Pergamon

Economics of Education Review 20 (2001) 533–543

Economics of Education Review

www.elsevier.com/locate/econedurev

Alumni giving at a small liberal arts college: evidence from consistent and occasional donors

Phanindra V. Wunnava [a,*], Michael A. Lauze [b]

[a] *Middlebury College, Munroe Hall 312, Middlebury, VT 05753, USA*
[b] *Charles River Associates, 600 13th Street, N.W., Suite 700, Washington, DC 20005, USA*

Received 30 September 1999; accepted 9 February 2000

Abstract

This study observed the financial giving of alumni at a small, private liberal arts college covering a 23 year period of consistent (longitudinal) and occasional donors. After observing historical characteristics of donors, college officials have a greater probability of accurately predicting future alumni gifts. Key determinants of alumni giving for both consistent and occasional donors are as follows: volunteering for the college, major in a social science division, language school attendance, residence in states with alumni chapters, and employment within the financial sector. Additionally, alumni with relatives who have attended the college, and alumni who have played a varsity sport during college, are two groups very likely to donate. Our study suggests that Alumni Offices may benefit from rating donors' giving potential (and subsequently focusing on these individuals), extensively publicizing reunions, and by targeting those who volunteered during their college years. Among occasional donors, Alumni Offices may want to target males, fraternity/sorority members, and alumni who are close to retirement.

JEL classification: JEL I2; JEL L3

Keywords: Educational economics; Educational finance; Expenditures; State and federal aid

1. Background

A number of factors have combined to compel private institutions of higher education in the US to rely ever more heavily upon financial donations from their alumni. It has long been the case that government appropriations — federal, state and local — at private higher education institutions are a minimal percentage of total funding. Not only are contributions to total funding from these sources minimal, but they are declining. Consequently, private donations to private baccalaureate institutions (like the one studied here) are supplementing government shortfalls[1]. Among private donors, corporate gifts (when they are available at all) are increasingly targeted at prestigious schools that promise a significant quid pro quo, such as favored access to prospective employees[2]. Table 1 illustrates the increasingly

* Corresponding author. Tel.: +1-802-443-5024; fax: +1-802-443-2084.

E-mail address: phani.wunnava@middlebury.edu (P.V. Wunnava).

[1] It is clear from Appendix A that private gifts and grants are a major source of outside funding for private baccalaureate institutions relative to public baccalaureate institutions.

[2] Some scholars have observed a recent corporate trend of giving financial gifts to fewer academic institutions in order to get something in return. Often that something in return is access to prospective employees. Accordingly, corporations are connecting with fewer and fewer academic institutions — only those programs which match their interests. Privately, some observers wonder whether small, liberal arts colleges (which neither offer the array of programs that large research institutions offer, nor the vocational training offered by two-year

0272-7757/01/$ - see front matter
PII: S0272-7757(00)00023-6

important role alumni are assuming in the financial support of institutions of higher learning. Further, in an increasingly competitive educational environment, where schools compete for the best applicants, alumni donations often fund attractive extracurricular programs such as sports programs and expanded educational programs. Given the trends outlined above, it is essential that those in charge of soliciting alumni for donations better understand the common alumni characteristics which may help them predict donor potential.

Although a school may have a vast pool of alumni, not all alumni are financially generous to their alma mater for one reason or another. Thus the alumni office is faced with the task of targeting potential donors and accurately and efficiently honing its efforts[3]. This study outlines the relative importance of certain donor characteristics of both consistent and occasional gift givers for a small liberal arts college. Even though our data indicate that consistent donors give more on average, occasional donors greatly outnumber the consistent donor group; thus, it is important to understand both groups of donors. Alumni offices from comparable institutions could benefit from this research in their fundraising efforts.

2. Review of literature

Several avenues exist for modeling charitable giving. A first approach examines the economics of charity based on the theory of consumer demand for a non-durable good or service. This approach focuses on the price and income effects of voluntary charitable giving (Feldstein & Taylor, 1976) and also enables researchers to evaluate how changes in tax policy affect the level of charitable contributions. Glenday, Gupta and Pawlak (1986) estimated the price and income elasticities of demand for charitable donations in Canada, which were used to analyze the 'cost-effectiveness' of tax incentives for donations. Jones and Posnett (1991), utilized 1984 Family Expenditure Survey (FES) data to observe the determinants of charitable giving in the UK. Their work, which was the first to use UK data, presented an interesting distinction. They found separate determinants of participation and amount of giving. The probability of participation was determined to be dependent on household income, the tax-price of charitable giving, education, sex, and the head of the household's employment status. However, the donation size responded only to household income.

