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Determinants of saving in U.S. nonprofit organizations

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Abstract

In this paper, we study how the saving behavior of nonprofit organizations are related to organizational characteristics. First, we present a model to show how these organizations make saving decisions based on their discount rate of future spending, prudence, and volatility of income. Then, we perform an econometric analysis using data from the 2000-2004 period. We find that savings are larger for organizations that depend more on public support or on returns from financial investments, while savings are smaller for organizations that rely more on government grants or on service fees. Moreover, volatility of revenue is associated with more savings, while social need objective is associated with smaller savings.

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1. Introduction

In this paper, we examine whether the risks associated with revenue structure and organizational characteristics of nonprofit organizations affect their saving decisions.

Nonprofit organizations carry out a range of activities from human charitable services to education, religion, health care, and art and cultural services. In recent years, the nonprofit sector in the U.S. has become an important part of the economy. In 1940, there were just over 12,000 nonprofit organizations. In 2007 there were 1.47 million nonprofit organizations registered with the Internal Revenue Service (IRS). Among them, more than 916,000 were registered as 501(c)(3) "public charities," a category that includes most of the arts, education, health care, and human service organizations (Wing, Roeger, and Pollak, 2010).[1] The scope and the importance of the nonprofit organization sector in the U.S. are apparent when compared to other sectors of the economy. In 2010, the nonprofit sector produced 5.5% of the U.S. GDP (that is, $751 billion), accounting for 10% of total employment (Roger, Blackwood and Pettijohn, 2012).

In terms of revenue structure, nonprofit organizations typically have three main sources of revenue: charitable contributions, government grants, and service fees, accounting for 12.3%, 29.4% and 50% of total revenue, respectively (Blackwood, Wing, and Pollak, 2008). There is great variation in the shares of income sources depending on the nature of services provided by each organization. For example, government grants account for 52% of income for human services organizations and charitable donations account for 44% of income for arts organizations. That is, some organizations depend more on public support while others depend more on government grants, service fees, returns from financial investments, or other sources.

In terms of saving behavior, one strand of the literature argues that nonprofit organizations often survive on very short-term budgets, estimating income frequently and spending as needed to meet the demand of as many clients as possible given their short-run income. They frequently focus on the immediate needs of their clients and spend little time on long-term planning, which would involve balancing revenues and expenditures with a focus on stabilizing or growing the organization (Handy and Webb, 2003a). This environment creates a strong incentive for nonprofit managers to save little or nothing. On the other hand, basic economic reasoning suggests that nonprofit organizations should save to generate future income (financial returns), to avoid volatility in program expenses (consumption smoothing), and to increase the probability of future survival (precautionary saving). Bowman (1999) notes that savings may be used to generate income for current operations, store wealth to protect the organization in the event that its popularity with future donors wanes, and increase the organization's chances of survival. Fisman and Hubbard (2005) indicate that saving is utilized by nonprofit organizations to guard against adverse revenue or expenditure shocks. Therefore, given that nonprofit organizations must be prudent, the ones that have less predictable revenue sources (public support) should save more to offset the risk of insufficient revenues in the future, while the ones that have more predictable sources (government grants and service fees) should save less (Handy and Webb, 2003b). Organizations that depend more on financial returns should also accumulate greater saving to keep a steady flow of returns since financial investments can be risky.

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[1] The nonprofit sector consists of a diverse group of organizations that range from small neighborhood associations to large hospitals and universities. The NTEE (National Taxonomy of Exempt Entities) Classification System, developed by The National Center for Charitable Statistics, categorizes 501(c)(3) "public charities" into 26 categories based on their public service mission.

However, saving to smooth service expenditures may create a dilemma for nonprofit donors, who may insist that funds be spent right away, thereby ensuring that their donations are put to good use at the expense of the production smoothing ability of the organization (Fisman and Hubbard, 2005). Handy and Webb (2003a) also discuss the nonprofit managers' tradeoff between using income to build up savings for the future and serving more clients in the present. They argue that the managers maximize the utility of clients (present and future) and balance the needs of clients against having enough funds to keep the operation afloat. Furthermore, Handy and Webb (2003b) show that expected negative shocks tend to induce saving, while dependence on government grants can lead to less saving because governments may perceive savings as a sign of lack of need.

