

Understanding Nonprofit Financial Health: Exploring the Effects of Organizational and Environmental Variables

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Abstract

Using Internal Revenue Service Form 990 information for all filing 501(c)(3) organizations from 1998 to 2003, this article explores the organizational and environmental factors that affect nonprofit financial health in two subsectors—human services and higher education. The results yield three noteworthy findings. First, theory and empirical data converge when four commonly used financial indicators are combined to form a single financial health construct. Second, accounting measures and revenue variables are not as clearly related to financial health as the literature suggests. Third, environmental variables including macroeconomic factors (gross domestic product and state product), community factors (median household income), as well as a nonprofit's financial prominence in their policy area (revenue share) are strong predictors of nonprofit financial health. This research contributes to the literature in several ways, most notably by incorporating a more open-systems approach to the study of nonprofit financial health with the inclusion of several environmental variables.

Keywords

nonprofit financial health, competition, revenue, assets, environmental effects

Introduction

Nonprofits observe best business practices, measure effectiveness, report to stakeholders, and manage billions in investments. Nonprofits use volunteer management programs,

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marketing plans, and fund development operations to further their missions and improve their services. All of these functions are predicated on financial sustainability and require a strong understanding of the factors that affect nonprofit finances. This article contributes to that knowledge by exploring the determinants of nonprofit financial health.

This line of inquiry began with Tuckman and Chang (1991), who explored the factors affecting nonprofit financial health and identified measures that hypothetically correlate with financial vulnerability. Subsequent studies (Greenlee & Trussel, 2000; Hager, 2001; Hodge & Piccolo, 2005; Trussel, 2002; Trussel, Greenlee, & Brady, 2002) built on the Tuckman–Chang measures, making incremental changes to the model, testing it with additional data, and refining our interpretation of the factors leading to financial vulnerability. Borrowing extensively from for-profit bankruptcy prediction models (Altman, 1968; Ohlson, 1980), the accounting-based approach to modeling nonprofit financial vulnerability was commonplace. Keating, Fischer, Gordon, and Greenlee (2005) identified 17 primarily accounting measures that predict nonprofit financial vulnerability.

Additional research streams contributed to our understanding of nonprofit financial health by exploring revenue volatility (Carroll & Stater, 2009), the role of investment assets and endowments (Bowman, 2002; Bowman, Tuckman, & Young, 2012), the significance of commercial revenues (Frumkin & Keating, 2002), and revenue diversification (Froelich, 1999). These research streams have made important contributions to the literature. However, these studies have principally focused on intra-organizational factors. Ever-changing social, political, and economic forces affect the nonprofit sector, and a strong financial position is required to adapt to these forces. Consistent with multiple streams of nonprofit literature that articulate the consequence of analyzing nonprofits in the larger system of which it is a part, there is the recognition that in addition to firm risk, nonprofits are subject to industry risk, market risk, and macroeconomic effects (Greenlee & Tuckman, 2007; Keating et al., 2005).¹

Despite this recognition, nonprofit researchers predominantly use a closed-system approach to the analysis of nonprofit financial health. Studies focus on firm-specific (intra-organizational) financial metrics (e.g., ratio of commercial revenue to total revenue, months of spending, return on assets) that affect a nonprofit's position to the marginalization of environmental forces. The idea that environmental variables can affect nonprofit financial health (Greenlee & Tuckman, 2007), nonprofit financial vulnerability (Keating et al., 2005), and nonprofit revenue volatility (Carroll & Stater, 2009) is discussed, but rarely examined. As a result, we do not have a clear understanding of the effects of environmental factors.

Identifying environmental factors (e.g., macroeconomic, community-based) and determining how they affect nonprofit financial health present a critical challenge to the strategic management of organizational finances, especially during difficult economic times with increased demand and competition for limited resources. An examination of the sustainability of nonprofits by focusing on their finances is of central importance and leads to the research question motivating this article:

Research Question 1: What are the organizational and environmental factors affecting nonprofit financial health?

This article addresses the gap in the literature and contributes substantially to our understanding of nonprofit financial health as well as the environmental factors affecting it. Specifically, this research offers three contributions. First, a more complete and multifaceted financial health measure is introduced. Second, multivariate analysis of nonprofit financial health is extended with the inclusion of environmental variables. Third, our conceptual understanding of the factors affecting nonprofit financial health is improved with the unexpected but important finding that commonly used accounting measures and revenue variables are not helpful in predicting nonprofit financial health.

According to Young (2010), “Nonprofits are private organizations producing a combination of private and public benefits. As such they must ensure that their financial bottom lines are sound” (p. 500). This article shows that if we want to ensure nonprofit financial bottom lines are sound, we should shift our focus away from accounting ratios and revenue measures exclusively and toward including environmental factors.

Nonprofit Financial Vulnerability

Accounting-based approaches to the study of nonprofit financial vulnerability have dominated since Tuckman and Chang (1991) began this discussion two decades ago. The underlying assumption is that by analyzing accounting ratios, researchers can make predictions regarding the future likelihood that a nonprofit will experience financial vulnerability (a bankruptcy proxy). These approaches borrow heavily from bankruptcy prediction models used in the for-profit sector and contain an inherent modeling flaw. Charitable organizations cannot be legally forced into liquidation or reorganization (Simon, Dale, & Chisolm, 2006; 11 U.S.C.A § 303(a)). Therefore, we do not have a comprehensive list of bankrupt nonprofits. Methods to identify bankrupt organizations used in for-profit literature, such as Moody’s Default Risk Services’ Corporate Default database, SDC Platinum’s Corporate Restructurings database, and the U.S. Department of Commerce’s Business Failure Index, are not available for the nonprofit sector (Hillegeist, Keating, Cram, & Lundstedt, 2004; Tuckman & Chang, 1991).

