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Managing Risk and Growth of Nonprofit Revenue

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Managers of nonprofit organizations are challenged to manage revenue growth and risk (i.e., volatility) in order to sustain current and future financial operations. Although the negative repercussions of revenue risk are generally perceived as undesirable, not all risk is bad. If higher levels of revenue risk are compensated with a greater amount of revenue growth, then organizations may rationally pursue volatile revenues that produce growth. This article examines the extent to which a reliance on major revenue sources by nonprofit organizations affects the magnitude of total revenue volatility as well as the pace of total revenue growth. A monitoring application is introduced that can be used to compare the effectiveness of revenue management among similar nonprofit organizations. It can also be used to guide nonprofit managers striving to achieve sustainable financial growth for their organizations.

Keywords: Revenue Risks, Revenue Growth, Revenue Volatility

Achieving a balance between the often-conflicting goals of revenue growth and revenue stability poses a serious challenge for efficient nonprofit management. Both objectives are critically important for the financial sustainability of nonprofit organizations—particularly now that nonprofits are tasked with handling more and more traditional government services. Indeed, as state and local governments face increasingly tumultuous political environments and growing pressures to increase efficiency and downsize, nonprofits have undertaken additional service responsibilities. To continue providing these services, it is crucial for nonprofit organizations to maintain adequate financial resources.

Traditionally, many of the public services provided by not-for-profit (i.e., nonprofit) organizations have been funded by government grants and fees. However, to accommodate the growing demand for services, nonprofits must become increasingly entrepreneurial in terms of utilizing multiple revenue sources to generate sufficient resources to accomplish their missions. Thus, revenue growth is often considered to be one of the primary goals when it comes to the financial management of nonprofit organizations.[1]

At a minimum, a nonprofit organization should have sufficient annual revenue growth to sustain current operations in future years. Revenue growth is also important for nonprofit organizations that seek to expand future service levels. At the same time that many nonprofits are seeking revenue growth and resource expansion, others are struggling with the immediate

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challenge of revenue instability. The dilemma for these organizations is that many long-term sources of revenue growth are volatile from year-to-year. Unstable revenue streams cause a variety of concerns, such as service provision disruptions and difficulties related to budgeting and financial planning. Despite these concerns, it is not generally feasible to completely eliminate revenue volatility. Instead, these concerning effects can be mitigated through savings and short-term loans as long as an organization's average annual revenue growth is sufficient to accommodate saving for (and servicing) these sources.

Young (2007) asserts that "the central features of nonprofit finance are its diverse income sources…and the need for each organization to find the strategies that will enable it to capture the income mix that best accomplishes its social mission" (p. 7). In this study, we explore which of the major nonprofit revenue sources contribute to nonprofit revenue growth and stability while controlling for financial ratios and other factors. Using financial data from the National Center for Charitable Statistics (NCCS) between 1998 and 2003, we test models that account for factors affecting the volatility and growth of nonprofit revenues. We consider the impact of the 2000 recession on nonprofit growth and stability and explore whether the effects of the major revenue components were consistent before and after the recession. The findings from this study offer important guidance for achieving sustainable nonprofit organizational development through revenue management.

The remainder of the article is structured as follows. The next section discusses two categories of relevant literature. We first review factors and assessments of nonprofit financial vulnerability and bankruptcy. We then focus on the financial impact of different revenue structures, with a particular focus on the potential connection between the mix of revenue sources that an organization has and its resource capacity. The next section outlines the methodology, the data, and the models. The fourth section discusses our empirical results. Finally, the last section concludes with a discussion of management implications.

Literature Review

Nonprofit Financial Performance

Research on nonprofit financial performance can be categorized into two groups. The first category focuses on assessment and helps to identify the financial factors that lead to organizational bankruptcy or demise. While the present study is not directly concerned with bankruptcy, bankruptcy is one possible result of excessive financial risk; therefore, this literature may help identify determinants of nonprofit financial risk.

The research on nonprofit financial performance indicates that nonprofit bankruptcy is associated with the types of revenue sources and/or the combinations of revenue sources available to a given nonprofit. Drawing on resource dependence theory, Grønbjerg (1990) argued that government funding is more stable than other sources. This gives nonprofit organizations an incentive to secure government funding to enhance their revenue growth and revenue predictability, as discussed by Kingma (1993). However, Chabotar (1989) suggested that nonprofit organizations should diversify their revenue bases to avoid becoming overly dependent on any single source of revenue. Thus, minimizing their financial vulnerability.

