp</i> = 0.	0.022	As above.
<i>Mthnilf</i>	<i>Mthnilf</i> = 1 if the 17-year old's mother is not in the labour force, otherwise <i>Mthnilf</i> = 0.	0.205	As above.
<i>Mthcert</i>	<i>Mthcert</i> = 1 if the 17-year old's mother's highest level of education is a Certificate I, II, III or IV; otherwise <i>Mthcert</i> = 0.	0.345	The 17-year old's mother has no post-school qualifications.
<i>Mthdiploma</i>	<i>Mthdiploma</i> = 1 if the 17-year old's mother's highest level of education is an Advanced Diploma or Diploma, otherwise <i>Mthdiploma</i> = 0.	0.102	As above.
<i>Mthdegree</i>	<i>Mthdegree</i> = 1 if the 17-year old's mother's highest level of education is a bachelor's degree or higher, otherwise <i>Mthdegree</i> = 0.	0.227	As above.
<i>Fthempskilllevel2</i>	<i>Fthempskilllevel2</i> = 1 if the 17-year old's father is employed and has an occupational skill level of 2, otherwise <i>Fthempskilllevel2</i> = 0.	0.104	The 17-year old's father is employed and has an occupational skill level of 1.
<i>Fthempskilllevel3</i>	<i>Fthempskilllevel3</i> = 1 if the 17-year old's father is employed and has an occupational skill level of 3, otherwise <i>Fthempskilllevel3</i> = 0.	0.194	As above.
<i>Fthempskilllevel4</i>	<i>Fthempskilllevel4</i> = 1 if the 17-year old's father is employed and has an occupational skill level of 4, otherwise <i>Fthempskilllevel4</i> = 0.	0.178	As above.
<i>Fthempskilllevel5</i>	<i>Fthempskilllevel5</i> = 1 if the 17-year old's father is employed and has an occupational skill level of 5, otherwise <i>Fthempskilllevel5</i> = 0.	0.073	As above.
<i>Fthunemp</i>	<i>Fthunemp</i> = 1 if the 17-year old's father is unemployed, otherwise <i>Fthunemp</i> = 0.	0.009	As above.
<i>Fthnilf</i>	<i>Fthnilf</i> = 1 if the 17-year old's father is not in the labour force, otherwise <i>Fthnilf</i> = 0.	0.077	As above.

(Continued)

Table A1. (Continued)

Variable	Description of variable	Mean	Omitted category
<i>Fthcert</i>	<i>Fthcert</i> = 1 if the 17-year old's father's highest level of education is a Certificate I, II, III or IV; otherwise <i>Fthcert</i> = 0.	0.345	The 17-year old's father has no post-school qualifications.
<i>Fthdiploma</i>	<i>Fthdiploma</i> = 1 if the 17-year old's father's highest level of education is an Advanced Diploma or Diploma, otherwise <i>Fthdiploma</i> = 0.	0.102	As above.
<i>Fthdegree</i>	<i>Fthdegree</i> = 1 if the 17-year old's father's highest level of education is a bachelor's degree or higher, otherwise <i>Fthdegree</i> = 0.	0.263	As above.

Table A2. The independent variables used in the lone-parent model of the probability of a 17-year old going to university.

Variable	Description of variable	Mean	Omitted category
<i>Onlychild</i>	The 17-year old is an only child, with <i>Onlychild</i> = 1 if the 17-year old is an only child, otherwise <i>Onlychild</i> = 0.	0.124	Not applicable.
<i>Male</i>	The gender of the 17-year old, with <i>Male</i> = 1 if the 17-year old is male and <i>Male</i> = 0 if the 17-year old is female.	0.51	Female.
<i>Reallhdispincome</i>	The real household disposable income for the household.	\$56,905	Not applicable.
<i>Inregnl</i>	The household is located in an inner regional area of Australia. <i>Inregnl</i> = 1 if the household is located in an inner regional area, otherwise <i>Inregnl</i> = 0.	0.23	The household is located in a major city in Australia.
<i>Outregnl</i>	The household is located in an outer regional area of Australia. <i>Outregnl</i> = 1 if the household is located in an outer regional area, otherwise <i>Outregnl</i> = 0.	0.093	As above.
<i>Remote</i>	The household is located in a remote or very remote area of Australia. <i>Remote</i> = 1 if the household is located in a remote or very remote area, otherwise <i>Remote</i> = 0.	0.013	As above.
<i>Govschool</i>	The 17-year old attended a government school, with <i>Govschool</i> = 1 if the 17-year old attended a government school, otherwise <i>Govschool</i> = 0.	0.758	The 17-year old attended a Catholic or other non-government school.

(Continued)

Table A2. (Continued)

Variable	Description of variable	Mean	Omitted category
<i>Rentgovhousing</i>	<i>Rentgovhousing</i> = 1 if the household rents from a government housing authority or a community or Cooperative housing group, otherwise <i>Rentgovhousing</i> = 0.	0.146	The household owns\is currently paying off mortgage on their home.
<i>Rentprvhousing</i>	<i>Rentprvhousing</i> = 1 if the household rents from a private landlord, otherwise <i>Rentprvhousing</i> = 0.	0.265	As above.
<i>Disability</i>	<i>Disability</i> = 1 if the 17-year old has a long-term health condition, otherwise <i>Disability</i> = 0.	0.141	Not applicable.
<i>Loneprtempsskilllevel2</i>	<i>Loneprtempsskilllevel2</i> = 1 if the 17-year old's lone parent is employed and has an occupational skill level of 2, otherwise <i>Loneprtempsskilllevel2</i> = 0.	0.081	The 17-year old's lone parent is employed and has an occupational skill level of 1.
<i>Loneprtempsskilllevel3</i>	<i>Loneprtempsskilllevel3</i> = 1 if the 17-year old's lone parent is employed and has an occupational skill level of 3, otherwise <i>Loneprtempsskilllevel3</i> = 0.	0.053	As above.
<i>Loneprtempsskilllevel4</i>	<i>Loneprtempsskilllevel4</i> = 1 if the 17-year old's lone parent is employed and has an occupational skill level of 4, otherwise <i>Loneprtempsskilllevel4</i> = 0.	0.1944	As above.
<i>Loneprtempsskilllevel5</i>	<i>Loneprtempsskilllevel5</i> = 1 if the 17-year old's lone parent is employed and has an occupational skill level of 5, otherwise <i>Loneprtempsskilllevel5</i> = 0.	0.121	As above.
<i>Loneprtunemp</i>	<i>Loneprtunemp</i> = 1 if the 17-year old's lone parent is unemployed, otherwise <i>Loneprtunemp</i> = 0.	0.053	As above.
<i>Loneprtnilf</i>	<i>Loneprtnilf</i> = 1 if the 17-year old's lone parent is not in the labour force, otherwise <i>Loneprtnilf</i> = 0.	0.25	As above.
<i>Loneprtcert</i>	<i>Loneprtcert</i> = 1 if the 17-year old's lone parent's highest level of education is a Certificate I, II, III or IV; otherwise <i>Loneprtcert</i> = 0.	0.247	The 17-year old's lone parent has no post-school qualifications.

(Continued)

Table A2. (*Continued*)

Variable	Description of variable	Mean	Omitted category
<i>Loneprtdiploma</i>	<i>Loneprtdiploma</i> = 1 if the 17-year old's lone parent's highest level of education is an Advanced Diploma or Diploma, otherwise <i>Loneprtdiploma</i> = 0.	0.081	As above.
<i>Loneprtdegree</i>	<i>Loneprtdegree</i> = 1 if the 17-year old's lone parent's highest level of education is a bachelor's degree or higher, otherwise <i>Loneprtdegree</i> = 0.	0.245	As above.

- [4] Koshy, P., Seymour, R. and Dockery, A.M. (2016), “Are there institutional differences in the earnings of Australian Higher education Graduates?”, *Economic Analysis and Policy*, Vol. 51, September, pp. 1–11.



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Full length article

Are there institutional differences in the earnings of Australian higher education graduates?[☆]

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ABSTRACT

This paper examines the effect of university quality, as proxied by institutional groupings, on the earnings outcomes of Australian university qualified persons. It uses data from the Household, Income and Labour Dynamics in Australia (HILDA) survey to examine the impact of a variety of factors on earnings, including: institution grouping, gender, age, field of study and industry of employment.

The paper reports strong evidence for large and significant field of study and industry effects on the earnings of university graduates. There is no significant evidence for the existence of an institutional effect in Australia, save for a minor effect in relation to regional universities. However, splitting the sample along gender lines reveals some evidence for negative earnings premiums for females in universities outside the Group of Eight and Australian Technology Network, with no such observed effects among males. Overall, the findings indicate a relatively muted earnings effect across Australian university groupings.

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1. Introduction

The central premise of the human capital model is that increased levels of education are associated with increased skill accumulation and productivity, leading to higher earnings for individuals. The benefits of higher earnings are in turn often coupled with other documented benefits such as better health outcomes, increased longevity and improved marriage and parenting prospects (Clarke and Leigh, 2011; Hartog and Oosterbeek, 1998). It is this general acceptance of the human capital model and the calculated benefits of education which underpins much of the rationale for public funding of education and how that funding is allocated.

Thus the level of earnings (and implied returns) from increasing rates of participation in, and perceived quality of, education are an important question for policymakers, not only in terms of the broader question of widening participation, but also in relation to questions of resourcing and planning. In higher education, where graduates enjoy the highest earnings premia, there are a number of issues of particular interest, including the extent to which gender and choice of academic discipline affect graduate outcomes.

In addition to these considerations, there is speculation that university quality, or perceptions of university quality, may impact on earnings and so this may be another factor driving earning differentials. There is an increasing body of

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empirical work examining the influence of university type and ranking on post-graduation salary outcomes. This issue is of particular relevance to Australian higher education, not only because of the stratification in the system in terms of measures of institutional quality but also in terms of the role various institutions play in enabling access to higher education. This paper reports estimates of a wage equation for a sample of Australian university graduates drawn from the Household, Income and Labour Dynamics in Australia (HILDA) survey. Specifically, it reports on the extent to which graduate earnings are impacted upon by the type of university attended after allowing for a wide variety of control variables.

2. The estimation of returns to education and institutional effects

The relationship between education and earnings, as predicted in the human capital model, is typically estimated using the wage equation attributed to [Mincer \(1974\)](#). A standard specification of the model takes the following form:

$$\ln(y_i) = \beta_0 + \beta_1 educ_i + \beta_2 exp_i + \beta_3 exp_i^2 + \beta_n Z_{ni} + \varepsilon, \quad (1)$$

where $\ln(y)$ is the natural logarithm of income (usually measured either weekly or hourly), $educ$ is the number of years of education, and exp and exp^2 denote labour market experience and its square respectively, while Z is a vector of other explanatory variables, such as age, location and field of study. In this specification, increasing levels of education are expected to be positively associated with income ($\beta_1 > 0$), while earnings over the course of a person's working lifetime are expected to increase with years of experience ($\beta_2 > 0$) but at increasingly smaller increments due to diminishing returns to experience ($\beta_3 < 0$). In effect, education is assumed to be positively correlated with skill acquisition and, combined with experience, commands an earnings premium in the labour force. In this model, human capital accumulation – through education and labour market experience – is the primary determinant of differentials in income levels between individuals. This standard model has been estimated in various forms and elements encompassed in the Z vector.

A review of the development of human capital theory and empirical work in Australia appears in [Preston \(1997\)](#). She confirms that Australian studies support the existence of an earnings premium for university graduates and more experienced workers (at diminishing rates over time) and lower premia for female workers and those individuals with younger children. [Borland et al. \(2000\)](#) suggest that studies conducted over the 1980s and 1990s in Australia 'tend to find similar results' along the lines of a 10 to 15% return to a Bachelor's degree compared to high school education only and thus 'it seems reasonable to conclude that the private return to a university degree is fairly sizeable' (p. 15).

In terms of the calculation of rates of return to human capital accumulation, two recent estimations of the human capital model in Australia have provided evidence on historical trends and contemporary returns.¹ [Wei \(2010\)](#) examines Australian Bureau of Statistics (ABS) Census data from 1981 to 2006, and finds that the measured rate of return increased at each census to 2001, where it peaked at 19.3%, before falling to 15.3% in 2006. The rate of return for females also peaked in 2001, at 19%, declining to 17.8% in 2006. However, Wei finds that these results are driven by improved employment outcomes among those without degrees, and that on an 'employees only' basis the returns to undergraduate degrees increase over time' (p.11). [Daly and Lewis \(2010\)](#) confirm Wei's results for the decline in the rate of return to a university undergraduate degree between 1986 and 2006, using ABS Census data in a study examining returns in three fields of study: Economics, Law, and Business.

Studies in human capital also focus on the relative benefits of the level of education (if any) in instances of over- or under-education, where individuals enter occupations with average levels of education which are above or below the required level of educational attainment for the occupation (see [Dockery and Miller, 2012](#) for an examination of this question in the Australian context). Australian and international studies consistently find a positive return to required years of education for the job, but a lower return for years of education in excess to that required. The research also finds that persons who manage to secure jobs for which they are under-educated enjoy a wage premium. An important aspect of this approach is that it incorporates both the demand and supply side of the labour market, while wages equations often consider only the supply side (the individual's attributes). The empirical evidence makes it clear that the demand side matters.

Another important area of research that incorporates demand side factors has been the relative returns of graduates given their level of qualification (e.g. School Leavers, Undergraduate Degrees, Postgraduate Coursework Degrees, etc.) and from different fields of study (e.g. Engineering; Law; Education). The [Daly and Lewis \(2010\)](#) study finds that bachelor degree holders have consistently enjoyed a wage premium over school leavers, peaking at 1.98 times that of school leaver earnings in 2001, somewhat declining to 1.64 times school leaver earnings in 2006 (p. 354). Despite this finding, the earnings differential for undergraduate degree holders is still substantial. [Preston \(1997\)](#) finds evidence over the first part of this period (late 1980s to mid-1990s) of substantial discrepancies across fields of study in Australia, with higher returns for Engineering, Law and Business, relative to Education, Arts and Nursing.

¹ There are two main approaches to estimating individual 'returns' to education. One is to estimate the wage premium associated with further years of education; the other is to calculate a 'rate of return' or net present value of the expected increase in life-time earnings relative to the costs, which include foregone earnings while in education and direct tuition costs. In this paper we focus on the former of these approaches, the wage premium. Studies of the rate of return, such as [Wei \(2010\)](#), demonstrate that differences are largely driven by differences in employment propensity as well as wage differences. The fall in the return to a degree, as noted in this paragraph, largely reflected employment gains to non-degree holders during the period of Wei's 2010 study.

Institutional effects

In view of the above evidence institutional effects on graduate earnings could be important in higher education. This is because universities tend to draw students of similar academic and socio-economic backgrounds for most of their courses. This commonly reflects the history of higher education, where historic institutions developed to cater to a relatively small enrolment, followed by an expansion in both overall enrolment and the number of institutions (Marginson, 2011; Koshy, 2016).

Australia is somewhat unique in having a higher education system which is both academically stratified and geographically segregated. In 2014, 85.5% of all applicants in 2014 applied to an institution in their home state or territory, with inter-state applications largely confined to nationally competitive courses, such as Medicine which accounted for 20.5% of all inter-state applicants (Australian Government Department of Education, 2015). This organisation reflects the growth of Australia's higher education infrastructure whereby the first six universities were funded by state governments, based in state capital cities, and received students from state-controlled secondary systems. The arrival of new institutions in post-war Australia, although often promulgated through policy by the Commonwealth such as the 'Dawkins' reforms' of the 1980s, constituted additions to institutions in state and territory jurisdictions, creating a local hierarchy in higher education.

