

SUPPLEMENTAL APPENDIX

Student Representation in Undergraduate Economics: The impact of STEM-designation

By Anthony Underwood, Emily C. Marshall, and Eren Bilen

Figure A1 reports the distribution of institutions by treatment status as of 2023. The control group consists of never-treated institutions. We categorize treated institutions based on their method of STEM designation, per IPEDS reporting: either by reclassifying an existing degree program from a non-STEM CIP code to an Econometrics and Quantitative Economics (EQE) degree (46.0603), or by retaining the original non-STEM program and adding a new EQE degree, thereby offering both. Following the 2012 addition of EQE degrees to the STEM-designated program list, most early adopters opted to offer both a non-STEM and a STEM-designated EQE degree, with the number of reclassifying institutions increasing gradually starting from 2017. By 2023, treated institutions are roughly evenly split between those that offer both and those that reclassify their major.

FIGURE A1: TREATMENT ADOPTION



Table A1 provides descriptive statistics for the 532 institutions in our sample. Treated institutions are more likely to be PhD-granting (56.5% vs. 42.5%) and less likely to be master’s-granting (10.2% vs. 34.4%). Liberal arts colleges also constitute a larger share of the treated group (33.3%) relative to the control (19.2%). Treated institutions tend to be larger in enrollment and more selective, with an average acceptance rate of 47.1% compared to 74.2% for the control. They also confer more degrees overall (20,903 vs. 12,283), with higher female representation (36.4% vs. 30.0%) and a larger share of non-resident students (21.2% vs. 9.0%). URM student representation is lower among treated institutions (17.2% vs. 22.6%).

TABLE A1: CHARACTERISTICS OF TREATED AND CONTROL GROUPS (2023)

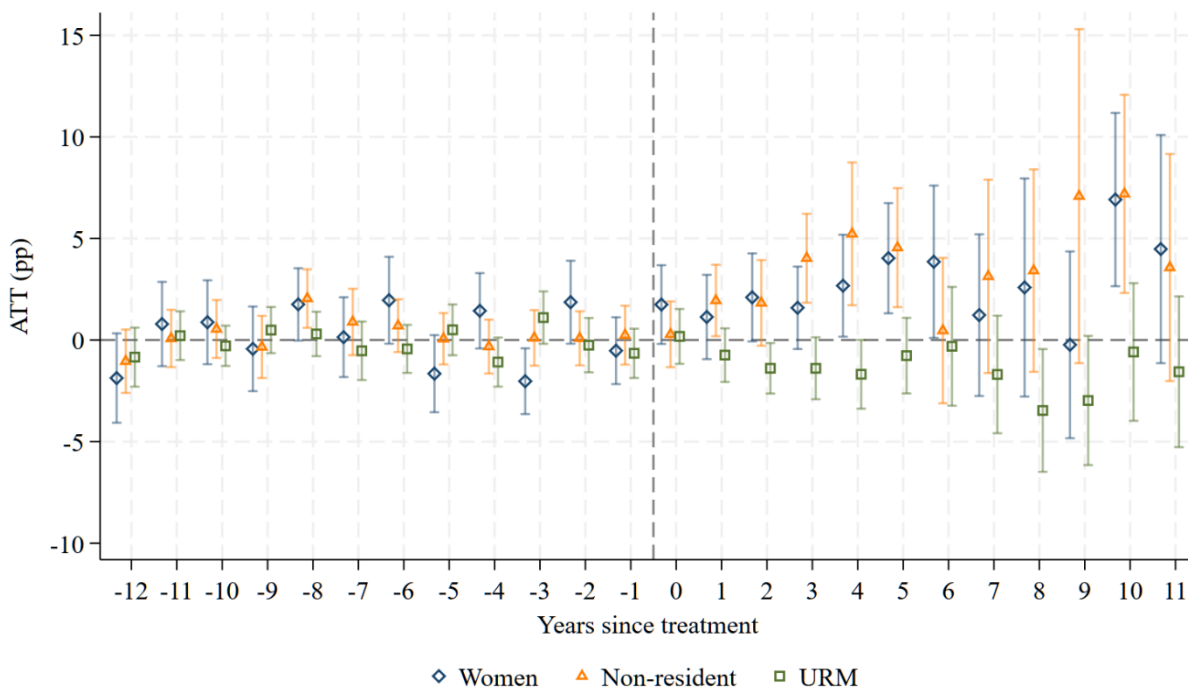
	Control (never-treated)	Treatment (EQE-STEM)		
		All	Reclassify	Offer Both
Number of Institutions (2023)	355	177	88	89
Carnegie Classification (%)				
PhD-granting	42.5	56.5	52.3	60.7
Masters-granting	34.4	10.2	10.2	10.1
Liberal Arts	19.2	33.3	37.5	29.2
Baccalaureate	3.9	0	0	0
Enrollment Size (%)				
Less than 5,000	43.4	39.0	44.3	33.7
5,000 to 19,999	37.5	32.2	30.7	33.7
Greater than 20,000	19.2	28.8	25	32.6
Acceptance Rate (%)	74.2	47.1	42.4	51.7
Total degrees conferred				
% Female	30.0	36.4	37.1	35.7
% Non-resident	9.0	21.2	24.1	18.5
% URM	22.6	17.2	17.5	16.9

