An improved model of effects of accounting measures of inefficiency on donations

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ABSTRACT

Informational intermediaries, so called "watchdog agencies", publish information on nonprofit organization (NPO) inefficiency that is calculated from NPO financial disclosures. The stated intent of the watchdog agencies is to provide this information to potential donors to incorporate into their donation decision making. The watchdog agencies publish four accounting measures of NPO inefficiency, calculated from NPO financial disclosures. However, only one of these measures, "donation price" (all expenses / program expenses), has been extensively tested in the literature and another of these measures, "cost to raise a dollar" (fundraising expenses / donations) has never been tested. Furthermore, no study has applied econometric methods to develop a "best parsimonious" model of donations among the many possible models that include one or more of these measures of NPO inefficiency. A best parsimonious model is developed, defined as the model with the highest coefficient of determination that does not suffer from excessive multicollinearity or significant omitted correlated variables misspecification. It is found that a model that includes two of the four measures of inefficiency, "cost to raise a dollar" (fundraising expenses / donations) and "administrative inefficiency" (administrative expenses / all expenses) is the best parsimonious model. It is found that a 1% increase in "cost to raise a dollar" and administrative inefficiency is related to a 0.76% and 0.12% decrease in donations, respectively.

Keywords: nonprofit, donations, fundraising, inefficiency, financial disclosures

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INTRODUCTION

U.S. nonprofit organizations (NPOs) meeting certain criteria must submit an annual informational tax form, Form 990, to the U.S. government (IRS, 2009). Instructions for the Form 990 require NPOs to classify their expenses into one of three types: program, administration, or fundraising. NPOs also must make the tax form available to the public, and "watchdog" agencies report metrics based on the tax form information. Collectively, the watchdog agencies publish the following four accounting measures of NPO inefficiency, calculated directly from NPO financial disclosures: price of giving (PRICE), defined as total expenses / program expenses, administrative inefficiency (ADEFF), defined as administrative expenses / total expenses, fundraising inefficiency (FREFF), defined as fundraising expenses / total expenses, and "cost to raise a dollar" (FUND), defined as fundraising expenses / donations.

A substantial body of research in the accounting, economics, and public administration literatures examines factors that affect donations to NPOs at the organization level as a function of organizational factors. These studies document a significant negative relation between donations and NPO inefficiency. However, the vast majority of these studies test models that include only one accounting measure of NPO inefficiency, PRICE, and many of the studies omit certain other factors known to impact donations. Therefore, the models tested in all prior studies potentially suffer from misspecification from omitting correlated factors such as other published accounting measure of NPO inefficiency. This paper adds to the literature on the determinants of donations to NPOs by developing and testing a model that suffers less from the omitted correlated variables problem and that explains much more of the variance in donations.

The results of this paper should be of interest to researchers of NPO financial disclosures and to managers and directors of NPOs. Researchers would have a better-specified model of donations to use in testing additional factors affecting donations. Managers and directors of the large NPOs tested in this paper would have improved evidence on which of the four accounting measures of inefficiency, published by the watchdog agencies, affect donations and would have a better estimate of the effect of these inefficiency measures on donations to their NPOs.

LITERATURE REVIEW

Jacobs and Marudas (2009) provides an extensive literature review of the numerous studies on factors, including those of interest here – accounting measures of NPO inefficiency calculated directly from NPO financial disclosures, that affect donations at the organizational level. Therefore, only a summary of the relevant results of those papers are presented here along with a more detailed review of the relevant papers published since Jacobs and Marudas (2009).

Weisbrod and Dominguez (1986), Posnett and Sandler (1989), Callen (1994), Khanna, Posnett and Sandler (1995), Tinkelman (1998), Tinkelman (1999), Khanna and Sandler (2000), Okten and Weisbrod (2000), Tinkelman (2004), Marudas and Jacobs (2004), Marudas (2004), and Marudas and Jacobs (2006) all test a model of donations that includes (only) one accounting measure of NPO inefficiency, PRICE (total expenses / program expenses). All of these studies find a significant negative relation between donations and PRICE.