This history is still in effect today. Over the last two decades, the advent of shared goals and challenges among institutions across the country has seen the creation of four recognised institutional groupings among Australia's 38 major universities, with 12 institutions remaining unaligned. The institutional groupings are as follows (Koshy, 2016):

- **Group of Eight:** Australia's older, research intensive universities, who are prominent in globally rankings: Australian National University (ANU), Melbourne, Monash, Sydney, New South Wales (UNSW), Queensland (UQ), Western Australia (UWA), and Adelaide.
- **Australian Technology Network (ATN):** Newer universities which were formed out of existing institutes of technology in the 1980s: Curtin University, University of Technology, Sydney (UTS), RMIT University (RMIT), Queensland University of Technology (QUT), and University of South Australia (UniSA).
- **Innovative Research Universities (IRU):** Universities established in the 1960s and 1970s: Murdoch, Flinders, Griffith, James Cook (JCU), Newcastle, La Trobe, and Charles Darwin University (CDU); and
- **Regional Universities Network (RUN):** New universities with campuses in regional areas: Southern Cross, New England (UNE), Federation, Sunshine Coast (SCU), Central Queensland (CQU), and Southern Queensland (USQ).

Further, there are 12 institutions who are 'unaligned' universities: Macquarie, Wollongong, Deakin, Charles Sturt (CSU), Tasmania, Australian Catholic University (ACU), Canberra, Edith Cowan University (ECU), Swinburne, Victoria, Western Sydney (UWS) and The Batchelor Institute (Batchelor), the latter managing its undergraduate courses through CDU in recent years.

There is strong evidence to support the idea that Australia's universities are, as a consequence, stratified in relation to perceived quality. This was recently noted by Norton and Cherastidtham (2015) in a discussion linking higher education fee setting for international students in Australia to minimum Australian Tertiary Admission Rank (ATAR) entry scores for domestic students.

This perception is in part reflected in the measured level of social disadvantage of students, which can be expected to in turn contribute to employment and earnings outcomes. Indeed, there are large disparities between the institutional groupings in terms of educational disadvantage. Koshy and Seymour (2015) show that in 2014, students from low socio-economic status backgrounds – those students residing in the bottom 25% of the Australian population in a postcode ranking of the ABS's SEIFA (Socio-Economic Index for Areas) Index – accounted for 17.9% of all Australian domestic undergraduates. However, their share in the Group of Eight was around 11% of enrolments, compared to 16.4% in the ATN, 21.7% in the IRU and 29.8% in RUN.

Given these marked differences, any observed differences in earnings across institutions after allowing for the usual set of controls in human capital models (described above and in the methodology below) will in part reflect the extent to which student socio-economic status impacts on future earnings.

Recent studies in Australia and overseas have looked at returns in relation to institutional differences. Birch et al. (2009) examine data from the 2003 Graduate Destination Survey (GDS) in Australia to determine if there are institutional differences, as measured by institutional wage premiums, in the returns to educational attainment. They find that while 'field of study' was a moderately important driver of differences in earnings across graduates (accounting for around 12% of the difference), institution, as measured by institutional groupings (the Group of Eight; the Australian Technology Network), appeared to have minimal impact on graduate salaries, measured in either weekly or hourly terms.

Carroll (2014) uses data from the 2012 GDS and information on global rankings to determine if institutional specific effects exist in determining graduate starting salaries. He finds evidence for a small institutional effect among globally ranked universities which is significant and is separate from selection effects.

In a study of immigrant earnings, Tani et al. (2013) find that immigrants with bachelor qualifications from institutions in Australia and New Zealand, the United Kingdom (UK) and Ireland, the United States (US) and Canada, and sub-Saharan Africa (South Africa), enjoy an earnings premium compared to graduates from other regions, with individuals possessing higher degrees from institutions in the UK and US enjoying a wage premium over those with similar qualifications from other countries, including Australia and New Zealand.

Overseas studies have provided some indication of how earnings may differ across institutional types. Brewer et al. (1999) examine rates of variation in US earnings, using data to determine the effect for US universities and smaller colleges. They find a substantial premium for smaller elite colleges, relative to middle and lower ranked public universities, with the evidence on a premium for larger, elite universities being weaker. A recent study of UK data by Walker and Zhu (2013) finds that there is no evidence to suggest any significant difference in returns to education across different types of higher education institution, once background factors are included in the model.

Other studies in the US by Dale and Krueger (2002) and Black and Smith (2006) examine the notion of institutional quality in the context of measurement. Both find that quality is likely to be difficult to capture using a single measure, which in the US context is usually the median score on the Scholastic Aptitude Test (SAT) among an institution's students. For this reason alone, institutional effects will likely be at least partially subsumed where institutions are offering a broadly similar array of offerings. Against this, Black and Smith (2006) observe that the SAT score indicator is the most reliable indicator of college quality, with institutions ordered hierarchically on the basis of the SAT averages of their entrant classes.

The above work has implications for this study. It is likely that given the structure of Australian higher education, with predominantly larger, public funded universities, that the findings for the Australian system as a whole will largely reflect those seen in these two studies of public institutions, with little variation across institutions in comparison with differences in earnings across field of study. This observation and the perception of quality differences across institutional groupings suggest that any differences between Australian institutions in terms of their graduate earnings will manifest themselves in a comparison of earnings across institutional groupings rather than a diverse distribution of earnings premia in a cross-section of individual institutions.

3. Data and methodology

The data used in this paper is drawn from Waves 1 to 12 of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey commenced in 2001 (Wave 1), with 7682 households and 19,914 individuals. A further 2153 households and 5477 individuals were added to Wave 11. The survey collects information about economic and subjective well-being, labour market dynamics and family dynamics. Interviews are conducted annually with all adult members of each household. One further question which was added to Wave 12 of the HILDA Survey was on which Australian university an individual obtained their highest post-school qualification from.

In this study we estimate a wage equation which explains variations in university graduate earnings across institutions, with particular reference to the effect of institutional groupings ("Institution Attended"). Given this, the sample used in the empirical analysis only includes those individuals who completed a bachelor degree, honours bachelor degree, graduate degree, graduate certificate, master degree or doctorate at an Australian university who work either full-time or part-time in one or more periods. Due to the limited number of observations in respect to particular universities, and the discussion above on university groupings, the universities were grouped into five broad institutional categories outlined in Appendix B. Four of the categories reflect institutional self-selection into an established category, with the fifth, "Unaligned Institutions" capturing other institutions in the system.

After controlling for missing data, the final unbalanced sample used in the empirical analysis contained 8789 observations for 1649 individuals.

The empirical model was used to investigate the notion that institutional quality may impact on earnings outcomes. The dependent variable in the model is the log of the real hourly wage rate for an individual's main job. It is derived from an individual's gross weekly wage divided by the number of hours per week usually worked in their main job. Table 1 outlines the variable structure of the model, where the independent variables in the model are presented in terms of the variable class (in bold) and the list of dummy categories for each variable class. The default or omitted category, where applicable, is enclosed in brackets (e.g. "Undergraduate Degree" is the omitted category for "Level of Education"). The variables in the models are primarily binary dummy variables (1 or 0). The calculated means of the variables included in the model can be found in Appendix A.

The empirical analysis below presents a wage equation including the standard human capital variables of age, gender, level of education, and experience, along with the key variables of interest "Institution Attended" and "Major Field of Study" (see Table 1). Other controls are included for sector of employment, part-time work status, state and territory, region of employment and industry of employment.

The preferred model was estimated using the random effects ordinary least squares (OLS) regression specification. The fixed effects specification could not be used as the key variables of interest, "Institution Attended" and "Major Field of Study", are not time-varying for the individual's highest qualification. To mitigate biased estimation due to the possible correlation between the explanatory variables X_i and unobserved individual effects a_i , Mundlak's (1978) formulation was applied to the model. Mundlak suggests that the $E(a_i|X_i)$ can be approximated as a simple linear function:

$$a_i = \bar{x}_i \mathbf{a} + \varepsilon_i, \quad \varepsilon_i \sim N(0, \sigma_\varepsilon^2). \quad (2)$$

As the dependent variable is the log of real hourly wage, the coefficients on binary variables can be interpreted as a percentage changes in the dependent variable relative to the omitted variable.

Table 1
Human capital model estimations to explain log (real hourly wages).

Variable
Personal characteristics —(Female); Male. Female * Dependent Children—(5–14); 0–4; 15–24; and >24. (Married); Not Married. (Disabled); Not Disabled Age; Age Squared
Level of education —(Undergraduate); Doctorate; Master's; Graduate Diploma or Certificate
Experience —Years with Current Employer; Years with Current Employer Squared; Years in Occupation, Years in Occupation Squared; Proportion of Time in Work; and Female Proportion of Time in Work.
Employment characteristics —Work Part-time; Public Sector.
Region —(Major Capital City); Inner Regional Area; Outer Regional or Remote Area.
State —(New South Wales); Victoria; Queensland; South Australia; Western Australia; Tasmania; Northern Territory; Australian Capital Territory.
Industry of employment —(Education); Agriculture Industry; Mining; Manufacturing; Utilities; Construction; Wholesale Trade; Retail Trade; Hospitality Industry; Transport; Information Media; Finance; Real Estate; Professional; Administration; Health; Arts and Recreation Services; Other Services.
Major field of study —(Education); Science; Information Technology; Engineering; Architecture; Agriculture; Medicine; Nursing; Other Health; Management; Law; Society and Culture; Hospitality; Arts.
Institution attended —(Group of Eight); Australian Technology Network; Innovative Research Universities; Regional University Network; Unaligned Universities.
Mundlak control variables —Average Years with Current Employer and Average Years in Occupation.

Note: See Appendix A for a listing of all variables, including omitted variables [in brackets].

4. Results

Table 2 presents the results of the analysis. As “Undergraduate Degree” is the excluded category for “Level of Education”, all results refer to this group and the relevant excluded category pertaining to the parameter estimate. For instance, the model reports a negative effect for female undergraduate graduates. The parameter estimate of -0.03 suggests that females earn around 3% less than males after controlling for all other effects. Surprisingly, this effect is not statistically significant, perhaps due to the presence of an extensive series of control variables (e.g. variables for the age of children in a family). The model does show a positive wage premium of 6.2% for married people. Results for the group of “Age” variables reflect the parabola-shape of the lifetime earnings function for most people, with earnings rising with age through to middle age followed by a flattening thereafter, as reflected in the negative parameter on the “Age Squared” variable. The only significant effect for educational attainment is on the “Graduate Diploma or Certificate”, variable which carries with it a substantial negative premium of 7.9% compared to individuals with only an “Undergraduate Degree”.

Of the four variables used to capture occupation-related experience, the linear measures of “Years with Current Employer” (0.6%) and “Years in Occupation” (1.0%) are positive and significant at the 1% and 5% levels respectively, while their squared counterparts report no effect.

A strong part-time work effect of around 14.1% is observed (“Work Part-Time”, 0.141, at the 1% level of significance) on hourly wages, as are regional effects which are negative (e.g. “Outer Regional or Remote Area”, -0.072 , at the 10% level) in comparison with metropolitan areas. The “State” effects show mostly negative impacts on hourly earnings across Australia in comparison with New South Wales, with the exception of the two territories (although these results are not significant at the 5% level).

The model controls for “Major Field of Study” effects using “Education” as the omitted field. Several disciplines, including “Law”, “Engineering”, “Nursing” and “Medicine” see earnings premia above “Education” at the 1% or 5% level of significance. These results are not only significant in the statistical sense, but reveal very large differences in earnings across fields of study. The direct interpretation of the coefficients is that those who completed their highest qualification in “Medicine” earn 50.8% more than a graduate from “Education”; while the premium associated with “Engineering” is 35.2%, “Nursing” around 22.8% and “Law”, a premium close to 19.3%.

The “Industry of Employment” variables include significant positive effects for “Finance” (0.175 at 1%) and “Mining” (0.145 at 10%) in comparison to “Education and Training”, the omitted control. “Retail Trade” (-0.225 at 1%) and “Arts and Recreation Services” (-0.212 at 1%) tended to reduce hourly earnings compared to the control.

Finally, the model incorporates a series of dummy variables for “Institution Attended”, as proxied by Australia’s broad university groupings and a grouping for unaligned universities. We find little evidence for a significant difference across these groupings relative to the omitted grouping, “Group of Eight”—which represents Australia’s older, more established universities. The exception is “Regional University Network” – the RUN universities – whose graduates earn around 11.3% less than other university graduates (-0.113 at the 5% level).

From this, it would appear that “Field of Study” effects tend to dominate institutional grouping effects in terms of the distribution of earnings outcomes for Australian graduates, after controlling for a wide range of factors. The one exception to this rule, the negative effect associated with graduating from a RUN institution, could be attributable to their (regional) campus location and also the relatively high number of low socio-economic students enrolled at these institutions. Overall, the finding on institutional effects corresponds to other recent work in both Australia and overseas which finds evidence for a limited earnings premium associated with university attended.

Table 2
Human capital model estimations to explain log (hourly wages).

Variable	Full model	Females only	Males only
<i>Personal characteristics</i>			
Female	−0.030 (0.125)	−	−
<i>Female with children [Female * Dependent Children 5 to 14]</i>			
Female * Dependent Children 0 to 4	0.043 (0.031)	0.055* (0.031)	−0.022 (0.022)
Female * Dependent Children 15 to 24	0.008 (0.025)	0.029 (0.027)	−0.023 (0.029)
Female * Dependent Children > 24	0.064 (0.063)	0.077 (0.064)	0.117 (0.083)
Married	0.062* (0.021)	0.027 (0.027)	0.044** (0.032)
Disabled	−0.009 (0.017)	0.005 (0.023)	−0.022 (0.023)
<i>Age</i>			
Age	0.073*** (0.008)	0.050*** (0.010)	0.108*** (0.013)
Age Squared	−0.0005*** (0.000)	−0.000** (0.000)	−0.001*** (0.000)
<i>Level of education [Undergraduate Degree]</i>			
Doctorate	−0.059 (0.062)	0.118* (0.064)	−0.242*** (0.103)
Master's Degree	0.005 (0.031)	0.053 (0.038)	−0.063 (0.052)
Graduate Diploma or Certificate	−0.079* (0.037)	−0.015 (0.040)	−0.170** (0.000)
<i>Experience</i>			
Years with Current Employer	0.006* (0.003)	0.009** (0.004)	0.004 (0.004)
Years with Current Employer Squared	0.000 (0.000)	−0.000 (0.000)	0.000 (0.000)
Years in Occupation	0.010*** (0.002)	0.010*** (0.003)	0.008*** (0.003)
Years in Occupation Squared	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)
<i>Labour force proportions and averages</i>			
Proportion in Work	0.768*** (0.109)	0.690*** (0.089)	0.670*** (0.000)
Female Proportion in Work	−0.031 (0.140)		
<i>Mundlak control variables</i>			
Average Years Current Employer	−0.015*** (0.003)	0.013*** (0.004)	−0.019*** (0.004)
Average Occupational Experience	−0.030*** (0.002)	−0.026*** (0.003)	−0.033 (0.004)
<i>Employment characteristics [Full-time; Private Sector]</i>			
Work Part-Time	0.141*** (0.020)	0.141*** (0.022)	0.161*** (0.045)
Public Sector	0.015 (0.021)	0.016 (0.026)	0.002 (0.033)
<i>Region [Major Capital City]</i>			
Inner Regional Area	−0.074** (0.033)	−0.054 (0.039)	−0.092* (0.054)
Outer Regional or Remote Area	−0.072 (0.037)	0.005 (0.046)	−0.185*** (0.057)
<i>State [New South Wales]</i>			
Victoria	−0.071*** (0.028)	−0.086*** (0.033)	−0.080* (0.046)
Queensland	−0.066** (0.032)	−0.089** (0.042)	−0.030 (0.045)
South Australia	−0.165*** (0.048)	−0.117** (0.054)	−0.025*** (0.045)
Western Australia	−0.023 (0.042)	0.015 (0.049)	−0.094 (0.076)