Although nonprofit organizations incorporated in a state or registered with the Internal Revenue Service (IRS) are required to notify governmental entities upon dissolution, these statutes are rarely enforced, and nonprofit organizations cease to operate voluntarily or involuntarily for several reasons. Despite the difficulties associated with identifying failed nonprofits, nonprofit researchers turn to various lists. The IRS compiles the most comprehensive list (Automatic Revocation of Exemption List), which includes organizations that failed to file Form 990 for 3 consecutive years and subsequently had their tax exemption automatically revoked. This list has come under fire for misidentifying active organizations as defunct. A study conducted on a small group of Indiana nonprofits suggests up to two-fifths of the revoked nonprofits are still operational (Grønbjerg, McGiverin-Bohan, Dmytryk, & Simons, 2011). Thus, even where lists are compiled to identify failed nonprofits, the error rate is considerable and

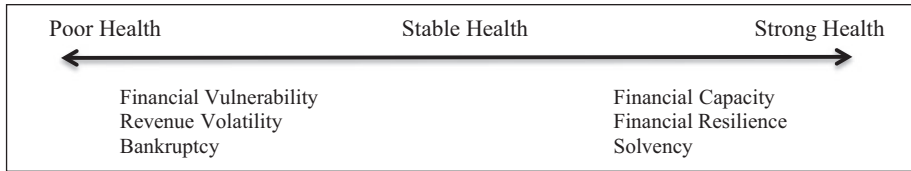


Figure 1. Nonprofit financial health continuum.

should not be used as a proxy for a bankruptcy list. In addition, the data are too coarse to know which organizations dissolved due to financial distress.

Without organizational bankruptcies as a viable dependent variable, nonprofit researchers turned to financial vulnerability as a proxy for bankruptcy. Studies over the last two decades have used multiple measures for financial vulnerability defined variously as a gradual or sharp decline in net assets, revenues, or program expenses. A firm's financial vulnerability has been determined via several different yet equally arbitrary cutoffs. For example, previous studies suggest that a 20% decrease in total net assets over 3 years (Trussel, 2002) or a 25% decrease in program expenses over 1 year (Keating et al., 2005) theoretically correlate with nonprofit financial vulnerability. However, any cutoff unnecessarily dichotomizes continuous variables, and valuable information is lost as a result. Furthermore, dichotomizing financial vulnerability and treating it as a proxy for bankruptcy mires the discussion in the for-profit bankruptcy conception. This research attempts to move beyond those parameters by reconceptualizing nonprofit financial health.

Reconceptualizing Nonprofit Financial Health

In response to the mostly negative conception of nonprofit sustainability in terms of bankruptcy and vulnerability, I begin by offering a more inclusive conceptualization of nonprofit financial health. Equally important to diagnosing the factors that lead to a vulnerable financial position is determining the factors that lead nonprofits to a strong financial position. Instead of restricting ourselves to a narrow view of nonprofit finances by focusing on vulnerability, I propose we view financial health on a continuum. Given this perspective, we can position financial vulnerability, revenue volatility, and bankruptcy on one side of the continuum and financial capacity, financial resilience, and solvency on the other (Figure 1). Embracing the gray and viewing financial health on a continuum provides two benefits over distinguishing financially vulnerable versus not financially vulnerable: it is more representative of the situation nonprofits confront, and it allows for a more nuanced analysis.

If various net asset, revenue, and program expense measures proposed by nonprofit researchers (discussed above) are suitable proxies for financial vulnerability, then the measures could be viewed as indicator variables driven by an underlying financial vulnerability construct. Furthermore, if financial vulnerability constitutes one end of a broader financial health spectrum, then by removing the dichotomy restriction and

allowing the measures to be continuous, we could combine the indicators to yield an underlying financial health construct. Although presumed, the convergence of the financial health measures is not a foregone conclusion. According to Prentice (2015), common financial concepts are multidimensional, and financial measures often fail to converge into unidimensional constructs. Therefore, the first step in this research was to test whether the measures have sufficient convergence to warrant dimension reduction.

To create the financial health construct, principal component analyses were performed on the natural log of the following four continuous measures: solvency, asset change, revenues, and program expenses. A total of 12 principal component analyses were conducted—for each of the 6 years in the digitized data (1998-2003) and across both the human services and higher education subsectors. Although convergence of the four indicator variables fluctuates from 1 year to the next (most notably in 2001), the results consistently recommend only one component based on eigenvalues (i.e., only one component in each principal component analysis has an eigenvalue greater than 1.0). Full results of the principal component analyses for each year are provided in Table 1 (human services) and Table 2 (higher education). The component loading for net asset change in 2001 presents an anomaly in both subsectors, suggesting an external force affected both subsectors. It is possible the macroeconomic effect of the dot com bubble burst in 2000 and the economic disruption from the events on 9/11 produced this anomaly, a quirk that bolsters this article's argument regarding the effects of environmental factors on financial health.