Greenlee and Brown (1999) examine a model that includes only one accounting measure of NPO inefficiency, FREFF (fundraising expenses / total expenses). They find an unusual positive relation between FREFF and donations. Their results are likely biased from having omitted, in their model, numerous factors known to affect donations.

Frumkin and Kim (2001) test a model that includes only one accounting measure of NPO inefficiency, ADEFF (administrative expenses / total expenses). They find no significant relation between ADEFF and donations. However, curiously, their model takes the log of all variables except ADEFF. Jacobs and Marudas (2004) test the same model with the same data, but with the log of ADEFF, and find a significant negative relation between donations and ADEFF. Tinkelman and Mankaney (2007) include two accounting measures of NPO inefficiency, ADEFF and FREFF, in a model of donations and find a significant negative relation between both measures and donations.

Jacobs and Marudas (2009) test a comprehensive model that includes all factors shown in the literature to affect donations and two of the four accounting measures of NPO inefficiency: PRICE and ADEFF. They find that both ADEFF (-0.12) and PRICE (-0.56) are significantly negatively related to donations in their full sample of a large data set of US NPOs.

Kitching (2009) adds a proxy for auditor quality to a model that includes all factors, except legacies and NPO wealth, known to affect donations but that includes only PRICE as the accounting measure of NPO inefficiency. This study finds PRICE negatively related to donations (-0.74) in the full sample and finds auditor quality to be significantly positively related to donations.

Gordon, Knock, and Neely (2009) model the percentage change in donations as a function of differences in watchdog ratings, PRICE (as the only accounting measure of NPO inefficiency), and other control variables, but omit some factors known to affect donations. The primary purpose of their paper is to test whether watchdog agency ratings have additional information content for donors. They find that the positive change in ratings is significantly positively related to donations and also find PRICE to be significantly negatively related to donations.

Prior studies provide substantial evidence of PRICE having a negative relation with donations to NPOs from the U.S., Canada, and the U.K. Three of the four studies of ADEFF also find ADEFF to be significantly negatively related to donations. One of the two studies, Greenlee and Brown (1999), that tests FREFF finds it to be perversely significantly positively related to donations, but this is likely the result of having omitted fundraising expense itself in the model. The other study, Tinkelman and Mankaney (2007), finds FREFF to be significantly negatively related to donations. However, no prior study has tested the accounting measure of NPO inefficiency, "cost to raise a dollar" (FUND, defined as fundraising expenses / donations), another accounting measure published by the watchdog agencies, and no prior study has tested all four accounting measures of NPO inefficiency in a single model.

EMPIRICAL SPECIFICATIONS

This section is organized in the following way. First, a model is developed that includes all organizational factors shown in the literature to affect donations (except legacies, auditor, and watchdog agency ratings for which data is not available) and one accounting inefficiency measure, PRICE. The model is tested using data for the NonProfit Times 100 from 2000-09. This testing is done to determine the extent to which results are similar to the results of prior papers that use different data sets in an effort to mitigate potential criticism that the model developed in this paper is dependent on the particular data set used.

Second, ADEFF is added to the model, since it is the accounting inefficiency measure most tested, other than PRICE. An assessment of the extent of multicollinearity is then

performed using variance inflation factors and misspecification from omitted correlated variables using the Ramsey (1969) RESET method.

Third, finding significant misspecification from omitted correlated variables, the two other accounting measures of inefficiency, FREFF (fundraising expenses / all expenses), and FUND (fundraising expenses / donations), are added to the model to reduce the misspecification from omitted correlated variables. Prior studies may have refrained from testing PRICE, ADEFF, and FREFF in one model; these variables are completely collinear in pure form. However, importantly, the three variables in logged form, although possibly highly correlated, are not perfectly collinear.