The remaining of the paper is organized as following. In section 2, we develop a simple model to better understand the determinants of saving for nonprofit organizations. Section 3 presents statistical estimations to test the relationships between savings and other variables suggested by the theoretical model. In Section 4, we describe the data used in the empirical analysis. Results are reported in Section 5 and concluding remarks are in Section 6.

2. Model of determinants of saving: the case of nonprofit organizations

In order to establish a theoretical foundation for the saving behavior of nonprofit organizations, we adopt a simplified two-period saving model based on Ventura and Eisenhouser's (2006) paper on prudence and precautionary saving. The model enable us to isolate both the consumption smoothing motive and the precautionary saving motive for nonprofit organizations, and therefore enable us to identify factors that are related to their saving behavior.

Consider y to be the net revenue available to spend in services in period 1 and s to represent savings in period 1. In period 2, the expected net revenue is $y - x - \tilde{u} + s$, where x is an expected revenue decline, $\tilde{u}$ represents a random shock with zero mean and variance $\sigma^2 = E(\tilde{u}^2)$. The expected negative shock (x) in period 2 makes the organization to want to save in period 1 (if the shock was positive, the organization might want to borrow in period 1). To simplify, we ignore the effects of interest rates by assuming a rate equal to 0. In practice, many nonprofit organizations save in order to generate a steady income, which is beneficial as long as the marginal discount rate is lower than the expected marginal return rate.

In principle, nonprofit organizations provide services to the people that they serve. To maximize the amount of welfare from the provision of services, each organization chooses the level of s to maximize the following objective function Ω:

$$\Omega = W(y - s) + \beta E W(y - x - \tilde{u} + s), \tag{1}$$

where W is a social welfare or utility function for the people who are served by the organization in each period, with $W' > 0$, $W'' < 0$, and $W''' > 0$. As usual, $\beta \leq 1$ is the inter-temporal preference factor.

Notice that in the case of a for-profit organization, y corresponds to the profit of the company while$(y - s)$ represents the dividends paid to shareholders or reinvested in the company. However, because in our model the interest rate for savings is less than the discount rate, a for-profit organization has no reason to save $(s = 0)$ even when the expected shock x is

negative.[2] The company should either pay dividends or, if the productivity rate is higher than the discount rate, invest the profit in additional capital. In the second period, the negative shock reduces the profit, which is acceptable to shareholders as long as economic profit remains positive. Otherwise, the company should simply exit at the end of period 1 to avoid the loss in period 2.

To see the effect of risk and prudence on the saving behavior of nonprofit organizations, it is helpful to construct a Taylor expansion around a stationary income level y, with $E(\tilde{u}) = 0$ and $s = 0$, so that

$$\Omega = W(y) - sW'(y) + 0.5s^2W''(y) - (1/6)\,s^3W'''(y)$$
$$+ \beta E\{W(y) + (s - x - \tilde{u})W'(y) + 0.5(s - x - \tilde{u})^2W''(y) + (1/6)(s - x - \tilde{u})^3W'''(y)\}, \quad (2)$$

where we assume that the forth and higher-order derivatives of $W(y)$ are negligible. The first order condition for the maximization of (2) is

$$-W'(y) + sW''(y) - 0.5s^2W'''(y) + \beta W'(y)$$
$$+ \beta E\{(s - x - \tilde{u})W''(y) + 0.5(s^2 + x^2 - 2sx - 2s\tilde{u} + 2x\tilde{u} + \tilde{u}^2)W'''(y)\} = 0. \quad (3)$$

Using $E(\tilde{u}) = 0$ and $E(\tilde{u}^2) = \sigma^2$ in equation (3) yields

$$(\beta - 1)W'(y) + (\beta + 1)sW''(y) + \beta xW''(y)$$
$$- 0.5s^2W'''(y) + 0.5\beta(s^2 + x^2 - 2sx)W'''(y) + 0.5\beta W'''(y)\,\sigma^2 = 0. \quad (4)$$

Finally, equation (4) allows us to pin down the consumption smoothing motive and the precautionary saving motive.