Next, component scores were computed via the regression method for each of the 12 principal components. These component scores were calculated from the 1 primary component that explained the majority of the variance for each of the 12 principal component analyses. Regression methods use an underlying model to predict an "optimal" component score and are superior to weighted-sum approaches (DiStefano, Zhu, & Mindrila, 2009).

In sum, the results from the principal component analyses suggest theory and empirical data come together. Commonly used indicators of financial health converge to yield one underlying construct for each of the 12 analyses. This finding is meaningful for two reasons. First, it empirically supports the concept of nonprofit financial health, and it shows that measures of net assets, revenues, and program expenses can be combined to capture it. Second, the convergence of the measures into one construct shows that the multiple and varied approaches to predicting financial vulnerability assess the same underlying concept.

Predicting Nonprofit Financial Health

In this section, I present the organizational and environmental factors that hypothetically affect the unidimensional measure of financial health derived in the previous section. A review of the literature yielded several predictors of nonprofit financial health; the strongest variables from previous studies were selected and included here. In addition to those variables culled from previous research, several extra-organizational variables are

Table 1. Financial Health Component Loadings by Year—Human Services.

Year	Number of components	Eigenvalue	% of variance	Component loadings			
				Indicator 1	Indicator 2	Indicator 3	Indicator 4
				Solvency	Net asset change	Revenues	Program expenses
1998	1	3.024	75.61	.879	.795	.929	.870
1999	1	3.154	78.85	.893	.769	.952	.927
2000	1	2.828	70.69	.882	.538	.953	.923
2001	1	2.639	65.97	.862	-.196	.966	.961
2002	1	3.066	76.64	.841	.706	.968	.961
2003	1	3.269	81.73	.821	.862	.959	.966

Note. Extraction method: principal component analysis. Results above indicate that each principal component analysis (1 per year) yielded a single component solution. The table reports the eigenvalue and % variance explained by the component, and the component loadings for the individual indicators on that component.

Table 2. Financial Health Component Loadings by Year—Higher Education.

Year	Number of components	Eigenvalue	% of variance	Component loadings			
				Indicator 1	Indicator 2	Indicator 3	Indicator 4
				Solvency	Net asset change	Revenues	Program expenses
1998	1	3.648	91.20	.974	.932	.977	.937
1999	1	3.543	88.58	.962	.886	.974	.941
2000	1	3.647	91.17	.977	.927	.990	.923
2001	1	2.929	73.23	.948	-.379	.987	.956
2002	1	3.215	80.36	.947	.704	.955	.954
2003	1	3.216	80.40	.953	.721	.956	.934

Note. Extraction method: principal component analysis. Results above indicate that each principal component analysis (1 per year) yielded a single component solution. The table reports the eigenvalue and % variance explained by the component, and the component loadings for the individual indicators on that component.

proposed. The predictors fall into four categories: environmental variables, accounting variables, revenue variables, and control variables. A summary of the hypothesized effects on financial health is provided in Table 3. The hypothesized relationships model the independent variables in Time 1 (e.g., 1998) and the financial health component scores in Time 2 (e.g., 1999).

Environmental Variables

Greenlee and Tuckman (2007) suggested the financial value of nonprofit firms can be altered by developments in the larger society. However, environmental variables as determinants of nonprofit financial health have not been the subject of much inquiry beyond their inclusion as control variables. Keating et al. (2005) used time dummy variables arguing that “macroeconomic factors may be impounded in the control variables for years used in the study since the markets and other economic factors were declining during 2000 as compared to the prosperity of 1998 and 1999” (p. 20), but given the small sample period the findings were inconclusive. This article will make the connection between macroeconomic factors and nonprofit financial health more evident. Keating et al. (2005) recommended incorporating macroeconomic variables such as gross domestic product (GDP) and state product (SP) in studies of nonprofit financial vulnerability. Therefore, GDP and SP are included here as environmental predictors.

LeRoux and Wright (2010) found that “high levels of competition affect the capacity of nonprofits to make strategic decisions in a negative way” (p. 584). They measured competition as the number of nonprofits in the metro area with the same National Taxonomy of Exempt Entities (NTEE) code as the respondent organization in their survey. They concluded that “nonprofits embedded in highly competitive environments may devote most of their administrative energies to more pressing activities such as day-to-day service delivery, at the expense of other fundamental tasks such as planning and decision making” (p. 584). This finding implies that nonprofits in highly competitive environments have less opportunity to adapt to the environment or make strategic financial decisions and, thus, are more susceptible to financial vulnerability.

Carroll and Stater (2009) found that organizations in urban areas had lower revenue volatility. They explained their findings by proposing that organizations in urban areas have higher levels of demand (greater market for their service) and greater access to funding opportunities. By looking at variables that measure density (NTEE_Dense), regional revenue share (Rev_Share_Reg), and carrying capacity (Med_House_Inc), these assumptions are tested more directly here.

Revenue share is operationalized by region, specifically by federal information processing standards (FIPS) code, with the goal of measuring the level of competition charities face in their geographic region.² Although this logic holds for human services organizations, constraining the analysis to region fails to capture fully the market for institutions of higher education. For instance, two soup kitchens operating in the same FIPS code may be competing for the same resources (e.g., donors, funding,

Table 3. Summary of Hypothesized Direct Effects on Financial Health.

