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Family Bonding with Universities

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Abstract One justification offered for legacy admissions policies at universities is that that they bind entire families to the university. Proponents maintain that these policies have a number of benefits, including increased donations from members of these families. We use a rich set of data from an anonymous selective research institution to investigate which types of family members have the most important effect upon donative behavior. We find that the effects of attendance by members of the younger generation (children, children-in-law, nieces and nephews) are greater than the effects of attendance by the older generations (parents, parents-in-law, aunts and uncles). Previous research has indicated that, in a variety of contexts, men and women differ in their altruistic behavior. However, we find that there are no statistically discernible differences between men and women in the way their donations depends on the alumni status of various types of relatives. Neither does the gender of the various types of relatives who attended the university seem to matter. Thus, for example, the impact of having a son attend the university is no different from the effect of a daughter.

Keywords Altruism · Alumni · Universities · Family · Donations · Legacies

Introduction

It is well-known that some universities give preferences to the children of alumni in the admissions process. In recent years, this practice has become increasingly controversial. The Economist (2004), for example, called these legacy preferences "the biggest insult to meritocracy." Two recent books, (Golden 2006; Karabel 2005), documented the history of these preferences and offered strong condemnations. Articles published on the subject

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carry provocative titles like, "The Real Affirmative Action Babies" (Lamb 1993) and "So Your Dad Went to Harvard: Now What About the Lower Board Scores of White Legacies?" (Megalli 1995). The implication is clear: legacy preferences displace minority or low-income students. Despite the heated rhetoric, it is unclear whether this is a quantitatively important phenomenon. For example, simulations by Espenshade and Chung (2005) suggests that the actual number of minority students displaced by legacy (and athlete) preferences at elite colleges is small.

Empirical research in this area has generally focused on the academic performance of legacy students (Martin and Spenner 2009), the impact of legacy preferences on the composition of the student body, and their implications for fairness (Howell and Turner 2004). An interesting aspect of legacy preferences that has not received much attention is that, while these preferences are mostly aimed at the children of alumni, "most U.S. universities give at least some degree of preference to graduates' [other] relatives, sometimes even a little to grandchildren, siblings, and nieces or nephews" (Golden et al. 2003) Many universities are quite open about the practice, and defend it in part because it helps bind entire families to their institutions. The President of the University of Pennsylvania, Amy Gutmann, articulated this view clearly: "We're proactive about it because the alumni are an important part of the mix that sustains us over time," Gutmann said. "Our alumni are loyal to us, and we are loyal in return." Gutmann was also careful to point out that legacy students must meet Penn's academic standards: "No one gets a free pass" (Heintz 2007).

Other university officials are less circumspect than Gutmann when it comes to the financial implications of family loyalty. The Dean of Admissions at the University of Pennsylvania observed, "It fosters more loyalty to Penn, keeps an ongoing interest in Penn among family members, helps us in our efforts to raise money and continues to create a wonderful family atmosphere" (Heintz 2007). In a similar vein, a member of the Rice University public relations staff said, "Any development professional will testify that a family's financial commitment is likely to grow with additional members' and generations' common affiliation" (Thomas and Shepard 2003). Sheldon Steinbach, general counsel of the American Council on Education, went as far as to say that "without legacy preference, there would be a significant decrease in giving from a core body of traditional support—families in which at least a second generation has gone to the institution" (Golden et al. 2003).

Are these financial benefits real? Alumni do increase their giving when their children approach college age, and increase their giving yet more when their children are admitted (Meer and Rosen 2009a). But the claims that legacy admissions bond entire families to a university go well beyond this, with giving affected by the alumni status of other relatives as well. Whether such a phenomenon actually exists has not received much exploration. Howell and Turner (2004) mention in passing that models of gift exchange imply that "legacies… make gifts to universities in exchange for having been favored in the admissions process." This comment implies that alumni whose parents attended their school may donate more than those whose parents did not, although their data do not allow them to explore this conjecture. Lara and Johnson (2008) and Holmes (2009) each examine donative behavior at small liberal arts schools, and include as an explanatory variable the number of relatives who attended the college. Both find that, other things being the same, the probability of making a gift increases with the number of relatives who attended the college, as does the amount of the gift, conditional on giving. While useful, this finding leaves open an important question: Do some family relationships matter more than others? In particular, are the impacts greatest when the family member is from an earlier

generation (such as a parent, aunt or uncle, or grandparent), the current generation (a sibling or cousin), or from the succeeding generation (a child, niece, or nephew)?

This paper uses a unique data set to estimate how alumni contributions to a selective research university are affected by the alumni status of the members of their family. The proprietary data provided by this university, henceforth referred to as Anon U, contain detailed information about donations made by alumni as well as a variety of their economic and demographic characteristics. In particular, we know all members of the alumnus's family who attended Anon U, including in-laws. The "Data and Econometric Framework" section describes the data and econometric framework. The results are presented in the "Results" section. We find that the type of relative who attended the university has a strong effect on an alumnus or alumna's giving behavior, *ceteris paribus*. In particular, the effects of attendance by members of the younger generation (children, children-in-law, nieces and nephews) are greater than the effects of attendance by the older generations (parents, parents-in-law, aunts and uncles). The "Alternative Specifications" section discusses the sensitivity of the results to alternative specifications of the model. The results are robust to the exclusion of outliers and do not differ for male and female alumni. The "Summary and Conclusions" section concludes with a summary and suggestions for future research.

Data and Econometric Framework

Data

Our primary data source is the administrative archives of Anon U's Development Office, which contain information on all alumni donations from 1983 to 2007. The data are proprietary and sensitive, and individuals' names were stripped from the records before being made available to us. Each individual has his or her relatives' identification numbers and relation types listed.