Case 1: Consumption smoothing motive for saving

In order to isolate the consumption smoothing motive for saving, we let $W'''(y) = 0$ in equation (4) so that there is no precautionary saving. Note that if $W''' = 0$, the absolute prudence factor, defined as $\left(-\frac{W'''(y)}{W''(y)}\right)$, equals zero. Therefore, equation (4) becomes

$$(\beta - 1)W'(y) + (\beta + 1)sW''(y) + \beta xW''(y) = 0, \quad (5)$$

which implies

$$s = -\frac{(\beta-1)}{(\beta+1)}\frac{W''(y)}{W'(y)} + \frac{\beta}{\beta+1}x. \quad (6)$$

From equation (6), we see that $\frac{ds}{d\beta} > 0$, that is, savings (s) increase with greater weight (β) on future welfare. In other words, organizations with a higher discount rate $(1 - \beta)$ of future spending put a higher value on current needs, hence save less. Since organizations that attend to social needs are likely to have more urgent need to use their funds, it is plausible that they would save less.

Hypothesis 1: *Organizations that attend to social needs have lower saving rates, holding other factors constant.*

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[2] In practice, businesses save, for instance, due to tax advantages or frictions in financial markets that make future borrowing more costly (see, for instance, Hart, 1962, and Riddick and Whited, 2012).

From equation (6), also note that if $\beta = 1$, then $s = 0.5x$, where x is the expected decrease in revenue in the second period. That is, consumption smoothing makes the organization to save enough to allow the same amount of expected services to be provided in each period. If $x = 0$ (no income decline expected), then the organization will not save. In fact, when $x = 0$, if the organization discounts the future ($\beta < 1$), then it is possible that the optimal choice is to borrow against future income (i.e., $s < 0$) because waiting is costly.

Case 2: Precautionary motive for saving

Now assume $\beta = 1$ (zero discount rate) and $x = 0$ in equation (4), so that we can focus on the precautionary saving motive only. Notice that under these conditions together with the absence of prudence, saving would be zero in equation (6). However, with prudence, equation (4) becomes

$$2sW''(y) + 0.5W'''(y)\,\sigma^2 = 0, \tag{7}$$

which yields

$$s = -0.25\frac{W'''(y)}{W''(y)}\,\sigma^2. \tag{8}$$

Equation (8) implies that saving is positive and increases with greater variance of income (σ^2) and greater absolute prudence $\left(-\frac{W'''(y)}{W''(y)}\right)$. This suggests that nonprofit organizations that depend more on volatile income sources and that are more prudent are likely to save more. According to Gronbjerg (1991) and Froelich (1999), revenue from individual contribution is unpredictable and unstable. On the other hand, Kramer (1981) and Gronbjerg (1993) describe government funding as the most stable revenue source. Therefore, it is reasonable to presume that revenue from public support is more volatile than revenue from government grant.

Hypothesis 2: *Nonprofit organizations that face higher revenue volatility save at higher rates, holding other factors constant.*

In terms of prudence, numerous studies indicate that smaller organizations are likely to be more prudent. Leary and Roberts (2004) and Altinkilic and Hansen (2000) suggest that in the presence of non-trivial fixed costs of raising external funds, large firms have cheaper access to outside financing per each dollar borrowed. Shumway (2001) and Duffie, Saita and Wang (2007) suggest that size may be a proxy for the probability of default and find that larger firms are less likely to fail.

Hypothesis 3: *Smaller nonprofit organizations have higher saving rates, holding other factors constant.*

In our empirical analysis, we test hypothesis 1 to 3, controlling for other characteristics of nonprofit organizations that might affect saving.

3. Empirical Methodology

We use regression analysis in order to assess whether the saving behavior of nonprofit organizations follows the patterns suggested by the model presented in the previous section. We show that savings accumulation is affected by the type of revenue sources, size of the organization, and objective of the organization.

For the dependent variable, we use the organizations' net wealth (i.e., the assets minus the liabilities). Alternatively, we use financial assets, which include cash holdings, saving accounts, and security holdings.

