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Does Generosity Beget Generosity? Alumni Giving and Undergraduate Financial Aid

Online Appendix

Appendix Table A1 presents the summary statistics for the variables used in our econometric model. Table A2 combines the results for the probability of giving in Table 1 with the results for conditional amounts of giving in Table 2 in order to estimate the effects of the various forms of financial aid on the average amount of giving.

The remaining tables show the results when we augment our basic models with interactions of the financial aid variables with indicators for race, gender, and age, respectively. Table A3 shows the outcomes when we interact the financial aid variables with the indicators for race.¹ Consider the first panel, which shows the results for loans. We do not report the regression coefficients themselves. Rather, for each racial category, we show the sum of the main effect of a given loan variable and the coefficient on the interaction between the loan variable and the race dichotomous variable. In short, the figures show the total effects of each loan variable for the respective ethnic categories. The coefficient for an ethnic group is italicized if it is statistically different at the 5 percent level from the corresponding figure for whites. The bottom portion of the first panel shows the p-value of a test of the hypothesis that the interaction terms are jointly significant (for example, 0.110 for the probability of making a gift) and the p-value of a test of the hypothesis that the average marginal effects for each ethnic group are equal (0.001). The figures suggest, then, that these interactions do not jointly improve the explanatory power of the equation, but one can reject the hypothesis that the average marginal effects of loans are the same across ethnic groups. It is important to note that the figures in the table measure the total impact

¹ Because there are so few Native Americans in our sample, they are not included in this analysis.

of each financial aid variable on giving, including the estimate of the associated intercept. However, the average marginal effects recorded toward the bottom of the panel do not include the effect of the intercept, because they measure the impact of an incremental increase of a given type of aid rather than the leap from no aid to some aid. The next two panels report the same information for scholarships and campus jobs.

Table A4 reports the results for interactions by gender. Coefficients for men and older alumni that are significantly different from the corresponding coefficients for women and younger alumni, respectively, are italicized. Table A5 has the interactions with age. The indicator for age takes a value of one if, in a given year, the individual graduated 10 or more years ago, and zero otherwise, and is estimated for the sample of those who were out of college for at least 10 years. As noted in the text, there are generally (but not always) no statistically discernible differences by demographic group.

Table A1*
Variable Definitions and Summary Statistics

Variable	Description	Mean	Standard Deviation
TotalYear	Total giving for year (2009 dollars) conditional on making a gift	173.26	2753.20
Didgive	1 if any donation given in year	0.613	0.487
Loans	Total loan aid (2009 dollars) conditional on receiving loan aid	16,315	8,082
Any Loan Aid	Received any loan aid	0.444	0.497
Scholarships	Total scholarship aid (2009 dollars) conditional on receiving scholarship aid	66,405	43,130
Any Scholarship Aid	Received any scholarship aid	0.442	0.497
Campus Jobs	Total job aid (2009 dollars) conditional on receiving job aid	9,751	4,467
Any Job Aid	Received any job aid	0.404	0.491
Yearssince	Number of years since graduation	6.18	3.83
Yearssince2	Number of years since graduation, squared	52.87	57.21
Spouseisalum	1 if the spouse is an alumnus	0.151	0.358
Male	1 if the alumnus is male	0.543	0.498
<i>Race/Ethnicity</i>			
White	Omitted Category: 1 if the alumnus is White	0.743	0.437
Amerind	1 if the alumnus is a Native American	0.0045	0.0671
Black	1 if the alumnus is Black	0.0666	0.249
Hispanic	1 if the alumnus is Hispanic	0.0582	0.234
Asian	1 if the alumnus is Asian	0.127	0.333
<i>Secondary Schooling</i>			
Public	Omitted Category: 1 if the alumnus attended public school	0.557	0.497
Boarding	1 if the alumnus attended boarding school	0.128	0.334
Private	1 if the alumnus attended private school	0.314	0.464
School - Other	1 if the alumnus attended another type of school	0.0017	0.0415
SATmath	SAT math score. Scores prior to 1996 are adjusted to reflect re-centering of the scoring scale.	714	67.4