A second approach examines factors that affect giving based on the degree of donor involvement in higher institutions. Donor 'involvement' may be characterized in many ways, including: formation of attitudes based on reading alumni publications, following successful sports programs, and the impact of relatives attending an institution. For example, perceived need for financial support, reading alumni publications, and subsequent enrollment for graduate work, are cited as determinants of alumni giving (Taylor & Martin, 1995). A few recent studies examine the success of sports teams as a factor that determines alumni giving. After controlling for characteristics of incoming students, characteristics of the institution, the effort the institution makes to solicit alumni giving, and the success of the school's football and basketball teams, Baade and Sundberg (1996a) conclude that winning records do not automatically boost alumni giving, but football bowl game appearances do result in significantly higher gift totals. Grimes and Chressanthis (1994) showed that after controlling for the population of alumni, student enrollment, state appropriations, and per capita income, the contributions were positively related to the overall winning percentage of the intercollegiate sports program. Okunade (1993) analyzed the likelihood of business school alumni giving donations to their alma mater. Using maximum-likelihood estimates, he determined that numerous variables had a strong and positive relationship with alumni giving. Some of those variables are: specific fields of major and other family members graduating from the university. Finally, Connolly and Blanchette (1986) identify discriminant analysis as the ideal technique to first, isolate *aggregate* alumni giving behavior, and then, predict individual giving. Their study determines that among young alumni, loyalty motivates giving rather than capacity to give. Further, among large gift donors, information on fellow classmates (with an eye toward reunion years) and an interest in the *potential gift-giver* activities are motivating factors for giving.

A third group of studies examines the effect of altruism (impure altruism) on charitable giving. Even though altruism theories predict that giving is purely a philanthropic and/or sympathetic motive (Kennett, 1980; Ribar & Wilhelm, 1995; Batson, 1990; Fultz, Batson, Fortenbach, McCarthy & Varney, 1986), Andreoni (1989) developed a different theory. His theory of 'impure' altruism states that donors receive a warm glow from giving, i.e. charitable giving satisfies one's ego and, thus, is not purely altruistic. For example, charitable contributions could be viewed as 'payments' in exchange

colleges) will be excluded from such corporate philanthropy (Mercer, 1996). Brittingham and Pezullo (1990) also provide evidence of a similar kind of 'self-interest' scenario regarding corporate giving.

[3] Harrison, Mitchell and Peterson (1995) also show that schools with higher development costs generate a substantially higher level of donations. Similarly, Baade and Sundberg (1996b) find that greater development efforts lead to higher alumni giving. From a recipient institution's view point, Harrison (1995) shows that fund-raising and college relations costs are crucial factors in influencing the probability of alumni giving.

Table 1
Giving to higher education by type of donor ($ in millions)

	Alumni		Nonalumni		Corporations		Foundations		Religion		Other		Total
	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount
1979–1980	910.0	23.9	847.0	22.3	696.0	18.3	903.0	23.8	155.0	4.1	289.0	7.6	3800.0
1980–1981	1049	24.8	1007	23.8	778.0	18.4	922.0	21.8	170.0	3.3	334.0	7.9	4352
1981–1982	1240	25.5	1097	22.6	976.0	20.1	1003	20.6	175.0	3.6	369.0	7.6	4952
1982–1983	1237	24.0	1190	23.1	1112	21.5	1018	19.7	208.0	4.0	397.0	7.7	5254
1983–1984	1305	23.3	1316	23.5	1271	22.7	1081	19.3	190.0	3.4	437.0	7.8	5692
1984–1985	1460	23.1	1416	22.4	1574	24.9	1175	18.6	208.0	3.3	487.0	7.7	6412
1985–1986	1825	24.7	1781	24.1	1702	23.0	1363	18.4	211.0	2.8	518.0	7.0	7493
1986–1987	2346	27.6	2066	24.3	1819	21.4	1513	17.8	204.0	2.4	552.0	6.8	8594
1987–1988	2042	24.9	1927	23.5	1853	22.6	1601	19.6	197.0	2.4	574.0	7.0	8287
1988–1989	2292	25.0	2077	23.3	1947	21.6	1742	19.5	257.0	2.7	632.0	7.1	9039
1989–1990	2540	25.7	2230	22.7	2170	22.1	1920	19.6	240.0	2.4	700.0	7.1	9893
1990–1991	2680	26.1	2310	22.5	2230	21.8	2030	19.9	240.0	2.4	710.0	6.9	10,293
1991–1992	2840	26.4	2500	23.3	2260	21.1	2090	19.5	240.0	2.2	770.0	7.1	10,792
1992–1993	2980	26.5	2530	22.5	2400	21.4	2200	19.6	250.0	2.2	840.0	7.4	11,292
1993–1994	3410	27.5	2800	22.6	2510	20.3	2540	20.6	240.0	1.9	850.0	6.8	12,443
1994–1995	3600	28.1	2940	23.0	2560	20.0	2460	19.3	250.0	2.0	940.0	7.3	12,842
1995–1996	3510	28.5	2920	23.7	2370	19.3	2400	19.6	219.0	1.8	840.0	6.8	12,352

Source: *Voluntary Support of Education*: Council for Aid to Education (various years).

for intangible personal rewards of self esteem or group membership (Zaleski & Zech, 1992; Maude, 1997). A study by Yoo and Harrison (1989) found that by providing such 'intangible personal rewards' to potential contributors, a recipient institution may induce higher levels of alumni donations.