Hypothesis	Variable	Expected effect on financial health
Environmental hypotheses		
1	Gross domestic product	+
2	State product	+
3	Median household income	+
4	Density	—
5	Regional revenue share	+
6	National revenue share	+
7	State revenue share	+
Accounting hypotheses		
8	Total net assets/total revenue	+
9	Total net assets/total assets	+
10	Net income/total assets	—
11	Net income	+
12	Working capital/total assets	+
13	Months of spending	+
14	Net income/total revenue	+
15	Markup	+
Revenue hypotheses		
16	Commercial revenue/total revenue	+
17	Revenue diversification index	+
Control variables		
—	Size	+
—	Investment portfolio/total assets	+
—	Prospectively endowed	+

Note. Hypotheses listed above apply to both human services and higher education samples with the exception of Hypotheses 6 and 7. National revenue share and state revenue share are only included in the model predicting financial health in higher education nonprofits.

volunteers), but a university's niche extends beyond a narrow geographic region. Therefore, two additional revenue share variables are introduced for the analysis of higher education: one that captures the organization's revenue share at the state level (Rev_Share_State) and one that captures the organization's revenue share at the national level (Rev_Share_Nat).

Accounting Variables

The first two accounting variables are total net assets divided by total revenue (TNA/TR) and total net assets divided by total assets (TNA/TA). Total net assets refer to the difference between total assets and total liabilities. Previous studies (Altman, 1968;

Bowman, 2011a; Keating et al., 2005; Tuckman & Chang, 1991) show that as these variables increase, financial vulnerability decreases.

The next two predictor variables are net income (NI) and net income divided by total assets (NI/TA). Net income represents the organization's revenues less expenses. In studies by Ohlson (1980) and Keating et al. (2005), net income had a negative relationship with financial vulnerability. However, as the ratio of net income to total assets increases, the likelihood of financial vulnerability increases (Bowman, 2011a; Keating et al., 2005; Ohlson, 1980). This effect occurs because as the share of an organization's total assets is increasingly comprised of current year net income, the organization is progressively revenue dependent. That is, the organization is operating paycheck-to-paycheck with few asset reserves and is not well positioned to respond to financial shocks.

Liquidity captures the organizational funds that are cash or can be turned into cash within the fiscal year and without significant expense. The first liquidity variable is working capital divided by total assets (WC/TA); working capital refers to the difference between current assets and both current liabilities and temporarily restricted net assets. The second is months of spending (MS), "the number of months an organization could survive after losing all current income and maintaining its spending on operations at a constant level" (Bowman, 2011b, p. 179). Altman (1968) and Keating et al. (2005) found a negative relationship between the ratio of working capital to total assets and financial vulnerability. Likewise, Bowman (2011a) implies months of spending will have the same effect.

The commonly used measure for margin, net income divided by total revenue (NI/TR), is adopted here. Tuckman and Chang (1991) found a negative relationship between the ratio of net income to total revenue and financial vulnerability. Markup (MU) is included and is defined as "an organization's annual surplus expressed as a percentage of spending on operations. For ordinary service providers it is the change in months of spending divided by spending on operations" (Bowman, 2011b, p. 179). In retailing, markup is "the difference between revenue and expenses expressed as a percentage of cost per unit sold" (Bowman, 2011b, p. 167). Although the concept is new to the nonprofit literature, Bowman (2011a) suggests that markup is preferred in the nonprofit sector over margin, because margin does not include depreciation. Furthermore, in the business literature, margin typically places revenue in the denominator, but dividing by revenue is "problematic because nonprofits have inaccessible revenues such as restricted gifts and endowment returns. Expenses, being unrestricted by definition, raise none of these problems" (Bowman, 2011a, p. 44). Markup places expenses in the denominator and thereby circumvents the problem associated with margin ratios.

Revenue Variables

Revenue diversification can minimize the volatility of portfolios managed by nonprofit organizations and is an oft-recommended revenue generation strategy (Carroll & Stater, 2009; Chang & Tuckman, 1996; Froelich, 1999; Frumkin & Keating, 2002; Jegers, 1997; Kingma, 1993). Therefore, "when designing a portfolio comprising

charitable donations from individuals and corporations, grants, contracts for service, and sales of goods and services,” nonprofits should consider the adequacy and potential instability of each revenue source (Carroll & Stater, 2009, p. 949; Grønbjerg, 1993; Kingma, 1993). Furthermore, research suggests different revenue streams do not reduce the likelihood of financial volatility equally. Nonprofits relying primarily on contributions will experience more revenue volatility (Carroll & Stater, 2009) and more financial distress (Frumkin & Keating, 2002). Carroll and Stater (2009) found that donative nonprofits (receiving greater than 50% of their funding from donations) experience over time an average volatility in their revenue structures that is 2.75% greater than commercial nonprofits. A nonprofit firm is less likely to experience financial vulnerability if it relies more heavily on commercial revenues rather than donative revenues as “contributions are nonrecurring and sensitive to changes in economic and political conditions” (Keating et al., 2005, p. 20).

An independent variable is included here that measures commercial revenue as a ratio of total revenue (COMREV). Keating et al. (2005) found that as this ratio rises, insolvency risk, funding disruption risk, and program disruption risk fall. Revenue diversification (RDI) is also included as organizations with few revenue sources are expected to be more vulnerable to financial shocks than those with multiple revenue sources.