SATverbal	SAT verbal score. Scores prior to 1996 are adjusted to reflect re-centering of the scoring scale.	712	66.4
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<i>Admissions Office "Non-Academic" Ranking</i>			
A	Omitted Category: 1 if the alumnus received the highest non-academic ranking from the admissions office	0.0224	0.148
B	1 if the alumnus received the second highest non-academic ranking from the admissions office	0.193	0.395
C	1 if the alumnus received the third highest non-academic ranking from the admissions office	0.467	0.499
D	1 if the alumnus received the fourth highest non-academic ranking from the admissions office	0.299	0.458
E	1 if the alumnus received the fifth highest non-academic ranking from the admissions office	0.0192	0.137
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<i>Admissions Office "Academic" Ranking</i>			
A	Omitted Category: 1 if the alumnus received the highest academic ranking from the admissions office	0.228	0.419
B	1 if the alumnus received the second highest academic ranking from the admissions office	0.407	0.491
C	1 if the alumnus received the third highest academic ranking from the admissions office	0.217	0.412
D	1 if the alumnus received the fourth highest academic ranking from the admissions office	0.121	0.326
E	1 if the alumnus received the fifth highest academic ranking from the admissions office	0.0268	0.161
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Clubsport	1 if the alumnus played on a club team	0.130	0.337
Honors	1 if the alumnus graduated <i>magna, summa, or cum laude</i>	0.463	0.499
Greek	1 if the alumnus was a member of a fraternity or sorority	0.730	0.444
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Athlete	1 if the alumnus played a varsity sport	0.377	0.485
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<i>Major</i>			
Molbio	Omitted Category: 1 if the alumnus majored in molecular biology	0.0591	0.236
Small Social Science	1 if the alumnus majored in Anthropology, Urban Studies, or Sociology.	0.0375	0.190
English	1 if the alumnus majored in English	0.101	0.301
Economics	1 if the alumnus majored in Economics	0.0889	0.285
Public Policy	1 if the alumnus majored in Public Policy	0.0634	0.244

Political Science	1 if the alumnus majored in Political Science	0.0998	0.300
Psychology	1 if the alumnus majored in Psychology	0.0470	0.212
History	1 if the alumnus majored in History	0.110	0.313
MAE	1 if the alumnus majored in Mechanical/Aerospace Engineering	0.0348	0.183
EE/CS	1 if the alumnus majored in Electrical Engineering or Computer Science	0.0589	0.235
Arch & Civ	1 if the alumnus majored in Architecture or Civil Engineering	0.0565	0.231
Small Humanities	1 if the alumnus majored in Art, Art History, Classics, East Asian Studies, Linguistics, Music, Near Eastern Studies, Philosophy, Religion, or Languages and Literature departments	0.109	0.312
Small Engineering	1 if the alumnus majored in "Engineering", Operations Research and Financial Engineering, or Chemical Engineering	0.0321	0.176
Small Sciences	1 if the alumnus majored in Applied Mathematics, Astrophysics, Biochemistry, Biology, Chemistry, Ecology and Evolutionary Biology, Geology, Mathematics, Physics, or Statistics	0.102	0.302
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<i>Minor</i>			
No Minor	Omitted Category: 1 if the alumnus received no minor	0.682	0.466
African/African-American Studies	1 if the alumnus received a minor in African or African-American Studies	0.0221	0.147
American Studies	1 if the alumnus received a minor in American Studies	0.03004	0.171
Latin	1 if the alumnus received a minor in Latin	0.0078	0.0880
Finance	1 if the alumnus received a minor in Finance	0.0231	0.150
Theater	1 if the alumnus received a minor in Theater	0.0184	0.134
Public Policy	1 if the alumnus received a minor in Public Policy	0.0562	0.230
Other Engineering	1 if the alumnus received a minor in Architecture, Basic Engineering, Bioengineering, Electrical Engineering, Geological Engineering, Management, Materials Sciences, or Robotics.	0.0199	0.140
Other Sciences	1 if the alumnus received a minor in Applied and Computational Mathematics, Biophysics, Cognitive Studies, Environmental Studies, Science in Human Affairs, or Neuroscience.	0.0559	0.230
Other Humanities	1 if the alumnus received a minor in a humanities field	0.0966	0.295
Teaching	1 if the alumnus received a teaching certificate	0.0172	0.130
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Reunion	1 if the year after graduation is a multiple of 5	0.162	0.368
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<i>Post Baccalaureate Education</i>			
No Advanced	Omitted Category: 1 if the alumnus has no advanced degree	0.794	0.404
PhD	1 if the alumnus has a Ph.D. or equivalent degree	0.0387	0.183
Masters	1 if the alumnus has a masters	0.0619	0.241
JD	1 if the alumnus has a JD	0.0428	0.202
MD/DDS	1 if the alumnus has a medical degree	0.0411	0.198
MBA	1 if the alumnus has an MBA	0.0415	0.199