A final method of study considers how individual donor profiles affect alumni giving. The 'age-donation' profiles of alumni in a life-cycle framework have been analyzed. Okunade, Wunnava and Walsh (1994) observed the relationship between age and giving at a large public university, using a pooled micro-data random sample. Based on a covariance regression model, they concluded that the difference between men's and women's giving is not statistically different. Furthermore, non-fraternity members and graduates of business school gave significantly more cash gifts, relative to the rest of the sample. Finally, after the age of 52, donations were predicted to decline. Olsen, Smith and Wunnava (1989), also analyzed the time dimension of alumni giving. Their study determined that "the growth rate of donations coincided with the age–income profile and became negative at the retirement age," which contradicts the findings of Okunade et al. (1994). Bruggink and Siddiqui (1995) modeled alumni giving based on micro-level data from a liberal arts college. The study identifies characteristics of alumni that both positively and negatively influenced alumni giving. Factors positively related to individual giving include income, age, alumni activity, being single, an engineering degree and Greek affiliation. Unemployment and distance of current residence from college negatively influenced giving.

3. Methodology

Our study improves on previous work with a much richer sample and by investigating differences between consistent and occasional donors. As modeled by previous research, our study also considers Greek affiliation, gender, area of study, employment sector, age and reunion years as predictors of alumni giving. We also account for other variables that may affect alumni giving, including: volunteering during college, relatives attending college, proximity to an alumni chapter office, attending a language school[4], ranking of potential donors by the Alumni Office, and athletic participation.

The main purpose of this study is to examine giving behavior of consistent donors (i.e., the donors who contribute each year) as well as all other donors (i.e., those who contribute occasionally). Accordingly, this study uses micro-level data of alumni donations of Middlebury College[5] from 1972 to 1994 (i.e., for a period of 23 years) for both consistent donors (Sample A) and occasional donors (Sample B). All donors in the sample graduated between the years of 1925 and 1972. The gifts were standardized to 1982–84 dollars. The dependent variable for the model is LNRGIVE, which is the log of the real amount given. The log of the real donations was used to capture non-linearities in the giving profiles of the donors. The following is the empirical specification[6]:

$$\begin{aligned}\text{LNRGIVE} = {} & \beta_0 + \beta_1\text{AGE} + \beta_2\text{AGESQ} + \beta_3\text{MALE} \\ & + \beta_4\text{RELATIVE} + \beta_5\text{SPORT} + \beta_6\text{GREEK} + \beta_7\text{VOLUNT} \\ & + [\text{Vector of Division dummies}] \\ & + [\text{Vector of Rating dummies}] + \beta_{14}\text{LANGSCH} \\ & + [\text{Vector of Sector dummies}] \\ & + [\text{Vector of Reunion dummies}] + \beta_{21}\text{CHAPTER} + \text{Error}\end{aligned}$$

4. Data

Our data set is representative of many other private baccalaureate institutions[7], since many of these schools have a similar enrollment, curriculum and student profiles as the one studied here. The sample of consistent donors (i.e., individuals who gave each year for the 23 year cycle) included 1095 individuals resulting in a total sample of 25,185 (= 1095 × 23). We considered consistent donors to account for characteristics of those alumni most likely to provide future gifts, because the historical trend of consecutive donors may provide insight on the life-cycle hypothesis of alumni donations. Furthermore, alumni officials place great emphasis on consistent donors when setting goals for alumni fund raising efforts (Okunade et al., 1994).

[4] As part of the curriculum, students go to Middlebury College's foreign language schools abroad to study French in Paris (France), German in Mainz (Germany), Italian in Florence (Italy), Russian in Moscow, Irkutsk, Yaroslavl, and Voronech (Russia); and Spanish in Madrid, Getafe, Logrono, and Segovia (Spain). Also on its main campus, Middlebury hosts eight extensive summer language programs focusing on Arabic, Chinese, French, German, Italian, Japanese, Russian, and Spanish.

[5] Middlebury College is one of New England's oldest coeducational small residential liberal arts colleges situated in the town of Middlebury, Vermont. It was established in 1800.

[6] Given the log–lin nature of the empirical model the coefficients scaled as $(e^{\beta}-1)$ could be interpreted as partial elasticities (i.e., a resulting percentage change in real giving in response to changes in independent variables). See Appendix B for variable definitions.

[7] Examples include institutions such as Amhearst, Bates, Bowdoin, Bryne Marr, Carlton, Colby, Connecticut, Davidson, Hamilton, Haverford, Oberlin, Ponoma, Reed, Swarthmore, Washington & Lee, Wellsley, and Williams, to name a few.

