Explaining Heterogeneity in Student Diversity Across Economics Departments

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Journal of Economic Education (2023)

Appendix 1: Heterogeneity of Role Model Effects

Table A1 shows the results of including interactions of department-level faculty diversity measures with an indicator variable representing low department student-to-faculty ratio (in the lowest quartile of all the student-to-faculty ratios in the population), calculated as the number of economics bachelor's degrees given out in a year divided by the number of faculty members in the department. We hypothesized that a low student to faculty ratio would result in students having more interaction time with their instructors, thus increasing the role modeling effects of diverse faculty, but we did not find evidence for or against this hypothesis. In Table A1, we find that all the coefficients on the interactions are statistically insignificant. Our sample sizes are just not large enough to allow precise identification of these parameters.

Table A1. Role Model and Department Student-to-Faculty Ratio Interactions

	Relative Gender Diversity[1]			Relative URM Diversity[1]		
	(1)	(2)	(3)	(4)	(5)	(6)
Economics Dept. Proportion of Female Faculty	0.162	0.347^{+}	0.321	0.444	1.155*	1.181*
	(0.150)	(0.179)	(0.193)	(0.448)	(0.546)	(0.589)
Economics Dept. Proportion of URM Faculty	0.033	–0.019	0.007	0.318	0.159	0.075
	(0.182)	(0.183)	(0.192)	(0.681)	(0.672)	(0.717)
Low Dept. Student-to-Faculty Ratio[2]	–0.125	–0.092	–0.103	–0.112	0.014	0.078
	(0.103)	(0.104)	(0.114)	(0.310)	(0.312)	(0.341)
Low Dept. Student-to-Faculty Ratio x Economics Dept. Proportion of Female Faculty	0.035	–0.122	–0.084	0.722	0.127	0.058
	(0.272)	(0.282)	(0.307)	(0.819)	(0.850)	(0.921)
Low Dept. Student-to-Faculty Ratio x Economics Dept. Proportion of URM Faculty	0.151	0.263	0.247	–1.62	–1.15	–1.30
	(0.381)	(0.394)	(0.419)	(1.220)	(1.232)	(1.308)
Inst. Proportion of Female Instructors		–0.605^{+}	–0.636		–2.16*	–1.57
		(0.336)	(0.392)		(0.986)	(1.134)
Inst. Proportion of URM Instructors		0.445	0.486		1.055	0.830
		(0.542)	(0.621)		(1.678)	(1.881)
Total Bachelor's Degrees Awarded (in 1000s)			–0.003			0.028
			(0.007)			(0.022)
Constant	0.546**	0.737**	0.781**	0.661**	1.369**	1.016*
	(0.063)	(0.145)	(0.173)	(0.190)	(0.416)	(0.501)
Regional Indicators	No	No	Yes	No	No	Yes
R^2	0.091	0.127	0.140	0.060	0.112	0.501
N	94	94	94	93	93	93

[1]*Relative Gender Diversity* is defined as the proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.
[2]*Low Student-to-Faculty Ratio* is an indicator that takes the value 1 if the department has a student-to-faculty ratio in the lowest quartile of department student-to-faculty ratios in our IPEDS Population. The student-to-faculty ratio is calculated as the number of reported bachelor degrees conferred in one year divided by the reported number of faculty in the department.

Note: All coefficients and standard errors rounded to three decimal places. Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Appendix 2: Controlling for Additional Variables

We recognize that many of our regression models omit potentially confounding variables. These relatively parsimonious models are meant to accommodate for the size of our analysis samples. In the tables below, we control for additional variables to verify the robustness of our results.

In Tables A2-A6, we augment the regression models shown in Tables 11, 14, 16, and 18 with additional columns that include a control for the number of economics bachelor's degrees given out in one year. The size of the economics department could be determinant of diversity while also affecting the amount of contact time students get with faculty members or the resources allocated to these departments. We find that adding this control to our preferred regressions does not substantially alter the signs, magnitudes, or significance of any of our results.

In Table A7 we present the estimation results of a regression model where we simultaneously include all the department-level policies and characteristics discussed above. These policies and characteristics are often positively correlated, as departments that implement some potentially diversity-friendly policies may be more likely to implement others. For example, we see evidence of this in the paper's Table 7 where departments that have higher gender diversity among faculty are more likely to offer courses in gender and sexuality studies. While including all these factors in our model pushes our sample size to its limit, it does allow us to interpret the impact of these policies and characteristics holding the other variables constant.