* These summary statistics are based on 137,699 observations between 1994 and 2009 of 13,831 alumni who graduated from 1993 to 2005. The unit of observation is the alumnus-year giving opportunity.

Table A2*
Effects on the Average Gift

	(1) Main Specification	(2) Including Field Variables	(3) Including 3-Digit ZIP Effects
Marginal Effect of Additional Loans	0.00515 (0.00491)	0.00590 (0.00606)	0.00654 (0.00473)
Effect of Any Loan Aid	-0.179** (0.0766)	-0.202** (0.0903)	-0.195** (0.0745)
Marginal Effect of Additional Scholarships	0.00214** (0.00107)	0.00135 (0.00118)	0.00210** (0.00104)
Effect of Any Scholarship Aid	-0.141* (0.0761)	-0.110 (0.0819)	-0.160** (0.0749)
Marginal Effect of Additional Job Aid	-0.0116 (0.00812)	-0.00963 (0.00878)	-0.0103 (0.00794)
Effect of Any Job Aid	-0.0258 (0.0837)	-0.0123 (0.0900)	-0.00117 (0.0823)
N	137,699	114,108	137,699

*Each column shows the marginal effect of additional aid of that type evaluated at the mean, as well as the effect of going from no aid of that type to a positive amount. These are unconditional effects; i.e., they take into account changes in both the probability of making a gift and the size of the gift, conditional on giving. The aid amounts are in thousands of dollars. Column (2) includes indicator variables for the field in which the individual works, and column (3) includes indicator variables for the individual's ZIP code. Each regression includes on the right hand side the variables listed in Table A1 as well as class effects, location effects and time effects. Standard errors are in parentheses. Coefficients significant at the 5 percent level are marked with **, while those significant at the 10 percent level are marked with *.

Table A3*
Race and the Effects of Financial Aid

		(1) Probability of Making a Gift	(2) Log Amount Conditional on Giving	(3) Probability of Being a Class Leader
Loans				
	Linear	0.00514** (0.00199)	-0.00840 (0.00630)	-0.00151 (0.00127)
White	Quadratic	-0.000179** (5.15x10 ⁻⁵)	0.000197 (0.000171)	2.27x10 ⁻⁵ (3.55x10 ⁻⁵)
	Indicator	-0.0465** (0.0212)	-0.0369 (0.0641)	-0.00501 (0.0128)
	Linear	-0.0109* (0.00579)	0.00648 (0.0149)	-0.00245 (0.00243)
Black	Quadratic	0.000122 (0.000138)	-0.000254 (0.000376)	2.98x10 ⁻⁵ (5.58x10 ⁻⁵)
	Indicator	0.0692 (0.0634)	-0.202 (0.145)	0.00868 (0.0266)
	Linear	0.00910 (0.00597)	-0.0123 (0.0154)	0.00131 (0.00303)
Hispanic	Quadratic	-0.000209 (0.000156)	9.92x10 ⁻⁵ (0.000430)	-3.27x10 ⁻⁵ (9.10x10 ⁻⁵)
	Indicator	-0.0793 (0.0654)	0.243 (0.156)	0.0219 (0.0331)
	Linear	0.00331 (0.00549)	0.0168 (0.0189)	0.00402 (0.00312)
Asian	Quadratic	-8.98x10 ⁻⁵ (0.000166)	-0.000627 (0.000640)	-0.000143 (0.000105)
	Indicator	-0.0214 (0.0451)	-0.210 (0.132)	-0.0408* (0.0228)
p-Value for Joint Significance of All Interaction Coefficients		0.110	0.433	0.365
p-Value for Equality of Average Marginal Effects		0.001	0.431	0.181