The work of Chang and Tuckman (1994) confirmed that diversified revenue sources are more likely than concentrated revenue sources to form a strong financial foundation. In addition, the authors pointed out that a nonprofit's activities and the magnitude of its fundraising expenditures affects its ability to diversify revenues. Froelich (1999) and Jegers (1997) acknowledged the potential benefits of revenue diversification but also discussed related concerns and constraints. Similarly, Frumkin and Keating (2011) argued that the desirability of revenue diversification is not always clear because revenue concentration offers some

significant benefits, such as lower administrative and fundraising expenses. Bowman (2011) examined nonprofit capacity and sustainability issues from both long- and short-term perspectives. He argued that long-term perspectives focus on maintaining or expanding services, while short-term perspectives aim for resiliency or capacity to absorb "occasional economic shocks while making progress toward meeting long-term objectives" (p. 39).

The Tuckman and Chang (1991) study is one of the most influential articles on nonprofit financial risk. The authors argued that revenue diversification is just one of four ways to reduce financial vulnerability. Their seminal study identified a conceptual framework for assessing financial vulnerability among nonprofits using four vulnerability criteria: inadequate equity balances, revenue concentration, low administrative costs, and low or negative operating margins.

A number of studies have used Tuckman and Chang's (1991) vulnerability measures to predict the bankruptcy of nonprofits. For example, Greenlee and Trussel (2000) and Trussel (2002) empirically tested the utility of the Tuckman-Chang vulnerability measures using multiyear national nonprofit samples. Hager (2001) tested the Tuckman-Chang measures using a population of nonprofit arts organizations and concluded that the measures were able to predict the demise of some nonprofit organizations, but not all types of arts nonprofits. Gordon, Fischer, Greenlee, and Keating (2013) compared the Tuckman-Chang model with the bankruptcy forecasting model in the corporate sector and concluded that neither was effective in predicting financial vulnerability. Instead, the authors proposed an expanded model that included factors capturing reliance on commercial activities and endowment sufficiency and showed that their model significantly outperformed its predecessors. In summary, financial risk differs greatly among nonprofit organizations and is contingent upon organizational and financial characteristics.

A second category of literature suggests that nonprofit financial risk can be controlled through proactive strategies to manage financial resources and improve an organization's financial strength. Similar to the first body of literature identified, this literature also draws on resource dependence theory. Hodge and Piccolo (2005) found that privately funded agencies were less vulnerable to economic shocks than government or commercially funded agencies. They also found that a CEO's strategic interactions with the board depended partly on the nature and mix of the organization's resources. Meanwhile, Fischer, Wilsker, and Young (2011) observed that revenue composition was usually driven by the nature of services provided. The authors found that organizations with mostly private benefits relied primarily on earned program revenues, while publicly oriented organizations relied more heavily on donations.

Given the importance of accumulating capital assets to expand service provision and achieve long-term sustainability, Yan, Denison, and Butler (2009) examined the extent to which revenue diversification and government grants were incorporated into debt financing decisions. To do so they used data from a national sample of arts, culture, and humanities nonprofit organizations. Their findings suggested that nonprofit organizations with greater revenue diversification were more likely to issue debt but did not necessarily have higher debt ratios. Government financial support, they found, increased both an organization's likelihood of issuing debt and its debt ratio. In a similar line of research, Denison (2009) showed that nonprofit organizations with greater program revenues, contributions, total assets, total revenues, and executive compensation were more likely to rely on mortgages. Denison (2009) also found that special event fundraising is a disincentive to bond financing and that an organization's use of debt is affected by the nature of its mission.

Chikoto and Neely (2013) examined revenue concentration and revenue growth. Using IRS Form 990 data similar to the data that we use in our study, they found that a nonprofit organization's revenue growth is inversely related to revenue diversification, as measured by a Herfindahl-Hirschman Index (HHI). The authors concluded that revenue concentration is

more effective in generating revenue growth in the short-term, but that the effects are reversed in the long-term. Our research complements Chikoto and Neely's (2013) work in that it examines both revenue growth and risk by identifying the revenue sources with the most potential for growth and the least amount of volatility, thus permitting some nonprofit managers to potentially manage and benchmark revenue sources.

Quantitative Risk and Return Measures

Risk managers often differentiate between risk and uncertainty. Risk is the volatility in outcomes that can be measured with probabilities. Uncertainties are unexpected outcomes that are difficult to predict (Crouhy, Galai, & Mark, 2006). We focus on volatility risk in this study by calculating the standard deviation of annual growth in annual revenue collections of nonprofit organizations.