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Table 2 (continued)

Variable	Full model	Females only	Males only
Tasmania	−0.099 (0.067)	−0.197** (0.085)	0.019 (0.098)
Northern Territory	0.123 (0.089)	0.015 (0.108)	0.265* (0.131)
Australian Capital Territory	0.067 (0.042)	0.051 (0.055)	0.076 (0.067)
<i>Major field of study [Education]</i>			
Science	0.020 (0.062)	−0.026 (0.077)	0.165 (0.104)
Information Technology	0.233*** (0.063)	0.131 (0.109)	0.436*** (0.093)
Engineering	0.352*** (0.063)	0.341*** (0.108)	0.498*** (0.930)
Architecture	0.147 (0.101)	0.123 (0.095)	0.249 (0.169)
Agriculture	0.022 (0.093)	−0.035 (0.111)	0.185 (0.146)
Medicine	0.509*** (0.082)	0.324** (0.093)	0.799*** (0.149)
Nursing	0.228*** (0.057)	0.193*** (0.059)	0.354*** (0.135)
Other Health	0.210*** (0.062)	0.139* (0.070)	0.410*** (0.129)
<i>Major field of study [Education]</i>			
Management	0.159*** (0.044)	0.090* (0.052)	0.321*** (0.081)
Law	0.193*** (0.093)	0.244** (0.087)	0.243 (0.179)
Society and Culture	−0.044 (0.048)	−0.062 (0.053)	0.056 (0.094)
Hospitality	0.233*** (0.084)	0.340*** (0.128)	0.275*** (0.089)
Arts	0.008 (0.071)	−0.059 (0.086)	0.245** (0.105)
<i>Industry of employment [Education and Training]</i>			
Agriculture Industry	−0.348*** (0.125)	−0.224 (0.350)	−0.376*** (0.128)
Mining	0.140 (0.079)	0.010 (0.120)	0.140 (0.092)
Manufacturing	−0.100** (0.046)	−0.054 (0.069)	−0.147** (0.059)
Utilities	0.108 (0.068)	0.218*** (0.070)	−0.025 (0.113)
Construction	−0.047 (0.054)	0.032 (0.115)	−0.115 (0.066)
Wholesale Trade	−0.124* (0.056)	−0.111 (0.078)	−0.160* (0.074)
Retail Trade	−0.225*** (0.063)	−0.212* (0.095)	−0.262** (0.063)
Hospitality Industry	−0.193* (0.076)	−0.327** (0.102)	−0.044 (0.097)
Transport	−0.107 (0.099)	−0.328* (0.188)	−0.038 (0.096)
Information Media	−0.129** (0.061)	−0.098 (0.078)	−0.215* (0.090)
Finance	0.175*** (0.065)	0.267** (0.106)	0.0403 (0.072)
Real Estate	−0.156 (0.103)	−0.246 (0.181)	−0.059 (0.062)
Professional	−0.037 (0.037)	−0.045 (0.053)	−0.073 (0.050)
Administration	−0.026 (0.034)	0.030 (0.047)	−0.100* (0.047)
Health	−0.038 (0.035)	−0.033 (0.043)	−0.028 (0.065)
Arts and Recreation Services	−0.212***	−0.194*	−0.219*

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Table 2 (continued)

Variable	Full model	Females only	Males only
Other Services	(0.068) –0.166*** (0.055)	(0.082) –0.118* (0.061)	(0.111) –0.222** (0.101)**
<i>Institution attended [Group of Eight]</i>			
Australian Technology Group	–0.001 (0.037)	–0.015 (0.044)	0.050 (0.061)
Innovation Research Universities	–0.032 (0.040)	–0.103* (0.050)	0.101 (0.066)
Unaligned Universities	–0.025 (0.031)	–0.082** (0.036)	0.049 (0.052)
Regional University Network	–0.113* (0.057)	–0.190*** (0.069)	–0.026 (0.093)
Constant	0.843*** (0.171)	1.44*** (0.201)	–0.005* (0.241)
Overall R2	0.134	0.138	0.136
Sample Size	8789	4665	4124

Note: Standard errors in parentheses; [Omitted category in brackets]; (a) = variable not entered.

* Denotes significance at the 10% level.

** Denotes significance at the 5% level.

*** Denotes significance at the 1% level.

While we control for gender differences in the main model, splitting the sample along gender lines and re-estimating the model without the “Female” variable, and using gender sub-samples provides evidence for differences in “Main Field of Study” and “Institution Attended” between genders.

Both genders have positive earnings impacts as a result of marriage (0.027 in the female sub-sample compared to 0.044 in the male sub-sample). However, the effect is only statistically significant in the male data. Noticeable differences include a less pronounced arc in the influence of age on earnings – the parameter on the “Age” variable was significant at the 1% level for both, but was double the size in the male sub-sample – 0.108 compared to 0.05 in the female sub-sample. The female sub-sample also shows a positive and significant earnings premium for doctoral degree holders (“Doctorate”) of 11.8% compared to those with only undergraduate degrees, in comparison with a negative 24.2% income premium in the male sub-sample.

The returns to “Experience” and “Work Part-Time” in hourly wages were broadly similar in both sub-samples, with no statistically significant effect seen for employment in the public sector (or alternatively, the private sector). The male sub-sample had a significant and negative (–0.185) effect on salary for living in “Outer Regional and Remote Areas” which may reflect the inclusion of industry controls in the model (e.g. “Mining”) as well as recently emerging work patterns such as fly-in/fly-out arrangements where workers commute from metropolitan regions to rural and remote worksites.

In terms of “Major Field of Study”, discipline-specific effects were seen in both sub-samples, with disciplines such as “Engineering” (0.341 for females; 0.498 for males), “Nursing” (0.193 for females; 0.354 for males), and “Management” (0.090 for females; 0.321 for males), while “Law” was significant at the 5% level in the female sub-sample only (0.244) and “Information Technology” in the male sub-sample only (0.436).

Finally, splitting the original sample across genders shows considerable differences in the importance of “Institution Attended” on earnings, relative to the control for “Group of Eight”. In the males sub-sample, “Institution Attended” carried no statistical importance in the model, relative to the control group. However, in the female sub-sample, attending institutions in the “Regional University Network” saw a reduction in hourly earnings of –19.0% (–0.190), a result significant at the 5% level. As well as this, attending an institution in the “Innovative Research Universities” and “Unaligned Universities” groups saw earning declines of 10.3% and 8.2% respectively, although the measured effect was not as statistically as strong. These results suggest that institutional differences in earnings seen in the combined sample relate primarily to female graduates.

5. Conclusion

This paper uses data from the HILDA survey to examine the impact of a variety of factors on university graduate earnings, including institutional factors. This analysis is undertaken using the standard wage equation, with the inclusion of other variables, including a control for higher education institution attended.

The key finding from the results for the entire sample is that an observed field of study effect tends to dominate that attributable to institutional grouping (“Institution Attended”) in terms of the distribution of earnings outcomes for Australian graduates. The one exception to this rule is for graduates of RUN institutions, who see lower earnings than other graduates, although even this is weakly significant and could be easily attributable to an imprecise measure of the impact on wages of employment in the regions and omitted factors such as size of the employing organisation. However, the general finding corresponds to other recent work in both Australia and overseas which sees limited evidence for an earnings premium associated with university attended.

An analysis of hourly earnings by gender indicates that the lower earnings observed for graduates from RUN institutions is only significant in the female sub-sample, with a reduced earnings (at a lower level of significance) also seen among female graduates from institutions in the “Unaligned Universities” and “Innovative Research Universities”. Given this, the overall finding on university effects suggest that institutional differences are relatively muted and may be attributable to regional location and therefore participation in regional labour markets or the unobserved family backgrounds of HILDA participants, which in turn may drive outcomes at the higher education level. To the extent these factors are determining wage differentials across institutional groups it does appear that there is evidence to suggest that institutional effects are limited, with field of study impacts predominating.

Although consistent with existing the Australian and international literature which points to limited institutional wage effects, the lack of evidence of a wage premium attached to graduation from the Group of Eight universities in Australia is still somewhat surprising. This is because there are reasons to expect a positive wage premium for graduates from these more prestigious institutions even if all institutions offered the much the same quality of education. First, because the Group of Eight are widely recognised as being the more prestigious institutions and are therefore likely to attract higher quality entrants. Since we do not have controls for tertiary entrance scores or other measures of previous academic performance, one would expect the results for the Group of Eight to be affected by unobserved factors that might be positively associated with wage outcomes due to this effect. Second, employers’ recognition of institutional status would be expected to give graduates from the Group of Eight at least some edge in applying for jobs as graduates.

A further possibility is that both these effects have diminished over time due to some form of convergence in the reputations of Australian higher education institutions, perhaps through the movement of newer institutions into traditional course offerings such as Medicine and Law, which account for a significant share of the wage differentials seen between graduates. If this is the case, and on the evidence of comparable returns across institutions seen here, it suggests that there is limited scope for price differentiation in degree programs across Australia in similar fields of study, except perhaps where particular programs have outstanding national or international reputations.

Appendix A. Means of the independent variables in the human capital model

Variable	Mean
<i>Personal characteristics</i>	
Female	53.08%
Female with children [<i>Female*Dependent Children 5–14</i>] ^a	15.16%
Female * Dependent Children 0–4	9.25%
Female * Dependent Children 15–24	9.49%
Female * Dependent Children >24	0.55%
Married	72.09%
Disabled	13.68%
Age ^b	40.69
Age Squared ^b	N/A
<i>Level of education [Undergraduate degree]</i>	
Doctorate	62.97%
Master’s Degree	4.83%
Graduate Diploma or Certificate	18.56%
<i>Experience</i>	
Years with Current Employer ^b	7.55
Years with Current Employer Squared ^b	N/A
Years in Occupation ^b	9.61
Years in Occupation Squared ^b	N/A
<i>Labour force proportions and averages</i>	
Proportion of time in work ^b	87.33%
Female proportion of time in work ^b	45.02%
<i>Employment characteristics [Full-time; private sector]</i>	
Public Sector	43.77%
Work Part-Time	22.76%
<i>Region [Major capital city]</i>	
Inner Regional Area	76.99%
Outer Regional or Remote Area	16.68%
<i>State [New South Wales]</i>	
Victoria	6.33%
	32.19%
	28.44%

Variable	Mean
Queensland	17.95%
South Australia	6.22%
Western Australia	7.17%
Tasmania	2.78%
Northern Territory	1.04%
Australian Capital Territory	4.21%
<i>Major field of study [Education]</i>	18.81%
Science	7.21%
Information Technology	5.47%
Engineering	6.88%
Architecture	1.91%
Agriculture	2.37%
Medicine	1.59%
Nursing	5.34%
Other Health	7.02%
Management	20.95%
Law	2.87%
Society and Culture	15.58%
Hospitality	0.35%
Arts	3.65%
<i>Industry of Employment [Education and Training]</i>	25.21%
Agriculture Industry	0.77%
Mining	0.88%
Manufacturing	4.54%
Utilities	0.69%
Construction	2.00%
Wholesale Trade	2.31%
Retail Trade	3.05%
Hospitality Industry	0.86%
Transport	1.39%
Information Media	3.23%
Finance	5.48%
Real Estate	0.64%
Professional	15.78%
Administration	13.56%
Health	16.46%
Arts and Recreation Services	1.90%
Other Services	1.23%
<i>Institution attended [Group of Eight]</i>	33.09%
Australian Technology Group	16.78%
Innovation Research Universities	12.38%
Unaligned Universities	30.16%
Regional University Network	7.59%
^a [Omitted category in brackets.]	
^b Continuous variable. The remainder of the variables are dummy variables.	

Appendix B. “Institution attended”: institutional groupings of Australian universities

Group of Eight

Monash University
 The Australian National University
 The University of Adelaide
 The University of Melbourne
 The University of Queensland
 The University of Sydney
 The University of Western Australia
 University of New South Wales

Australian Technology Network (ATN)

Curtin University of Technology
 Queensland University of Technology
 RMIT University
 University of South Australia
 University of Technology, Sydney

Innovative Research Universities (IRU)

Charles Darwin University
 Flinders University of South Australia
 Griffith University
 James Cook University
 La Trobe University
 Murdoch University
 University of Newcastle*

Regional Universities Network (RUN)

Central Queensland University
 Southern Cross University
 University of Ballarat
 University of New England
 University of Southern Queensland
 University of the Sunshine Coast

Unaligned Universities

Australian Catholic University
 Batchelor Institute of Indigenous Tertiary Education
 Charles Sturt University
 Deakin University
 Edith Cowan University
 Macquarie University
 Swinburne University of Technology
 University of Canberra
 University of Tasmania
 University of Western Sydney
 University of Wollongong
 Victoria University

Note:*Newcastle left the IRU in December 2014.

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Closing the Gap:

Bridges for Access and Lifelong Learning

Editors
Michael Hill, Anthony Hudson,
Stephanie Mckendry, Neil Raven,
Danny Saunders, John Storan
and Tom Ward



Forum for Access and Continuing Education

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Preface

A key role for the Forum for Access and Continuing Education (FACE) as a practitioner led network is to facilitate the exchange and dissemination of knowledge and practice relating to higher education (HE) access and lifelong learning. The annual conference and publication are but two important ways that FACE works to achieve this. Each year the annual conference not only attracts delegates from all parts of the UK but also a growing number of international delegates. Each year our conference takes place in a different part of the UK and is hosted by a different HE institution. It is a great tribute to FACE conference host institutions that in addition to attracting growing numbers of first time delegates the conference also does equally well in attracting regular attendees. The conference therefore provides a stimulating platform and friendly setting for FACE members, non-members and student delegates to participate in workshops and paper presentations which can have a formative impact on the content of the chapters included in this publication. So therefore the collection of chapters in this book has been shaped and influenced by the process of having been presented and discussed at the conference and I would suggest that they benefit significantly as a consequence. Indeed, it is fascinating to see how this inter-relation between conference and publication works to enhance the arguments, scope and content of the final version of each of the conference papers that come together in this book. In one sense then the conference offers the opportunity of a rehearsal or testing ground where ideas and work in progress can be discussed with peers and, through this, exposed to the wider context and debates taking place. Brought together as they are in this book each chapter therefore contributes to the collective voice of the publication as a whole which in turn adds to the body of knowledge that FACE publications and conferences have created over the last two decades of publishing and conferencing activity. Therefore the annual conference plays a crucial part in the process of producing this publication.

The 2015 annual conference from which this publication derives was excellently organised and hosted by the University of South Wales and I would like to thank and acknowledge the work of the conference team in staging such a successful and memorable conference. The conference

title ‘Closing the gap: Bridges for Access and Lifelong Learning’ provided a stimulating reference point for the rich variety of papers delivered at the conference, many of which are included in this publication. Taking the title as their starting point the various chapters offer a rich and varied set of perspectives, some informed by research findings and insights, others by practice and the delivery of innovative and challenging outreach programmes, for example. However, I suspect for most contributors a combination of perspectives was drawn upon in shaping the contents of their chapters and sharing them with the wider FACE readership.