Fourth, since multicollinearity is found to be excessive, from including both FREFF and FUND in the model, and PRICE is no longer significant, the model is tested with ADEFF and FREFF as the only inefficiency variables and then with ADEFF and FUND as the only inefficiency variables. The extent of multicollinearity and misspecification from omitted correlated variables are assessed and a comparison then made of the explanatory power of each model as measured by the coefficient of determination, to arrive at the "best" parsimonious model.

The Marudas and Jacobs (2006) model is used because it is the most comprehensive model. It includes all factors, except legacies, watchdog agency ratings, and auditor because of data limitations, from the literature. However, they include PRICE as the only specification of inefficiency. This model is tested, using the data set from the NonProfit Times 100, to compare the results with the results of prior research that uses different NPO data sets. The log of all variables is taken (Marudas, 2004; Tinkelman, 1999 and 1998). Taking the log of the variable reduces the effects of extreme values and captures better the continually diminishing marginal returns between the independent and dependent variables. The model is tested using pooled cross-sectional data and then tested using the Fama-MacBeth (1973) method, which tests each year of data separately and averages the results across years. Since two methods yield qualitatively similar results, only the Fama-MacBeth results are reported.

$$\ln DON_{i,t} = b0 + b1\ln PRICE_{i,t-1} + b2\ln FR_{i,t-1} + b3\ln GOV_{i,t-1} + b4\ln PREV_{i,t-1} + b5\ln AGE_{i,t} + b6\ln WEALTH_{i,t} + b7\ln TOTASS_{i,t} + u_{i,t}$$

where i is NPO, t is year, DON is donations, PRICE is all expenses / program expenses, FR is fundraising expense, GOV is government revenue, PREV is program revenue, AGE is years since the NPO was founded, WEALTH is defined as (net assets - permanently restricted net assets) / (all expenses - fundraising expenses), TOTASS is all assets, and u is the residual.

Results are as indicated in Table 1 (Appendix). Results from the Fama-MacBeth method and from testing pooled cross-sectional data show PRICE to be significantly negative (-3.1 and -2.8, respectively) and all other variables in the model to be significant with signs consistent with prior studies. The coefficients of determination (0.48 and 0.40, respectively) are also similar to those of prior studies.

These results are highly consistent with results from prior studies that tested similar models, with PRICE as the only accounting measure of NPO inefficiency, and suggest that the data used in the current paper are sufficiently similar to the NPO data used in the prior studies. The coefficient estimates on PRICE across years are also examined to assess how stable they are across time. Results for each year are as indicated in the first four columns of Table 2

(Appendix). PRICE is consistently significantly negative each year from 2000-09, except for 2007, where it is negative but not significant.

Next, the Ramsey (1969) RESET method is applied to assess misspecification from omitted correlated variables. Results from applying this method to the model in equation (1) are as indicated in the last two columns of Table 2 (Appendix). The p-values are for the null hypothesis that the model has no omitted correlated variables. The results indicate that for four of the ten years (2002-03 and 2006-07), there is significant misspecification of the model from omitted correlated variables. This is not surprising since there is evidence in the literature that some other accounting measures of NPO inefficiency impact donations and since the watchdog agencies publish three such measures in addition to PRICE. Therefore, an additional accounting measure of inefficiency, ADEFF, defined as administrative expenses / total expenses is introduced into the model. This accounting measure of inefficiency is introduced into the model in equation (1), because it has been included in models of prior studies of determinants of donations (Jacobs and Marudas, 2009; Tinkelman and Mankaney, 2007; Frumkin and Kim, 2000; Greenlee and Brown, 1999). Thus, the next model tested is

$$\ln DON_{i,t} = b0 + b1\ln PRICE_{i,t-1} + b2\ln ADEFF_{i,t-1} + b3\ln FR_{i,t-1} + b4\ln GOV_{i,t-1} + b5\ln PREV_{i,t-1} + b6\ln AGE_{i,t} + b7\ln WEALTH_{i,t} + b8\ln TOTASS_{i,t} + u_{i,t}$$

where ADEFF is administrative expenses / all expenses.