The financial priorities of nonprofits are arguably different than those of for-profit corporations and tax-supported governments. However, some of the concepts in the literature on risk and return in the for-profit sector can be applied to nonprofit organizations. In Markowitz's (1952) seminal article, in which he laid out his portfolio theory, he also articulated the fundamental maxim of mean-variance models: that "the investor does (or should) consider expected return a desirable thing and variance of return an undesirable thing" (p. 77). Thus, investors typically expect a greater average return when the variance of returns is high. Tobin's (1958) work established the standard deviation as a preferred method to measure variance. Furthermore, the works of Markowitz (1952), Tobin (1958), and many others demonstrate the widely observed principle that increasing average returns in for-profit markets generally requires taking on greater risk with respect to the variance of returns. This premise has also been applied to commercial firms in the context of diversification and capital structure (see, for instance, Amit & Livnat, 1988a, 1988b; Rubinstein, 1973). The financial risk of a corporation is also influenced by the debt and fixed asset leverage (Brealey & Myers, 1991).

Revenue volatility is a familiar concept in corporate finance. Revenue collections are frequently unpredictable and fluctuate year-to-year. As an active approach to mitigate the impact of volatility, many organizations and individual investors use the strategy of portfolio diversification. Diversification reduces risk more than yield as long as the price movements of different securities in an investment portfolio are not perfectly correlated (Brealey & Myers, 1991). A single security's contribution to the (market) risk of the whole portfolio depends on how sensitive the security is to market movements.

A similar rationale can be applied to the revenue structure and percentage growth in revenue of nonprofit organizations (Kearns, 2007; Kingma, 1993). By employing multiple revenue sources, similar to a mix of security holdings, an organization may reduce its financial risk hedging against the decline of any single revenue while enabling the total revenues to grow over time (Frumkin & Keating, 2002). However, this improved revenue stability may come at the cost of suppressed revenue growth.

Carroll and Stater (2009) also conducted a study relevant to this research. They used a national sample of nonprofit organizations from 1991 to 2003 to empirically test the function of revenue diversification in stabilizing nonprofit revenue streams. Their results indicated that equal reliance on earned income, investments, and contributions can indeed reduce concerns about revenue volatility. Regarding the existence of the risk-reward relationship, their research used a proxy approach to examine whether an organization's growth potential, as measured by fund balance and retained earnings, helps to reduce revenue volatility; they found that both factors were negatively associated with volatility, suggesting a complementary relationship rather than a trade-off.

The preceding discussion of the literature on financial vulnerability and quantitative measures of risk and return gives rise to the following hypothesized relationship:

> *Hypothesis$_1$: Standard deviation (i.e., risk) and percentage growth of annual revenues (i.e., return) are inversely related.*

Important control variables include revenue shares of government grants, contributions, program revenue, investment revenue, fixed-assets leverage, and debt leverage, along with an organization's size, age, and nonprofit subsector.

Model Development

Revenue growth is measured by calculating the six-year average of the annual change in total revenues. Specifically, the percent change in total revenues for organization *j* is given by equation [1], where the difference in total revenues of period *t* and period *t-1* is divided by the last period's revenues. The average percent change in total revenues of organization *j* for the six years of observations in our sample is given by equation [2]. Financial risk is measured by the standard deviation of the five annual percent changes in total revenue for organization *j* given by equation [3].

$$\Delta R_{jt} = \frac{R_{j,t+1} - R_{jt}}{R_{jt}} \qquad [1]$$

$$\overline{\Delta R_j} = \frac{1}{5}\sum_{t=1}^{5}(\Delta R_{jt}) \qquad [2]$$

$$R_j^{SD} = \left[\frac{1}{4}\sum_{t=1}^{5}\left(\Delta R_{jt} - \overline{\Delta R_j}\right)^2\right]^{1/2} \qquad [3]$$

The recent work of Mayer, Wang, Egginton, and Flint (2014) argued that the trade-off between volatility and expected growth of revenue should not be taken for granted; instead, the specific effects of revenue diversification on volatility and expected growth vary with changes in portfolio components. It is, therefore, a practical challenge for nonprofit managers and an empirical question for nonprofit researchers to identify whether nonprofit organizations have peculiar financial characteristics that contribute to a given level of revenue instability and growth (which we use as our dependent variables).[2]

A first step is to examine the overall correlation between average growth and the standard deviation. The aggregate mean–variance trade-off is examined through the correlation coefficient of the sample mean and the variance. The correlation coefficient between the sample average revenue growth and the standard deviation of revenue growth is 0.98, suggesting strong evidence of a risk and return trade-off. Organizations with high average revenue growth rates are associated with high standard deviations in revenue growth rates. Note that, while this finding is intuitive, there is nothing mathematically requiring that the standard deviation should be high relative to revenue growth for a specific organization. For example, an organization that has consistent revenue growth of 10% every year for four years would have a fairly high average annual growth of 10% for the period with a low standard deviation of zero.