In columns 2 and 4 we also include several institution-level measures that could be correlated with the department-level variables.

Our findings described in the paper where we look at categories of interventions separately largely hold up. We find no significant effects of student support policies, and the proportion of female faculty in the department remains a strong predictor of both gender and URM diversity of economics students. Offering courses in gender and sexuality studies, postcolonial theory, or antiracist theory does not significantly change gender diversity, but when holding other policies constant, courses in gender and sexuality studies are marginally negatively associated with URM diversity. Service-learning is now significantly positively associated with gender diversity and no longer has a significant negative effect on URM diversity. The signs and magnitudes of the effects of active learning pedagogy change very little, but they are much less precisely estimated and lose statistical significance.

Table A2. Relative Diversity and Student Support (Controlling for Size of Economics Department)

	Relative Gender Diversity[1]				Relative URM Diversity[1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Department-Level Tutoring Center	–0.010	–0.022	–0.005	–0.020	0.002	–0.009	–0.010	–0.023
	(0.040)	(0.041)	(0.041)	(0.042)	(0.121)	(0.125)	(0.123)	(0.127)
Economics Undergraduate Club	0.015	0.012	0.024	0.021	0.045	0.041	0.057	0.053
	(0.064)	(0.063)	(0.066)	(0.066)	(0.190)	(0.191)	(0.198)	(0.199)
Clubs Directed at Underrepresented Groups	0.047	0.042	0.054	0.050	0.111	0.105	0.069	0.065
	(0.043)	(0.043)	(0.045)	(0.044)	(0.129)	(0.130)	(0.133)	(0.133)
Remedial Math Course			–0.053	–0.062			0.220	0.214
			(0.047)	(0.047)			(0.140)	(0.141)
Department-Level Mentoring Program			0.014	0.030			0.027	0.041
			(0.045)	(0.046)			(0.136)	(0.140)
Core-Sequence Support Courses			–0.033	–0.037			–0.152	–0.155
			(0.052)	(0.051)			(0.152)	(0.153)
Summer Bridge Programs			0.056	0.043			–0.078	–0.091
			(0.067)	(0.067)			(0.207)	(0.210)
Economics Degrees Awarded in One Year		0.0003		0.0004		0.0003		0.0003
		(0.0002)		(0.0002)		(0.0007)		(0.0007)
Constant	0.552**	0.625**	0.542**	0.519**	0.752**	0.740**	0.720**	0.700**
	(0.060)	(0.062)	(0.075)	(0.076)	(0.177)	(0.180)	(0.223)	(0.229)
R^2	0.017	0.020	0.042	0.070	0.011	0.013	0.050	0.052
N	94	94	94	94	93	93	93	93

[1]*Relative Gender Diversity* is defined as the proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.

Note: All coefficients and standard errors rounded to three decimal places except coefficients and standard errors for Economics Degrees Awarded in One Year (rounded to four decimal places). Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A3. Relative Gender Diversity and Role Modeling (Controlling for Size of Economics Department)

	Relative Gender Diversity[1]							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dept. Proportion of Female Faculty	0.224^{+}	0.264*	0.209^{+}	0.242^{+}	0.297*	0.298*	0.279^{+}	0.278^{+}
	(0.124)	(0.124)	(0.124)	(0.125)	(0.148)	(0.147)	(0.152)	(0.152)
Dept. Proportion of URM Faculty	0.070	0.051	0.043	0.025	0.011	0.003	0.037	0.033
	(0.161)	(0.159)	(0.161)	(0.160)	(0.167)	(0.167)	(0.174)	(0.174)
Female Speaker in the Last Year			0.062	0.065	0.059	0.063	0.067	0.070
			(0.047)	(0.046)	(0.048)	(0.048)	(0.049)	(0.049)
URM Speaker in the Last Year			0.031	0.013	0.018	0.006	0.012	–0.001
			(0.040)	(0.042)	(0.042)	(0.043)	(0.044)	(0.045)
Inst. Proportion of Female Instructors					–0.371	–0.259	–0.331	–0.297
					(0.331)	(0.341)	(0.374)	(0.375)
Inst. Proportion of URM Instructors					0.419	0.326	0.449	0.353
					(0.558)	(0.560)	(0.614)	(0.618)
Total Degrees Awarded (in 1000s)							0.001	–0.004
							(0.007)	(0.08)
Economics Degrees Awarded in One Year		0.0004^{+}		0.0004		0.0003		0.0003
		(0.0002)		(0.0002)		(0.0002)		(0.0003)
Constant	0.493**	0.453**	0.440**	0.441**	0.561**	0.498**	0.568**	0.546**
	(0.050)	(0.055)	(0.058)	(0.061)	(0.149)	(0.156)	(0.172)	(0.172)
Regional Indicators	No	No	No	No	No	No	Yes	Yes
R^2	0.036	0.069	0.069	0.095	0.086	0.103	0.104	0.118
N	94	94	94	94	94	94	94	94