Our unit of observation is a yearly giving opportunity. For example, if an individual has been an alumna for 5 years, she accounts for 5 giving opportunities in our analysis, starting in the first fiscal year after graduation. Multiple gifts for the same purpose in the same year are summed together. The Development Office data also include information on academic major, the alumnus's undergraduate extracurricular activities, post graduate education, occupation, residence, and whether he or she is married to another graduate of Anon U. Anon U's Registrar supplemented these data with information on SAT scores, academic honors, ethnicity, type of high school, summary evaluations made by the Admissions Office during the application process, and grade point average. The Registrar's data are available only for the classes of 1972–2005, so we restrict our analysis to this group of individuals.

As noted above, previous research has documented that the presence of a family member who attended a university increases an alumnus's giving to that institution. This is true in our data as well. For example, among alumni with family members who attended Anon U, the proportion who make a gift in a given year is 0.635**,** while for those who did not, it is 0.507**.** The conditional mean donation is $1114 for those who had a family member attend, and $837 for those who did not. These tendencies continue to be present even after taking into account other variables that might affect giving.[1] Our focus,

[1] In regressions that include the right hand side variables listed in Table 1, the marginal effect of a relative who attended Anon U on the probability of making a donation is 0.101 (SE = 0.0043) and the proportional effect on the amount given, conditional on making a gift, is 0.0429 (SE = 0.0139).

Table 1 Summary statistics

Variable	Mean	SD
Whether gave	0.639	0.480
Total giving in a year, conditional on making a gift	1,114	27,738
Spouse	0.346	0.476
Sibling	0.411	0.492
Sibling-in-law	0.109	0.312
Cousin	0.138	0.345
Child	0.0120	0.109
Child-in-law	0.0284	0.166
Niece/nephew	0.00958	0.0974
Parent	0.380	0.486
Parent-in-law	0.0651	0.247
Aunt/uncle	0.149	0.356
Grandfather	0.0899	0.286
Great-uncle	0.0382	0.192
Other in-law	0.0334	0.180

Other variables included on the right hand side of the basic specification are: years since graduation and its square; an indicator for reunion year (multiples of 5 since graduation); race; gender; type of high school; academic and non-academic rating by the admissions department; SAT scores; participation in varsity and club athletics while at Anon U; college GPA; receipt of academic honors; membership in social organizations; academic major and minor; receipt of an athletic, academic, department, or service award from the university; receipt of a graduate scholarship; receipt of an advanced degree such as a masters, M.B.A., J.D., M.D., or Ph.D.; state and foreign country indicators; year effects; and graduating class year effects. Full summary statistics and variable definitions are available on request. There are 212,538 observations

however, is not on the effect of having some relative(s) who attended the university, but on the comparative impacts of different types of family relationships. Therefore, our analysis sample includes only alumni who had at least one family member who attended Anon U.[2] This gives us 222,838 observations, representing 13,170 alumni. We delete 10,300 observations because of missing or unreliable data on covariates. This leaves 212,538 observations on 12,646 alumni. As indicated at the top of Table 1, of these observations, the proportion associated with a gift is 0.639 (SD = 0.480), and the mean gift conditional on making a gift is \$1,114 (SD = \$27,738).

An immediate issue is how to characterize the extent to which an alumnus's family is connected with Anon U. One possibility is simply to add up the number of family members who have attended, but this does not allow us to distinguish among the effects of different types of family relationships. We instead include a series of dichotomous variables each of which takes a value of one if the alumnus had a relative in that category who attended Anon U: spouse, sibling, child, parent, cousin, aunt or uncle, great-uncle, grandfather, niece or nephew, parent-in-law, sibling-in-law, or another in-law.[3] An individual is

[2] More technically, if alumni without relatives were in the sample, then the reference group for each relation would consist of those with no alumni relatives at all and those with some other type of relative. It would be difficult to interpret such results.

[3] Anon U began did not begin admitting women until the 1960s. Consequently, we have grandfathers and great-uncles in our sample, but no grandmothers or great-aunts. The "other in-law" category is relatively small and includes cousins, grandparents, aunts and uncles, and nieces and nephews-in-law.

characterized as having a given type of relative when the relative matriculates at Anon U, rather than when he or she graduates, and relatives are drawn from members of all graduating classes between 1900 and 2012.[4] The means of these dichotomous variables are reported in Table 1.

Conditional on having any relative who attended Anon U, the mean number of relatives is 2.2. Conditional on having a relative of a given type who attended Anon U, the modal number of relatives of that type is one. For example, of the alumni whose siblings attended Anon U, 81% of them had only one sibling who did so. The comparable figures for children-in-law and siblings-in-law were 85 and 83%, respectively.[5]

Econometric Specification

Previous empirical work on the determinants of giving suggests that variables can have different effects on the decision whether or not to donate—the extensive margin—than on the decision how much to donate, conditional on making a gift—the intensive margin.[6] A statistical model that allows for this possibility is therefore needed. We assume that each alumnus first chooses whether or not to make a gift and then, conditional on making a gift, decides how much to donate. Following Huck and Rasul (2007), a natural specification is a hurdle model. In our context, the first step in the implementation of the hurdle model is to estimate a probit for whether or not the individual makes a gift. The second step is to use ordinary least squares on the positive observations to analyze the decision about how much to give.[7] An assumption is needed to make causal inferences from the second-stage estimates, namely, that the second stage is conditionally independent of the first. We discuss this further below.

It is straightforward to use the estimates from these two steps to calculate unconditional marginal effects on the mean level of giving; this allows us to characterize the effect of family relationships on giving taking into account both the impacts on the intensive and extensive margins.[8] We correct for correlation among the error terms for any given individual with a clustering procedure in both the probit and OLS models. We also clustered on families rather than individuals and found that this had only a negligible effect on the standard errors.