Results from testing the model and applying the Fama-MacBeth method are as indicated in Table 3 (Appendix). To assess the extent of multicollinearity, the variance inflation factors are assessed. All are below 10, indicating no significant multicollinearity in the model. The results show that adding ADEFF to the model increases the coefficient of determination from 0.48, from testing the model with PRICE alone, to 0.61. This indicates that ADEFF is significant in explaining variation in donations.

Furthermore, results from testing the model on each year of cross-sectional data, as indicated in Table 4 (Appendix), show that ADEFF is significantly negative in each of the ten years of data. PRICE, however, is not statistically significant in any of the ten years except 2007, when it is perversely significantly positive. These results as indicated in Table 4 (Appendix) show that including ADEFF in the model makes PRICE redundant in explaining donations.

Adding ADEFF to the model explains more of the variance in donations. However, results from applying the Ramsey RESET to each of the ten years of data, as indicated in the last two columns of Table 4 (Appendix), show that in five years there is a significant misspecification of the model from omitted correlated variables. This suggests that adding other accounting measures of inefficiency may improve the model.

To determine whether the part of PRICE correlated with ADEFF (PRICE_PRED) or the part of PRICE uncorrelated with ADEFF (PRICE_RES) explains donations significantly, two-stage regression is applied. In the first stage, PRICE is regressed on ADEFF only and the residuals (PRICE_RES) and predicted value (PRICE_PRED) are saved. In the second stage, DON is regressed on PRICE_RES, PRICE_PRED and the control variables.

Interestingly, results as indicated in Table 5 (Appendix) show that it is the part of PRICE correlated with ADEFF (PRICE_PRED) that is significantly related to DON with a predicted negative sign. In contrast, the part of PRICE uncorrelated with ADEFF (PRICE_RES) is not significant and has a positive sign. Thus, the negative sign and statistical significance found in

the previous studies is shown to be due to the part of PRICE correlated with ADEFF (PRICE_PRED). The uncorrelated part of PRICE is not significant in explaining donations.

Because of the significant misspecification from omitted correlated variables, to the previous model are added the two additional accounting measures of inefficiency, namely FREFF (fundraising expenses / total expenses) and FUND (fundraising expenses / donations). Thus, the next model tested is

$$\begin{aligned}\ln DON_{i,t} = {} & b0 + b1\ln ADEFF_{i,t-1} + b2\ln FREFF_{i,t-1} + b3\ln FUND_{i,t-1} + b4\ln PRICE_{i,t-1} + \\ & b5\ln FR_{i,t-1} + b6\ln GOV_{i,t} + b7\ln PREV_{i,t-1} + b8\ln AGE_{i,t} + b9\ln WEALTH_{i,t} \\ & + b10\ln TOTASS_{i,t} + u_{i,t}\end{aligned}$$

where FREFF is fundraising expenses / all expenses and FUND is fundraising expenses / donations.

The results from testing the model using the Fama-MacBeth method are as indicated in in Table 6 (Appendix). The mean coefficient of determination increases from 0.48, from the model that includes only PRICE, to 0.88. Interestingly, PRICE is no longer significant. However, multicollinearity in the model is high; variance inflation factors are very high, sometimes over 30, making interpretation of the significance of independent variables problematic.