Table 2
Sample A and B characteristics

Variable[a]	Sample A: Consistent donors (n=25,185)		Sample B: Occasional donors (n=88,327)	
	Mean	SD	Mean	SD
LNRGIVE	4.3416	1.3558	3.8612	1.2280
AGE	33.947	13.230	28.041	13.204
AGESQ	1327.4	927.39	960.66	828.15
MALE	0.36895	0.48253	0.48585	0.49980
RELATIVE	0.55525	0.49695	0.47004	0.49910
SPORT	0.12785	0.33393	0.16013	0.36673
GREEK	0.30137	0.45886	0.39598	0.48906
VOLUNT	0.25297	0.43472	0.14840	00.35550
Divisions				
SSCIENCE	0.26667	0.44223	0.30281	0.45947
LITERATR	0.11416	0.31801	0.11294	0.31653
FLANG	0.11689	0.32130	0.10360	0.30475
ARTS	0.04840	0.21462	0.04621	0.20995
Rating				
SUPER	0.04201	0.20061	0.02810	0.16526
MODERATE	0.11872	0.32347	0.07522	0.26375
Language school				
LANGSCH	0.04566	0.20876	0.04282	0.20245
Sector				
FINANCE	0.05571	0.22936	0.04813	0.21404
PERSSERV	0.15434	0.36128	0.08661	0.28126
PROFSERV	0.22922	0.42034	0.22909	0.42025
EDUC	0.20000	0.40001	0.17605	0.38087
Reunions				
R_1	0.11142	0.31465	0.22696	0.41887
R_2	0.04650	0.21056	0.05717	0.23218
Chapter State(s)				
CHAPTER	0.19845	0.39884	0.53393	0.49885

[a] See Appendix B for variable descriptions.

Given the fact that consistent donors are only a minority, it is very crucial that the alumni office encourages occasional donors to contribute as frequently as possible. The sample of occasional donors (i.e., those who gave sporadically) consisted of 7511 alumni, resulting in a total sample of 88,327 over the 23-year period. It is interesting to note that this college's alumni participation in giving to their alma mater during the sample years is 73.8% (= [consistent donors: 1095 + occasional donors: 7511]/total alumni base: 11,673). The sample means for both donor groups are reported in Table 2. It is obvious from Table 2 that consistent donors on an average give higher amounts than occasional donors[8] Not surprisingly, on an average, consistent donors are a bit older than occasional donors. It is also worth noting that more than half of the occasional donors live in chapter states relative to a 20% residence in chapter states by consistent donors.

The regression results for both samples are reported in Table 3. Given the longitudinal nature of Sample A (i.e., combination of both time-series and cross-sectional data), the model was estimated by the POOL command (which accounts for both heteroskedasticity and autocorrelation) of *Shazam*. This is otherwise known as a *cross-sectionally heteroskedastic and time-wise autoregressive model* (Kmenta, 1986)[9]. With the exception of

[8] The difference in average giving between consistent and occasional donors is statistically significant. The observed z value is 50.6203. Details of the test can be obtained upon a request.

[9] This technique, by subjecting the observations to two transformations, one designed to remove autocorrelation and the other to remove heteroskedasticity, comes up with a disturbance term (ε_{it}) that is asymptotically nonautoregressive and homoskedastic. To find consistent estimates, OLS is applied to obtain the regression residuals and then these are used to perform transformations so that the error term is asymptotically nonautoregressive and homoskedastic [for details see Kmenta (1986,

the MALE[10] and GREEK variables, all other variables were significant at the 95% confidence level.

Since Sample B is not purely longitudinal in nature, OLS is used for estimation. The focus here is on the alumni donations from 1972 to 1994 of occasional donors (i.e., graduates from the classes 1925 through 1972). With the exception of the coefficient for the LITERATR dummy, all the estimates for Sample B are statistically significant. In general, the majority of Sample A coefficients are larger in magnitude than those of Sample B.

5. Results

5.1. Consistent versus occasional donors: profile similarities/differences

5.1.1. The gender effect

One variable of marked difference between the two samples is the MALE variable, which is significant for occasional donors but not for consistent donors. Among consistent donors, the lack of significance of the MALE variable indicates that, based on longitudinal sample, no statistical difference exists between the giving of men and women. Okunade et al. (1994) found similar results.

5.1.2. The reunion effect

Reunions also are a time of increased giving for consistent and occasional donors alike. The reunion dummies in Sample A behaved as expected. The estimate of R_2 (which categorizes the 25th, 50th, and 60th reunions) is much higher than R_1 (which captures every 5th reunion). The R_1 coefficient of.139 indicates that about a 14.9% increase in the level of alumni donations occurs during the reunion years. This increase is to be expected. Much more interesting, however, is the coefficient of the R_2 dummy, whose relatively larger magnitude reflects a 137% increase in the level of alumni donations during *major* reunion years. Once this estimated value (0.864) is added to the coefficient of R_1, the *total* reunion effect could be computed. The results suggest that during these major reunions, alumni donations show an increase of 172%[11].

It has been documented in the literature [for example, Grant and Lindauer (1986), Olsen et al. (1989) and Olsen, Smith & Wunnava (1989)] that reunions play a crucial role for occasional donors. The rationale suggests that both alumni participation and especially gift giving are higher during reunion years than in non-reunion years. Accordingly, the estimates of reunion dummies (R_1=0.1438, R_2=0.7277) are indeed comparable to that of consistent donors (R_1=0.1396, R_2=0.8640). One study (Connolly & Blanchette, 1986) suggests that when planning to attend reunions, in some instances, alumni may be more interested in their classmates than they are in becoming involved directly with the institution. This theory may be more appropriate for occasional donors: the opportunities to see fellow alumni may be the impetus occasional donors need to donate. Five-year reunions may be more important for occasional donors than other major reunions.