To measure dependence on different sources of revenues (public support, government grants, service fees, and returns on financial investments), we compute the share of each revenue source with respect to program expenses (this allows us to assess Hypothesis 2). For a proxy of organization size, we use expenses on program services.[3] We include size in order to control for prudence. As discussed earlier, we presume that smaller organizations are likely more prudent (Hypothesis 3). The objective of the organization should affect the discount rate, so we add a dummy variable for social need objective (social needs might be more urgent, according to Hypothesis 1). Alternatively, we run separate regressions for organization in the *Human Services* category (most of them attend to social needs) and for the ones in the *Arts* category (none of them attend to social needs). We do not run separate regressions for other categories because they represent mostly service-based organizations like education or health institutions. A fundraising effort measure is also included to control for idiosyncratic differences in the way revenue is obtained that might affect the incentives for saving. Organizations that must spend relatively more on fundraising should be afraid of revenue instability, thus saving more. This correlation between types of income sources and savings may not be fully captured by our measures of revenue dependence, so the fundraising variable in the regression could be positively associated with savings. Volatility of funding is also captured by the variance-to-mean ratio of the revenues of the organization over the years. This variance can be very large for many nonprofit organizations as they do not have predictable flows of revenues and expenses (the flows depend on the needs for services in each year, economic conditions, government grant rules, etc.). For that reason, we perform the analysis using the averages of the dependent and explanatory variables over the 2000-2004 period. However, this allows for the possibility of endogeneity between the dependent variable (savings) and sources of revenues (governments and donors may reduce their support based on the amount of existing savings, thus weakening the incentive to save). Hence, the relationships found in our work should not be interpreted as causal effects.

The following model specification is estimated:

$$S_i = \alpha_0 + \alpha_1 Size_i + \alpha_2 PS_i + \alpha_3 GG_i + \alpha_4 SF_i + \alpha_5 R_i + \alpha_6 V_i + \alpha_7 FE_i + \alpha_8 d_i + \varepsilon_i, \quad (9)$$

where S_i represents the savings of the organization i and $Size_i$ is a measure of the size of the organization. PS_i denotes the share of public support revenue relative to program expenses, GG_i denotes the government grants share, SF_i denotes the service fees share, and R_i denotes the net returns on financial investments share. V_i is a measure of revenue volatility, represented by the variance-to-mean ratio of the organization's annual revenue over the 2000-2004 period. FE_i denotes fundraising expenses relative to program expenses. The dummy variable d_i identifies organizations that have social need objectives. Last, ε_i denotes the estimation error.

4. Data

[3] We choose expenditure on program services rather than revenue as the proxy for size because revenue seems to be more unstable, being affected by unusual events like sales of non-financial assets, unexpected changes in public support, loss of a government grant, large gains or losses from investments, etc.

Data is taken from the Statistics of Income (SOI) files of the IRS from 2000 to 2004. This data set was obtained through the National Center for Charitable Statistics (NCCS) at the Urban Institute. The NCCS collects and compiles the IRS 990 form filed annually by 501(c)3 nonprofit organizations in the U.S. with annual gross receipts above $25,000. Descriptive statistics for the main variables used in the estimation are presented in Table 1. Net assets (total assets minus liabilities) is used as a proxy for total accumulated savings. Alternatively we use financial assets (cash, saving accounts, and financial securities holdings) to capture only financial savings, but this measure may include investments pursued with borrowed funds (unfortunately it is not possible to separate loaned investments funds from other debts).

We excluded small organizations with program expenses of less than $100,000 in any year. We also excluded organizations located outside of the U.S. and the ones without data for all years. Last, we excluded organizations with negative net assets, financial assets, or total revenues as we wanted to focus on organizations that are financially stable. To study how revenue composition affects saving accumulation behavior, we considered the four major revenue sources: public support (which includes private grants), government grants, service fees, and returns from financial assets.[4] Because returns from financial assets can be negative, the corresponding revenue to program expenses share can be negative.[5]