Scholarships				
White	Linear	0.000958* (0.000503)	0.00266* (0.00146)	0.000262 (0.000272)
	Quadratic	-6.99x10 ⁻⁶ ** (3.31x10 ⁻⁶)	-1.84x10 ⁻⁵ * (9.96x10 ⁻⁶)	-2.00x10 ⁻⁶ (1.76x10 ⁻⁶)
	Indicator	-0.00531 (0.0219)	-0.227** (0.0618)	-0.0325** (0.0127)
Black	Linear	0.00232* (0.00127)	0.00176 (0.00305)	0.000763 (0.000438)
	Quadratic	-1.46x10 ⁻⁵ ** (7.09x10 ⁻⁶)	2.43x10 ⁻⁶ (1.71x10 ⁻⁵)	-3.96x10 ⁻⁶ (2.57x10 ⁻⁶)
	Indicator	-0.0524 (0.0711)	-0.156 (0.169)	-0.000456 (0.0247)
Hispanic	Linear	-0.00271** (0.00129)	0.00378 (0.00342)	0.000508 (0.000614)
	Quadratic	1.61x10 ⁻⁵ ** (7.37x10 ⁻⁶)	-1.97x10 ⁻⁵ (1.97x10 ⁻⁵)	-1.08x10 ⁻⁶ (3.36x10 ⁻⁶)
	Indicator	0.0998 (0.0672)	-0.204 (0.165)	-0.0806** (0.0316)
Asian	Linear	0.000287 (0.00100)	0.00116 (0.00262)	0.000844 (0.000462)
	Quadratic	-3.76x10 ⁻⁷ (6.13x10 ⁻⁶)	8.85x10 ⁻⁶ (1.61x10 ⁻⁵)	-2.51x10 ⁻⁶ (2.96x10 ⁻⁶)
	Indicator	-0.0158 (0.0433)	-0.00777 (0.0955)	-0.0194 (0.0158)
p-Value for Joint Significance of All Interaction Coefficients		0.162	0.005	0.010
p-Value for Equality of Average Marginal Effects		0.143	0.987	0.423

Campus Jobs				
White	Linear	-0.00738** (0.00288)	-0.000784 (0.00784)	-0.000411 (0.00184)
	Quadratic	0.000447** (0.000100)	-0.000133 (0.000251)	0.0000278 (0.0000734)
	Indicator	-0.0219 (0.0228)	0.0186 (0.0643)	-0.00953 (0.0140)
Black	Linear	-0.00154 (0.00707)	0.0102 (0.0166)	-0.000141 (0.00276)
	Quadratic	0.000262 (0.000243)	-0.000374 (0.000558)	3.21x10 ⁻⁵ (0.000107)
	Indicator	0.0593 (0.0657)	-0.0471 (0.149)	-0.00445 (0.0235)
Hispanic	Linear	-0.00255 (0.0122)	-0.0312 (0.0226)	-0.00110 (0.00522)
	Quadratic	0.000273 (0.000501)	0.000786 (0.000752)	-1.89x10 ⁻⁵ (0.000183)
	Indicator	-0.00839 (0.0794)	0.0731 (0.182)	-0.00834 (0.0370)
Asian	Linear	-0.00152 (0.00823)	-0.00351 (0.0270)	-0.00219 (0.00515)
	Quadratic	3.73x10 ⁻⁵ (0.000363)	-8.00x10 ⁻⁵ (0.00132)	6.58x10 ⁻⁵ (0.000281)
	Indicator	0.0213 (0.0527)	0.00443 (0.139)	0.0112 (0.0241)
p-Value for Joint Significance of All Interaction Coefficients		0.430	0.972	0.979
p-Value for Equality of Average Marginal Effects		0.421	0.520	0.906