5.1.3. The life-cycle (age) effect

As expected, AGE (AGESQ) variables support the life-cycle hypothesis among consistent donors (Olsen et al., 1989). One can predict the growth rate of alumni donations by evaluating the partial derivative δLNRGIVE/δAGE=0 from the estimated equation — which yields AGE* to be about 61 years[12]. So it is apparent that the growth rate of alumni donations remains positive until the class age of alumni reaches 61 years. Assuming that the average alumnus/alumna is about 21 years old when he/she graduates from this college, this would mean that he/she would be about 82 years of age when the growth rate of giving begins to level off and then decline. Hence one could conclude that the pattern of giving goes beyond the typical average retirement age of 65, and the alumni office could benefit from soliciting

---

pp. 618–622)]. The particular characteristics of this model are as follows:

$E(\varepsilon_{it}^2)=\sigma_i^2$ (heteroskedasticity)

$E(\varepsilon_{it}\varepsilon_{jt})=0$ [$(i\neq j$ − cross-sectional independence]

where

$\varepsilon_{it}=\rho_i\varepsilon_{i,t-1}+u_{it}$ (as far as autocorrelation is concerned (ρ_i) may vary across the cross-sectional units and

u_{it} is the classical error),

$u_{it}\sim N(0,\sigma_{ui}^2)$,

$\varepsilon_{it}\sim N(0,[\sigma_{ui}^2/1-\rho^2])$,

and

$E(\varepsilon_{i,t-1}u_{jt})=0$ for all i,j.

[10] Brittingham and Pezullo (1990) show that neither gender nor marital status may be good predictors of alumni giving.

[11] $(e^{0.139+0.864}-1)=1.72$ (i.e., 172%).

[12] AGE*=0.041086/2(0.0003363)=61.06 years.

Table 3
Regression results (dependent variable: log of real amount given in 1982–84 dollars)

Variable[c] name	Sample A: Consistent donors[a]			Sample B: All other donors[b]		
	Estimated coefficient	*T*-ratio (25,163 df)	*P*-value	Estimated coefficient	*T*-ratio (88,305 df)	*P*-value
AGE	0.0411	30.24	0.000	0.0409	36.908	0.0001
AGESQ	−0.0003	−17.02	0.000	−0.0005	−29.566	0.0001
Gender dummy						
MALE	−0.0040	−0.1593	0.873	0.0940	7.030	0.0001
Relative dummy						
RELATIVE	0.1430	12.23	0.000	0.0591	8.020	0.0001
Sports dummy						
SPORT	0.1997	9.522	0.000	0.0247	2.284	0.0224
Fraternity dummy						
GREEK	0.0214	0.8135	0.416	0.0828	6.026	0.0001
Volunteer dummy						
VOLUNT	0.7919	52.38	0.000	0.6722	62.290	0.0001
Division dummies						
SSCIENCE	0.1395	9.860	0.000	0.0362	4.073	0.0001
LITERATR	0.0519	2.598	0.009	−0.0134	−1.098	0.2721
FLANG	0.1168	5.505	0.000	−0.0532	−3.919	0.0001
ARTS	0.0683	2.650	0.008	−0.1161	−6.465	0.0001
Rating dummies						
SUPER	1.4989	33.51	0.000	1.5536	68.779	0.0001
MODERATE	0.8166	37.43	0.000	1.0229	71.244	0.0001
Language dummy						
LANGSCH	0.2258	9.074	0.000	0.1939	10.061	0.0001
Sector dummies						
FINANCE	0.3560	11.67	0.000	0.0573	3.249	0.0012
PERSSERV	0.1355	6.881	0.000	0.1762	12.522	0.0001
PROFSERV	0.1366	8.200	0.000	0.0285	3.059	0.0022
EDUC	0.0755	4.406	0.000	−0.1974	−18.917	0.0001
Reunion dummies						
R_1	0.1396	6.747	0.000	0.1438	14.786	0.0001
R_2	0.8640	46.94	0.000	0.7277	41.313	0.0001
Chapter dummy						
CHAPTER	0.1972	21.22	0.000	0.0254	3.476	0.0005
CONSTANT	2.6739	100.5	0.000	2.801	153.282	0.0001
	Buse-Rsq=0.37698			Rsq=0.229		

[a] Based on cross-sectionally heteroskedastic and time-wise autoregressive estimation of Kmenta (1986) given the longitudinal nature of the data.

[b] OLS estimation method given the stacked nature of the data.

[c] See Appendix B for variable descriptions.

contributions from alumni who may have passed their retirement age.

Examining Sample B reveals a donation profile of much shorter duration. It is apparent that the growth rate of alumni donations remains positive until the class age (AGE*)[13] of alumni reaches only about 39 years. Assuming that an average alumnus/alumna is about 21 years old when he/she graduates from this college, this would mean that he/she would be about 60 years of age when the growth rate of giving peaks and the level of contributions begins to level off and then decline. Hence one could conclude that the pattern of giving peaks considerably before the typical retirement age of 65 — and it may be hard for the alumni/development office to solicit increased contributions from alumni who may be fast approaching their retirement age. This is a stark contrast to the findings for consistent donors. Thus, alumni offices should target occasional donors before they reach retirement age.