Table 1: Variable description

Variable	Description	Mean	S.E.	Min.	Max.
Net_asset	End of year assets minus liabilities	$91.07	$499.34	$0.00	$24,737.56
Financial_assets	End of year cash, savings, and financial investments	$63.89	$550.11	$0.00	$44,979.33
Prog_expenses	Expenses related to program services	$56.88	$244.67	$0.11	$16,886.34
Fundraising_share	Fundraising expenses over program expenses	0.03	0.09	0.00	4.86
Revenue_VMR	Variance-to-mean ratio of total revenue during 2000-2004	4.29	25.61	0.00	1,333.95
PSupport_share	Public support revenue over program expenses	0.44	1.49	0.00	115.51
GGrants_share	Government grants over program expenses	0.11	0.29	0.00	6.30
Fees_share	Service fees over program expenses	0.67	0.54	0.00	13.16
Returns_share	Net gains from investment assets over program expenses	0.19	0.90	-1.32	57.82

[4] Together, these four revenue categories represent about 97.5% of the total revenue of the organizations in the sample used. Other common revenue sources include member dues, gains from sales of non-investment assets, sales of inventories, and gains from events.

[5] About 4.1% of organizations in the final sample had negative average financial returns in the 2000-2004 period. Few organizations also reported negative values for other revenue sources. Because these might be due to reporting errors or adjustments, we excluded these organizations (the results are not affected by this exclusion).

d_social_need	Dummy for social need services	0.22	0.42	0.00	1.00

Notes: The values used are the means for each organization during the 2000-2004 period. The sample includes 8,933 organizations that had data for all years in the period and had at least $100,000 in program expenses every year. Exclusions are discussed in the text.
Source: Urban Institute (2004).

We included a dummy variable that takes value 1 for organizations with social need objectives.[6] We excluded organizations that have unknown objectives or that are categorized as "out-of-scope," which are government entities, foreign organizations, and other special cases.

In Table 2, we present a comparison of the variables across two main categories of the non-profit industry: *Human services* and *Arts, culture, and humanities*.[7] Note that, although the mean annual program expense of organizations in the two categories are similar, the average organization in the *Arts* category had much more savings. Our estimations help explain why there are significant differences in saving behavior across organizations. The results are discussed in the next section.

Table 2: Comparison of variables across types of organization

Variable	All categories	*Human Services*	*Arts*
Net_asset	$91.07	$15.68	$60.68
Financial_assets	$63.89	$10.25	$38.65
Prog_expenses	$56.88	$11.97	$12.43
Fundraising_share	0.03	0.03	0.09
Revenue_VMR	4.29	0.71	2.48
PSupport_share	0.44	0.29	0.89
GGrants_share	0.11	0.20	0.18
Fees_share	0.67	0.62	0.34
Returns_share	0.19	0.09	0.23
d_social_need	0.22	0.82	0.00
Observations	8,933	2,135	564

5. Results

Estimation results are presented in Table 3. The dependent variable is *ln(Net_assets)*, with *ln(Financial_assets)* used as an alternative (see column 2). Results in column 3 consider only organizations in the *Human services* category. Results in column 4 includes organizations in the *Arts, culture, and humanities* category.

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[6] Following the criteria adopted by Andreoni and Payne (2003), social need organizations include those classified under the NTEE categories of C, I, J, K, L, P, and S. Organizations with NTEE codes of less than 20 are excluded because they include, among others, professional societies, technical assistance agencies, research institutes, and fund-raising organizations.

[7] This categorization follows the NTEE5 classification, which has five categories: *Education*, *Arts, culture, and humanities*, *Human services*, *Health services*, and *Others*. We run separate regressions for the *Arts, culture, and humanities* and the *Human services* categories, which mostly include organizations that provide public services. The category *Education* includes mostly universities and other educational institutions. *Health services* include mostly hospitals and medical centers. *Others* include environmental, international, mutual benefit, public, religion, and unknown organizations.

First, note that savings seem to grow at a slower rate as the size of program expenses grows. The elasticity of savings to expenditure size, represented by the coefficient of *ln(Prog_expenses)*, is generally less than one, except for *Arts* organizations (column 4). This implies that a one percent increase in size leads to a less than one percent increase in accumulated savings, holding other explanatory variables constant. This is likely due to bigger organizations having access to cheaper additional funding through credit or support when needed.

