ACSES Australian Centre for Student Equity and Success | Curtin University

Equity Frontiers Trial Protocol

"Estimating the causal effects of the Demand-Driven System reform on higher education equity"

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1 Overview

Title:	Estimating the causal effects of the Demand-Driven System reform on higher education equity		
Start date:	28/11/2025	**QED finish date**	26/03/2027
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QED summary (<300 words)	This QED project seeks to estimate the causal effects of the Demand-Driven System (DDS) reform on student outcomes using the Person Level Integrated Data Asset (PLIDA). It aims to investigate heterogeneous impacts on equity groups, including low socio-economic (SES), regional, and Indigenous students using a quasi-experimental methodology, a Synthetic Difference-in-Differences (SDiD) framework. Specifically, the proposed study seeks to answer the following key research questions: (i) how did the DDS reform affect higher education access, progression, and early labour market outcomes for equity group students in Australia? (ii) to what extent did these effects differ across key dimensions such as field of study, institution type, and relative to outcomes observed among non-equity students?		
Funding (total, and funding sources)	The project budget totals $159,436 (Excl. GST), reflecting the resources necessary to deliver high-quality outcomes within the agreed timeframe. This budget includes personnel costs (including in-kind contribution of $9,625), essential data access fees, and reporting expenditures. The total cost to the Australian Centre for Student Equity and Success (ACSES) (funding source), after deducting in-kind contributions, is $149,811 (Excl. GST).		
Ethics approval (grantor, date, reference ID)	Curtin University Human Research Ethics Committee (HREC) has exempted this study from ethics review (record number EX83085)		

2 Background and objective

2.1 Background

Existing studies have examined the effects of the DDS on higher education access and equity, most existing analyses have relied on descriptive statistics, aggregate trends, or simple regression models (e.g., Norton, 2014; Dean, 2024). While the findings from prior studies suggest that the reform succeeded in expanding overall participation, questions remain about the causal effects of DDS on access, completion, and early labour market outcomes of students from underrepresented groups, including those from low SES, regional, and Indigenous backgrounds. The approaches employed in existing studies, while informative, often fall short of establishing credible causal relationships between the reform and observed changes in enrolment, completion, and labour market outcomes, especially among equity groups. This project seeks to fill that gap and provide evidence using advanced quasi-experimental methods and nationally linked administrative data.

2.2 Intervention

The intervention evaluated is the DDS reform introduced in Australian higher education between 2009 and 2012. The DDS removes caps on the number of Commonwealth-supported undergraduate places that universities may offer. It enables higher education institutions to enrol all qualified domestic students who meet entry standards.

The intervention operates nationally across all universities and applies uniformly to eligible Australian undergraduate students. It represents a structural policy change rather than a program applied to selected individuals or institutions. The key mechanism of change is the expansion of access to higher education through deregulated enrolment caps, which allows universities to respond flexibly to student demand and potentially increase participation among students from traditionally underrepresented groups.

In this evaluation, the “treatment” refers to exposure to the DDS reform for students from equity backgrounds, specifically, those from low SES, regional, and Indigenous populations, during and after its rollout (2009 onwards). The “comparison” or “synthetic control group” comprises students from non-equity backgrounds who display similar pre-reform enrolment and progression trends (2005–2008). The identification strategy follows a SDiD design, in which both equity and non-equity students are observed in the pre-reform (2005–2008) and post-reform (2009 onwards) periods. The effect of DDS is identified from the differential change over time in outcomes between equity and non-equity students, comparing post-reform cohorts to pre-reform cohorts, controlling for common time shocks and time-invariant group differences.

In addition, variations within the intervention occur through differences in institutional response (e.g., universities with varying resource levels and geographic locations) and field of study choices. These will also enable analysis of heterogeneous impacts by discipline and institution type.

2.3 Objectives

The main objective of this QED project is to evaluate the impact of the DDS initiative on student outcomes. Through the removal of caps on Commonwealth-supported places, the DDS intends to enable universities to enrol as many eligible domestic undergraduate students as they choose, thereby expanded institutional access and pathways for enhanced

enrolments, completions, and labour market outcomes. Specifically, the analysis considers a range of outcome variables capturing students' educational participation, progression, and post-study labour market performance. Measures of participation and access include university enrolment by field of study and institution type, while academic progression is assessed using completion rates. Labour market outcomes are evaluated through employment status and income derived from tax records.