[13] AGE*=0.040912/2(0.000523)=39.11 years.

5.1.4. Effect of volunteering

Among consistent donors, the results indicate that volunteering during college has a relatively strong effect on giving after graduation. This is indicated by the large (=0.792) and statistically significant coefficient of VOLUNT variable. Hence alumni who volunteer contribute about 120% more[14] than non-volunteer alumni. This finding that volunteering alumni give more than non-volunteering alumni is in accordance with the trend detected by a recent survey that volunteers in general give more than non-volunteers to charity[15]. Although showing a slightly smaller effect than in consistent donors, those occasional donors who volunteered during college also gave significantly more, approximately 96%[16] more than those who did not volunteer.

5.1.5. Involvement effect (relative/sport variables)

The RELATIVE and SPORT dummy variables are highly significant and indicate marginal effects[17] of about 14.3 and 20.0%, respectively for consistent donors. In contrast, occasional donors show much smaller (though statistically significant) marginal effects for these two variables. In sample B, the estimates for RELATIVE and SPORT amount to 5.9 and 2.5%, respectively. Clearly, the impact of involvement is higher for consistent donors, and is reflected in their donations.

5.1.6. Area of study & job sector effect

The benchmark for area of study is a combination of individuals in the Humanities division, Natural Science division and miscellaneous majors. For consistent donors, the Social Sciences division had the highest estimate (=0.14) of all the division dummies, which is not at all surprising, followed by the Foreign Languages division with an estimate of 0.117. The remaining divisions of Literature and Arts nearly tied, with estimates in the range of 0.052–0.068, respectively.

Occasional donors showed a negative effect on giving if their major fell into the Foreign Languages or Arts division; this directly contrasts the findings for consistent donors. Further, for consistent donors, of the sector dummies, the FINANCE coefficient estimate (0.356) is the highest. However, for occasional donors, those who work in the personal service sector (hotel/restaurant business) contribute almost 12% more (0.176 vs 0.057) than the alumni employed in the finance sector.

Interestingly, for both consistent and occasional donors, those alumni who attended a language school seemed to have an affinity toward the college, as their estimates of 0.22 and 0.19, respectively, are relatively large and statistically significant.

5.1.7. Other results

The lack of GREEK significance among consistent donors indicates that there is no statistical difference between the donations of members and non-members of Greek organizations. This is very different from the occasional donor sample, where the 0.083 was highly significant.

The CHAPTER variable is a regional variable that attempts to capture the giving in cities where official alumni chapters exist. Our data are limited by state, and therefore interpretation of the CHAPTER results should be taken with caution. For example, New York City has an active alumni chapter. Yet, New York City is not necessarily a valid indicator of the giving for the entire state of New York.

As expected, the alumni with a SUPER rating gave more than one and one half times as much as those with a MODERATE rating (1.49 vs 0.82). This could be translated as premium contributions of 344% and 126%, respectively[18] by rated[19] alumni relative to other alumni. Very similar premia can be observed from the rating dummies for occasional donors, with 371% and 177%[20] contributions respectively.

6. Conclusions

This study observed the financial giving of alumni at a small, private liberal arts college over a 23-year period. After observing historical characteristics of donors, college officials have a greater probability of accurately predicting future alumni gifts. For both consistent (Sample A) and occasional (Sample B) donors, our research identified the following characteristics of alumni as some of the most important to donating: volunteering for the college, major in the social science division, language school attendance, residence in states with alumni chapters, and employment within the financial sector. Additionally, alumni with relatives who have attended the college and alumni who have played a varsity sport during college are two groups very likely to donate. The

[14] $(e^{0.792}-1)=1.20$ (i.e., 120%).

[15] *Giving and Volunteering in the United States Findings from a National Survey* (1986).

[16] $(e^{0.672}-1)=0.96$ (i.e., 96%).

[17] $(e^{0.143}-1)=0.1537$ (i.e., 15.37%) and $(e^{0.20}-1)=0.2214$ (i.e., 22.14%).

[18] $(e^{1.49}-1)=3.44$ (i.e., 344%) and $(e^{0.82}-1)=1.26$ (i.e., 126%).

[19] Alumni office staff and volunteers derived these ratings based on their analysis of some or all of the following characteristics of potential donors: occupation, interest in the college/neighborhood, previous generosity, gifts given to other institutions, and anecdotal evidence of family resources.

[20] $(e^{1.55}-1)=3.71$ (i.e., 371%) and $(e^{1.02}-1)=1.77$ (i.e., 177%).

efforts of the alumni office seem to be fruitful in terms of rating potential donors, and also in arranging major reunions.