An alternative two-step procedure, suggested by Heckman (1979), can also be used to estimate the amount of giving, conditional on it being positive. Heckman's model augments the OLS equation in the second stage with the inverse Mills ratio. There is some

[4] Our data indicate whether an individual was ever married to a fellow alumnus of Anon U, but information about when the marriage took place is spotty In effect, then, the spouse and in-law variables measure whether the individual ever had that type of relative. The "Alternative Specifications" section shows that it is unlikely that this limitation in the data affects our substantive results.

[5] Not surprisingly, then, when we estimated a model in which each variable was the number of relatives in each category, we found that there was little difference in our substantive results.

[6] Thus, for example, it would not be appropriate to use a Tobit model, which imposes the constraint that the marginal effect of a given variable on the probability of giving and the marginal effect on the amount given are the same up to a constant of proportionality.

[7] More precisely, this is the complete dominance hurdle model. See the Appendix for further details on the derivation of the empirical model.

[8] Denote the amount of giving as Y, and the vector of right hand side variables as X. Then the first stage of the estimation gives results for $\Pr[Y > 0|X]$ and the second stage gives $E[Y|X,Y > 0]$. The unconditional value of giving, $E[Y|X]$, is $\Pr[Y > 0|X]*E[Y|X,Y > 0]$. The marginal effects, $\partial E[Y|X]/\partial X$, are straightforward to compute, and standard errors are obtained using the delta method.

controversy in the literature with respect to which estimator is superior (Leung and Yu 1996); hence, a sensible approach is to estimate the model both ways. We show below that our substantive results are essentially unchanged when we use Heckman's method.

As is typically the case, a few relatively large gifts account for a disproportionate amount of Anon U's donations. For example, in our analysis sample, the top 1% of gifts in 2007 accounted for 81.6% of total giving. These large gifts are critical to the university, so it is important to determine whether family bonding affects the likelihood of such gifts. We therefore also use a probit model to estimate the probability that the alumnus is a "class leader" in a given year, where a class leader is defined as an individual who donated an amount greater than or equal to the 90th percentile of gifts in his or her class.

In addition to the family relationship variables in Table 1, we include on the right hand side a series of variables about each alumnus that has been shown in previous studies to exert an important influence on alumni giving (Cunningham and Cochi-Ficano 2002; Shulman and Bowen 2001; Lara and Daniel 2008; Holmes 2009). These include years since graduation, gender, ethnicity, SAT scores, ranking of the candidate by the admissions office when they applied to Anon U, course of study, and post-baccalaureate education. The literature also shows that alumni giving is heavily influenced by the affinity that they develop for their schools as undergraduates. Participation in varsity sports and membership in fraternities are two ways in which such affinities develop (Clotfelter 2001; Monks 2003); we include variables relating to these activities. The model also includes time effects, class effects, and location effects. The year effects reflect the impacts of the business cycle, the stock market, and so on.[9] The year effects also account for the size of Anon U's fund-raising staff and the amount of its fundraising expenditures, which vary from year to year. The class effects control for common influences on alumni in the same class, such as the political milieu when they were undergraduates, the presence of certain professors or administrators, and so on.

A final econometric issue relates to the fact that our data contain a few very large outliers. For example, there are 12 gifts greater than $1 million in our sample. To address this issue, we use the logarithm of the amount of giving on the left hand side of the OLS equation. As an additional check to make sure that outliers are not driving our results, we estimate the OLS equation with the top 1% of the observations eliminated. As shown below, the substantive results with respect to the impact of different types of relatives are not affected.

Results

Column (1) of Table 2 shows the marginal effects of the family relationship variables on the probability of making a gift. The numbers in parentheses are standard errors. In addition to the variables listed in the table, the models include the other right hand side variables mentioned in the previous section, which are suppressed for brevity.

The first entry in this column indicates that alumni with a spouse who attended Anon U are 12.3% points more likely to make a gift in a given year than those who did not. The next bank of estimates considers relatives who are in the same generation as the alumnus—siblings, siblings-in-law, and cousins. The magnitudes of the coefficients are small and one cannot reject the hypothesis that they are zero. Thus, the attendance of relatives in the same

[9] Bristol (1991) emphasizes the role of the stock market and Ehrenberg and Smith 2003 document the importance of macroeconomic conditions.

Table 2 Basic model

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving	(4) Probability of being a class leader Probit model
Spouse	0.123**	−0.110**	0.475**	0.0110**
	(0.00745)	(0.0262)	(0.0390)	(0.00514)
Sibling	−0.00261	0.0612**	0.0282	0.0101**
	(0.00692)	(0.0235)	(0.0370)	(0.00449)
Sibling-in-law	0.00935	0.0150	0.0516	0.00507
	(0.0106)	(0.0386)	(0.0570)	(0.00694)
Cousin	0.00506	0.0441	0.0515	0.00792
	(0.0107)	(0.0380)	(0.0572)	(0.00690)
Child	0.129**	0.476**	0.948**	0.0982**
	(0.0208)	(0.091)	(0.131)	(0.0184)
Child-in-law	0.0399**	0.130**	0.263**	0.0308**
	(0.0172)	(0.0590)	(0.0938)	(0.0119)
Niece/nephew	0.0744**	0.111	0.399**	0.0470**
	(0.0246)	(0.117)	(0.149)	(0.0199)
Parent	0.0171**	−0.0555**	0.0397	−0.00633
	(0.00794)	(0.0275)	(0.0421)	(0.00511)
Parent-in-law	0.0365**	0.0673	0.209**	0.0160*
	(0.0137)	(0.0465)	(0.0739)	(0.00912)
Aunt/uncle	0.0275**	0.0815**	0.177**	0.0139**
	(0.0106)	(0.0372)	(0.0579)	(0.00712)
Grandfather	0.00728	0.0142	0.0418	0.00066
	(0.0133)	(0.0472)	(0.0712)	(0.00827)
Great-uncle	−0.00813	0.0440	−0.00791	0.0158
	(0.0181)	(0.0650)	(0.0977)	(0.0120)
Other in-law	0.0442**	0.0947	0.263**	0.0374**
	(0.0184)	(0.0691)	(0.104)	(0.0134)