The core research questions, and their related hypotheses are designed to test the effectiveness of the DDS policy initiative in improving outcomes for underrepresented groups. The related hypotheses to be tested include:

H1: The DDS increased the probability of undergraduate enrolment for students from low SES, regional, and Indigenous backgrounds, beyond what would have occurred without the reform.

H2: Students from these underrepresented groups who enrolled under the DDS had completion rates comparable to that of non-equity students, narrowing the gap in outcomes in the post-DDS period.

H3: Graduates from equity groups who benefited from the DDS achieved positive early labour market outcomes, such as employment and earnings, narrowing the gap with non-equity students, and demonstrating the long-term value of their expanded access to education.

3 QED design

3.1 Outcomes

The project identifies clear and measurable outcomes including:

- Participation, access: University enrolments by field of study and institution type.
- Progression: Completion rate.
- Labour market outcomes: Employment status and income (from tax records).

3.2 QED design

This project employs a novel quasi-experimental method, a SDiD framework, innovated by Arkhangelsky et al. (2021). Compared with a traditional DiD design, the SDiD framework strengthens causal identification by constructing a weighted synthetic control group that closely matches the treated group's pre-treatment outcome trends, thereby relaxing the strict parallel-trends assumption. By optimally weighting both units and time periods, SDiD improves pre-treatment balance and produces a more credible counterfactual when treated and untreated groups differ systematically at baseline or exhibit divergent pre-trends.

The QED design involves constructing a credible counterfactual control group from non-equity students using linked administrative data. The treatment group consists of students from equity backgrounds, including those from low SES, regional, and Indigenous populations who were enrolled during and after the introduction of the DDS reform (2009–onwards). This approach allows us to estimate the causal impacts of the DDS policy by comparing the actual outcomes of treated equity groups to the outcomes they would have experienced in the absence of the intervention, consistent with the potential outcomes framework (Abadie, 2021; Rubin, 2005).

This method combines the strengths of traditional DiD with synthetic control techniques, improving both internal validity and robustness. The SDiD approach strengthens causal identification by constructing a synthetic control group from non-equity students who closely mirror the pre-reform trends of equity students. The synthetic control approach allows for constructing a robust comparison group using a donor pool composed of students from non-equity backgrounds who exhibit similar pre-reform enrolment trends in the years prior to DDS implementation (2005–2008). This approach applies weights to the non-equity groups that minimise the difference in pre-treatment trends. This allows us to create a weighted combination of control units that closely resemble the treatment group's characteristics before the reform. This improves the credibility of counterfactual comparisons and reduces bias arising from structural differences between groups.

3.3 Detailed QED process

The study utilises longitudinal microdata from PLIDA. Application for access to the data is submitted and progresses well. PLIDA has high-quality administrative data that contain millions of observations for the national cohorts which will support robust inference. Quality assurance is achieved through leveraging on precise administrative records rather than relying on surveys or proxy measures. This significantly reduces measurement error and will strengthen the reliability of our findings.

The design also mitigates key sources of bias, including confounding and selection effects, by incorporating fixed effects, rich covariate controls, and validation checks such as pre-trend testing and placebo analyses.

3.4 Participants

The research population includes the universe of students in Australia provided by PLIDA. The dataset has rich information and high-quality administrative data that contain millions of observations for the national cohorts which assures large sample size and robust effect sizes, supporting robust inference.

3.5 Participant withdrawal criteria and procedures

The project utilises existing de-identified administrative data. Hence, withdrawal is not applicable.

4 Data management and statistical analysis

4.1 Statistical methods

The project employs innovative SDiD method to estimate the average treatment effects. The SDiD framework enhances identification by forming a weighted synthetic control that closely replicates the treated group's pre-treatment outcome dynamics. Through the joint optimisation of unit and time weights, SDiD achieves superior pre-treatment balance and yields a more credible counterfactual in settings where treated and control groups differ systematically at baseline or display non-parallel pre-treatment trends. The unit weights are chosen to ensure that treated units are compared with control units that exhibited approximately parallel outcome trajectories prior to treatment adoption. In addition, SDiD selects time weights to place greater emphasis on pre-treatment periods that most closely resemble the post-treatment period by aligning each control unit's post-treatment average with a weighted average of its pre-treatment outcomes across the selected controls.