Focusing on a longitudinal sample (Sample A) provides valuable insights into life-cycle behavior of alumni giving. Interestingly, gender and membership in Greek fraternities are statistically insignificant for consistent donors. Since consistent donors are only a minority, the alumni office should also focus on sporadic donors and encourage them to give more frequently. Sample B (occasional donors) gives slightly a different story than Sample A. The role of gender and membership in Greek fraternities is indeed statistically significant for occasional donors. One other area of marked difference is the donation profile of shorter duration for occasional donors relative to consistent donors.

Based on our results, alumni offices may benefit from the following policies. Careful ranking of alumni giving potential is crucial, and alumni offices should continue (or start) the practice of rating potential donors. Reunions, both five year and major, are times of increased giving from alumni; thus, extensive publicizing of reunion events may encourage greater participation. alumni offices should target those who volunteered during college. Among occasional donors, alumni offices may want to concentrate on male donors and those who are members of Greek fraternities or sororities. Since occasional donors have a shorter duration of giving than consistent donors, alumni offices may benefit from focusing on occasional donors prior to their retirement years.

Acknowledgements

Earlier versions of this paper were presented at the Lehigh University Economics Department Seminar Series (April 1997), and at the Southern Economic Association conference, Atlanta, Georgia (November 1997). We would like to acknowledge financial support from the Ade Howe Kent Research Fund. We would like to thank Kim Ehritt and the Alumni Records Office (of Middlebury College) for their extensive help in providing the data, Noga Peled, Michael Lauterbach, and Emilia Luvcheva for their able research assistance. A major part of the paper was completed when Wunnava was a visiting Professor of Economics at the University of North Carolina, Chapel Hill during the academic year 1999–2000. He thanks the UNC–CH Economics Department for collegial support. We would also like to thank William Melton II, William Warren, Kathy Hayes, and two anonymous referees of this journal for their valuable suggestions. The usual caveat applies.

Appendix A

The revenue of baccalaureate degree-granting institutions, by source of funds 1993–94 through 1995–96, is shown in Table 4.

Appendix B

Variable definitions

LNRGIVE =log of real amount given (in 1982–84 dollars)

AGE =giving year *minus* year of graduation; AGESQ=age squared

MALE =1 for male; 0 otherwise

RELATIVE =1 if a relative attended this institution; 0 otherwise

SPORT =1 if played a varsity sport; 0 otherwise

GREEK =1 if was member of fraternity or sorority; 0 otherwise

VOLUNT =1 if was active in volunteer programs; 0 otherwise

Division dummies (benchmark category consists of humanities division + natural science division + miscellaneous)

SSCIENCE =1 if major — social science division, contains: economics, geography, political science, psychology, sociology–anthropology, teacher education; 0 otherwise

LITERATUR =1 if American literature and civilization, English; 0 otherwise

FLANG =1 if major — foreign language division, contains: Chinese, French, German, Italian, Japanese, Russian, Spanish; 0 otherwise

ARTS =1 if major — arts division, contains: art, music, theater, dance, and film/video; 0 otherwise

Rating dummies

SUPER =1 if giving potential of an alumni is $100,000–$1,000,000 (over 5 years), as ranked by the alumni office; 0 otherwise

MODERATE =1 if giving potential of an alumni is $ 25,000–$99,999 (over 5 years), as ranked by the alumni office; 0 otherwise

Language dummy

LANGSCH =1 if alumni attended a language school program of this institution; 0 otherwise

Table 4
The revenue of vaccalaureate degree-granting institutions, by source of funds

	1993-94	1994-95	1995-96
		($ '000)	
Public baccalaureate institutions			
Total revenue	2,295,679	2,514,859	2,614,689
Federal government	107,299	162,796	169,645
State government	1,023,881	1,127,165	1,119,902
Local government	24,368	21,070	20,952
Private gifts and grants	51,001	58,890	69,393
Private baccalaureate institutions			
Total revenue	11,830,417	12,608,249	13,844,720
Federal government	390,636	413,518	427,024
State government	327,401	339,147	346,823
Local government	2885	2814	9828
Private gifts and grants	1,033,854	1,088,520	1,299,133
	1993-94	1994-95	1995-96
		(as a % of total revenue)	
Public baccalaureate institutions			
Federal government	4.67%	6.47%	6.49%
State government	44.60%	44.82%	42.83%
Local government	1.06%	0.84%	0.80%
Private gifts and grants	2.22%	2.34%	2.65%
Private baccalaureate institutions			
Federal government	3.30%	3.28%	3.08%
State government	2.77%	2.69%	2.51%
Local government	0.02%	0.02%	0.07%
Private gifts and grants	8.74%	8.63%	9.38%

Source: *Digest of Education Statistics*, Table "Revenue of degree-granting institutions, by source of funds, and by control and type of institution," US Department of Education (various years).