Therefore, an attempt is made to develop the "best" parsimonious model; i.e., the model with the highest coefficient of determination that does not suffer from excessive multicollinearity or significant omitted correlated variables misspecification. First, PRICE is dropped from the model because, when any of the other three accounting measures of inefficiency, ADEFF, FREFF or FUND are present in the model, PRICE becomes insignificant. Thus, the following model with the three inefficiency variables is tested:

$$\begin{aligned}\ln DON_{i,t} = {} & b0 + b1\ln ADEFF_{i,t-1} + b2\ln FREFF_{i,t-1} + b3\ln FUND_{i,t-1} + b4\ln FR_{i,t-1} + \\ & b5\ln GOV_{i,t-1} + b6\ln PREV_{i,t-1} + b7\ln AGE_{i,t} + b8\ln WEALTH_{i,t} + \\ & b9\ln TOTASS_{i,t} + u_{i,t}\end{aligned}$$

Although the coefficient of determination remains the same, 0.88, there still is excessive multicollinearity stemming from the high correlation of FUND and FREFF: variance inflation factors are still over 15. Therefore, one of these two variables must be dropped. The model with ADEFF and FREFF is tested and the model with ADEFF and FUND is tested. The variance inflation factors in each of these models does not exceed 10, indicating that multicollinearity is no longer excessive. The results from testing each of these models are as indicated in Table 7 (Appendix). The model with ADEFF and FREFF has a coefficient of determination of 0.73 whereas the model with ADEFF and FUND has a higher coefficient of determination of 0.87. The only prior study that tests a model with ADEFF and FREFF, Tinkelman and Mankaney (2007), reports significant coefficient estimates on ADEFF and FREFF of -0.06 and -0.54, respectively and an adjusted coefficient of determination of 0.40, whereas the current study shows significant coefficient estimates, shown in Table 7, of -0.24 and -0.76, respectively with an adjusted coefficient of determination of 0.73. This may be because the large sample that Tinkelman and Mankaney (2007) test contains smaller NPOs than the sample in the current paper, which consists of the largest U.S. non-education NPOs.

Results from applying the Ramsey RESET to each model are as indicated in Table 8 (Appendix). The results show that the model with ADEFF and FREFF suffers from a significant

omitted correlated variable problem in six of the ten years of cross sectional regressions, whereas the model with ADEFF and FUND suffers from this problem in only two of the ten years of cross sectional regressions.

Therefore, the "best" parsimonious model of donations is that which includes only ADEFF and FUND, i.e.,

$$lnDONi,t = b0 + b1lnADEFFi,t-1 + b2lnFUNDi,t-1 + b3lnFRi,t-1 + b4lnGOVi,t + b5lnPREVi,t + b6lnAGEi,t + b7lnWEALTHi,t + b8lnTOTASSi,t + ui,t$$

Results for all variables in this model, from testing the data from the Nonprofit Times 100 applying the Fama-MacBeth method (which averages the coefficients and standard errors across each of the ten years of data) are as indicated in Table 9 (Appendix). The results for fundraising, governmental revenue, program revenue, age, wealth, and size (total assets) are qualitatively similar to the results of prior studies. The only notable quantitative difference from results of prior studies is the coefficient on size (TOTASS), which is substantially smaller in magnitude than those of prior studies. The coefficient of determination is a relatively high 0.87, suggesting that the model explains to a great extent the variation in donations.

DATA

The data tested are from the NonProfit Times 100. This is a list, published annually by the NonProfit Times, of the 100 U.S. non-education NPOs receiving the most total revenues, at least ten percent of which is from donations. These data are used for the following reasons. First, the strength of the relation between ADEFF and donations is significantly greater for U.S. NPOs that receive one tenth or more of their revenue as donations than for U.S. NPOs that receive less than one tenth of their revenue as donations (Tinkelman and Mankaney, 2007). Second, the quality of this data is relatively high because the data are compiled and reviewed by Grant Thornton, a major international accounting firm, and the financial statements of all NPOs in the sample are subject to an independent audit.

Because the model requires lagged values of some variables, only NPOs for which there is data two years in a row can be used. The lists for 2000-2009 report some NPO data as "not available", and some NPOs are not on the list two years in a row. Therefore, the following observations, from a possible 100 per year, are available:

2000-2001	72
2001-2002	73
2002-2003	72
2003-2004	82
2004-2005	80
2005-2006	73
2006-07	82
2007-08	83
2008-09	74

Because the log of zero has no value, $1 is added to GOV and PREV when either is zero; none of the other variables were ever zero.