Column (1) shows the incremental effects on the probability of making a gift in a given year, based on a probit model and using 212,538 observations. Column (2) shows the incremental effects on the amount of the gift, conditional on making a gift, using ordinary least squares and using observations with a positive gift, a total of 135,783 observations. Column (3) combines these, and shows the marginal effects on total giving. Column (4) shows the incremental effect of being a "class leader" in a given year, where a class leader is defined as an individual who donated an amount greater than or equal to the 90th percentile of gifts in his or her class**.** The figures in parentheses are standard errors. Coefficients that are statistically significant at the 5% level are marked with **; those significant at the 10% level are marked with *. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the footnote of Table 1. Full results are available on request

generation at Anon U does not affect the probability of making a gift. The next set of figures looks at the impact of relatives in the succeeding generation. Here the findings are rather different. If one's child attended Anon U, the probability of making a gift increases by 12.9% points, a child-in-law increases it by 3.99% points, and a niece or nephew increases it by 7.4% points. The notion that alumni are more likely to make a donation when their children are accepted by their alma mater is widely believed among fundraisers and has been documented in previous work (Meer and Rosen 2009a). The novel finding here is that other relatives in the next generation also affect giving, and the pattern of the point estimates seems to make sense—the matriculation of one's own child has a bigger impact than either nieces and nephews or children-in-law.

The next set of estimates examines the impact of relatives in the preceding generation. Having a parent, parent-in-law or aunt/uncle who attended Anon U increases the likelihood of giving, but the effects are not as large as for relatives in the succeeding generation. The point estimates, which are between 1.7 and 3.7% points, are fairly close to each other. The next set of numbers, which shows the estimates for grandfathers and great-uncles, indicates that as we move another generation earlier the effect on the probability of giving becomes so attenuated that it is statistically not discernible from zero. Finally, the "other in-law" estimate indicates that having some other in-law relative increases the probability of giving by 4.4% points. This fairly large estimate is difficult to interpret, though, as it represents a relatively small number of positive observations and a mix of different relative types.

Taken together, the results in Column (1) suggest that there is something to the family bonding view described at the outset. The kinds of family members who attended this institution do affect the likelihood that an alumnus will make a gift. In this context, we think that the substantial effects for members of the preceding generation are particularly noteworthy. Unlike the case of one's own children, it is highly unlikely that that giving to Anon U reflects gratitude for the fact that they were accepted to the university. Hence, this finding makes the existence of family bonding particularly compelling.

Column (2) shows OLS estimates of the amount given, conditional on making a gift. To interpret the negative coefficient on the spouse variable, note that half the value of gifts from married alumni are credited to each individual. Thus, our finding implies that married couples jointly choose to give less, conditional on giving, even as the results in column (1) show that they are substantially more likely to make a gift. We conjecture that this finding arises because a gift to Anon U has public good aspects for couples. Specifically, suppose that a gift generates a "warm glow" that is nonrival and nonexcludable. In that case, each spouse derives utility from the other spouse's gift, and the couple gives less jointly than they would have if they were unmarried. Having a sibling who attended Anon U raises the conditional amount given by about 6.1%; otherwise, relatives in the same generation have no statistically significant impact on the amount given.[10] In the succeeding generation, a child who attended is associated with about a 48% increase in giving; a child-in-law with a 13% increase. The estimate for nieces and nephews is positive, but not statistically significant. In the preceding generation, the point estimates for parents-in-law and aunts/uncles are positive and relatively close in magnitude, 6.7 and 8.2%, respectively. The negative coefficient on the parent variable is not easy to interpret. It might indicate that there is some kind of substitution of giving between generations of the nuclear family, but we cannot be sure. As was the case for the probability of giving, having grandfathers and great-uncles who attended Anon U exerts no statistically discernible impact on the amount an alumnus donates.

Column (3) combines the estimates in Columns (1) and (2) to calculate the overall effect on the unconditional mean of giving. Unsurprisingly, we find that children, children-in-law, and nieces and nephews are associated with higher average gifts. Parents-in-law and aunts and uncles are also associated with significantly higher giving, but for parents, the combination of a higher propensity to make any gift but a lower gift amount, conditional on giving, results in an insignificant overall effect on giving. This is consistent with the hypothesis posited above, that individuals substitute their parents' giving for their own.

[10] Note that because of the presence of a constant in the model, even in the presence of insignificant or negative coefficients, it can still predict positive values of donations. Indeed, because the left hand side variable is the logarithm of amount given, negative values for the level of giving are ruled out.

The fourth column of Table 2 shows how each family relationship changes the probability that an individual will be a class leader, other things being the same. The results suggest that having an Anon U spouse increases the probability of being a class leader by 1.1% points. Thus, while the mean amount given by a married couple is lower than what each person would have given individually (column (2)), they are more likely to be among the largest givers. To put this figure in perspective, recall that, by construction, the probability that a random alumnus will be a class leader is only 10%. Hence, a 1.1% point increase is substantial. Consistent with the results in Columns (1) and (2), the largest effects are for relatives in the next generation, with a child having the largest effect (9.8% points) and children-in-law and nieces/nephews having effects in the 3–5% point range. There is not much of an impact from having relatives in earlier generations who went to Anon U, except for aunts/uncles, for whom the effect is 1.4% points. Taken together, the results in column (4) do not lend strong support to the notion that family bonding leads to exceptionally high giving. Alumni respond positively when members of the next generation in their families attend Anon U, but coming from a family with a tradition of attending the university does not seem to have an impact along this dimension, other things being the same.

Alternative Specifications

In order to assess the robustness of our results, we estimated a number of alternative specifications of our model.