Diversification of revenue sources is associated consistently with lower financial vulnerability (Chang & Tuckman, 1996; Froelich, 1999; Frumkin & Keating, 2002; Grønbjerg, 1993; Tuckman & Chang, 1991) and less revenue volatility (Carroll & Stater, 2009). It is linked to decreases in the likelihood of closure of arts organizations (Hager, 2001), the likelihood that a nonprofit will cut program expenses (Greenlee, 2002; Greenlee & Trussel, 2000), and the risk of insolvency (Keating et al., 2005). Consistent with previous nonprofit financial management research (Calabrese, 2011; Carroll & Stater, 2009; Frumkin & Keating, 2002; Greenlee & Trussel, 2000; Hager, 2001; Keating et al., 2005; Trussel, 2002; Trussel et al., 2002; Tuckman & Chang, 1991), a Hirschman–Herfindahl index is used to calculate RDI. The RDI provides a score that reflects the balance of an organization’s revenue across the categories of earned income, donative income, and investment income.

Control Variables

Based on prior research, I include three organization-level control variables, size, investment portfolio, and endowment; all are commonly cited predictors of financial health. These variables speak to the legitimacy, size, and slack resources of the organization to resist external constraints. Size (SIZE), measured as the natural log of total assets, has consistently been used in the literature (Hodge & Piccolo, 2005; Keating et al., 2005; Trussel, 2002). The organization’s investment sufficiency (INVEST), measured as the ratio of investment portfolio to total assets (Bowman, 2002; Keating et al., 2005), is expected to increase financial health. Finally, consistent with Bowman et al. (2012), endowment sufficiency (ENDOW) is expected to increase financial health by increasing financial slack to overcome short-run financial shocks.³

Table 4. Proportion of Sample Meeting Conditions for Selection.

Sample selection	<i>n</i>	% yes
Total sample	1,388,480	100
Public charity	1,376,137	99.1
Individual return	1,385,597	99.8
Long form	1,104,666	79.6
Accrual accounting	699,408	50.4
Statement of Financial Accounting Standards 117	1,084,112	78.1
Active: Total expenses > depreciation + interest paid	1,378,447	99.3
Active: Total assets > 0	1,332,137	95.9
No obvious data errors (negative liabilities, negative expenses, no program expenses)	1,055,538	76.0
Federal Information Processing Standards code	1,383,598	99.6
U.S. states and District of Columbia	1,387,288	99.9
All	549,688	39.6

Method

Data for this study were compiled from the National Center for Charitable Statistics (NCCS), the Census Bureau, the Bureau of Economic Analysis, and the Consumer Price Index. I use the NCCS-GuideStar National Nonprofit Research Database (more commonly known as the digitized data), which includes all numbered items from Form 990 and Form 990-EZ for all filing 501(c)(3) organizations for years 1998 to 2003. Following the recommendations of Bowman et al. (2012) and Calabrese (2011), I cleaned the digitized data files to reduce measurement error and to overcome concerns regarding the accuracy of financial variables gleaned from 990 data. In addition, cases that failed to report a FIPS code and cases from outlying territories (Aruba, Puerto Rico, Guam, Mariana Islands, Palau, and Virgin Islands) were removed. Table 4 shows the process of data selection and the proportion of the sample meeting the selection conditions.

Data on GDP and SP for the years 1998 to 2003 are from the Bureau of Economic Analysis. Median household income and population figures for years 1998 to 2003 are from the Census Bureau. Following Carroll and Stater (2009), inflation was controlled using information from the consumer price index to place all values in 2003 dollars.

The diversity of the nonprofit sector is well documented (Hager, 2001). Even focusing on 501(c)(3) charitable organizations yields a broad range of organizational types and subsectors. According to Hager, “trying to understand the behavior of nonprofit organizations by studying all kinds of nonprofits at once is empirically problematic” (p. 379). Therefore, narrowing the focus from sector-wide to the human services and higher education subsectors in the analysis below will yield richer and more interpretable results.

The human services subsector represents a heterogeneous mix of mission areas (NTEE categories I, J, K, L, M, N, O, P) and has the most organizations among the

major 12 groups. In addition, human services is arguably the most financially vulnerable subsector with the lowest mean level of net assets and the lowest mean increase in year-over-year assets. In contrast to the human services subsector, higher education (NTEE category B40) was chosen given its relative mission focus and financial health. Higher education has the highest mean level of net assets and the highest mean increase in year-over-year assets. The side-by-side analysis of human services and higher education should provide valuable insight regarding the utility of the proposed model.

For-profit bankruptcy prediction models have traditionally used methodology that accommodates a dichotomous dependent variable (Altman, 1968; Hillegeist et al., 2004; Ohlson, 1980; Shumway, 2001). As nonprofit financial vulnerability has its roots in for-profit bankruptcy models, these studies have also used methods of analysis that incorporate a dichotomous dependent variable (e.g., single period logistic regression, discrete hazard rate regression).