[1]*Relative Gender Diversity* is defined as proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.

Notes: All coefficients and standard errors rounded to three decimal places. Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A4. Relative URM Diversity and Role Modeling (Controlling for Size of Economics Department)

	Relative URM Diversity[1]							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dept. Proportion of Female Faculty	0.643^{+}	0.710^{+}	0.666^{+}	0.701^{+}	1.233**	1.232**	1.269**	1.270**
	(0.367)	(0.374)	(0.369)	(0.377)	(0.439)	(0.441)	(0.448)	(0.450)
Dept. Proportion of URM Faculty	–0.158	–0.218	–0.209	–0.238	–0.171	–0.168	–0.285	–0.271
	(0.561)	(0.566)	(0.561)	(0.566)	(0.583)	(0.588)	(0.600)	(0.602)
Female Speaker in the Last Year			–0.012	–0.010	–0.060	–0.060	–0.074	–0.080
			(0.139)	(0.140)	(0.140)	(0.141)	(0.145)	(0.145)
URM Speaker in the Last Year			0.187	0.170	0.147	0.149	0.162	0.188
			(0.121)	(0.127)	(0.123)	(0.127)	(0.129)	(0.133)
Inst. Proportion of Female Instructors					–2.166*	–2.178*	–1.560	–1.617
					(0.945)	(0.981)	(1.064)	(1.069)
Inst. Proportion of URM Instructors					0.462	0.470	0.169	0.350
					(1.687)	(1.707)	(1.826)	(1.845)
Total Degrees Awarded (in 1000s)							0.030	0.039
							(0.022)	(0.025)
Economics Degrees Awarded in One Year		0.0006		0.0004		0.0000		–0.0007
		(0.0007)		(0.0007)		(0.0007)		(0.0009)
Constant	0.621**	0.558**	0.535**	0.507**	1.383**	1.390**	1.034*	1.072*
	(0.150)	(0.164)	(0.174)	(0.183)	(0.424)	(0.449)	(0.492)	(0.495)
Regional Indicators	No	No	No	No	No	No	Yes	Yes
R^2	0.034	0.043	0.061	0.063	0.115	0.115	0.137	0.144
N	93	93	93	93	93	93	93	93

[1]*Relative Gender Diversity* is defined as proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.

Note: All coefficients and standard errors rounded to three decimal places except coefficients and standard errors for Economics Degrees Awarded in One Year (rounded to four decimal places). Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A5. Relative Diversity and Course Content (Controlling for Size of Economics Department)

	Relative Gender Diversity[1]				Relative URM Diversity[1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Course in Gender and Sexuality Studies Offered	0.084 (0.059)	0.093 (0.059)	0.070 (0.060)	0.078 (0.060)	–0.250 (0.165)	–0.245 (0.166)	–0.215 (0.164)	–0.212 (0.166)
Course in Postcolonial Theory Offered	–0.019 (0.060)	–0.006 (0.060)	–0.015 (0.060)	–0.001 (0.059)	0.050 (0.179)	0.058 (0.182)	0.047 (0.177)	0.053 (0.180)
Course in Antiracist Theory Offered	–0.040 (0.061)	–0.055 (0.061)	–0.036 (0.061)	–0.052 (0.061)	0.242 (0.180)	0.232 (0.183)	0.227 (0.178)	0.220 (0.182)
Some Economics Courses Implement Service-Learning			0.051 (0.042)	0.058 (0.041)			–0.212^{+} (0.124)	–0.211^{+} (0.125)
Economics Degrees Awarded in One Year		0.0004 (0.0002)		0.0004^{+} (0.0002)		0.0002 (0.0007)		0.0001 (0.0007)
Constant	0.568** (0.024)	0.539** (0.029)	0.551** (0.027)	0.519** (0.033)	0.838** (0.071)	0.822** (0.088)	0.902** (0.079)	0.891** (0.096)
R^2	0.022	0.051	0.039	0.071	0.033	0.034	0.064	0.065
N	94	94	94	94	93	93	93	93