Permanent Income

Unfortunately, our data include no direct information on income, an important determinant of alumni giving (Shulman and Bowen 2001, p. 404). To assess the consequences, we begin by noting that a number of the variables in our basic specification also proxy for the individual's permanent or family income, including gender, ethnicity, college major and grade point average, advanced degrees, years since graduation, and location.

Further, although we lack annual income data, for a large subset of our alumni, we have information that is closely related to permanent income, occupation and field. We have these variables for 155,571 observations, representing 8,483 alumni.[11] The proportion of individuals in this sample who make a donation is 67.7%, somewhat higher than the 63.9% figure for our basic sample. The summary statistics showing the proportions of the samples in the various fields are available upon request. The fields of education, finance, health care and law are highly represented. We re-estimate our basic models with this subsample including the occupation and field data in order to see whether our substantive results are sensitive to their inclusion.

To establish a baseline for this exercise, we estimate our model using only the sample of alumni for whom we have occupation and position, but without including these variables. These results are recorded in Table 3. A comparison of these estimates with those in Table 2 indicates that the behavioral patterns of the individuals in this subsample do not differ substantially from those for the sample as a whole. We next augment this model with

[11] Due to lack of reliable data regarding the start- and stop-dates of occupation and field, these variables indicate whether the alumnus was ever involved in that field or occupation, rather than whether they are involved during the particular year of observation.

Table 3 Field and occupation sample, not including field and occupation variables

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving	(4) Probability of being a class leader Probit model
Spouse	0.0995**	−0.138**	0.358**	0.00329
	(0.00830)	(0.0298)	(0.0449)	(0.00638)
Sibling	−0.00216	0.0477*	0.0231	0.00882
	(0.00770)	(0.0266)	(0.0428)	(0.00559)
Sibling-in-law	0.00782	−0.00111	0.0351	0.00179
	(0.0117)	(0.0419)	(0.0651)	(0.00835)
Cousin	−0.00593	0.00300	−0.0252	−0.00113
	(0.0117)	(0.0436)	(0.0655)	(0.00856)
Child	0.114**	0.458**	0.891**	0.0995**
	(0.0204)	(0.0971)	(0.134)	(0.0203)
Child-in-law	0.0516**	0.170**	0.364**	0.0442**
	(0.0192)	(0.0711)	(0.112)	(0.0157)
Niece/nephew	0.0573**	0.161	0.384**	0.0556**
	(0.0257)	(0.129)	(0.165)	(0.0236)
Parent	0.0111	−0.0696**	0.0262	−0.00911
	(0.00901)	(0.0317)	(0.0497)	(0.00643)
Parent-in-law	0.0441**	0.0880*	0.267**	0.0183*
	(0.0148)	(0.0519)	(0.0835)	(0.0113)
Aunt/uncle	0.0338**	0.0737*	0.208**	0.0175**
	(0.0116)	(0.0430)	(0.0669)	(0.00913)
Grandfather	0.0152	0.00659	0.0744	−0.000512
	(0.0146)	(0.0553)	(0.0827)	(0.0106)
Great-uncle	−0.0202	0.128*	−0.00651	0.0343**
	(0.0205)	(0.0773)	(0.118)	(0.0162)
Other in-law	0.0597**	0.138*	0.377**	0.0447**
	(0.0198)	(0.0764)	(0.119)	(0.0171)

The figures in this table show the results when the basic models are estimated using only the sample of alumni for whom we have information on field and occupation, although the field and occupation variables are not included. Column (1) shows the incremental effects on the probability of making a gift in a given year, based on a probit model and using 155,546 observations. Column (2) shows the incremental effects on the amount of the gift, conditional on making a gift, using ordinary least squares and using observations with a positive gift, a total of 105,317 observations. Column (3) combines these, and shows the marginal effects on total giving. Column (4) shows the incremental effect of being a "class leader" in a given year, where a class leader is defined as an individual who donated an amount greater than or equal to the 90th percentile of gifts in his or her class. The figures in parentheses are standard errors. Coefficients that are statistically significant at the 5% level are marked with **; those significant at the 10% level are marked with *. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the footnote of Table 1. Full results are available on request

the occupation and position variables; these results are in Table 4. Comparing Tables 3 and 4, we see that the addition of the field and occupation variables has no substantive impact on the estimates. We conclude that it is unlikely that our results with respect to family relationships are being driven by the omission of income from our set of right hand side variables.

This discussion of the role of the alumnus's income raises a related issue—the possible importance of dynastic income. We have interpreted our results in Tables 2 and 4, particularly those relating to impact of having older relatives who attended Anon U, as telling

Table 4 Field and occupation sample, including field and occupation variables

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving	(4) Probability of being a class leader Probit model
Spouse	0.102**	−0.144**	0.364**	0.00151
	(0.00826)	(0.0290)	(0.0443)	(0.00623)
Sibling	−0.00214	0.0476*	0.0232	0.00840
	(0.00765)	(0.0258)	(0.0423)	(0.00550)
Sibling-in-law	0.00735	0.00873	0.0398	0.00298
	(0.0116)	(0.0404)	(0.0644)	(0.00817)
Cousin	−0.00501	0.0270	−0.00432	0.00278
	(0.0116)	(0.0427)	(0.0648)	(0.00850)
Child	0.107**	0.449**	0.850**	0.0963**
	(0.0208)	(0.0950)	(0.134)	(0.0198)
Child-in-law	0.0478**	0.139*	0.322**	0.0379**
	(0.0190)	(0.0691)	(0.110)	(0.0150)
Niece/nephew	0.0520*	0.122	0.329**	0.0475**
	(0.0258)	(0.125)	(0.161)	(0.0229)
Parent	0.0131**	−0.0558*	0.0212	−0.00653
	(0.00899)	(0.0311)	(0.0495)	(0.00634)
Parent-in-law	0.0461**	0.0689	0.262**	0.0149
	(0.0146)	(0.0499)	(0.0810)	(0.0107)
Aunt/uncle	0.0339**	0.0661	0.203**	0.0160*
	(0.0115)	(0.0417)	(0.0661)	(0.00885)
Grandfather	0.0156	0.0124	0.0805	0.00162
	(0.0145)	(0.0540)	(0.0816)	(0.0104)
Great-uncle	−0.0208	0.0920	−0.0336	0.0253*
	(0.0208)	(0.0743)	(0.118)	(0.0154)
Other in-law	0.0602**	0.160**	0.396**	0.0487**
	(0.0196)	(0.0750)	(0.117)	(0.0169)