Sector dummies

FINANCE =1 if alumni belongs to banking (commercial/investment/savings/trust), brokerage, insurance, or real estate sector; 0 otherwise

PERSSERV =1 if alumni belongs to hotel and restaurant sector or a homemaker; 0 otherwise

PROFSERV =1 if alumni belongs to any of the following sectors: accounting, agribusiness, architecture, aviation/aerospace, financial analyst, import/export, library work, economist, electronics, museum/historical preservation engineering, industrial designer, investment counseling, law, medicine (health services, nursing, physicians, dentists, etc.), personnel/counseling; 0 otherwise

EDUC =1 if alumni belongs to education sector; 0 otherwise

Reunion dummies

R_1 =1 for every 5th year reunion; 0 otherwise

R_2 =1 for every 25th, 50th, and 60th year reunion; 0 otherwise

Chapter dummy

CHAPTER =1 if alumni lives in one of the following states: CA, CO, CT, IL, MA, NY, VT, WA; 0 otherwise

References

Andreoni, J. (1989). Giving with impure altruism: applications to charity and Ricardian equivalence. *Journal of Political Economy*, *97* (6), 1447–1458.

Baade, A., & Sundberg, J. O. (1996a). Fourth down and goal to go? Assessing the link between athletics and alumni giving. *Social Science Quarterly*, *77* (4), 789–803.

Baade, A., & Sundberg, J. O. (1996b). What determines alumni generosity. *Economics of Education Review*, *15* (1), 75–81.

Batson, C. D. (1990). How social an animal? The human capacity for caring. *American Psychologist, 45* (3), 336–346.

Bruggink, T. H., & Siddiqui, K. (1995). An econometric model of alumni giving: a case study for a liberal arts college. *American Economist, 39* (2), 53–61.

Brittingham, B., & Pezullo, T. (1990). The campus green: fund-raising in higher education. *ASHE–ERIC Higher Education Report No.1*. Washington, DC: School of Education and Human Development, The George Washington University.

Connolly, M. S., & Blanchette, R. (1986). Understanding and predicting alumni giving behavior. In J. A. Dunn Jr, *Enhancing the management of fund raising* (pp. 69–89). San Francisco, CA: Jossey-Bass.

Feldstein, M., & Taylor, A. (1976). The income tax and charitable contributions. *Econometrica, 44* (6), 1201–1222.

Fultz, J., Batson, C. D., Fortenbach, V., McCarthy, P., & Varney, L. (1986). Social evaluation and the empathy–altruism hypothesis. *Journal of Personality and Social Psychology, 50* (4), 761–769.

Giving and volunteering in the United States: findings from a national survey (1986). Washington, DC: Independent Sector.

Glenday, G., Gupta, A., & Pawlak, H. (1986). Tax incentives for personal charitable contributions. *The Review of Economics and Statistics, 68* (4), 688–693.

Grant, J., & Lindauer, D. (1986). The economics of charity life-cycle pattern of alumnae contributions. *Eastern Economic Journal, 12* (2), 129–141.

Grimes, P., & Chressanthis, G. (1994). Alumni contributions to academics: the role of intercollegiate sports and NCCA sanctions. *American Journal of Economics and Sociology, 53* (1), 27–40.

Harrison, W. B. (1995). College relations and fund-raising expenditures: influencing the probability of alumni giving to higher education. *Economics of Education Review, 14* (1), 73–84.

Harrison, W., Mitchell, S., & Peterson, S. (1995). Alumni donations and colleges' development expenditures: Does spending matter? *American Journal of Economics and Sociology, 54* (4), 397–412.

Jones, A., & Posnett, J. (1991). Charitable donations by UK households: evidence from the Family Expenditure Survey. *Applied Economics, 23* (2), 343–351.

Kennett, D. (1980). Altruism and economic behavior. *American Journal of Economics and Sociology, 39* (2), 183–198.

Kmenta, J. (1986). *Elements of econometrics.* (2nd ed). New York: Macmillan.

Mercer, J. (1996). Companies seek economic gain from their gifts to colleges, they hope that their ties to academic will produce future employees and consumers. *Chronicle of Higher Education, 43* (September 27), A37–A38.

Maude, M. (1997). On motivation today part II: The donor. *Fund Raising Management, 28* (9), 40–42.

Okunade, A. A., Wunnava, P. V., & Walsh, R. Jr. (1994). Charitable giving of alumni: micro-data evidence from a large public university. *American Journal of Economics and Sociology, 53* (1), 73–84.

Okunade, A. A. (1993). Logistic regressions and probability of business school alumni donations: micro-data evidence. *Education Economics, 1* (3), 243–258.

Olsen, K., Smith, A. L., & Wunnava, P. V. (1989). An empirical study of the life-cycle hypothesis with respect to alumni donations. *American Economist, 33* (2), 60–63.

Ribar, D., & Wilhelm, M. (1995). Charitable contributions to international relief and development. *National Tax Journal, 48* (2), 229–244.

Taylor, A., & Martin, J. Jr. (1995). Characteristics of alumni donors and nondonors at a research I, public university. *Research in Higher Education, 36* (3), 283–301.

Yoo, Y. H., & Harrison, W. B. (1989). Altruism in the market for giving and receiving: a case of higher education. *Economics of Education Review, 8* (4), 367–379.

Zaleski, P., & Zech, C. (1992). Determinants of contributions to religious organizations: free riding and other factors. *American Journal of Economics and Sociology, 51* (4), 459–472.