The annual FACE book is a unique publication in many ways bringing together as it does such a diverse range of voices and perspectives. It provides an opportunity for instance for first time early career authors to get published and to do so in company with highly experienced fellow contributors. It includes chapters informed by the practice and policy context of the UK alongside contributions from Sweden, Australia and the USA, for example. Within the different chapters we encounter researcher accounts but also policy perspectives and practice informed descriptions of work in progress drawn from the contexts of schools, universities or colleges. Together this collectively creates an exciting blend of insight and understanding anchored in the passion, commitment and creativity that FACE authors bring from their work to this publication. The FACE publication is not only therefore an impressive source of knowledge and understanding which explores the key issues in the field of HE access and lifelong learning but it is also a space to showcase the excellent scholarship skills of the contributors and the wider community of practice. This latest book is a really impressive example of precisely these qualities and many congratulations to all the contributors for this. I hope like me you will both enjoy and learn much from this excellent collection of chapters.

Finally, I would like to thank and acknowledge each of the authors who have contributed so willingly to this book. Also many thanks to the wonderful editorial team who each year give so generously of their time and expertise, and also to our excellent graphic design student who created such a wonderful cover.



Professor John Storan, Chair, FACE

Equity policy in Australian higher education: past, present and prospective

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Introduction

This chapter outlines recent developments in the definition, measurement and reporting of disadvantage or ‘equity status’ in Australian higher education. Australia’s policy response to disadvantage has settled around national target setting in relation to institutional participation and population attainment goals in higher education. The chapter examines policy outcomes as a result, with a brief discussion of the prospects for future directions in equity policy.

Equity policy in Australia

Equity policy in higher education – the framework designed to address disadvantage in the sector – emerged in Australia as part of the most significant set of reforms in Australian higher education history (the ‘Dawkins reforms’, named after the initiating Minister), initially outlined in the 1988 White Paper, *Higher Education: a policy statement* (Dawkins, 1988). It evolved in the context of the broader thrust of this document which has been bolstered since its release through supporting policy initiatives and development by the Commonwealth ever since.

The White Paper (Dawkins, 1988) recommended an expansion in the Australian higher education system, underpinned by the removal of the ‘binary divide’ between universities and other tertiary institutions (institutes of technology and colleges of advanced education), allowing all institutions access to the same Commonwealth system of funding, and the system-wide introduction of the Higher Education Contribution Scheme (HECS, now known as HECS-HELP) for income-contingent student loan payments which partially funded the system’s expansion (see Chapman and Tulip (2010) for the role of HECS in this policy context).

As an adjunct to these changes, Australia pursued an explicit policy of establishing national targets for participation in higher education among disadvantaged groups (Koshy, 2012). Commencing with the initial identification of disadvantage or equity groups, national policy has seen an integration of data collection systems and policy responses over the past 25 years culminating in today's system.

Defining equity status

The 1988 White Paper explicitly ushered in the modern era of equity measurement and policy in higher education, calling for the 'development of a statement of national equity objectives in higher education' (Dawkins, 1988: 54). The initial response to the White Paper was a government taskforce document, *A Fair Chance for All* (Department of Employment, Education and Training (DEET), 1990), which outlined the case for the identification and monitoring of access, participation and performance in regards to six identified equity groups:

- People from socio-economically disadvantaged backgrounds (low socio-economic status (SES) students);
- People with disability;
- Indigenous people;
- People from rural and isolated (remote) areas;
- Women (which became women in non-traditional areas – WINTA); and
- People from non-English speaking backgrounds (NESB).

Until this point, equity groups in Australia were not explicitly identified or evaluated as part of formal student collections, with policy largely focused on student-centred policies (income support, relocation assistance and general scholarships) and those at the institutional level (particular institutional initiatives in relation to identified groups). The Martin Review – *Equity and General Performance Indicators in Higher Education* (Martin, 1994) – established definitions and potential indicators for each equity group. The current definitions of equity groups (based on the Martin definitions) are outlined as follows.

- SES is assigned to students on the basis of the SES of the geographical location in which they reside, as identified by postcode or, as now, by Australian Bureau of Statistics (ABS) statistical area (SA1) classification. All SA1 areas are ranked on the basis of ABS estimates of the Socio-Economic Index for Areas (SEIFA) of education and occupation calculated using census data. Low SES students come from the bottom 25 per cent of Australian SA1s (with a postcode backup) in a national ranking.
- Regional students are defined as having a permanent home address in an SA1/postcode area that is classified as regional using historical Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) classifications and the Australian Statistical Geography Standard (ASGS).
- Students with disability are those who self-report a disability to their higher education provider, either at the time of their enrolment or during the course of their studies. Major disability classifications are: hearing, learning, mobility, visual, medical and other.
- Indigenous students are those who self-report as Indigenous to their higher education provider, either at the time of their enrolment or during the course of their studies.
- Remote students are defined as having a permanent home address in an SA1/postcode area that is classified as regional or remote using historical MCEETYA classifications and the ASGS.
- WINTA students are female students who are enrolled in the Natural and Physical Sciences; Information Technology; Engineering and Related Technologies; Architecture and Building; Agriculture, Environmental and Related Studies; and Economics and Econometrics.
- NESB students are those from a non-English speaking background who have been resident in Australia for less than 10 years.

In order to facilitate the collection of student equity data, the Martin Review (Martin, 1994) provided a framework for identifying students at the point of enrolment which was later integrated into Australia's Higher Education Information Management System (HEIMS) – the central online facility used for institutions to direct data to the Commonwealth.

Table 1: Method of identification of Australian higher education student equity groups, 2015

Student Equity Group	Method of Identification	Target Population Share (2006 Reference Share)
Low SES students	Postcode/SA1 area of student's enrolling address	25.0%
Students with disability	Self-reported	8.0%
Indigenous students	Self-reported	2.3%
Students from regional areas	Postcode/SA1 area of student's enrolling address	25.4%
Students from remote areas	Postcode/SA1 area of student's enrolling address	2.4%
WINTA students*	Enrolment in identified major	N/A
NESB Students	Self-reported	3.7%

Source: Based on Pitman and Koshy (2015), Appendix A, from Australian Department of Education (2015a).

Note: * The WINTA measure is an enrolment share in selected courses rather than a population target, and is therefore not reported in this context.

The design of the equity data collection allowed for the Commonwealth and higher education providers to assign equity status to students with minimal requirement for additional data collection. In the case of Indigenous students, students with disability and NESB students, this requires self-identification by students during the enrolment process, with the WINTA equity group identified through enrolment data.

Students from regional areas and remote students receive their designated status on the basis of their enrolling postcode. Australia is somewhat unusual in also using geographical location to determine statuses. A student's SES is assigned on the basis of their enrolling postcode (or

SA1, another geo measure), with Australian census averages for each postcode on factors such as occupational type, income and educational attainment being used to characterise SES. Low SES students are those with residential addresses in the bottom 25 per cent of the population on the basis of this area ranking.

While this minimal approach reduces the requirement for data collection involving individual students, it also means that the Australian measure of SES is a considerably blunter measure than it should be. This becomes apparent when comparing the demographics of Australian states and territories. Currently, the Commonwealth assesses enrolment performance against equity group reference values for all equity groups (see Table 2). These are enrolment share targets (domestic undergraduates) for various equity groups which relate to state and territory-specific population shares for each of these groups (e.g. per cent share of enrolment of students with disability compared with a population share of eight per cent).

In this context, low SES refers to students in the bottom 25 per cent (bottom quartile) in a population ranking of SES which combines an area (ABS collection district) measure of neighbourhood SES in a national ranking. As a consequence, the measured low SES population in each state differs substantially, ranging from 0 per cent in the Australian Capital Territory (with no low SES postcodes on a national ranking) to 54.1 per cent in Tasmania (see Table 2).

Policymakers did seek to overcome this problem by instituting national excellence targets which were some proportion of each state's share of low SES population and, alternatively, also included an institutional count of students receiving some form of income assistance from the Government (Department of Education, Employment and Workplace Relations (DEEWR), 2011). Other suggestions have included using state-based rankings of postcodes (Koshy, 2011) or using an entry level survey of all students to collect demographic data.

Once defined, the equity groups could be identified in the HEIMS system, with various measures and indicators being developed to compare their performance with that of the broader higher education population, the most important of which are the following:

Table 2: Equity group reference values, percentage from relevant population

State/ Territory	Low SES	Disability	Indigenous	Regional	Remote	NESB
New South Wales	23.5%	8.0%	2.23%	23.32%	0.60%	4.66%
Victoria	19.9%	8.0%	0.63%	24.41%	0.10%	4.30%
Queensland	30.5%	8.0%	3.16%	29.37%	3.61%	2.35%
Western Australia	19.8%	8.0%	2.78%	21.57%	6.98%	3.21%
South Australia	35.7%	8.0%	1.76%	23.73%	3.74%	2.50%
Tasmania	54.1%	8.0%	3.65%	57.04%	2.31%	1.09%
Northern Territory	26.4%	8.0%	23.65%	56.09%	43.91%	1.94%
Australian Capital Territory	0.0%	8.0%	1.33%	0.11%	0.00%	3.62%

Source: Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCS RTE) (2012)

Note: Equity reference values show the percentage of people from the various equity groups in the general population (aged 15-64) of each State and Territory using 2006 ABS census data.

- Access rate: measured as the share of ‘new commencements’ in the Australian system;
- Participation rate: the key target indicator, which is measured as the share of total student enrolments in the Australian system, for all students.
- Participation ratio: participation rate (equity group)/participation rate (all)

Performance measures include:

- Retention rate: continuing students/all enrolled students minus completed;
- Success rate: equivalent full-time student load (EFTSL) passed/EFTSL certified (passed, failed or withdrawn); and
- Attainment rate: award course completions of equity students/all domestic award course completions.

These measures allow for a comparison of equity group enrolment and performance over time.

In addition to the collection of data from higher education enrolment records, the early 1990s also saw the establishment of other important data collection systems in higher education. These include the Australian Graduate Survey (AGS), more commonly referred to by its employment component, the Graduate Destination Survey (GDS), which collects data on employment and earnings outcomes from a sample of graduating students in their first year after their degree (Graduate Careers Australia (GCA), 2015). In addition, the AGS has historically collected data from students on their perceptions of their institution and course, via the Course Experience Questionnaire (CEQ). While these datasets do not necessarily link directly to academic enrolment or performance data (the GDS defines a subset of equity groups differently from the HEIMS database), they have provided the basis for collection of outcomes data in higher education, eventually resulting in the new Graduate Outcomes Survey (GOS), which commenced in 2016 and which does have direct links to academic collections.

From this perspective, the initial collection of student equity data in Australia resulted in the definition of equity groups and establishment of data systems to support the analysis of policy in the context of general data collection in higher education.

Performance in equity group enrolment to 2007

Recent equity group enrolment statistics show a level of considerable underperformance relative to their broad population reference shares.

Closing the Gap: Bridges for Access and Lifelong Learning

For low SES students, their definition implies a 25 per cent population share, compared with a 16.2 per cent share of undergraduate enrolment in 2007, a figure broadly consistent with movements between 2001 and 2007. Other equity groups witnessed a similarly static performance, with only the disability group seeing some growth over this period, perhaps due to increased self-identification among students, and other groups seeing a decline (WINTA, regional and remote) or remaining static (Indigenous and NESB). All equity groups were under-represented compared to their respective reference shares over this period.

The distribution of equity students in terms of the measured participation rate differs across formal Australian institutional groupings. For example, the largest equity group, low SES students, had a national participation rate of 16.2 per cent, but this was only 10.1 per cent among Group of

Table 3: Historic equity group higher education participation, 2001 to 2007, undergraduates, and 2006 population reference share

Student Equity Groups	2001	2003	2005	2007	Reference Share (2006)
Low SES	16.8%	16.5%	16.0%	16.2%	25.0%
Students with disability	3.4%	3.9%	4.3%	4.4%	8.0%
Indigenous	1.2%	1.3%	1.2%	1.3%	2.3%*
Regional	20.2%	19.8%	19.1%	19.1%	25.4%*
Remote	1.3%	1.2%	1.1%	1.0%	2.4%*
WINTA	21.0%	20.7%	19.9%	19.1%	N/A
NESB	3.2%	3.1%	3.1%	3.2%	3.7%*

Source: Australian Department of Education (2015a) and author calculations.

Note: * National reference share calculated from reported state and territory population reference shares using 2006 population weights, except for WINTA which is a course reference share. The WINTA estimates here are share of total undergraduate population and indicate female enrolment growth in relevant courses compared with overall growth in enrolments.

Table 4: Equity group share of enrolment (participation rate), 2007, undergraduates, by institutional grouping

Institutional Grouping	Low SES	Disability	Indigenous	Regional	Remote	WINTA*	NESB
National	16.2%	4.4%	1.3%	19.1%	1.0%	19.1%	3.2%
Group of Eight	10.1%	3.6%	0.6%	11.5%	0.5%	21.3%	4.1%
ATN	14.5%	4.5%	1.4%	10.3%	1.0%	21.5%	3.4%
IRU	19.4%	5.3%	1.6%	19.9%	1.6%	16.3%	2.2%
RUN	28.7%	5.0%	1.7%	57.1%	2.2%	20.4%	0.8%
Unaligned	17.5%	4.3%	1.6%	19.5%	0.8%	17.6%	3.4%

Source: Australian Department of Education (2015a) and author calculations.

Note: * WINTA institutional estimates are for 2008, the earliest year for which institutional data are available.

Eight institutions, a grouping of the oldest higher education institutions in Australia. This compares with 14.5 per cent for institutions in the Australian Technology Network (ATN) – comprising former institutes of technology – rising to 19.4 per cent for the new institutions in the Innovative Research Universities (IRU) group and 28.7 per cent for the Regional Universities Network (RUN) institutions, comprising Australia’s regional universities.

The Group of Eight had higher levels of representation among WINTA and NESB students in 2007 than the national average, with participation levels among regional, rural and Indigenous groups contingent on institutions’ geographical locations.

The higher education system in Australia: 2008 to 2013

Student equity policy under the Rudd and Gillard Governments

Equity policy received new impetus with the election of the Rudd Labor Government in Australia in 2008. Labor established a national goal for higher education participation, setting a target of 40 per cent of 25 to 34 year olds attaining a bachelor's degree or higher by 2025. This represented a marked increase in participation and necessitated the need for a commensurate expansion in higher education places across Australia in line with recommendations of the 2008 *Review of Australian Higher Education* (the 'Bradley Review'), which supported both an expansion in the higher education system and greater certainty in institutional funding (Bradley et al., 2008). This led directly to the deregulation of undergraduate university places over 2010 to 2012, with the introduction of the Demand Driven Funding System (DDFS) and universities free to adjust their enrolments in view of the perceived demand for courses.

In view of the expansion anticipated under full place deregulation, the focus of policy makers intensified in relation to access and participation outcomes among students from low SES households. In 2007, low SES students accounted for 14.9 per cent of all higher education places and around 16.2 per cent of the domestic undergraduate higher education population. For the first time, the Rudd and Gillard Governments outlined an explicit target for higher education participation in relation to students from low SES backgrounds: that by 2020, 20 per cent of all domestic undergraduate students in Australia would come from low SES households (Bradley et al., 2008). This target was specifically set for undergraduates which became the focus of equity policy insofar as the Bradley reforms were instituted.

Underpinning this policy shift was the recognition that in Australia, as elsewhere, higher education attainment is associated with positive socio-economic outcomes such as enhanced earnings profiles (Wei, 2010) and better health and longevity (Clarke and Leigh, 2011).