[1]*Relative Gender Diversity* is defined as proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.

Note: All coefficients and standard errors rounded to three decimal places except coefficients and standard errors for Economics Degrees Awarded in One Year (rounded to four decimal places). Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A6. Relative Diversity and Active Learning Pedagogy (Controlling for Size of Economics Department)

	Relative Gender Diversity[1]				Relative URM Diversity[1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Use of In-Class Polling Questions	0.086^{+}	0.079^{+}			0.158	0.147		
	(0.045)	(0.047)			(0.140)	(0.146)		
Use of Flipped Classroom Teaching	–0.008	–0.008			–0.161	–0.161		
	(0.045)	(0.045)			(0.140)	(0.141)		
Some Classes Use Peer Instruction	–0.047	–0.046			–0.032	–0.030		
	(0.054)	(0.054)			(0.169)	(0.170)		
Some Classes Use Group Activities	0.204**	0.197**			0.080	0.069		
	(0.069)	(0.070)			(0.214)	(0.220)		
Active Learning: 25 to 50 Percent of Courses			–0.002	0.000			–0.099	–0.095
			(0.066)	(0.066)			(0.201)	(0.202)
Active Learning: 50 to 75 Percent of Courses			0.017	0.017			–0.006	–0.007
			(0.064)	(0.063)			(0.196)	(0.197)
Active Learning: 75+ Percent of Courses			0.053	0.054			–0.137	–0.135
			(0.061)	(0.061)			(0.185)	(0.186)
Economics Degrees Awarded in One Year		0.0001		0.0003		0.0002		0.0003
		(0.0002)		(0.0002)		(0.0007)		(0.0007)
Constant	0.372**	0.373**	0.554**	0.531**	0.785**	0.788**	0.905**	0.880**
	(0.078)	(0.079)	(0.051)	(0.053)	(0.245)	(0.247)	(0.158)	(0.167)
R^2	0.119	0.122	0.015	0.037	0.025	0.026	0.011	0.014
N	94	94	94	94	93	93	93	93

[1]*Relative Gender Diversity* is defined as proportion of female students in economics divided by the proportion of female students at the university. *Relative URM Diversity* is defined in the same manner, but for URM students.

Note: All coefficients and standard errors rounded to three decimal places except coefficients and standard errors for Economics Degrees Awarded in One Year (rounded to four decimal places). Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table A7. Regression: Relative Diversity and All Department Characteristics