SUMMARY AND CONCLUSIONS

This paper advances the literature on the determinants of donations to NPOs by developing an improved model of donations at the organizational level as a function of organizational characteristics. The improvements stem from having examined models with from one to all four accounting measures of inefficiency and virtually all other organizational variables found in the literature to be significantly associated with donations. The accounting measures used are calculated from NPO financial disclosures. It is found that the improved model is that which includes the accounting measures of NPO inefficiency ADEFF (administrative expenses / total expenses) and FUND (fundraising expenses / donations), both significantly negatively associated with donations. There is relatively little misspecification due to omitted correlated variables, no excessive multicollinearity, and a high adjusted coefficient of determination, 0.87, the highest of any model in the literature. Furthermore, no prior study has included FUND in a model of donations.

The results indicate that donations to NPOs are very sensitive to one of the accounting measures of inefficiency that the watchdog agencies publish, FUND (fundraising expenses / donations); on average, a one-hundredth increase in FUND is related to a 0.76% reduction in donations. The results also indicate that donations are somewhat sensitive to another accounting measure of inefficiency that the watchdog agencies publish, ADEFF (administrative expenses / all expenses); on average, a one-hundredth increase in ADEFF is related to a 0.12% reduction in donations.

The implications of this study are important for researchers, and to managers, directors, and regulators of NPOs. Researchers of the determinants of donations should consider using the improved model developed in this paper when testing additional factors hypothesized to affect donations. Furthermore, testing certain factors that could not be tested in this paper because of data limitations, such as watchdog ratings and auditor quality, using the improved model, may provide results that differ significantly from results of prior studies that used different models.

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APPENDIX

Table 1
Results from Testing the PRICE Model

$$lnDON_{i,t} = b0 + b1lnPRICE_{i,t-1} + b2lnFR_{i,t-1} + b3lnGOV_{i,t-1} + b4lnPREV_{i,t-1} + b5lnAGE_{i,t} + b6lnWEALTH_{i,t} + b7lnTOTASS_{i,t} + u_{i,t} \quad (1)$$

	Fama-MacBeth		Pooled Cross-section	
	coefficient	standard error	coefficient	standard error
PRICE	-3.12***	0.40	-2.85***	0.37
FR	0.27***	0.03	0.19***	0.03
GOV	-0.02***	0.00	-0.01***	0.00
PREV	-0.01***	0.00	-0.01***	0.00
TOTASS	0.32***	0.02	0.32***	0.04
WEALTH	-0.25***	0.02	-0.23***	0.03
AGE	-0.41***	0.05	-0.37***	0.06
CONSTANT	10.7***	0.57	11.57***	0.64
N	75.5 (mean)		755	
R-Squared	0.48 (mean)		0.40	

PRICE is all expenses / program expenses.
FR is fundraising expenses.
GOV is government revenue.
PREV is program revenue.
TOTASS is all assets.
WEALTH is (net assets - permanently restricted net assets) / (all expenses - fundraising expenses)).
AGE is age of the NPO in years.
Fama-Macbeth coefficients are the means of the coefficients of 10 yearly cross-sectional regressions and reported standard errors are the means of the standard errors of the coefficients of 10 yearly cross-sectional regressions. For pooled cross-sectional regression, heteroscedasticity corrected robust standard error and t values are reported.
*** indicates significance at the 1% level or better.

Table 2
Stability of the Significance of PRICE

Year	PRICE coefficient	N	R-Squared	RESET F Test	p-value
2000	-1.82**	63	0.49	0.47	0.70
2001	-3.14***	72	0.51	1.18	0.33
2002	-3.32***	73	0.61	5.47	0.00
2003	-2.46***	73	0.38	4.36	0.01
2004	-2.54***	82	0.51	0.92	0.44
2005	-5.75***	80	0.54	1.43	0.24
2006	-4.41***	73	0.55	6.13	0.00
2007	-0.88	82	0.36	8.05	0.00
2008	-3.28**	83	0.39	0.41	0.74
2009	-3.58**	74	0.40	0.30	0.82
Average	-3.12***	75.5	0.48	2.87	0.33

The Ramsey RESET F test is conducted using the fitted values of donations, where Ho: model has no omitted variables. p-value is for the RESET F test.
** indicates significance at the 5% significance level.
*** indicates significance at the 1% significance level or better.