The Commonwealth's first response to the Bradley Review (Bradley et al., 2008) came in the 2009 Federal Budget with the release of *Transforming Australia's Higher Education System* (Commonwealth of Australia, 2009), a four year \$5.4 billion policy package for higher education. As well as this funding, the Government reiterated the Commonwealth's support for equity in higher education with specific reference to the 2020 target. The centrepiece of this reform was the creation of the Higher Education Participation and Partnerships Program (HEPPP), whereby funding support for equity enrolments is provided at the institutional level to Table A providers – Australia's 38 public universities – in order to support activities related to encouraging equity student access to, and participation in, higher education. In addition, the Commonwealth also provided additional assistance to universities in the form of programs to support specific equity groups – the Indigenous Support Program (ISP) and Higher Education Disability Support Program (HEDSP).

The HEPPP initially ran over 3 years, from 2011 to 2013 (Australian Department of Education and Training, 2015b). The money was allocated on an institutional basis through a system of individual institutional compacts which provided detail on and undertakings by each institution. It was divided into a 'Participation' component which funded universities' internal programs, worth \$295.6 million, and a 'Partnerships' component, which funded collaborative initiatives between universities, the vocational education and training (VET) sector and other external agencies.

Table 5: National higher education equity funding (main programs), 2011 to 2013

Equity Program	\$ million
HEPPP – Participation	295.6
HEPPP – Partnerships	129.9
Indigenous Support Program	112.4
Higher Education Disability Support Program	19.4
Total – major equity programs	557.3

Source: Australian Department of Education and Training (2015)

Partnership funding was valued at \$129.9 million. The HEPPP provided funding to Table A providers of \$425.5 million in total, around 1.8 per cent of total higher education funding over this 3 year period (\$23.8 billion). The average HEPPP funding for each institution was around \$3.7 million per year or \$11.2 million over the 3 year cycle.

Programs funded under the HEPPP varied widely, in accordance with HEPPP guidelines which suggested an array of possibilities in terms of outreach, preparation, support and scholarship activities. Importantly, institutional performance under the HEPPP was both planned and monitored through the use of individual institutional compacts, with onus on providers to submit evidence as to the effectiveness of their HEPPP-funded programs.

In addition, the Government also provided \$112.4 million to the system under the ISP between 2011 and 2013, with the HEDSP providing funding for a further \$19.4 million. Total funding under major student equity programs over this 3 year period was \$557.3 million.

Changes in higher education: 2007 to 2013

The immediate impact of the DDFS on undergraduate education can be seen in its impact on Table A providers. Between 2007 and 2013, undergraduate enrolment increased from 528,844 to 668,665, an increase of more than a quarter (26.4 per cent). The vast majority of this growth, around 82.5 per cent, took place after 2009, in the lead up to and eventual introduction of the DDFS. However, the expansion in student places was not evenly distributed across the system. The Group of Eight institutions saw markedly lower growth than the national average, with an expansion in places of only 14.3 per cent, while the 'Unaligned Group' of newer universities oversaw a 41.9 per cent expansion in places. Institutions in New South Wales and Queensland recorded growth just under the national average. Victoria saw growth in line with the national average, while Western Australia (31.4 per cent) and the Northern Territory (37.3 per cent) saw faster growth to 2013.

The growth in overall enrolments has seen an impact on equity group participation, although this is somewhat mixed across different

Table 6: Domestic undergraduate enrolments, higher education, Table A providers, institutional grouping and state and territory, 2007-2013

	2007	2009	2011	2013	Growth 07-13	Growth 07-13 %
National	528,844	553,374	600,412	668,665	139,821	26.4%
Group of Eight	147,609	152,718	159,749	168,682	21,073	14.3%
ATN	94,486	97,467	102,097	115,712	21,226	22.5%
IRU	88,632	93,518	100,849	110,622	21,990	24.8%
RUN	47,650	49,716	54,072	60,188	12,538	26.3%
Unaligned	150,467	159,955	183,645	213,461	62,994	41.9%
New South Wales	168,521	177,540	191,504	205,852	37,331	22.2%
Victoria	125,606	128,467	138,037	159,394	33,788	26.9%
Queensland	105,434	109,415	118,218	130,586	25,152	23.9%
Western Australia	51,857	55,201	60,740	68,164	16,307	31.4%
South Australia	38,716	40,203	43,227	46,605	7,889	20.4%
Tasmania	12,042	12,612	13,061	16,914	4,872	40.5%
Northern Territory	4,339	4,865	5,213	5,958	1,619	37.3%
Australian Capital Territory	13,810	14,734	16,403	17,642	3,832	27.7%
Multi-state ^a	8,519	10,337	14,009	17,550	9,031	106.0%

Source: Australian Department of Education (2015a)

Note: a. The Australian Catholic University is the multi-state institution.

groups. Low SES students accounted for 17.6 per cent of all domestic undergraduates in 2013, up from 16.2 per cent in 2007. Students with disability saw an increase in measured enrolment from 4.4 to 5.5 per cent, with NESB seeing a smaller increase to 3.4 per cent in 2013, and Indigenous enrolments increased to 1.5 per cent. Enrolment shares of regional and rural students declined slightly, as did WINTA's share.

An examination of the change in low SES participation among the university groupings shows that most institutions (Table A providers) responded to HEPPP and the 2020 target by increasing their low SES share of enrolment. Historically, low SES students have seen higher participation in newer universities, with the IRU Group's share of 19.4 per cent already approaching the 20 per cent participation share target in 2007 and exceeding it in 2013.

Table 7: Equity group higher education participation, 2007 to 2013, undergraduates, and 2006 population reference share

Student Equity Groups	2007	2009	2011	2013	Reference Share (2006)
Low SES	16.2%	16.3%	17.0%	17.6%	25.0%
Students with disability	4.4%	4.5%	5.0%	5.5%	8.0%
Indigenous	1.3%	1.3%	1.4%	1.5%	2.3%*
Regional	19.1%	18.8%	19.2%	19.0%	25.4%*
Remote	1.0%	1.0%	0.9%	0.9%	2.4%*
WINTA	19.1%	19.1%	18.3%	18.8%	N/A
NESB	3.2%	3.2%	3.2%	3.4%	3.7%*

Source: Australian Department of Education (2015a) and author calculations.

Note: * National reference share calculated from reported state and territory population reference shares using 2006 population weights, except for WINTA which is a course reference share. The WINTA estimates here are share of total undergraduate population and indicate female enrolment growth in relevant courses compared with overall growth in enrolments.

Table 8: Low SES student equity participation rate, by institutional groupings, Table A providers, 2007-2013

	2007	2009	2011	2013	Change in %, 2007 to 2013
National	16.2%	16.3%	17.0%	17.6%	1.4%
Group of Eight	10.1%	9.8%	10.6%	11.1%	1.0%
ATN	14.5%	14.8%	15.4%	16.1%	1.6%
IRU	19.4%	19.4%	20.1%	21.2%	1.8%
RUN	28.7%	29.3%	29.8%	29.8%	1.1%
Unaligned	17.5%	17.7%	18.1%	18.4%	0.9%

Source: Australian Department of Education (2015a) and author calculations.

The traditional university grouping, the Group of Eight, which reached 11.1 per cent by 2013, continues to have lower levels of low SES participation, in large part due to their increasing academic selectivity, an outcome consistent with that seen elsewhere (see Raffae and Croxford (2015) for a discussion of the UK and Hoxby (2009) for the US).

Determining the impact of policy

On the face of these figures, it is difficult to determine the true success of the introduction of the DDFS in increasing equity group enrolment, other than to note that during a period of considerable expansion, with the exception of WINTA, equity group representation either remained static (growth in line with growth for the general higher education population) or increased at a faster rate.

The impact of the DDFS

Generally, the experience in Australian policy-making in recent years has been to initiate top-level policy in terms of target setting and funding and to review the system's performance through that lens. The overall rapid

expansion in the system – the equivalent of a quarter of undergraduate places between 2007 and 2013 – has led many to link the increase in higher education places with its perceived positive influence on equity outcomes, and a perceived reduction in the quality of degrees (see Pitman et al. (2015) for a discussion). As one former Labor minister, Kim Carr (as quoted in Hare (2013)), put it:

...we have to make sure that across the system quality remains a priority. I am a very strong believer in equity, but I am also a believer in excellence.... So I need to consider whether it is appropriate here to re-examine the growth rates in the university system.

These concerns highlight the issue of the definition of equity status in higher education and the measurement of trade-offs between expansion in the system and the outcomes for students.

Certainly, it is undeniable that universities have been accepting more students. Between 2009 and 2014, applications to universities increased by 10.3 per cent, while offers expanded by 19 per cent and student acceptances by 15.7 per cent. As a consequence, the offer rate (offers/applications) increased from 76.5 per cent in 2009 to 82.6 per cent in 2014, while the acceptance rate declined from 72.6 per cent to 70.6 per cent, as student choice under DDFS increased (Australian Department of Education, 2015c: Table A1).

Pitman et al. (2015) observe that it is perhaps not surprising that the expansion in places under the DDFS saw an increase in low SES enrolments and enrolments from students who would otherwise be regarded as being ‘marginal’ in the system. Studies in the Australian context, such as Marks (2005), have indicated that measured ‘unmet’ demand in the Australian higher education system tended to skew towards low SES students and those who generally exhibited lower academic achievement in secondary systems. The performance measure most closely associated with this argument is the attainment (completion) measure. Recent work by Edwards and McMillan (2015) examines outcomes for the 2005 cohort for a period up to 9 years after their initial enrolment. They find that just over two thirds (68.9 per cent) of low SES students who commenced their

Table 9: Attitudes to finances, low SES and other students, per cent

Survey Statement	Low SES Undergraduates		Middle and High SES Undergraduates	
	Full-time	Part-time	Full-time	Part-time
Agree that: 'My financial situation is often a source of worry for me'	76.6	65.2	66.7	63.3
Agree that: 'I feel in control of my financial situation'	26.7	36.4	33.4	40.4

Source: Data drawn from Table 8.12 in Bexley et al. (2013: 90).

degree in 2005 completed at any point up to 9 years later, compared with 72.6 per cent of medium SES and 77.7 per cent of high SES students.

The caveat to this line of thinking is that participation is a complex issue, with non-participation often due to extenuating factors, notably student financial support and part-time employment. Bexley et al. (2013) analyse student income patterns and self-assessments of their financial situations. They find that 76.6 per cent of low SES undergraduates agree with the statement 'My financial situation is often a source of worry for me' compared with 65.2 per cent of middle and high SES undergraduates, while only 26.7 per cent of full-time low SES students agree with the statement that 'I feel in control of my financial situation' compared with 33.4 per cent of middle and high SES full-time undergraduates.

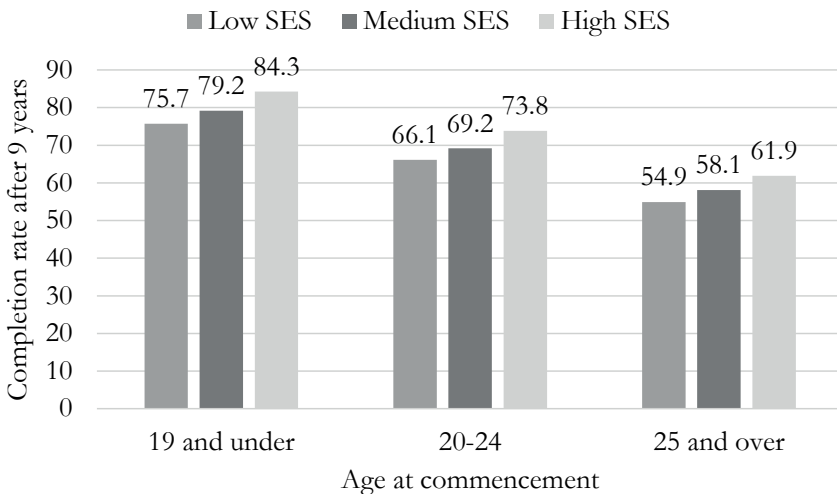
Financial support impacts more on completion rates among mature age students (older than 25). Edwards and McMillan (2015), in looking at the 2005 undergraduate cohort, find that 9 year completion rates for low SES students over 25 are 54.9 per cent, compared with a completion rate of 75.7 per cent among low SES school leavers.

The HEPPP, other equity funding and the 20 per cent low SES participation target

Although the HEPPP allowed for institutions to establish systems for monitoring programs, in practice, however, the limited funding for doing so and the need to establish programs quickly led to a paucity of data on outcomes, although anecdotal and post-program studies are often undertaken.

For outreach programs, the paucity of data is more problematic, coupled with a tendency for institutions not to collaborate, although quantitative and qualitative work is being undertaken on major initiatives. Koshy and Islam (2015) undertook a study for the Queensland Widening Participation Consortium – a rare example of a ‘whole of state’ approach to outreach programs in Australia – which found evidence for increases in application numbers in schools that were subject to consortium activities, including visits to schools by university staff and on-campus functions for classes. However, this study emphasises the importance of collecting data on

Figure 1: Completion rates nine years after commencement, by SES and age, domestic undergraduate commencers, 2005, per cent



Source: Figure 16 of Edwards and McMillan (2015: 23).

program delivery and control variables at the school level (Koshy and Islam, 2014: 30).

Typically, research is best undertaken on enabling programs operating within universities, as student data is readily available as is counterfactual data from non-participants. Nevertheless, the preferred approach is to build evaluation structures into all intervention projects.

Naylor et al. (2013: 7) discuss the issue of intervention assessment as part of their Australian review in the context of the need for an informed structure, built around a 'framework of educational progression for lifelong learning'. They observe that:

A major finding of this project is the relative dearth of publicly available, peer-reviewed research or evaluation, conducted with rigorous methodologies, on the effects of equity initiatives. In some cases, this is due to the high number of confounding factors that can influence, say, an individual's decision to attend university, and the complexity of attempting to analyse those decisions within a diverse population. In these situations, it may be difficult, if not impossible, to assess the efficacy of equity initiatives and programs with any reliability. Program design in these circumstances is an act of faith, though often highly well-judged and highly credible. A stronger platform for research and evaluation needs to be developed and utilised and the results of program evaluation should be published more widely. (Naylor et al., 2013: 7)

One encouraging policy response is a prospective scoping study on a Widening Participation Longitudinal Study (WPLS), which would at least provide longitudinal data on transitions to post-compulsory education while also collecting information on general outreach interventions among students, as well as establishing capacity to incorporate external program testing into collection under this longitudinal survey.

Future directions in equity policy: 2015-16 and beyond

The uncertain policy environment

Upon election in September 2013, the Coalition Government established the *Review of the Demand Driven Funding System* (the 'Norton Kemp Review') (Norton and Kemp, 2014). This review, released in April 2014, supported the DDFS and the extension of Commonwealth support to private providers, while allowing the Commonwealth to maintain control over university fees. The review also called for the abolition of the attainment and low SES targets in higher education.

The Government's response to the review appeared in the 2014-15 Federal Budget and called for full fee deregulation for undergraduate places and an extension of public funding to all higher education providers, coupled with the condition that 20 per cent of funding from fee increases would be set aside for scholarships to be administered by institutions. Fee increases would be required in order to enable universities to cover cuts in public provision for higher education of 20 per cent or around \$1.1 billion in reduced funding.