*This table shows, for each racial category, the sum of the main effect of a given financial aid variable and the coefficient on the interaction between the financial aid variable and the race dichotomous variable. Aid amounts are in thousands of dollars. Coefficients for each race that are significantly different from the corresponding coefficient for whites are italicized. Coefficients significant at the 5 percent level are marked with **, while those significant at the 10 percent level are marked with *.

Table A4*
Gender and the Effects of Financial Aid

		(1) Probability of Making a Gift	(2) Log Amount Conditional on Giving	(3) Probability of Being a Class Leader
Loans				
Female	Linear	0.00211 (0.00264)	-0.00623 (0.00777)	-0.000624 (0.00151)
	Quadratic	-0.000117 (7.14x10 ⁻⁵)	0.000107 (0.000219)	7.41x10 ⁻⁶ (4.44x10 ⁻⁵)
	Indicator	-0.0277** (0.0260)	0.0209 (0.0692)	-3.15x10 ⁻⁵ (0.0136)
Male	Linear	0.00552** (0.00217)	-0.000542 (0.00691)	-0.000849 (0.00131)
	Quadratic	-0.000180** (5.48x10 ⁻⁵)	-5.06x10 ⁻⁵ (0.0001871)	-8.20x10 ⁻⁷ (3.47x10 ⁻⁵)
	Indicator	-0.0430* (0.0235)	-0.148* (0.0741)	-0.0167 (0.0142)
p-Value for Joint Significance of All Interaction Coefficients		0.579	0.168	0.254
p-Value for Equality of Average Marginal Effects		0.284	0.602	0.786
Scholarships				
Female	Linear	0.00156** (0.000548)	3.20x10 ⁻⁵ (0.00137)	0.000367 (0.000237)
	Quadratic	-8.59x10 ⁻⁶ ** (3.42x10 ⁻⁶)	5.93x10 ⁻⁶ (8.89x10 ⁻⁶)	-9.82x10 ⁻⁷ (1.45x10 ⁻⁶)
	Indicator	-0.0229 (0.0262)	-0.228** (0.0635)	-0.0493** (0.0117)
Male	Linear	-0.000413 (0.000544)	0.00297 (0.00163)	0.000362 (0.000313)
	Quadratic	1.95x10 ⁻⁶ (3.38x10 ⁻⁶)	-1.41x10 ⁻⁵ (1.03x10 ⁻⁵)	-1.83x10 ⁻⁶ (1.94x10 ⁻⁶)
	Indicator	0.00890 (0.0248)	-0.150** (0.0728)	-0.0184 (0.0147)
p-Value for Joint Significance of All Interaction Coefficients		0.042	0.145	0.223
p-Value for Equality of Average Marginal Effects		0.007	0.200	0.837

Campus Jobs				
Female	Linear	-0.00919** (0.00343)	-0.00735 (0.00794)	-0.00169 (0.00172)
	Quadratic	0.000504** (0.000124)	-0.000104 (0.000198)	3.79x10 ⁻⁵ (5.68x10 ⁻⁵)
	Indicator	-0.00938 (0.0275)	-0.00939 (0.0275)	0.00519 (0.0140)
Male	Linear	-0.00174 (0.00375)	0.00381 (0.0114)	0.000251 (0.00242)
	Quadratic	0.000229 (0.000146)	-0.000130 (0.000455)	1.27x10 ⁻⁵ (0.000105)
	Indicator	-0.0114 (0.0270)	-0.0378 (0.0792)	-0.0155 (0.0162)
p-Value for Joint Significance of All Interaction Coefficients		0.297	0.385	0.677
p-Value for Equality of Average Marginal Effects		0.159	0.309	0.414

*This table shows, for each gender, the sum of the main effect of a given financial aid variable and the coefficient on the interaction between the financial aid variable and the gender dichotomous variable. Aid amounts are in thousands of dollars. Coefficients for men that are significantly different from the corresponding coefficient for women are italicized. Coefficients significant at the 5 percent level are marked with **, while those significant at the 10 percent level are marked with *.