Table 3
Results from Testing the Model with PRICE and ADEFF

$$lnDONi,t = b0 + b1lnPRICEi,t-1 + b2lnADEFFi,t-1 + b3lnFRi,t-1 + b4lnGOVi,t-1 + b5lnPREVi,t + b6lnAGEi,t + b7lnWEALTHi,t + b8lnTOTASSi,t + ui,t$$

	coefficient	t-value	p-value
PRICE	0.54	1.04	0.33
ADEFF	-0.52***	-20.07	0.00
FR	0.25***	7.73	0.00
GOV	-0.01***	-3.63	0.01
PREV	-0.00**	-2.24	0.05
TOTASS	0.41***	18.24	0.00
WEALTH	-0.24***	-10.78	0.00
AGE	-0.26***	-6.30	0.00
CONSTANT	6.36***	11.58	0.00
N	75.5 (mean)		
R-Squared	0.61 (mean)		

PRICE is all expenses / program expenses.
ADEFF is administrative expenses / all expenses.
FR is fundraising expenses.
GOV is government revenue.
PREV is program revenue.

TOTASS is all assets.
WEALTH is defined as (net assets – permanently restricted net assets) / (all expenses - fundraising expenses)).
AGE is age of the NPO in years.
Reported coefficients are the means of the coefficients of 10 yearly cross-sectional regressions and reported t-values and p-values are the means of 10 yearly cross-sectional regressions.
** indicates significance at the 5% significance level.
*** indicates significance at the 1% significance level or better.

Table 4
Yearly Regression Results from the PRICE and ADEFF Model

$$lnDONi,t = b0 + b1lnPRICEi,t-1 + b2lnADEFFi,t-1 + b3lnFRi,t-1 + b4lnGOVi,t-1 + b5lnPREVi,t-1 + b6lnAGEi,t + b7lnWEALTHi,t + b8lnTOTASSi,t + ui,t$$

Year	PRICE	ADEFF	N	R-Squared	Reset F Test	P-value
2000	0.07	-0.43***	63	0.5611	2.13	0.108
2001	-0.85	-0.54***	72	0.6249	1.67	0.182
2002	-0.77	-0.38***	73	0.6675	9.71	0.000
2003	0.87	-0.49***	73	0.4930	3.39	0.024
2004	1.51	-0.59***	82	0.6703	2.04	0.116
2005	-1.63	-0.54***	80	0.6853	2.64	0.056
2006	-0.38	-0.51***	73	0.6750	5.69	0.002
2007	4.03***	-0.60***	82	0.5624	2.82	0.045
2008	2.51	-0.68***	83	0.6117	0.24	0.871
2009	0.01	-0.48***	74	0.5389	0.53	0.664
mean	0.54	-0.52***	75.5	0.6090	3.09	0.207

Table 5
Fama-Macbeth Regression of Donation with Decomposed PRICE

	coefficient	t-value	p-value
PRICE_RES	0.54	1.04	0.33
PRICE_PRED	-7.92***	-15.13	0.00
FR	0.25***	7.73	0.00
GOV	-0.01***	-3.63	0.01
PREV	-0.00**	-2.24	0.05
TOTASS	0.41***	18.24	0.00
WEALTH	-0.24***	-10.78	0.00
AGE	-0.26***	-6.30	0.00
CONSTANT	9.25***	17.58	0.00
N	75.5 (mean)		
R-Squared	0.6090 (mean)		

PRICE_RES and PRICE_PRED are residuals and fitted values from regressing PRICE on ADEFF only. Reported coefficients are the mean coefficients of 10 yearly cross-sectional regressions and t-values and p-values are the means of 10 yearly cross-section regressions.
* indicates significance at 10% significance level.
** indicates significance at 5% significance level.
*** indicates significance at 1% significance level.