	Relative Gender Diversity		Relative URM Diversity	
	(1)	(2)	(3)	(4)
A. Student Support				
Department-Level Tutoring Center	–0.003 (0.047)	–0.011 (0.050)	–0.047 (0.143)	–0.020 (0.051)
Economics Undergraduate Club	0.087 (0.076)	0.111 (0.079)	0.010 (0.227)	0.115 (0.078)
Clubs Directed at Underrepresented Groups	0.070 (0.050)	0.061 (0.052)	–0.002 (0.152)	0.037 (0.053)
Remedial Math Course	–0.074 (0.057)	–0.054 (0.062)	0.219 (0.170)	–0.021 (0.060)
Department-Level Mentoring Program	–0.018 (0.053)	–0.018 (0.058)	0.133 (0.164)	0.019 (0.060)
Core-Sequence Support Courses	–0.084 (0.061)	–0.086 (0.063)	–0.049 (0.182)	–0.067 (0.063)
Summer Bridge Programs	0.060 (0.071)	0.029 (0.079)	–0.191 (0.222)	0.013 (0.081)
B. Role Modeling				
Dept. Proportion of Female Faculty	0.350* (0.172)	0.395* (0.194)	1.369* (0.527)	0.449* (0.198)
Dept. Proportion of URM Faculty	0.125 (0.197)	0.339 (0.222)	–0.444 (0.686)	0.569* (0.250)
Female Speaker in the Last Year	0.055 (0.054)	0.039 (0.058)	–0.067 (0.166)	0.026 (0.059)
URM Speaker in the Last Year	–0.037 (0.051)	–0.044 (0.054)	0.234 (0.150)	–0.021 (0.052)
C. Course Content				
Course in Gender and Sexuality Studies Offered	–0.001 (0.067)	–0.004 (0.074)	–0.368^{+} (0.190)	0.040 (0.069)
Course in Postcolonial Theory Offered	0.034 (0.069)	0.055 (0.073)	0.051 (0.206)	0.008 (0.074)
Course in Antiracist Theory Offered	–0.014 (0.077)	–0.049 (0.090)	0.308 (0.220)	–0.128 (0.082)
Some Economics Courses Implement Service-Learning	0.125* (0.053)	0.122* (0.055)	–0.251 (0.157)	0.080 (0.054)
D. Active Learning Pedagogy				
Use of In-Class Polling Questions	0.100^{+} (0.056)	0.060 (0.062)	0.130 (0.163)	0.034 (0.060)
Use of Flipped Classroom Teaching	0.000 (0.052)	0.032 (0.059)	–0.158 (0.154)	0.022 (0.059)
Some Classes Use Peer Instruction	–0.086 (0.068)	–0.088 (0.070)	–0.085 (0.206)	–0.070 (0.071)
Some Classes Use Group Activities	0.090 (0.089)	0.083 (0.094)	0.074 (0.272)	0.082 (0.097)
	0.061	0.077	0.091	0.055

Active Learning: 25 to 50 Percent of Courses	(0.081)	(0.086)	(0.251)	(0.088)
Active Learning: 50 to 75 Percent of Courses	0.004 (0.077)	0.020 (0.084)	–0.031 (0.239)	–0.001 (0.087)
Active Learning: 75+ Percent of Courses	0.065 (0.076)	0.059 (0.080)	0.005 (0.244)	0.039 (0.087)
E. Institutional Characteristics				
Total Bachelor's Degrees Awarded (in 1000s)	0.001 (0.008)	–0.001 (0.013)	0.032 (0.026)	–0.003 (0.013)
Economics Degrees Awarded in One Year		–0.0001 (0.0004)		–0.0002 (0.0004)
Inst. Located in the South	–0.019 (0.073)	–0.062 (0.081)	–0.216 (0.219)	–0.089 (0.081)
Inst. Located in the Midwest	–0.075 (0.065)	–0.091 (0.072)	–0.016 (0.204)	–0.136^{+} (0.075)
Inst. Located in the West	–0.126^{+} (0.066)	–0.127^{+} (0.075)	0.076 (0.199)	–0.111 (0.074)
Inst. Proportion of Female Instructors	–0.634 (0.425)	–0.335 (0.472)	–0.986 (1.219)	0.215 (0.435)
Inst. Proportion of URM Instructors	0.837 (0.626)	0.558 (0.676)	–0.182 (1.961)	0.058 (0.694)
Carnegie Classification: Master's Colleges & Universities		–0.082 (0.070)		–0.145^{+} (0.074)
Carnegie Classification: Doctoral/Professional Universities		–0.036 (0.113)		–0.108 (0.114)
Carnegie Classification: R2		0.066 (0.095)		0.062 (0.097)
Carnegie Classification: R1		0.036 (0.127)		0.071 (0.127)
Public		–0.052 (0.058)		–0.060 (0.059)
Highest Econ-Associated Degree Offered: Master's		0.028 (0.080)		0.049 (0.080)
Highest Econ-Associated Degree Offered: PhD		0.058 (0.091)		0.063 (0.091)
Constant	0.468* (0.218)	0.367 (0.245)	0.758 (0.645)	0.179 (0.234)
R^2	0.317	0.383	0.289	0.442
N	94	94	93	93

Note: All coefficients and standard errors rounded to three decimal places except coefficients and standard errors for Economics Degrees Awarded in One Year (rounded to four decimal places). Standard errors in parentheses $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$