In this analysis I move away from the financial vulnerability conception and operationalize financial health as a continuous variable; therefore, an alternative statistical approach is necessary. Generalized estimating equations (GEE) is used for the analysis of longitudinal data and is superior to logistic methods for these data. GEE can accommodate correlated data and model all years in the digitized data instead of modeling a biased subset of the data, as previous studies have done.⁴

GEE was used here by initially modeling all predictors with hypothesized effects. Consistent with commonly accepted practice (Garson, 2012b), nonsignificant predictors were then removed one at a time until all remaining variables were significant. Given the large sample size and the possibility for small effects to achieve statistical significance, the cutoff used was .01. If a predictor variable remained statistically significant at the .01 level, it remained in the model. If not, the variable was trimmed.⁵

Findings

Human Services

The GEE results from the analysis of human services nonprofits are reported in Table 5.⁶ With the exception of density, each of the environmental variables achieves statistical significance. Despite the logic that increased density will increase competition and diminish access to valuable resources, this relationship was not supported. The results in Table 5 support the hypotheses that propose increases in GDP, SP, median household income, and regional revenue share will lead to increases in nonprofit financial health.

Of the eight accounting variables in the model, only two achieve statistical significance for human services nonprofits. Hypothesis 10 (Table 3) proposes that as NI/TA increases, financial health will decrease. Here, the coefficient is negative and the variable is significant, suggesting that nonprofits with a larger share of organizational assets dependent upon current year earnings are more vulnerable to financial shock.

Hypothesis 11 proposes that as NI increases, financial health will increase. The coefficient for NI is positive and the variable is significant, which supports the hypothesis. Taken together with the empirical support found for Hypothesis 10, these

Table 5. Generalized Estimating Equations Results—Human Services.

	B	SE	Hypothesis test	
			Wald chi-square	Significance
(Intercept)	.000	.0034	0.014	.906
Med_House_Inc	.010	.0024	16.490	.000
Rev_Share_Reg	.048	.0085	32.611	.000
SP	.014	.0038	14.530	.000
GDP	.009	.0035	7.223	.007
NI/TA	-.007	.0025	8.138	.004
NI	.610	.1649	13.664	.000
SIZE	.188	.0100	351.277	.000

Note. Dependent variable: Financial health. $n = 179,164$. Trimmed model quasi-likelihood under independence criterion (QIC) = 119,778.94; full model QIC = 129,740.75.

findings show that human services nonprofits with greater net income have higher levels of financial health, unless their net income comprises a large share of their overall total assets. These findings are noteworthy because they indicate that both revenue and assets are necessary for financial health.

The hypotheses proposing that increases in MS and MU will yield increases in financial health are not supported. Similarly, hypotheses that propose financial health will increase with increases in TNA/TR, TNA/TA, WC/TA, and NI/TR, are likewise not supported.

Hypothesis 16 proposes that as the ratio of commercial revenue to total revenue increases, financial health will increase. This hypothesis is not supported. In addition, the hypothesis that greater revenue diversification leads to increases in financial health (Hypothesis 17) is not supported here.

Higher Education

Table 6 presents the results of the GEE analysis for higher education nonprofits. Hypothesis 1 proposes that an increase in GDP leads to an increase in financial health. This hypothesis is supported. Hypothesis 6 suggests that increases in national revenue share will lead to an increase in financial health in higher education nonprofits, an hypothesis supported in these data. The remaining environmental variables—SP, median household income, density, regional revenue share, and state-level revenue share—do not attain statistical significance.

Of the eight accounting variables, only NI/TA achieves statistical significance. Hypothesis 10 proposes that as NI/TA increases, financial health will decrease, which is supported in these data. As with human services, this finding suggests that increased revenue dependence, without significant asset reserves, will result in poorer financial health.

Hypotheses 11, 13, and 15 are not supported. Hypothesis 11 predicts that increases in NI will lead to increases in financial health. This effect was statistically significant

Table 6. Generalized Estimating Equations Results—Higher Education.

	<i>B</i>	<i>SE</i>	Hypothesis test	
			Wald chi-square	Significance
(Intercept)	−.013	.0040	10.537	.001
[Endow = 1]	.046	.0083	30.488	.000
[Endow = 0]	0 ^a	—	—	—
Rev_Share_Nat	.929	.0245	1,442.427	.000
GDP	.015	.0033	19.005	.000
NI/TA	−.020	.0056	13.319	.000
COMREV	−.017	.0060	7.783	.005
INVEST	.019	.0040	23.038	.000
SIZE	.060	.0097	37.696	.000

Note. Dependent variable: financial health. *n* = 6,996. Trimmed model QIC = 597.543; Full Model QIC = 970.59.
^aSet to zero because this parameter is redundant.

in human services but is not significant here. Hypotheses 13 and 15 propose that increases in MS and MU will lead to increases in financial health. The results do not support these hypotheses.⁷

As in human services, hypotheses that propose financial health will increase with increases in TNA/TR, TNA/TA, WC/TA, and NI/TR, are not supported in higher education nonprofits.

Hypothesis 17 proposes that greater revenue diversification will increase financial health. Although this hypothesis is not supported, RDI was the final variable trimmed from the model and was nearly statistically significant at the .10 level. Given the large sample size, this level of significance was not deemed sufficient. However, the directionality of the variable suggests a more diversified revenue portfolio may be in the financial interest of higher education nonprofits.

Hypothesis 16 proposes that an increase in the ratio of commercial revenue to total revenue is associated with an increase in financial health. This hypothesis is not supported, and the opposite effect is statistically significant. Although this finding may seem counterintuitive, the implication is that tuition-driven nonprofit institutions of higher education are on average less financially healthy.

Discussion

The conventional approach to modeling nonprofit finances involves using intra-organizational factors (primarily accounting and revenue variables) to predict poor nonprofit financial health (e.g., financial vulnerability). This article builds on previous research by reconceptualizing nonprofit financial health and exploring both the organizational and environmental factors affecting nonprofit financial health. The findings yield a more multifaceted financial health construct and improve our understanding of the factors affecting nonprofit financial health in the human services and higher education nonprofit subsectors.