We estimate the average treatment effect using the SDiD estimator, expressed as follows:

$$Y_{it} = \alpha_i + \beta_1 * Post_t + \beta_2 * EquityStudent_i + \beta_3 * (Post_t * EquityStudent_i) + X_i'\gamma + \delta_t + \varepsilon_{it}$$

Where Y_{it} denotes the outcome for student *i*, at year *t*. $\mathrm{EquityStudent_i}$ represents a binary indicator equal to one for equity students and zero otherwise, while $Post_t$ takes the value 1 for 2009 onwards. X_i' is a vector of covariates capturing demographic, geographic, and household characteristics; α_i and δ_t are individual and year fixed effects. We will also include location-by-year and institution-by-year fixed effects to adjust for compositional shifts and time-varying local shocks. ε_{it} represents the error term.

The key parameter of interest, β_3 , captures the causal effect of the DDS reform on university participation, progression, completion, and early labour market outcomes for equity students. By exploiting the exogeneous policy changes in higher education enrolment caps during the DDS rollout and comparing trends between equity and non-equity groups, the analysis isolates the reform's impact on access and longer-term educational trajectories for equity students. A p-value of less than 5% is used to assess statistical significance of the estimates. The model controls for covariates capturing demographic, geographic, and household characteristics as well as location-by-year and institution-by-year fixed effects to adjust for compositional shifts and time-varying local shocks.

4.2 Sample cleaning

The data required from the project from PLIDA will undergo systematic quality screening prior to the QED estimation and analysis. All variables will be inspected for consistency, valid ranges, and expected data types. Patterns of missing values will be profiled by variable and respondent, including cross-tabulation of missing values across key covariates and outcome variables. Unused data and anomalies will be verified against codebook definitions and will be excluded if they do not satisfy definitions.

4.3 Sample inclusion/exclusion

The study uses Australian population available in PLIDA for the years before and after the reform. Observations that do not match across all PLIDA modules used in this study will be excluded. We will describe the criteria used to exclude observations with incomplete, inconsistent, or implausible records (e.g. missing key demographic variables, enrolment

dates, or outcome measures), as well as how duplicate records were identified and resolved. Where relevant, we will summarise these procedures and refer explicitly to the established PLIDA data protocol for full technical documentation. These data cleaning and exclusion decisions will be made following standard PLIDA guidelines and are documented to ensure that they do not systematically bias the analysis, thereby supporting the validity and replicability of the findings.

4.4 Data management.

All data management procedures comply with Australian Bureau of Statistics (ABS) and Curtin University standards. The project uses de-identified administrative data from the PLIDA, accessed and analysed solely within the secure ABS DataLab environment. No unit record data are stored, downloaded, or transferred outside this facility. Variables are coded according to PLIDA codebooks and Data Dictionary standards. Data and code files are stored within the DataLab. The DataLab applies multi-factor authentication, network isolation, and monitoring, and only aggregated, non-identifiable statistical outputs that satisfy ABS confidentiality rules may be released.

At project completion, analytical code, output tables, and documentation are archived in accordance with ABS retention and Curtin University research data management policies, with all records securely stored on BCEC servers for at least five years.

4.5 Additional analyses.

Secondary analyses examine heterogeneity in the effects of the DDS across equity subgroups and institutional contexts. Subgroup analyses are conducted by socio-economic status, Indigenous identification, regional and remote location, institution type (e.g., Group of Eight, regional universities), and field of study. These analyses assess whether the DDS generated differential impacts on access, completion, and labour market outcomes across cohorts and contexts.

Robustness checks, including placebo and sensitivity analyses, are applied to validate findings and ensure that observed subgroup effects are not driven by confounding or model specification errors.

4.6 Quality control & quality assurance

Quality control and assurance procedures are embedded throughout all stages of the project to ensure data integrity, reproducibility, and adherence to protocol. All data processing and analysis are performed within the ABS DataLab. Also, regular internal project meetings monitor compliance with the approved QED protocol, document methodological decisions, and address any deviations.

Final outputs are validated against predefined inclusion criteria and ABS confidentiality requirements prior to extraction. The team will also make sure they follow all analytical steps and check variable definitions in detail to ensure consistency across all process. Quality checks of the code used to run the analysis will also be frequently done by the team to ensure the reproducibility of the results.

5 Publication

The expected output includes:

- ACSES report
- Scholarly publication in impactful peer-reviewed journal

6 Appendices

References

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