The figures in this table show the results when the basic models are estimated using only the sample of alumni for whom we have information on field and occupation, and the field and occupation variables are included on the right hand side. Column (1) shows the incremental effects on the probability of making a gift in a given year, based on a probit model and using 155,546 observations. Column (2) shows the incremental effects on the amount of the gift, conditional on making gift, using ordinary least squares and using observations with a positive gift, a total of 105,317 observations. Column (3) combines these, and shows the marginal effects on total giving. Column (4) shows the incremental effect of being a "class leader" in a given year, where a class leader is defined as an individual who donated an amount greater than or equal to the 90th percentile of gifts in his or her class**.** The figures in parentheses are standard errors. Coefficients that are statistically significant at the 5% level are marked with **; those significant at the 10% level are marked with *. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the footnote of Table 1. Full results are available on request

us something about family bonding. One might argue that they simply reflect (unobserved) dynastic wealth. Certain families, both within and across generations, have more wealth than others, and hence have a capacity to give larger gifts. Note, however, that even if this observation is correct, by itself it says little about the validity of our estimates. If the concern is that having *any* relative who attended Anon U is associated with greater family wealth, then the fact that our sample consists only of individuals with alumni relatives mitigates this problem. The results may be spurious, though, if the *type* of relative is

associated with greater family wealth. For instance, having a parent who attended Anon U may be more correlated with dynastic wealth than having a child who attended.

To address this issue, we begin by noting that some of our covariates are likely correlated with dynastic income as well as individual income, as above. These include race and an indicator for whether the individual went to a public or private high school. Cunningham and Cochi-Ficano (2002) point out that SAT scores are closely related to family socioeconomic status as well. To the extent that such variables account for dynastic income, the issue is moot. To investigate this issue more systematically, we began by deleting the top 1% of total family giving observations, working on the premise that these are likely to be the families with particularly high wealth. When we estimated the models in Table 2 with this sample, we found that the results were basically the same. In the same spirit, we deleted the observations from families with the 1% highest average gift per family. Again, we found that the results were basically unchanged. In short, this admittedly rough attempt to see if differences in dynastic wealth are driving our results shows no evidence that that do.

Removing Outliers

As is the case at most universities, a few large gifts account for a disproportionate share of total donations to Anon U. For example, as noted earlier, the top 1% of positive gifts for general purposes in our sample accounted for 81.6% of the total in 2007 This raises the possibility that our results for amounts given are being driven by just a few observations. Our use of logs for the left hand side variables attenuates the impact of outliers, but as another check, we re-estimate the models for amounts given with the top 1% of donations in each category deleted from the sample. The results are in Table 5. When we compare these results to their counterparts in Table 1, we see that the signs and magnitudes are similar. Hence, outliers do not appear to be driving our results.

Gender Differences

Previous empirical research on altruism indicates that the behavior of men and women can differ in substantial ways (See, Andreoni and Vesterlund 2001; Meer and Rosen 2009b). This raises the possibility that the impact of family bonding may be different for men and women. To address this issue, we interact each of the family relationship variables with an indicator for whether the alumnus is male. The results are reported in Table 6.[12] None of the interaction terms is statistically significant, and the terms are jointly insignificant. On the extensive margin, the interaction terms are jointly significant only at $p = 0.29$, and on the intensive margin, they are significant at $p = 0.63$. This is consistent with the notion that the impact of having relatives who attended Anon U is no different for men than for women.

A further question along these lines is whether bonding depends on the gender of the relevant relative. For example, is the impact of a cousin relatively greater if the cousin is male or female? We address this issue by including a set of variables controlling for the proportion of each type of relative that is male. These results, which are available upon request, indicate that these controls are neither individually nor jointly significant, and their

[12] As noted earlier, in our data, half of any gift donated by an individual is credited to the person's spouse. Hence, it makes no sense to interact the gender and spouse variables, so such interactions are not included in this table.

Table 5 Dropping top 1% of givers

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving
Spouse	0.124**	−0.106**	0.475**
	(0.00748)	(0.0239)	(0.0378)
Sibling	−0.00256	0.0563**	0.0253
	(0.00694)	(0.0214)	(0.0360)
Sibling-in-law	0.00927	0.00690	0.0454
	(0.0106)	(0.0344)	(0.0552)
Cousin	0.00550	0.0565*	0.0612
	(0.0107)	(0.0341)	(0.0554)
Child	0.128**	0.404**	0.879**
	(0.0212)	(0.0760)	(0.123)
Child-in-law	0.0372**	0.0877*	0.224**
	(0.0172)	(0.0511)	(0.0894)
Niece/nephew	0.0700**	0.0628	0.354**
	(0.0246)	(0.0965)	(0.138)
Parent	0.0180**	−0.0348	0.0567
	(0.00797)	(0.0249)	(0.0409)
Parent-in-law	0.0366**	0.0643	0.205**
	(0.0137)	(0.0425)	(0.0720)
Aunt/uncle	0.0267**	0.0606*	0.159**
	(0.0107)	(0.0331)	(0.0557)
Grandfather	0.00655	−0.00760	0.0239
	(0.0133)	(0.0404)	(0.0680)
Great-uncle	−0.00793	0.0492	−0.00337
	(0.0182)	(0.0573)	(0.0945)
Other in-law	0.0438**	0.0669	0.240**
	(0.0185)	(0.0603)	(0.0996)