Table 6
Results from Testing all Four Accounting Inefficiency Measures

lnDONi,t = b0 + b1lnADEFFi,t-1 + b2lnFREFFi,t-1 + b3lnFUNDi,t-1 + b4lnPRICEi,t-1 + b5lnFRi,t-1 + b6lnGOVi,t-1 + b7lnPREVi,t-1 + b8lnAGEi,t + b9lnWEALTHi,t + b10lnTOTASSi,t + ui,t

	coefficient	t-value	p-value
PRICE	0.15	0.64	0.54
ADEFF	-0.09**	-2.95	0.02
FREFF	-0.20***	-3.45	0.01
FUND	-0.71***	-8.22	0.00
FR	0.96***	29.23	0.00
GOV	-0.00	-0.64	0.54
PREV	-0.00*	-2.09	0.06
TOTASS	-0.08	-0.54	0.60
WEALTH	0.01	0.55	0.59
AGE	-0.08**	-2.63	0.03
CONSTANT	1.11*	1.99	0.08
N	75.5 (mean)		
R-Squared	0.88 (mean)		

FREFF is fundraising expenses / all expenses.
FUND is fundraising expense / donations.
Reported coefficients are the means of 10 yearly cross-sectional regressions and t-values and p-values are the means of 10 yearly cross-sectional regressions.
* indicates significance at the 10% significance level.
** indicates significance at the 5% significance level.
*** indicates significance at the 1% significance level or better.

Table 7
Results from Testing Competing Models

	Coefficient		
	Model 1	Model 2	Model 3
ADEFF	-0.08**	-0.24***	-0.12**
FREFF	-0.19***	-0.76***	-
FUND	-0.71***	-	-0.76***

FR	0.96***	0.91***	0.84***
GOV	-0.00	-0.01***	0.00
PREV	-0.00**	-0.01***	-0.00
TOTASS	-0.01	-0.04	0.08**
WEALTH	0.01	0.07***	-0.06**
AGE	-0.08**	-0.26***	-0.06*
CONSTANT	1.21*	3.27***	1.76*
Avg. N	75.5	75.5	75.5
Avg. R-Squared	0.88	0.73	0.87

Reported coefficients are the means of the 10 yearly cross-sectional regressions and reported standard errors are standard errors of coefficients of 10 yearly cross-sectional regressions.
* indicates significance at 10% significance level.
** indicates significance at 5% significance level.
*** indicates significance at 1% significance level.

Table 8
Results of the Ramsey RESET Test Applied to the Model with ADEFF and FREFF and the Model with ADEFF and FUND

	ADEFF and FREFF		**ADEFF and FUND**	
Year	RESET F Stat	p-value	RESET F Stat	p-value
2000	2.44	0.08	2.13	0.11
2001	2.18	0.10	1.85	0.15
2002	3.36	0.02	1.21	0.33
2003	3.56	0.09	1.29	0.30
2004	1.36	0.26	5.58	0.00
2005	1.73	0.17	0.51	0.68
2006	4.71	0.01	1.41	0.25
2007	1.44	0.24	10.25	0.00
2008	0.28	0.84	0.62	0.61
2009	4.36	0.01	0.40	0.75

Table 9
Results from Testing the "Best Parsimonious" Model

	Coefficient	t-statistic
ADEFF	-0.12**	-2.5
FUND	-0.76***	-8.3
FR	0.84***	12.0
GOV	0.00	0.5
PREV	-0.00	-1.3
AGE	-0.06*	-2.1
WEALTH	-0.06**	-2.8

TOTASS	0.08**	2.7
INTERCEPT	1.76*	2.0
R-squared	0.87	