The implications for equity in Australian higher education were unsettling with one university indicating that it would charge an annual flat fee of \$16,000 for all undergraduate degrees, in comparison with the 2013 cost of \$6,044 per annum for an Arts degree. This projected increase in fees, coupled with an increase in the interest rate of repayment under the HECS-HELP system, implied a substantial increase in the projected time taken to repay the debt, with even the most favourable scenarios (males with 3 or 4 year business degrees) seeing increases in the time taken to pay back debt from 7 or 8 years to in excess of 10 years, and in worst case scenarios (female teachers) debt repayment horizons hitting 26 years (Phillips and Parker, 2014).

By June 2015, the legislation underpinning these reforms was yet to pass the Australian Senate, although the then Education minister, Christopher Pyne, indicated that the legislative reforms would be introduced later in the year (Hare, 2015). With a change in leadership which saw Malcolm

Turnbull replace Tony Abbott as Prime Minister in September 2015, the Coalition's new Education minister, Simon Birmingham, announced a two year delay in the implementation of the DDFS – should it even proceed (Trounson and Lewis, 2015) – with further developments awaiting the outcome of the July 2016 federal election. The systemic adjustments made by Rudd and Gillard remain in place: the deregulation of undergraduate places and formal funding for HEPPP-like equity programs, comprising a new Access and Participation Fund, a new Scholarships Fund, and elements of the previous HEPPP, notably the National Priorities Pool (NPP) which funds special projects in equity (Australian Department of Education and Training, 2015).

New development: data collections

Equity policy in Australian higher education will continue to be managed through the collection and analysis of key datasets. Over the past decade Australia has seen the development, or prospective development, of datasets which either provide important data for developments elsewhere or add to existing collections on student equity performance in higher education. Three key developments (one 'pre-higher education', one 'access' and one 'post-higher education') have been:

- National Assessment Program – Literacy and Numeracy (NAPLAN): the NAPLAN test for primary and secondary students is an annual Australia-wide test given to students in Years 3, 5, 7 and 9 (children aged 9, 11, 13 and 15) and administered by the Australian Curriculum Assessment and Reporting Authority (ACARA). It is designed to assess performance across 4 key areas: reading, writing, language conventions (spelling, grammar and punctuation) and numeracy (ACARA, 2015). The NAPLAN test results allow for a partial subset across identified equity groups.
- Widening Participation Longitudinal Study (WPLS): the scoping study for the WPLS has just commenced. However, it is envisaged that the WPLS will comprise a tracking study of secondary students in the three to five years prior to them entering post-compulsory education (Australian Department of Education, 2014). The WPLS will be designed to allow for results to be reported at the equity group level,

and will also provide a basis for additional collections on topics such as student perceptions of higher education and exposure to outreach and access programs managed through universities.

- Graduate Outcomes Survey (GOS): the GOS has replaced the AGS/GDS in 2015-16. Essentially, the GOS will become an electronic survey, with closer alignment with HEIMS collections within the higher education system and (it is anticipated) direct alignment with equity definitions within HEIMS. The GOS will therefore enable institutional-level reporting on outcomes for equity students.

These developments point to increasing data collection in Australian education which will underpin analysis of overall performance within the system as well as performance at the institutional and equity group level.

Future monitoring: the Equity Performance Framework

The future of student equity performance reporting in Australia will in large part be shaped through the current Equity Performance Framework (EPF), a project being undertaken by the National Centre for Student Equity in Higher Education (NCSEHE) for the Australian Department of Education and Training (Pitman and Koshy, 2015).

The framework, in its current draft, is hierarchical in structure and comprises three tiers. Each tier has related domains and within each domain are specific indicators that measure higher education equity performance. Underlying each indicator are data which represent the measurement of that indicator. The tiers are:

- Context (pre-higher education) – covering pre-primary, primary and secondary education results. Data for this will be sourced from three key areas – the Australian Early Development Census (AEDC) collections on child development, NAPLAN test results and national data on schools. Though this tier has no direct link to higher education collections, there are similar definitions of equity status (low SES, regional/remote, Indigenous), which allow for the separate reporting of equity trends up to secondary level.

- Performance (higher education) – covering Australian higher education providers and university students at all levels of study. This constitutes the bulk of existing collections in higher education as well as applications data from all states and territories and indicators sourced from the proposed WPLS.
- Outcomes (post-higher education) – covering graduates from higher education. This will use data from the GOS to report on equity student outcomes post-graduation, with direct links to equity definitions established within the higher education system.

In addition, the framework will report an ‘input’ tier, comprising Domain I (equity inputs) which provides data on funding and equity activities for every higher education institution.

The EPF will thus provide ‘high level’ data to assess institutional performance and, in conjunction with more precise datasets, establish benchmarks for performance assessment in relation to institutional interventions and national policy settings.

Conclusion

Over the past 25 years, Australian higher education has seen the development of data collections to provide evidence for equity policy interventions. Some of these interventions have been at the national level through target-setting and others have occurred at the institutional level through individual provider programs. In both cases it is difficult to draw out the impacts of various interventions in view of changes occurring elsewhere, problems in defining equity group status and the exclusion of program evaluation mechanisms as part of their rollout.

The emergence of new data collections, such as the proposed longitudinal study of secondary students, has the potential to provide for ‘controlled’ studies of interventions at the institutional and, possibly, the individual level. This will allow for further evidence-based policy in an area which will continue to be a focus of government.

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Parental expectations for young people's participation in higher education in Australia

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ABSTRACT

This paper examines factors affecting parental expectations of higher education prospects for their children using Australian household survey data. We find that a variety of factors influence parental expectations, of which parents' assessment of their children's academic performance is the strongest. Factors known to impact upon actual higher education participation, such as parental education and remoteness, are already evident in parental expectations, but with limited evidence of expectations being shaped by financial constraints. We also find evidence of a 'same gender' effect, with mothers exhibiting higher expectations for higher education for their daughters. This may be in part due to significantly lower expectations held by fathers with sub-bachelor qualifications. These factors contribute to higher expectations overall for girls entering university. The research points to the importance of interventions commencing in early childhood, and accounting for key household background characteristics when designing, implementing and evaluating programmes for widening participation in higher education.

KEYWORDS

Aspirations; parental expectations; higher education participation; socio-economic status; family

1. Introduction

In recent years, Australian policy-makers have committed considerable resources to the support of programmes designed to increase participation in higher education by school students. These programmes are largely associated with outreach activities which bolster student aspiration in addition to managing student retention. Since 2010, they have been substantially funded through the Higher Education Participation and Partnerships Program (HEPPP), with total related funding of just over A\$1 billion during this period, representing a substantial national commitment to this effort (ACIL Allen Consulting 2017, 20).

Such outreach work among school-aged students relies on evidence about the key determinants of participation in higher education by young people, be they economic, cultural or academic. An aspiration to attend university is the first step towards participation and represents those aspects of an individual's decision to participate in higher education which are motivational.

An influential explanatory model for higher education aspiration and achievement is the status attainment model, which began with an examination of social stratification and achievement (Blau and Duncan 1967), and which was gradually expanded to include a variety of factors including: parental influence and expectations, household and family background characteristics, academic performance, peer influence and neighbourhood effects (for early work, see Sewell and Hauser 1972,

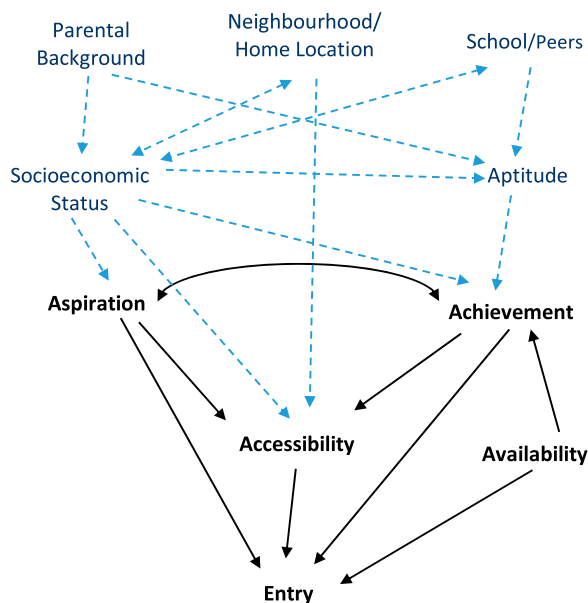


Figure 1. A representative model of higher education participation – socio-economic and systemic factors.

Note: Figure 1 is based on Figure 0.7 in Anderson et al. (1980, 7).

1975). Figure 1 below presents a representation of this participation model in which family, school and social background factors (denoted in grey and dashed lines) interact with factors affecting student navigation of the higher education system (denoted in black and solid lines). Here, aspiration is informed by the socio-economic realities facing students which determine the probability of transition to higher education.

This forms the basis of *expectation* which is qualitatively different from *aspiration* (Khattab 2015). Expectation can be thought of as the extent to which factors affecting aspiration interact with a student's prior achievement and perceptions of accessibility and availability of places in higher education to shape their perceptions of the likelihood of entry.

In this framework, parental expectation is a significant, long-term determinant of student aspiration, expectation and participation in higher education. A recent Australian study by Gemici et al. (2014) finds that young people whose parents express a preference for them to attend university are 11 times more likely to do so. Wu and Bai (2015) using longitudinal data from the Taiwan Youth Project find that 'parental expectations fundamentally affected university aspirations' in an educational context where economic status was shown to not unduly affect access and attainment in higher education. This is a situation not dissimilar to that found to be the case in Australia (Cardak and Ryan 2009; Marks 2017). However, while there has been a concerted focus in the literature on the role of expectations in determining higher education participation outcomes, the formation and determinants of parental aspiration have attracted less attention. As Spera, Wentzel, and Matto (2009) note:

... although the relationship of parental aspirations to student outcomes has been well documented, researchers have not assessed contextual factors that might influence the formation and adoption of such aspirations for their children's educational attainment. (1140)

This paper addresses this topic in Australia, using data from responses to a question on parental expectations for children's participation in higher education in the Household, Income and Labour Dynamics in Australia (HILDA) survey. It draws on HILDA's extensive set of parental and family controls to examine differences across income and socio-economic strata which explain and identify key influences on parental expectations.

2. The formation of parental expectations for higher education participation

The literature on parental influence on educational outcomes of their children identifies four broad factors which figure prominently in the formation of parental expectations: parental educational attainment; sociological factors such as parental occupational status, family structure and ethnicity; family income and wealth; and parental assessments of children's school performance.

Parental educational attainment is a well-established predictor of parental expectations. An Australian study of university aspirations among students in Melbourne by Bowden and Doughney (2010) finds a gradient in higher educational aspirations in relation to parental educational background, their preferred measure of socio-economic status. Davis-Kean (2005), in an examination of school performance, finds that parents' years of schooling is the most important socio-economic factor when looking at school age children and ongoing educational progress. Parents with higher levels of attainment tend to form higher levels of expectation in relation to their children's participation in higher education (see for instance, Gill and Reynolds 1999). This extends to studies examining educational preferences across cultures. For instance, in the US, Yamamoto and Holloway (2010) study the impact of ethnicity and school climate on parental aspirations and find that within each ethnic sub-group parental aspiration is significantly correlated to parental education, although the impact is more heterogeneous at lower levels of parental education.

A myriad of social factors, bracketed as 'socio-economic status', influence expectations. In Australia, as elsewhere there is strong historic evidence for continued under-representation of people from disadvantaged or 'low socio-economic' backgrounds (Anderson et al. 1980; James 2002; Koshy 2016). These include ethnic background, family structure, parental occupation and gender. They also encapsulate effects associated with Bourdieu (1986), who identifies cultural capital (access to cultural practices associated with education) and social capital (access to social networks associated with advancement) as important resources which enable students to progress to higher education and acquire human capital (see also, Coleman 1988). Social capital also encapsulates broader notions of access to information and social support networks – as discussed in Putnam (1995) and more critically in Portes (1998) – which can be thought of impacting indirectly on the prospects of transition to higher education, an idea also present in extensions of the 'capability approach' to analysing disadvantage (Sen 1985). Yu and Daraganova (2014) observe that parental expectation acts directly, to affect children's own expectations and eventual attainment and can 'compensate for a lack of financial and human resources' (105). Socio-economic factors have been postulated to drive this process (McCarron and Inkelas 2006; Turley, Santos, and Ceja 2007). Kim, Sherraden, and Clancy (2013) find that when socio-economic factors are taken into consideration, racial differences in parental educational preferences tend to become less significant. In a 12 country study, Buchmann and Dalton (2002) examine the impact of interpersonal influences on student aspiration and suggest that their findings 'reinforce the point that peers and parents are separate influences and indicate that they may function differently across institutional contexts' (113). Importantly, they observe that parental expectation is both formed in these environments but also interacts with them, citing the example of 'tracking' in schooling across several countries which sees children separated according to academic ability at an early age. While this could build educational expectation on the basis of tracking, it could also conceivably be a function of parental support for children at an early age. Further, Wood, Kaplan, and McLloyd (2007) point to 'a growing body of research that attempts to elucidate the extent to which school-level factors play a compensatory role when family processes are compromised' (424).

Marks (2017) sounds a note of caution on the focus of socio-economic status in education given evidence that where measures of academic ability, prior learning and educational background are included in models, socio-economic status becomes a less powerful explanatory variable. Gore et al. (2015), in looking at career aspirations, find that socio-economic status is less pervasive as an explanation for patterns of occupational preferences among school students (Years 4, 6, 8 and 10), but they observe differences in the level and motivation of students to enter higher education.

These include a sense of greater scope to pursue individual interests and passions among students from higher socio-economic status backgrounds, in comparison with stronger financial motivations among those from lower socio-economic backgrounds, with these differences emerging in children as young as nine (173). This important qualifier recognises that parental influence, as mediated by social and educational advantage, extends over the life course (McMillan and Western 2000), which is especially pertinent during the developmental phase, so received evidence on factors such as prior learning may reflect in some part the effect of reduced socio-economic status (Heckman 2000).

Financial advantage, in the form of higher level of income and wealth, enables parents and families to invest resources in children's education. Zhan and Sherraden (2011), in a US study of the impact of financial assets and liabilities on educational participation find that 'differences in economic resources are associated with a substantial portion of the Black-White gaps in college attendance and graduation' (2173). In particular, they find that ownership of non-financial assets are important in determining the educational participation of children in minority families, a result they attribute to the relative unimportance of financial asset holdings in low socio-economic minority households and also the stability associated with key non-financial assets such as home ownership, a finding echoed by Nam and Huang (2009). These findings accord with Huang et al.'s (2010) observation that economic theory posits that financial constraints act in both the short term and long term to reduce educational opportunities. Immediate financial constraints limit options for children attending higher education institutions, and the effects of financial constraints that reflect a family's background during a child's development accumulate over the longer term. Both operate to reduce attainment opportunities in post-secondary education. The authors control for both effects in their study using a structural equation model approach and find that long-term factors tend to dominate outcomes, but that the short-term issue of financing education is still relevant. Generally, families with greater access to financial resources are in a position to consider the final implications of post-secondary education for their children, supporting existing aspirations.

The Australian evidence on income and wealth is less certain. Dockery, Seymour, and Koshy (2016) find that household income was insignificant in predicting higher education access using a sample from HILDA, with housing effects also being less important. One explanation for this is that the nature of higher education student financing in Australia has reduced the impact of credit constraints on access (Cardak and Ryan 2009). In the Australian arena the existence of an income contingent loans system for tuition payments and the reality that most university-aged students in Australia commute from home to university rather than pay university board, may make financing requirements associated with higher education less of a factor in shaping expectation. A possible exemption from this general observation applies to students from regional and remote areas, where relocating to attend a higher education institution is common (Koshy and Phillimore 2013) and the total cost of participation is therefore greater (see Kilpatrick and Abbott-Chapman 2002; Alloway and Dalley-Trim 2009; Abbott-Chapman 2011; Wilks and Wilson 2012).