The analysis of human services produced several findings that are essential to enriching our understanding of nonprofit financial health. First, the accounting variables that have long served as the basis for nonprofit financial vulnerability and for-profit bankruptcy prediction models are not consistently significant predictors of financial health. Instead, the utility of the accounting variables is in showing nonprofit managers that they should pay attention to revenues and assets. As total assets are increasingly comprised of current year net income (i.e., an organization is revenue dependent with few asset reserves), financial health decreases. Therefore, a focus on increasing revenue is only beneficial if assets are also accumulated.

Second, specific revenue streams are not as clearly related to financial health as previous studies demonstrate. The findings suggest that the tendency in the literature to espouse the importance of specific revenues for all nonprofits is likely over stated. For human services organizations, revenue diversification and increases in commercial revenue are not reliable methods to increase financial health. Rather, human services organizations should pursue revenue streams consistent with their mission-related activities and avoid the transaction costs or possible mission-drift associated with revenue diversification and commercialization. These findings are consistent with the benefits theory offered by Young (2007), "which postulates that revenue streams derive from the nature of the services offered by nonprofit organizations" (Wilsker & Young, 2010, p. 197).

Third, the proposed environmental variables are strong predictors of financial health for human services organizations. The idea that extra-organizational factors affect nonprofit financial health has been proposed in previous studies, but these effects have gone largely untested. The significant findings here confirm that macro-economic factors (GDP and SP), community factors (median household income), as well as an organization's financial prominence among peer organizations in the region (revenue share), can improve financial health in human services organizations.

The analysis of higher education nonprofits enhances our understanding of nonprofit financial health and offers convergent and divergent findings to human services. First, accounting and revenue variables are only useful insofar as they suggest that greater revenue dependence, specifically on commercial revenue, decreases financial health.

Second, environmental factors are strong predictors of financial health in higher education organizations. As GDP and national revenue share increase, financial health increases. Regional and state-level environmental variables did not achieve statistical significance. Thus, higher education nonprofits are competitive nationally, whereas human services nonprofits are competitive statewide and locally.

Finally, higher education nonprofits with a greater ratio of investments to total assets and institutions that are prospectively endowed have greater financial health. Consistent with Bowman et al. (2012), this finding suggests that on average, prospectively endowed organizations experience significantly greater financial health than those nonprofits not similarly endowed.⁸

Taken together, the human services and higher education findings suggest accounting-centric approaches to modeling nonprofit financial health overlook important

factors. The results show that accounting ratios do not have consistently significant effects on financial health when controlling for environmental factors. For both human services and higher education nonprofits, the utility of the accounting variables is in demonstrating that it is essential for nonprofit managers to maintain asset reserves that go beyond current fiscal year income. The focus in the literature on using multiple accounting ratios to make predictions appears misplaced. Part of the problem rests in the fact that projections of financial health (as well as financial vulnerability and bankruptcy probability) are statements about the likelihood of future events, but accounting ratios are metrics designed to measure past performance. Hillegeist et al. (2004) proposed that accounting measures “may not be very informative about the future status of the firm” (p. 6). The findings here support this conclusion. Beyond making simple assessments regarding an organization’s net income and total assets, repurposing accounting measures to make predictions regarding a nonprofit’s future financial health is not useful in these data.

Therefore, future studies of nonprofit finances should shift the focus from accounting to a broader recognition of financial management fundamentals. Although this article falls short of making prescriptions for practicing nonprofit managers, the results show the importance of going beyond financial statements to observe the community and the nonprofit’s place within it. Greenlee and Tuckman (2007) argued that assuming a nonprofit’s potential for market value is useful, even though the value cannot be realized through a firm’s sale, because it “stands to reason that the value will be altered by developments in the larger society, such as recessions, or changes in the stock market or tax laws” (p. 321). The findings here bolster that argument.

Although studies have hypothesized the effects of environmental variables on nonprofit financial health, this proposal is an important area lacking systematic analysis. It is possible this gap exists because environmental forces are considered beyond managerial control, and researchers prefer to focus on intra-organizational factors seen as being within the domain of managers. By contrast, this research embraces the analysis of environmental variables in relation to nonprofit finances, and the findings suggest that macroeconomic variables, competition-related variables, and community-level variables are significant predictors of nonprofit financial health. The findings also indicate competition goes beyond a narrowly defined geographic area: Regional level variables are highly predictive of financial health for human services organizations, but they are not predictive for higher education nonprofits, where the niche appears to be nationwide.

Limitations

As with many previous attempts to model nonprofit financial health, this research uses the digitized data from the NCCS. NCCS data have sampling bias toward larger organizations. However, these data are the standard for large sample studies of nonprofit finances. Also, this research goes beyond previous studies in efforts to minimize bias by retaining in the analysis a greater number of organizations and for additional years.⁹

Another limitation stems from the use of GEE to model financial health. GEE is a population-averaged approach that yields results on the average response across organizations over time, rather than individual-level change. Therefore, changes in the predictor variables provide population-averaged information that applies to the sample as a whole. As such, the findings do not make predictions for specific nonprofits. However, GEE provides richer results by including all data points over multiple years. Given previous studies' difficulty in correctly predicting individual-level financial distress (Keating et al., 2005), this limitation seems acceptable for the information generated.