Column (1) shows the incremental effects on the probability of making a gift in a given year, based on a probit model and using 211,188 observations. Column (2) shows the incremental effects on the amount of the gift, conditional on making gift, using ordinary least squares and using observations with a positive gift, a total of 134,433 observations. Column (3) combines these, and shows the marginal effects on total giving. The figures in parentheses are standard errors. Coefficients that are statistically significant at the 5% level are marked with **; those significant at the 10% level are marked with *. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the footnote of Table 1. Full results are available on request

point estimates are small. Further, interacting these variables with the indicator for whether the alumnus is male yields no significant results. We therefore conclude that the gender of relatives who attended or attend Anon U is irrelevant for the formation of family bonds.

Indicator for Marital Status

As noted above, our data do not provide reliable data with respect to the start date of marriages, which means that in a given year, the indicators for the presence of spouses and in-laws who attended Anon U may be computed with error. To investigate whether this shortcoming is a concern, we begin by assuming that many marriages have taken place by the time the alumnus is 8 years out of school. Hence, if we estimate our model using only

Table 6 Differential effects by gender

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving	(4) Probability of being a class leader Probit model
Spouse	0.123**	−0.111	0.472**	0.0108**
	(0.00745)	(0.0262)	(0.0390)	(0.00514)
Sibling	−0.00270	0.0256	0.0400	0.0110
	(0.0101)	(0.0333)	(0.0540)	(0.00689)
Male × sibling	−0.00067	0.0614	0.0370	−0.00178
	(0.0128)	(0.0432)	(0.0688)	(0.00837)
Sibling-in-law	0.0173	0.0295	0.0966	0.00434
	(0.0160)	(0.0555)	(0.0861)	(0.0110)
Male × sibling-in-law	−0.0129	−0.0241	−0.0730	0.00134
	(0.0216)	(0.0761)	(0.115)	(0.0139)
Cousin	−0.0178	0.105*	−0.0121	0.0146
	(0.0168)	(0.0572)	(0.0909)	(0.0115)
Male × cousin	0.0391	−0.105	0.102	−0.00967
	(0.0207)	(0.0756)	(0.111)	(0.0131)
Child	0.171**	0.685**	1.32**	0.143**
	(0.0346)	(0.0167)	(0.241)	(0.0388)
Male × child	−0.0722	−0.289	−0.490*	−0.0371
	(0.0594)	(0.193)	(0.286)	(0.0219)
Child-in-law	0.0629**	0.0588	0.322**	0.0117
	(0.0273)	(0.0767)	(0.144)	(0.0167)
Male × child-in-law	−0.0440	0.130	−0.117	0.0305
	(0.0383)	(0.114)	(0.199)	(0.0239)
Niece/nephew	0.0698	0.259	0.498	0.0770**
	(0.0525)	(0.232)	(0.313)	(0.0443)
Male × niece/nephew	0.00221	−0.203	−0.124	−0.0284
	(0.0646)	(0.267)	(0.342)	(0.0313)
Parent	0.0188	−0.0490	0.0517	−0.00514
	(0.0113)	(0.0382)	(0.0599)	(0.00774)
Male × parent	−0.00283	−0.0105	−0.0194	−0.00195
	(0.0141)	(0.0478)	(0.0748)	(0.00928)
Parent-in-law	0.0458**	0.0917	0.268**	0.0267
	(0.0206)	(0.0644)	(0.111)	(0.0144)
Male × parent-in-law	−0.0185	−0.00435	−0.110	−0.0160
	(0.0283)	(0.0898)	(0.146)	(0.0151)
Aunt/uncle	0.0460**	0.0586	0.245**	0.0138
	(0.0156)	(0.0528)	(0.0850)	(0.0111)
Male × aunt/uncle	−0.0336	0.0450	−0.122	0.000446
	(0.0222)	(0.0736)	(0.118)	(0.0137)
Grandfather	−0.0106	−0.0264	−0.0643	−0.0113
	(0.0206)	(0.0676)	(0.108)	(0.0123)
Male × grandfather	0.0322	0.0642	0.187	0.0210
	(0.0259)	(0.0938)	(0.142)	(0.0184)
Great-uncle	−0.00903	0.0683	0.00373	0.0185
	(0.0287)	(0.0944)	(0.155)	(0.0205)
Male × great-uncle	−0.000167	−0.0329	−0.0263	−0.004161
	(0.0368)	(0.129)	(0.196)	(0.0229)

Table 6 continued

	(1) Probability of making a gift Probit model	(2) Log amount conditional on giving OLS	(3) Total effect on giving	(4) Probability of being a class leader Probit model
Other in-law	0.0127 (0.0272)	0.0370 (0.107)	0.0811 (0.151)	0.0220 (0.0195)
Male × other in-law	0.0580 (0.0358)	0.0901 (0.139)	0.322 (0.205)	0.0226 (0.0258)