Finally, parental perceptions of a child's academic ability and prospects inform their expectations. Various studies have found that even after controlling for socio-economic background factors, an individual child's academic potential, proxied by prior achievement, is important in shaping expectations (Gore et al. 2015), as are perceptions of 'school climate' whereby children's performance is assessed in the broader context of their school (Spera, Wentzel, and Matto 2009). However, it should be noted that the direction of this cause is uncertain and it is likely to be multi-directional as good academic performance is both a driver and derivative of student and parental expectation of progress towards post-secondary study (Alexander and Eckland 1975; Spera, Wentzel, and Matto 2009, 1149; Bozick et al. 2010).

More generally, parents also appear to take into consideration broader education and training prospects for their children. For instance, a number of studies have identified a strong gender effect in parental aspirations, with higher levels of expectation that girls will attend university (Gil-Flores, Padilla-Carmona, and Suarez-Ortega 2011; Yu and Daraganova 2014).

It is a parent's assessment of their child's abilities, coupled with a knowledge of the likely options that translates aspiration into expectation as the child grows older. This point is examined in the context of student aspiration formation in a study by Marjoribanks (2003) using data from the Longitudinal Surveys of Australian Youth (LSAY) which models attainment in view of a series of background factors over time. He finds that 'academic performance at the beginning of secondary schooling has an important impact on the formation of adolescents' education aspirations' (241) – a finding which other studies find to hold for parental aspirations as well (Goldenberg et al. 2001; Zhang et al. 2011).

3. Data and methodology

We use data from the HILDA survey to examine the formation of parental expectations.

Commencing in 2001, HILDA is a panel survey of individuals from a representative sample of private households.¹ Within selected households all occupants aged 15 and over are surveyed annually. Around 13,000 individuals from over 7000 households have responded in each year, with year-on-year attrition rates averaging below 10%. In 2011, an additional top-up sample of 2153 households encompassing 4009 responding individuals was recruited to the survey sample (HILDA Survey Annual Report 2012).

HILDA represents Australia's most comprehensive household longitudinal collection covering economic and socio-economic dimensions of household formation and activity in Australia. HILDA provides a rich set of explanatory variables for inclusion in modelling parental expectations of higher education participation for their children. This includes information on a child's age, school type, household income and parental educational background, occupation and employment status.

The set of survey instruments includes a Household Questionnaire administered to an adult member of the household and collecting information about the household unit; as well as individual surveys with each member of the household aged 15 or over. The variables used in the modelling are listed in Table 1, with summary statistics provided in Appendix.

Specifically, we use data from Wave 12 (2012) of HILDA in which a module featuring questions on 'education, skills and abilities' was introduced into the survey.² The 2012 module included, for the first time, questions in the Household Questionnaire on parental perceptions of their children's academic performance and *their* expectations for higher education participation for each child. Thus, these particular questions were answered only by the parent who completed the Household Questionnaire. Specifically, the question relating to parental expectations was:

Do you think that this child will go onto university when they finish schooling or at some time in the future?

This question was asked with reference to each child in the household aged 4–18 providing responses for a sample of 3252 children in 1635 households, of which 1204 were couple parent households (with 2422 children) and 431 were single parent households (830 children).

The response options and shares by family type were as follows:

- Yes, definitely (31.3% – couple/23.9% – single parent);
- Yes, probably (31.8%/30%);
- Maybe (23.3%/27.2%) and
- No (13.6%/21.8%).

The combined response for 'Yes, definitely' and 'Yes, probably' of 63% is considerably higher than the national higher education attainment target of 40% for people aged 25–34, set by the Rudd government in 2007 (Koshy 2016). Given this overwhelming preference for higher education, we focus on the most emphatic response of 'Yes, definitely'. We estimate a series of ordered probit models, to model the probability (0–1) that the parent responds 'Yes, definitely'. Marginal effects are reported for each variable, holding other variables at the *sample average*, to identify the impact it has on the probability of this response.

Table 1. Parental expectations model variables.

Variable
<i>Dependent variable:</i>
Response to HILDA (Wave 12, 2012) question: Do you think this child will go onto university when they finish school? Four possible responses 'Yes, definitely', 'Yes, probably', 'Maybe' and 'No'. Coded as 'Yes, definitely' = 1; otherwise = 0.
<i>Independent variables:</i>
Respondent characteristics –
Gender (respondent is female)
Age (in years)
Respondent and child same gender
Parental Assessment of Overall Academic Performance [Average] – Excellent; Above Average; Below Average; Well below average
Child characteristics –
Age [14–18] – Aged 4–6; Aged 7–13
Gender (child is female)
Birth position [first child] – second child; third to sixth child
School –
Attended government school
Household characteristics –
Socio-economic status [middle] – high socio-economic status; low socio-economic status
Household disposable income (in \$10,000 dollar increments)
Housing [owner occupier] – renting in government housing; renting in private housing
Area –
State [New South Wales] – Victoria; Queensland; South Australia; Western Australia; Tasmania; Northern Territory; Australian Capital Territory
Region [Metro] – Inner Regional; Outer Regional and Remote
Parent Characteristics – (Separate for 'Father' and 'Mother' in <i>Couple Parent Model</i> ; 'Parent' in <i>Single Parent Household</i>)
Parent age
Parent is female (yes) (single household only)
Parent born in Australia (yes) (single household only)
Occupation [Category 1 (highest skilled)] – Category 2; Category 3; Category 4; Category 5 (lowest skilled)
Mother/father/parent unemployed
Mother/father/parent not in labour force
Education [degree or higher] – TAFE Certificate 3 or 4/Diploma; Year 12; Year 11 or below

Note: For sets of categorical dummies, omitted variables are in brackets [omitted category]. See Table 2 for a listing of all variables.

4. Results

Table 2 below presents the results of the analysis. The model was estimated for the two household sub-samples: – couple parent and single parent households, with the couple parent sample being split into two further sub-samples by the parent ('mother' or 'father') who completed the Household Questionnaire. As noted in the discussion above, the results presented here are marginal effects.

4.1. The couple parent household sample

For the sample of couple households, the estimated effects of the gender and age of the responding parent are insignificant. However, where the respondent and child are the same gender, there is a significant marginal effect observed of 0.038, implying a 3.8% increase in the probability of selecting 'Yes, definitely', at the 1% level of significance ($p < .01$). Thus mothers appear to hold relatively higher expectations for daughters relative to sons, while fathers hold relatively higher expectations for sons relative to daughters, other things being equal.

The impact of parental estimation of their child's academic ability is, as expected, highly significant in shaping expectations of future higher education participation, with higher probabilities of a 'Yes, definitely' response for children seen as being 'Excellent' (34.8%, $p < .01$) or 'Above Average' (22.8%, $p < .01$) compared to the omitted category of 'Average'. Similarly, a statistically significant negative effect is observed where children are deemed to be 'Below Average' (–18.4%, $p < .01$) or 'Well Below Average' (–34.5%, $p < .01$). These are the most powerful effects observed in the model.

Table 2. Parental expectation model – ‘Yes, definitely’ to ‘child to go onto university when they finish school’, for couple parent (all, female, and male respondents) and single parent households.

Variable	Couple	Female respondents	Male respondents	Single
<i>Respondent characteristics</i>				
Respondent is female	0.003 (0.022)	–	–	0.015 (0.054)
Age [years]	0.001 (0.003)	0.000 (0.005)	–0.064** (0.034)	0.002 (0.002)
Respondent and child same gender	0.038** (0.018)	0.104** (0.017)	–0.04 (0.049)	0.056** (0.034)
<i>Parental assessment of overall academic performance [average]</i>				
Excellent	0.348** (0.026)	0.346** (0.03)	0.349** (0.038)	0.317** (0.036)
Above average	0.228** (0.019)	0.22** (0.021)	0.252** (0.08)	0.185** (0.026)
Below average	–0.184** (0.038)	–0.132** (0.043)	–0.296** (0.155)	–0.155** (0.05)
Well below average	–0.345** (0.09)	–0.418** (0.099)	–0.101 (0.039)	–0.278** (0.098)
<i>Child characteristics [age 7–13]</i>				
Aged 4–6	0.022 (0.019)	0.036 (0.022)	–0.018 (0.043)	0.074** (0.041)
Aged 14–18	0.057** (0.022)	0.061** (0.025)	0.043 (0.027)	–0.027 (0.028)
Child is female	0.072** (0.018)	–	–	–0.005 (0.033)
<i>Birth position [first child]</i>				
Second child	0.000 (0.014)	0.002 (0.017)	–0.007 (0.04)	0.029 (0.027)
Third to sixth child	–0.038 (0.026)	–0.028 (0.029)	–0.062 (0.054)	0.021 (0.035)
<i>School</i>				
Attended government school	–0.112** (0.02)	–0.104** (0.023)	–0.133** (0.051)	–0.091** (0.027)
<i>Household characteristics</i>				
<i>Socio-economic status [middle]</i>				
High socio-economic status	0.004 (0.027)	0.011 (0.03)	–0.003 (0.004)	0.02 (0.046)
Low socio-economic status	–0.037 (0.023)	–0.049** (0.026)	–0.041 (0.161)	–0.077** (0.027)
Household disposable income	0.001 (0.002)	0.001 (0.002)	–0.001 (0.059)	0.003 (0.002)
<i>Housing [owner occupier]</i>				
Renting in government housing	0.008 (0.071)	0.051 (0.077)	–0.129 (0.051)	–0.019 (0.043)
Renting in private housing	0.029 (0.026)	0.04 (0.028)	0.007 (0.055)	0.055** (0.028)
<i>State [New South Wales]</i>				
Victoria	–0.014 (0.026)	–0.011 (0.03)	–0.017 (0.077)	0.034 (0.035)
Queensland	0.022 (0.027)	0.029 (0.03)	0.03 (0.07)	0.064** (0.033)
South Australia	–0.037 (0.036)	–0.025 (0.04)	–0.056 (0.094)	–0.063 (0.042)
Western Australia	–0.036 (0.032)	–0.047 (0.035)	–0.055 (0.148)	–0.027 (0.056)
Tasmania	0.018 (0.049)	0.055 (0.056)	–0.081 (0.102)	0.076 (0.052)
Northern Territory	0.084 (0.094)	0.06 (0.113)	0.059 (0.005)	–0.265** (0.068)
Australian Capital Territory	–0.121** (0.055)	–0.145** (0.06)	–0.065 (0.07)	0.133 (0.158)
<i>Region [Metro]</i>				
Inner regional	–0.084** (0.024)	–0.074** (0.027)	–0.114** (0.000)	–0.029 (0.028)
Outer regional and remote	–0.123** (0.03)	–0.124** (0.033)	–0.08 (0.000)	0.032 (0.035)
<i>Mother/parent characteristics</i>				
Mother/parent age	0.000 (0.004)	0.003 (0.006)	–0.005 (0.096)	0.000 (0.002)
Parent is female	–	–	–	0.031 (0.062)
Parent born in Australia	–	–	–	–0.064** (0.037)
<i>Mother/parent occupation [Occupation Category 1 (highest skilled)]</i>				
Category 2	0.029 (0.036)	–0.033 (0.042)	0.169** (0.065)	0.024 (0.055)
Category 3	0.009 (0.043)	–0.005 (0.049)	0.031 (0.087)	–0.099 (0.081)
Category 4	–0.01 (0.031)	–0.068** (0.034)	0.121** (0.139)	–0.003 (0.046)
Category 5 (lowest skilled)	–0.083** (0.039)	–0.082** (0.042)	–0.14 (0.059)	–0.013 (0.053)
<i>Labour force status [mother/parent employed]</i>				
Mother/parent unemployed	0.006 (0.054)	–0.075 (0.057)	0.295** (0.055)	0.11** (0.061)
Mother/parent not in labour force	–0.008 (0.031)	–0.042 (0.035)	0.049 (0.066)	–0.008 (0.049)
<i>Mother/parent education [degree or higher]</i>				
TAFE Certificate 3 or 4/Diploma	–0.078** (0.029)	–0.073** (0.033)	–0.086 (0.069)	–0.084** (0.045)
Year 12	–0.053** (0.032)	–0.068** (0.036)	–0.001 (0.006)	–0.093** (0.054)
Year 11 or below	–0.103** (0.034)	–0.12** (0.038)	–0.085 (0.058)	–0.145** (0.052)
<i>Father characteristics</i>				
Father age	0.000 (0.002)	–0.001 (0.002)	0.069** (0.071)	–
<i>Father occupation [Occupation Category 1 (highest skilled)]</i>				
Category 2	0.042 (0.029)	–0.097** (0.031)	–0.232** (0.077)	–
Category 3	–0.094** (0.035)	–0.077** (0.041)	–0.158** (0.051)	–
Category 4	–0.157** (0.034)	–0.118** (0.039)	–0.228** (0.066)	–
Category 5 (lowest skilled)	–0.084** (0.024)	–0.074** (0.027)	–0.114** (0.000)	–
<i>Labour force status [father/parent employed]</i>				
Father unemployed	–0.041 (0.061)	–0.007 (0.061)	–0.147 (0.048)	–

(Continued)

Table 2. Continued.

Variable	Couple	Female respondents	Male respondents	Single
Father not in labour force	0.035 (0.05)	0.043 (0.058)	-0.005 (0.07)	-
<i>Father education [degree or higher]</i>				
TAFE Certificate 3 or 4/Diploma	-0.146** (0.026)	-0.097** (0.031)	-0.232** (0.077)	-
Year 12	-0.094** (0.035)	-0.077** (0.041)	-0.158** (0.051)	-
Year 11 or below	-0.157** (0.034)	-0.118** (0.039)	-0.228** (0.066)	-
N (sample size)	2422	1666	756	830

*Denotes significance at the 5% level. Standard errors in parentheses; [Omitted category in brackets].

**Denotes significance at the 1% level.

Estimated coefficients for child-specific characteristics revealed outcomes anticipated or demonstrated in the literature. Age of the child is significant in affecting responses, with 'Aged 14 to 18' showing a significant impact of 5.7% relative to the control category of 'Aged 7 to 13', indicating growing expectations of higher education participation as children approach Year 12 completion. Birth order effects (e.g. first to sixth child) are not detected in this model. There is a strong impact of the gender of the child in favour of girls (7.2%, $p < .01$), which again supports the contention that gender is an important determinant of parental aspiration for higher education participation by their children. The result is also in line with the reality that women now make up a higher proportion of university students in Australia (Koshy 2016).

Within couple families, household characteristics are not significant factors in shaping aspiration in this model. For instance, no significant effect is viewed for socio-economic status. Additionally, household disposable income and variables capturing housing tenure – 'Owner Occupier', 'Renting in Government Housing' and 'Renting in Private Housing' – are insignificant.

Against this, a strong schooling effect is observed, with a child attending a government school associated with a -11.2% marginal effect ($p < .01$), implying a reduced aspiration for higher education relative to those attending non-government schools. This accords somewhat with the evidence on the impact of school type on university performance. Li and Dockery (2015) find evidence that 'higher SES schools inflate their students' ATAR scores and improve their access to university' (91), suggesting that parents with stronger expectations that their children will enter higher education may actively seek to enrol them in private schools which, in the Australian context, are generally higher SES schools.