Notes: Based on authors' calculations using 2023 IPEDS data.

Figure A2 presents dynamic treatment effect estimates for the share of degrees conferred to women, non-resident students, and URM students. For all three groups, pre-trends are statistically indistinguishable from zero, which supports the identifying assumptions of the event-

study design. Post-treatment effects diverge by subgroup. The share of degrees awarded to non-resident students rises sharply beginning around three to four years after treatment and continues into later periods, with point estimates ranging around 5 to 10 percentage points. Gains for women are more modest but exhibit a sustained upward trend. In contrast, estimates for URM students show little change over the post-treatment period, with confidence intervals that generally include zero and point estimates between 0 to -5 percentage points. All estimates are based on a fully balanced panel using the Callaway & Sant'anna (2021) estimator.

FIGURE A2: EVENT STUDY PLOT, percentage of degrees conferred



Notes: Figure A2 plots dynamic treatment effect estimates (for the percentage of total degrees conferred) showing average differences between treated and (never-treated) control institutions by years relative to treatment adoption. Coefficients for periods prior to adoption provide a diagnostic check on the parallel-trends assumption, while post-treatment coefficients illustrate how treatment effects evolve over time. Confidence intervals are shown at the 95% level. These dynamic estimates differ from the overall ATT which aggregates effects across cohorts and time; the overall ATT is reported separately in Table 1.

Table A2 reports overall ATT estimates for subgroups of women. The strongest effects are observed for non-resident women, both in levels (3.060, $p < 0.05$) and in percentages (2.126, $p < 0.01$). URM women show modest statistically significant gains in levels (0.736, $p < 0.1$), though not in percentages, while estimates for resident women are positive but statistically indistinguishable from zero. These results suggest that the impact of STEM expansion is

concentrated among non-resident women, with weaker evidence of gains for URM women and no measurable effect for resident women.

TABLE A2: OVERALL ATT BY WOMEN SUBGROUPS

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-Resident Women Total	Non-Resident Women Percent	Resident Women Total	Resident Women Percent	URM Women Total	URM Women Percent
ATT	3.060** (1.263)	2.126*** (0.5339)	1.259 (1.769)	0.0864 (0.8685)	0.7358* (0.4086)	-0.6078 (0.3704)

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Reported estimates correspond to the average treatment effect on the treated from a fully-balanced panel of 532 institutions (N=14,634) using the Callaway & Sant'anna (2021) estimator, via *estat simple*, which averages treatment effects across cohorts and post-treatment periods under staggered adoption.