Second, notice that revenue volatility (measured by *Revenue_VMR*) is positively correlated with savings, an indication that non-profit organizations save for precautionary reasons.

Dependence on public support (*PSupport_share*) and returns on investment assets (*Returns_share*) are positively correlated with savings. In the case of public support, this might be due to the lower predictability of this type of revenue, leading to caution and thus greater saving. Moreover, organizations that spend relatively more on fundraising (*Fundraising_share*) tend to save even more. This suggests that organizations that have more difficulty getting public support are more prudent. Organizations that depend on returns on financial assets must also save more to obtain acceptable flows of returns over time and to protect against the volatility of financial returns.

On the other hand, organizations that rely more on government grants (*GGrants_share*) or on service fees (*Fees_share*) seem to have smaller savings. As discussed earlier, government grants and service fees are more predictable than the other major sources of revenue, so organizations that rely on them have less need for precautionary saving.

Table 3: Estimation results

	All categories		All categories		*Human Services*		*Arts*	
	(1)		(2)		(3)		(4)	
Dependent variable:	*ln(Net_assets)*		*ln(Financial_assets)*		*ln(Net_assets)*		*ln(Net_assets)*	
ln(Prog_expenses)	0.804	***	0.852	***	0.820	***	1.027	***
	(0.014)		*(0.014)*		*(0.022)*		*(0.030)*	
Fundraising_share	1.744	**	1.889	**	1.027	**	1.083	**
	(0.775)		*(0.820)*		*(0.489)*		*(0.491)*	
Revenue_VMR	0.003	***	0.002	***	0.023	**	0.006	*
	(0.001)		*(0.001)*		*(0.010)*		*(0.003)*	
PSupport_share	0.087		0.058		0.923	***	0.377	***
	(0.069)		*(0.056)*		*(0.101)*		*(0.052)*	
GGrants_share	-0.883	***	-1.106	***	-0.223		-0.020	
	(0.139)		*(0.139)*		*(0.142)*		*(0.154)*	
Fees_share	-0.698	***	-0.993	***	0.223	**	-0.706	***
	(0.112)		*(0.102)*		*(0.101)*		*(0.154)*	
Returns_share	0.362	***	0.385	***	1.900	***	1.269	***
	(0.136)		*(0.147)*		*(0.207)*		*(0.148)*	
d_social_need	-0.598	***	-0.650	***	-0.254	***		
	(0.045)		*(0.049)*		*(0.080)*			
constant	1.484	***	0.805	***	-0.046		0.993	***
	(0.116)		*(0.111)*		*(0.121)*		*(0.134)*	

Observations	8,924	8,901	2,135	563
F-test	1533.24	1115.36	242.27	226.56
R^2	0.64	0.55	0.55	0.78

Significance levels: * p<0.10, **p<0.05, ***p<0.01.
Robust standard errors reported in parentheses.

Results also indicate that social need organizations (identified by *d_social_need*) save significantly less, suggesting that they are less willing to trade future spending for current spending. The magnitude of this relationship is large. In column 1, the estimated coefficient of *d_social_need* indicates that these organizations save approximately 60% less relatively to others.

6. Conclusion

This paper studies the determinants of nonprofit organizations' saving behavior. We show that saving tends to increase with reliance on public support and financial returns, but to decrease with reliance on government grants and service fees. Saving is also substantially lower for organizations that attend to social needs. Moreover, size of the organization and volatility of revenue are positively correlated to savings. These results suggest that nonprofit organizations make saving decisions based on prudence and urgency of needs.

A possible policy implication of the results found here is that, if the opportunity cost of saving to the government is lower than to nonprofit organizations, then government grants should rise during periods of low revenue from other sources, so that nonprofit organizations could save less and dedicate more of their revenues to provide services to the public.

For future research, it would be interesting to study whether government and public support are affected by the size of accumulated savings. If this effect is large for some organizations, they might strategically respond by accumulating less savings to attract more donations and grants. Another question to answer is whether fundraising efforts by organization's managers are affected by the amount of financial assets held. Would managers engage in more effort if the organization is at a greater risk of not having funds needed in the near future? If so, institutional limits on savings could lead to greater effort and efficiency.

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