There is only one observed state effect, a negative and highly significant result associated with the Australian Capital Territory, which implies a reduced 'area effect' in the territory with the lowest level of socio-economic disadvantage in Australia (for a discussion, see: Koshy 2011). This somewhat perverse result may reflect the high proportion of Commonwealth public service workers in that territory who are classified as being in high-skilled occupations, a factor that is already controlled for in the models. Compared with families living in metropolitan areas, those in regional areas – 'Inner Regional' (-8.4%) and 'Outer Regional and Remote' (-12.3%) – display markedly lower expectations at the 1% level of significance. This is consistent with the significant evidence on higher education expectations in Australia's regions (Department of Education, Employment and Workplace Relations 2010).

Parental characteristics in the couple respondent sample indicated that in the case of both mothers and fathers, parental age and workforce participation (*Unemployed; Not in Labour Force*) are statistically insignificant in affecting the probability of respondents selecting 'Yes, definitely'.

Occupational effects are also observed. In HILDA, occupations are classified using the Australian Bureau of Statistics (ABS) Occupational Categories 1–5 (2006), whereby Australian and New Zealand Standard Classification of Occupations (ANZSCO) are classified on the basis of skill, as defined by the range and complexity of tasks undertaken in each occupation. These are ordered from Level 1 (the highest skill level) to Level 5 (lowest). For both mothers and fathers, parental employment in the lowest skilled category, Occupation Category 5, reduced the probability of a 'Yes, definitely' response by around 8.3% in both cases (a marginal effect of -8.3% for mothers' occupation and -8.4% for fathers').

Parental attainment of a degree is important in shaping expectations, with all other levels of qualification associated with significant negative effects in the case of both parents, with increasing divergence on the basis of parent gender as years of schooling and/or training increase. For instance, in the case where the highest level of educational attainment is 'Year 11 or below', both the father's qualification level (−15.7%) and mother's qualification level (−10.3%) see highly significant and similar negative impacts on aspiration. Where the highest qualification is 'TAFE Certificate 3 or 4/ Diploma', the effect for fathers' qualification (−14.6%) is around double that of mothers' qualification (−7.8%), partly explained by the observed preference for girls to attend university and also the pre-dominance of males in vocational education and training.

4.2. The couple parent household sample by gender of responding parent

In the couple sample, female responding parent (mothers) account for 69% of all respondents, or 1666 respondents out of a total couple sample of 2422. This indicates that gender effects related to mothers may dominate the couple results. However, the male respondent sample (fathers), at 756 observations, is still large enough to enable us to split the sample along these lines.

Some differences on the basis of the respondent gender are observable. The significant effect of respondent and child being of the same gender is shown to apply only to mothers, with the effect among fathers being insignificant. Further, the marginal effect is considerably larger among mothers than that seen in the combined sample (10.4% compared to 3.8%). Hence the 'same gender' bias noted above can be attributed solely to mothers having higher expectations for daughters to attend university than for their sons. An age effect appears in the father sub-sample (−6.4%), the only significant age effect identified in this modelling.

Parents' assessment of the child's academic performance has a monotonic impact among mothers, with the likelihood of a very positive view of children's participation increasing steadily from 'Below Average' through to 'Excellent' whereas among fathers, the parameter on 'Below Average' is insignificant.

The observed increase in expectations for older children (aged 14–18) years appears to be largely present in the mother subset, with a slightly higher significant response (6.1% compared to 5.7% for the couple sample overall), with the effect on fathers' responses being insignificant.

The strong effect of the child attending a government school as opposed to a private school is observed for both parent sub-samples at broadly similar levels, −10.4% for mothers and −13.3% for fathers.

In terms of regional effects, that seen for 'Inner Regional' remained highly significant for both genders of respondent, but with fathers seeing a stronger negative impact (−11.4% compared to −7.4% for mothers), whereas results in 'Outer Regional and Remote' areas showed that only mothers exhibited a highly significant effect for location in a *Remote* area (−12.4%), accounting for that seen in the overall sample.

The impact of occupation varied across the mother and father sub-samples. Among mothers, highly significant effects are observed for mother's occupation in the lower skilled categories of 4 (−6.8%) and 5 (−8.2%), with the latter driving the effect seen in the overall sample. Among fathers, highly significant and substantial effects are seen where mothers are employed in higher status occupations in 'Occupational Category 2' (16.9%) and 'Occupational Category 4' (12.1%). Employment variables are generally not significant in the sub-samples, with the exception of 'Mother Unemployed' in the father sub-sample, which is both highly significant and constituted a large effect at around 29.5%.

In terms of parental educational background, university-educated parents had the highest expectations of their children also attending university irrespective of parental gender. For fathers it is their own qualifications that have the strongest association with their expectations, while mothers' expectations appear to be shaped equally by their own level of education and that of their partner's.

4.3. The single parent household sample

Another consideration in relation to socio-economic status is that of family structure. Krein and Beller (1988) find that children from single parent families tend to have lower rates of educational attainment, with a particularly pronounced effect among children who have spent the greatest number of years in such situations and with boys seeing a greater negative effect than girls.

As shown above by the pattern of responses to the question on higher education expectations, single parents had substantially lower expectations that their children would go on to university than partnered parents. However, covariates may have differential effects on aspirations within these households. To examine this issue, we estimate a similar model using a single parent household sample from HILDA.

As with the couples sample, respondent age and gender are insignificant in explaining the probability of a respondent indicating their child will definitely go to university. There is a positive effect of the respondent and child being of the same gender (5.6%, $p < .01$) in keeping with that seen in the mother sub-sample and the couple households sample in general. Given the fact that 85.1% of single parent households are headed by females, we would expect some commonalities with results from the female couple sub-sample.

Comparable effects to those identified for the couple sample are found for parental estimation of their child's academic ability, the child attending a government school as opposed to a private school and parent's educational attainment. The single parent model included an additional variable for the parent having been born in Australia, which had a negative impact on aspiration (-6.4%, $p < .01$).

Looking at child characteristics, age is largely insignificant, with the exception of 'Aged 4 to 6' which is highly significant for single parent households (7.4%, $p < .01$), indicating a greater degree of assertiveness on this question for relatively younger children than is present in couple households. Possibly this reflects recognition of immediate resource constraints facing single parents for children close to finishing school, but hopes that their circumstances will have improved by the time their younger children leave school. The single parent sample showed no strong effect of the gender of the child, by contrast with the overall sample. However, with the vast majority of single parents being mothers, such an effect will be captured through the variable indicating whether the respondent and child are the same gender. Thus the single parent results are consistent in suggesting higher expectations for female children.

The household characteristic variables in the single parent model are insignificant, with the exception of that for *Low Socioeconomic Status* (-7.7%, $p < .01$). This indicates that measures of socio-economic disadvantage may be more relevant in capturing the compounding nature of disadvantage in single rather than couple households.

Parental occupational status is not significant in the single parent model, while unemployment is positively associated with increased expectation of university attendance (11.0%, $p < .01$).

5. Conclusion and discussion

Parental expectations are an important determinant of higher education access, with studies finding a strong link between the two (notably Gemici et al. 2014, in the Australian context). In this paper, we examine Australian evidence on the key drivers of parental expectations using data from the HILDA study. We do so by looking at two broad samples, one for couple households and the other for single parent households, and in addition, we split the couple household sample into mother and father sub-samples.

There are strong commonalities across these four cases. Primarily these relate to parental assessment of the academic performance of their child. There is an estimated 34.8% increase in the probability of a parent answering 'Yes, definitely' to the focus question, 'Do you think that this child will go onto university when they finish school?', when their assessment of a child's academic performance is 'Excellent' as opposed to 'Average', while 'Below Average' and 'Well Below Average' assessments

resulted in reduced probability of parents nominating the 'Yes, definitely' option relative to 'Average' assessments. Single parent households report similar patterns of expectation. This finding is in line with previous studies in Australia (such as Marjoribanks 2003) and Marks' (2017) assessment in relation to the importance of prior academic performance in determining higher education access and participation.

Variables in relation to socio-economic status are less significant in the couple parents' model as are those tracking household income and housing status and home ownership. However, 'low socio-economic status' is shown to have some negative impacts in the mother sub-sample (−4.9%) and the single (and predominantly female) sample (−7.7%), with respondents in the lowest skilled occupations (Categories 4 and 5) also likely to have lower expectations of their children's higher education participation. To some extent, this echoes Marks (2017) observations on socio-economic variables having less explanatory power in view of variables which either capture actual or perceived academic performance in relation to higher education participation (and in this context, the expectation which proceeds it).

Against this, there is a strong school effect across all models, with attendance at a government school associated with a reduced expectation and certainty around eventual higher education attendance, relative to parents of children attending a private school. In the Australian context, it could be the case that investment in non-government school is a better proxy for socio-economic status in relation to education than income and wealth accumulation variables and/or reflects a willingness on the part of parents to invest in their children's education.

Other observed socio-economic factors are important. Gender variables are significant, both in relation to the responder and child. In the mother sub-sample of the couples model, there is a 10.4% increase in the probability of a definitive expectation of higher education attendance where it is asked of female child, with no similar effect existing (either way) for males. A similar story exists in the single parent household sample, again, where most of the respondents are female. These findings coupled with a 7.2% effect of the child being female indicate that parents, particularly mothers, view girls as having greater opportunities in higher education than in other post-compulsory settings, a finding that confirms the observations from data in the LSAC by Yu and Daraganova (2014).

This view is likely to reflect the reality in Australia that young females face far more limited post-school vocational education and training pathways if they do not go on to study at university than is the case for males (Buchler and Dockery 2015). This represents an interesting hypothesis in view of the findings in this paper and one which can be tested using data from future collections of the 'education, skills and abilities' module in HILDA.

The couple parent samples show significant regional effects which track distance whereas the single parent sample shows that these factors are not significant in the context of overall drivers of parental expectation in these households.

Finally, parental educational background is important in shaping expectations of their children's participation in higher education, with significant reductions in expectations as the number of years of schooling declined, a finding that is robust across all models studied. Additionally, there is a strong indication of the importance of paternal TAFE participation in shaping expectations of alternatives to university. For instance, in a couple household where the father has a TAFE certificate (3 or 4) or diploma, there is a 14.6% reduction in support for 'Yes, definitely', driven in large part by a 23.2% reduction among father respondents only. Again, this may reflect broader options for young males in the VET system, with fathers with trade qualifications placing a greater likelihood on their sons following similar career paths.

Overall, expectations for higher education attainment are high among parents, with over 60% of parents in couple households seeing this as a prospect for their child, with this figure falling to 53% in single parent households. These findings confirm previous evidence on parental expectations for their children's entry into higher education. Namely, that parental assessment of their children's ability coupled with their educational and occupational backgrounds inform their expectations in relation to higher education participation.

It does raise the important policy question: how do we address educational disadvantage associated with family background?

Encouragingly, current measures to address the financial aspects of this disadvantage appear to be effective in Australia (Cardak and Ryan 2009; Dockery, Seymour, and Koshy 2016). Nevertheless, there is some evidence that socio-economic disadvantage may persist – for instance, in the strong observed school effect in this study – both in terms of the provision of resources as well as education and parental initiative. Moreover, the importance of children's perceived academic performance in shaping expectations suggests such effects may commence in early childhood and accumulate through primary and secondary school.

More broadly, it is this interplay between economic and educational advantage that education policy is designed to address and these results suggest that higher education policy, be it geared towards widening participation or attendant issues such as student income support, should flow from an evidence base that captures critical household characteristics that shape parental expectations in relation to higher education, especially where parents have no direct experience of university attendance.

The findings here demonstrate that many of the factors known to be associated with relative exclusion from higher education have their precedence in parental expectations, supporting growing evidence of the benefit of intervention strategies that commence in early childhood (Heckman 2000). Sole-parent status and living in a regional or remote area, in particular, are among key household background variables that need to be integrated into the design, delivery and evaluation of intervention strategies, whether those strategies work to identify and directly address the barriers faced by such families directly, or to otherwise revise those parents' expectations.

The analysis was made possible by the addition of the 'education, skills and abilities' module into the 2012 wave of the HILDA survey. Data from future repeats of this module will be made available at four year intervals, with the 2016 release due to be released in December 2017. This provides considerable scope for future analyses and comparisons with the 2012 collection. Promising avenues for future research include the within-child persistence and evolution of parental expectations across the life course; the effects of changes in circumstances (such as family structure); and relating parental expectations to actual educational outcomes.

Notes

1. See <http://www.melbourneinstitute.com/hilda/> and Watson and Wooden (2010) for details on the survey.
2. A follow up to this module was included in the Wave 16 HILDA collection in 2016, with data from this to be released in December 2017.

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No potential conflict of interest was reported by the authors.

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Appendix. Means of the independent variables in the expectations model – couple and single parent household samples.

Variable	Couple parent household	Single parent household
<i>Sample size – respondents (N)</i>		
Total respondents	2422	830
Female respondents	1666	706
<i>Respondent characteristics</i>		
Respondent is female	0.688	0.851
Age [years]	41.8	41.0
Respondent and child same gender	0.509	0.481
<i>Parental assessment of overall academic performance</i>		
Excellent	0.209	0.157
Above average	0.372	0.273
Average	0.357	0.464
Below average	0.051	0.083
Well below average	0.011	0.023
<i>Child characteristics</i>		
Aged 4–6	0.165	0.127
Aged 7–13	0.530	0.522
Age 14–18	0.302	0.314
Child is female	0.488	0.478
<i>Birth position</i>		
First child	0.497	0.519
Second child	0.353	0.340
Third child	0.117	0.106
Fourth child	0.023	0.019
Fifth child	0.005	0.016
Sixth child	0.002	0.000
<i>School</i>		
Attended government school	0.636	0.755
<i>Household characteristics</i>		
High socio-economic status	0.223	0.082
Middle socio-economic status	0.541	0.540
Low socio-economic status	0.235	0.378
Household disposable income	\$118,649	\$69,965
<i>Housing</i>		
Owner occupier	0.791	0.372
Renting in government housing	0.019	0.118
Renting in private housing	0.189	0.510
<i>State</i>		
New South Wales	0.293	0.275
Victoria	0.242	0.271
Queensland	0.210	0.229
South Australia	0.088	0.110
Western Australia	0.100	0.059
Tasmania	0.034	0.047
Northern Territory	0.010	0.005
Australian Capital Territory	0.021	0.005
<i>Region</i>		
Major city	0.623	0.531
Inner regional	0.248	0.312
Outer regional	0.114	0.140
Remote	0.014	0.012
Very remote	0.001	0.005
<i>Mother/parent characteristics</i>		<i>Parent variables</i>
Mother/parent age	41.0	41.0
Parent is female	–	0.871
Parent born in Australia	–	0.807
<i>Mother/parent occupation</i>		
Category 1 (highest skilled)	0.271	0.165
Category 2	0.115	0.086
Category 3	0.045	0.036
Category 4	0.216	0.206

(Continued)

Appendix. Continued.

Variable	Couple parent household	Single parent household
Category 5 (lowest skilled)	0.082	0.131
Mother/parent unemployed	0.027	0.047
Mother/parent not in labour force	0.244	0.329
<i>Mother/parent education</i>		
Degree or above	0.357	0.175
TAFE Certificate 3 or 4/Diploma	0.283	0.361
Degree or above	0.151	0.149
Year 11 or below	0.209	0.314
<i>Father characteristics</i>		
Father age [Years]	44.0	–
<i>Father occupation</i>		
Category 1 (highest skilled)	0.382	–
Category 2	0.122	–
Category 3	0.163	–
Category 4	0.170	–
Category 5 (lowest skilled)	0.071	–
Father unemployed	0.026	–
Father not in labour force	0.066	–
<i>Father education</i>		
Degree or above	0.302	–
TAFE Certificate 3 or 4/Diploma	0.424	–
Degree or above	0.103	–
Year 11 or below	0.171	–

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