Table A5*
Age and the Effects of Financial Aid

		(1) Probability of Making a Gift	(2) Log Amount Conditional on Giving	(3) Probability of Being a Class Leader
Loans				
	Linear	0.00456* (0.00234)	-0.00545 (0.00694)	-0.00205 (0.00150)
Younger	Quadratic	-0.000155** (5.58x10 ⁻⁵)	2.69x10 ⁻⁵ (0.000178)	2.23x10 ⁻⁵ (4.03x10 ⁻⁵)
	Indicator	-0.0495* (0.0256)	-0.0675 (0.0737)	-0.00218 (0.0149)
	Linear	0.00303 (0.00308)	-0.00457 (0.0120)	-0.000394 (0.00163)
Older	Quadratic	-0.000135* (7.52x10 ⁻⁵)	0.000136 (0.000314)	1.28x10 ⁻⁶ (4.03x10 ⁻⁵)
	Indicator	-0.0137 (0.0336)	-0.0318 (0.125)	-0.00865 (0.0196)
p-Value for Joint Significance of Interaction Coefficients		0.505	0.341	0.270
p-Value for Equality of Average Marginal Effects		0.537	0.730	0.203
Scholarships				
	Linear	0.000562 (0.000584)	0.00117 (0.00155)	0.000458 (0.000296)
Younger	Quadratic	-4.15x10 ⁻⁶ (4.08x10 ⁻⁶)	-3.21x10 ⁻⁶ (1.14x10 ⁻⁵)	-2.38x10 ⁻⁶ (2.08x10 ⁻⁶)
	Indicator	-0.00577 (0.0237)	-0.108* (0.0595)	-0.0296** (0.0125)
	Linear	0.000535 (0.000761)	0.00130 (0.00285)	0.000319 (0.000426)
Older	Quadratic	-6.42x10 ⁻⁶ (5.34x10 ⁻⁶)	2.13x10 ⁻⁶ (2.10x10 ⁻⁵)	-1.08x10 ⁻⁶ (3.00x10 ⁻⁶)
	Indicator	0.0147 (0.0312)	-0.248** (0.105)	-0.0278 (0.0179)
p-Value for Joint Significance of Interaction Coefficients		0.210	0.254	0.947
p-Value for Equality of Average Marginal Effects		0.770	0.820	0.802

Campus Jobs				
Younger	Linear	-0.00326 (0.00325)	-5.49×10^{-5} (0.00848)	-0.000391 (0.00188)
	Quadratic	0.000295** (0.000107)	-1.88×10^{-5} (0.000272)	3.79×10^{-5} (7.09×10^{-5})
	Indicator	-0.0211 (0.0250)	0.000377 (0.0642)	-0.00163 (0.0138)
Older	Linear	-0.00689 (0.00422)	-0.00685 (0.0137)	-0.000715 (0.00244)
	Quadratic	0.000516** (0.000139)	-0.000231 (0.000361)	-1.41×10^{-5} (7.65×10^{-5})
	Indicator	0.0153 (0.0323)	0.0619 (0.115)	-0.00207 (0.0200)
p-Value for Joint Significance of Interaction Coefficients		0.177	0.081	0.167
p-Value for Equality of Average Marginal Effects		0.491	0.387	0.648

*This table shows, for each age category (graduated more than ten years ago and graduated less than ten years ago), the sum of the main effect of a given financial aid variable and the coefficient on the interaction between the financial aid variable and the age dichotomous variable. Aid amounts are in thousands of dollars. Coefficients for older alumni that are significantly different from the corresponding coefficient for younger alumni are italicized. Coefficients significant at the 5 percent level are marked with **, while those significant at the 10 percent level are marked with *.