Conclusion

This article has two primary goals. The first is to combine the varied research streams on nonprofit finances by developing and testing a theoretical construct of nonprofit financial health. The financial health construct proposed here yields more information and reminds us that the varied analyses of nonprofit finances are engaging the same underlying concept.

The second goal is to explore the environment in which nonprofits operate and how the community, market, and macroeconomy affect nonprofit financial health. In the end, the findings provide evidence that researchers and practitioners should take a broader view of nonprofit financial management to include environmental factors.

This article brings a more open-systems perspective to the analysis of nonprofit financial health and provides three contributions. First, a more complete and multifaceted concept of nonprofit financial health is proposed. Instead of focusing on proxies of financial vulnerability, this study combines four financial measures to create a single financial health construct. The convergence of the measures provides empirical support for the theoretical financial health construct. In addition, this finding suggests that previous nonprofit financial vulnerability studies that used seemingly different dependent variables were modeling related indicators.

The second contribution is the finding that accounting variables central to many financial vulnerability studies are not helpful for predicting nonprofit financial health. We should move beyond accounting-centric approaches to modeling nonprofit financial health, and accounting measures should be used as they are intended, as diagnostic tools, not as predictors of financial health. Finally, this article contributes to our understanding of nonprofit financial health and begins to address the gap in the literature regarding extra-organizational factors by extending multivariate analysis to include environmental variables. Findings here support the conception that environmental factors affect nonprofit finances.

This research provides several implications for future studies. The divergent findings for human services and higher education nonprofits reinforce the position advocated by Hager (2001) that nonprofit financial health studies should continue to take a more nuanced and detailed approach. Analyses performed on the charitable sector as a whole are undermined by the diversity of the sector. Hence, future studies should focus on subsectors and even within subsectors.

Building on the work done here, future studies should explore the viability of creating a financial health index. Theory and empirical evidence come together here to produce a financial health construct. Creating an index for these indicators that is simple to comprehend and easy to use would help practicing nonprofit managers in assessing their organization's financial health.

In addition, future studies should extend the analysis of the effect of environmental factors on nonprofit financial health by exploring these relationships in other data and for alternative subsectors. Regardless of the subsector or data, this article demonstrates that future analyses should incorporate environmental variables. Extra-organizational factors that affect the economy and the market in which nonprofits operate including corporate earnings, tax rates, stock and bond returns, and fluctuations in government funding theoretically influence nonprofit finances and should be explored.

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Notes

1. The idea that industry and market effects alter firm profitability is extensively covered in the for-profit literature starting with Schmalensee (1985). Duffie, Saita, and Wang (2007) incorporated firm-specific, sector-wide, and macroeconomic effects in their corporate default model.
2. FIPS codes represent counties or county equivalents. For additional information, please visit http://www.nws.noaa.gov/mirs/public/prods/maps/cnty_fips_def.htm. Nonprofits often provide services beyond the geographical areas specified in 990 data. Therefore, this research uses county-level data as opposed to more precise ZIP code data in an attempt to attenuate this issue. Nonetheless, the observed misalignment between 990 location data and nonprofit service area is a limitation of this research.
3. For additional materials including descriptive statistics, correlation tables, and variable calculations, please visit the author's website: <http://people.uncw.edu/prenticecr/index.html>.
4. The digitized data are not true panel data "where the same subjects are measured in each time period" (Garson, 2012a, p. 91). Rather, the data are cross-sectional time series data. Although predominantly composed of the same subjects, the data also contain different subjects for each time period. As such, population-averaged panel data regression methods are ideal. Previous studies used logistic models and routinely only measured organizations with multiple years of consecutive data. For example, previous studies identify financially

vulnerable nonprofits (e.g., nonprofits with a 20% decline in net assets from 1997 to 1999), and then they look at the numbers from the preceding fiscal year (1996) to see if the regression model could have correctly predicted it. The problem with that approach is that nonprofits with 4 or more consecutive years of data have 3.6 times greater average total annual revenue than organizations with only 1 or 2 consecutive years of data. This may be why Keating et al. (2005) warned that “while the existing prediction models provide insights into some indicators of future financial vulnerability, they are not very effective in distinguishing the particular firms that will experience distress” (p. 22).

5. Type III sums of squares was selected, so the entry order of the predictors does not have an effect on the model.
6. The results of the initial run suggest the proposed model with 18 independent variables is not suitable for the human services data and a more parsimonious model is appropriate. Therefore, nonsignificant variables were removed one at a time while monitoring QIC until 7 variables remained. Each time a nonsignificant variable was removed, QIC lowered. The result is a more parsimonious model with better fit.
7. The high correlation (.926) between MS and MU warranted a closer look. Hence, during the iterative process where nonsignificant variables were removed, multiple runs were performed with both MS and MU in, both taken out, and each variable in with the other removed. After multiple runs, it was evident the variables do not have a clear effect on financial health and the QIC was lowest with both variables trimmed.
8. Categorical variable information shows that 32.4% of higher education observations are prospectively endowed, whereas only 6.3% of human services observations are.
9. Despite this bias, previous researchers routinely include in their data only those organizations with 3 or more consecutive years of tax returns. This practice biases the sample even more toward larger organizations. Therefore, the multiyear restriction is not imposed here. Please refer to Note 4 for additional information.

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