This table augments the basic model with a series of interaction terms. Each of the relationship variables is interacted with a dichotomous variable that takes a value of one if the alumnus is a male. Column (1) shows the incremental effects on the probability of making a gift in a given year, based on a probit model and using 212,538 observations. Column (2) shows the incremental effects on the amount of the gift, conditional on making a gift, using ordinary least squares and using observations with a positive gift, a total of 135,783 observations. Column (3) combines these, and shows the marginal effects on total giving. Column (4) shows the incremental effect of being a "class leader" in a given year, where a class leader is defined as an individual who donated an amount greater than or equal to the 90th percentile of gifts in his or her class**.** The figures in parentheses are standard errors. Coefficients that are statistically significant at the 5% level are marked with **; those significant at the 10% level are marked with *. Standard errors are adjusted for clustering based on individuals. In addition to the variables listed, the regressions include the variables listed in the footnote of Table 1. Full results are available on request

observations for which alumni are roughly 30 years of age or older, we have eliminated most of the observations for which an alumnus is not yet married to his or her alumnus spouse. When we estimated our basic models with this truncated data set, we found that the coefficients on the spouse and in-law variables were quite similar to their counterparts when the entire sample is used. For instance, the parent-in-law coefficient on the extensive margin was 0.0404 (SE = 0.0161), compared to 0.0365 (SE = 0.0137) in Table 2, using the full sample. The coefficient for spouse on the intensive margin was −0.129 (SE = 0.0335), compared to −0.110 (SE = 0.0262) in Table 2. While we cannot rule out other interpretations, this finding provides at least some assurance that our results are not an artifact of misclassifications of marital status.

Alternative Econometric Specification

An alternative econometric estimator augments the OLS equation for the amount given with the inverse Mills ratio generated by the first stage probit (Heckman 1979). This model explicitly allows for correlation between the errors in the first and second stage equations. The econometric literature indicates that the desirability of this estimator relative to the hurdle model is unclear. In particular, Leung and Yu (1996) observe that even if the errors in the true model are correlated, the hurdle model may, under certain circumstances, yield better estimates. In any case, it seems sensible to re-estimate the model using Heckman's approach to see if the substantive results are affected. They are not. For instance, the selection model yields an estimate of the effect of having a spouse who also attended Anon U of 46.2% on the overall amount of the gift and −12.3% on the size of the gift, conditional on giving one. The results from our basic specification are 47.5 and −11.0%, respectively. The other variables are similarly close in magnitude. Hence, our results are robust with respect to this change in econometric specification.

Summary and Conclusions

A spokeswoman for the University of Michigan laid out the case for legacy admissions in this way: "When you have families who have a longstanding connection to the university, there is a level of engagement that's of great value to the institution; they're more likely to give time and services, like recruiting and fund-raising" (Bauza 2003). We use a rich set of data from an anonymous selective research institution to examine the notion that legacy admissions bind families to universities. Specifically, we investigate which types of family members have the most important effects in this context. We find that the effects of attendance by members of the younger generation (children, children-in-law, nieces and nephews) are greater than the effects of attendance by the older generations (parents, parents-in-law, aunts and uncles, and grandparents). In short, alumni giving behavior is consistent with the notion that families bond with universities, but from the standpoint of stimulating giving, different types of family members have rather different effects.

Our results are based on data from a single selective research university. Consequently, one must be cautious about assuming that the results would apply to other institutions as well. That said, our findings suggest that university officials need at least to consider the possibility that the configuration of family members who have attended the institution can have an important effect on giving.

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Appendix

Derivation of the Estimating Equations

In this Appendix we derive the equations that comprise our canonical econometric model. As in Cunningham and Cochi-Ficano (2002), we assume a conventional utility-maximization framework. Consider an alumnus whose utility depends on the consumption of two commodities. The first is a composite numeraire consumption good, C, and the second is donations to her alma mater, D. The individual's problem is to maximize a utility function, U,

$$U = U(C, D; Z)$$

subject to

$$p_D \cdot D + C = M,$$

where Z is a vector of the individuals' attributes that affect the amount of utility that she derives from her consumption bundle, p_D is the opportunity cost of a dollar of donations, and M is money income. In our context, Z includes, *inter alia,* variables that characterize the individual's affinity to her school, including which members of her family attended.[13] Then the utility maximizing amount of donations, D^*, is given by

[13] The effect of these family connections would ordinarily be subsumed into the unobservable component of alumni giving, one part of which is the individual alumnus's or alumna's affinity for the school. Brittingham and Pezzullo (1990) point out that one of "the best predictors of alumni giving [is] an emotional attachment to the school." From this standpoint, our data allow us to estimate the extent to which emotional attachment is enhanced through the formation of family bonds.

$$D^* = \frac{-\partial V(p_d, M; Z)/\partial p_d}{-\partial V(p_d, M; Z)/\partial M}$$

where V(•) is the indirect utility function.

As noted in the text, in our data there are a substantial number of observations in which individuals make no donations in a given year. Several statistical models can be used to estimate the model in this situation (See, Ground and Koch 2007) The approach that makes the most sense in our context is the complete dominance hurdle model, which has been used in previous empirical studies of charitable giving (see, for example, Huck and Rasul 2007). In this model, in the first stage, an individual decides whether or not to make a gift. In the second stage, conditional on having made the decision to give, the individual gives a positive amount. Intuitively, because an individual can give as much or as little as she wants in a given year, once she has decided to make a gift, there is no second hurdle to clear when determining the amount. In essence, we assume that anyone who wishes to make a gift does so.

To implement this framework, we follow Florkowski et al. (2000). We define Ω to be the variable that equals one if the individual decides to make a donation in the first stage; otherwise it is zero. Assuming linearity,

$$\Omega^* = X\theta + \varepsilon$$

where θ is a parameter vector and ε is a normally distributed error term. Ω equals 1 if $\Omega^* > 0$ and 0 otherwise. Again assuming linearity, we can write

$$D^* = X\beta + \mu$$

where beta is a parameter vector, and mu is a random error. Observed donations, D, equal desired donations, D* as long as Ω is greater than zero:

$$D = D^* \text{ if } \Omega = 1$$

If not,

$$D = 0 \text{ if } \Omega = 0$$

As demonstrated in Florkowski et al. (2000), assuming that μ and ε are normally distributed and uncorrelated, then the first stage equation is a probit, and the second stage equation can be estimated by ordinary least squares, using only the observations with positive values of donations. This is the statistical approach used in the text.

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