We consider the six major revenue sources to be a unique investment in a nonprofit organization's financial portfolio (Kearns, 2007; Kingma, 1993). These revenue sources manifest with different degrees of economic responsiveness to the macro environment. The total return of a portfolio is the weighted average return of the individual securities that comprise the portfolio. Therefore, the mean growth in total revenues ($\overline{\Delta R_j}$) for organization *j* can be broken down into the weighted average growth in each of the six major revenue sources

i, as shown by equation [4]. Here $\overline{\Delta R_{Ji}}$ is the mean annual percent growth for revenue source i, and w_{ij} is the proportion of the revenue from individual source (i) to total revenues for organization j. The sum of the weighted percent change for each revenue source equals the total average annual growth rate (i.e., percent change in total revenues) for each organization. Similarly, the standard deviation for the total growth rate (R^{SD}) is divided into the weighted average components for each revenue source as shown in equation [5]. Unlike Carroll and Stater (2009) who used the HHI to measure revenue diversification, we examine the individual impact of each revenue source on revenue volatility and growth using the weighted average approach. Therefore, our model does not require the assumption that equal shares of revenues are optimal.

$$\overline{\Delta R_J} = \sum_{i=1}^{6} \overline{\Delta R_{Ji}} w_{ji} \qquad [4]$$

$$R_j^{SD} = \sum_{i=1}^{6} R_{ij}^{SD} * w_{ij} \qquad [5]$$

Based on the associations previously discussed in the nonprofit and corporate literature, we establish two models to further investigate the growth and volatility of the total revenue of nonprofit organizations as follows:

$$\textit{Revenue Average Growth} = \alpha + \beta(\textit{Major Revenue Sources}) + \gamma(\textit{Financial Ratios}) + \delta(\textit{Economic Factor}) + \varphi(\textit{Nonprofit Subsectors}) + \varepsilon$$

$$\textit{Revenue Standard Deviation} = \alpha + \beta(\textit{Major Revenue Sources}) + \gamma(\textit{Financial Ratios}) + \delta(\textit{Economic Factor}) + \varphi(\textit{Nonprofit Subsectors}) + \varepsilon$$

The two dependent variables are *average annual total revenue growth* and *the standard deviation of revenue growth*, as discussed above. The explanatory variables are the same for both models. The explanatory variables are described in Table 1 and fall into four categories. The first category comprises five of the six major revenue sources for nonprofits: contributions, program revenues, dues, investments, and other revenues. Grant revenue is omitted. The revenue variables are measured as a proportion of total revenue. The inclusion of the proportion of each revenue source is based on the weighted average return formula in equation [4]. Therefore, the beta for each revenue source can be interpreted as the sample mean return of an individual revenue source (relative to grant revenue). The same logic applies to the standard deviation model.

The second category of explanatory variables consists of several financial measures. The log of total revenue captures economies of scale and organizational size. The fixed-asset ratio is the ratio of fixed assets to total organizational assets and is a measure of the revenue-producing assets. The fixed-asset ratio measures the portion of the total assets that may be used to provide services, as opposed to endowment funds that generate investment revenues. The bond ratio, mortgage ratio, and liability ratio capture the influence of financial leverage on revenue growth and volatility. Financial leverage occurs as a result of the fixed cost associated with obligatory debt service payments.

The third category is the economic climate of the state in which the nonprofit organization is located and is measured by the log of state personal income. The effects of economic climate are also considered by creating a dichotomous variable equal to one during and after the recession and examining this dichotomous variable's interactions with the other variables.

The fourth category is the organizational characteristics of the nonprofit organization within the nonprofit subsectors represented in the sample described in Table 2. The two control variables in this group are organizational age and nonprofit subsector (i.e., NTEE classification code) in which the organization operates.

Table 1. Description of Variables

Variable	Definition	Mean	Standard Deviation
Average Growth	Average of annual % change in total revenue	0.200	0.677
Standard Deviation	Standard deviation of % change in total revenue	0.422	0.882
Coef_variation	Ratio of standard deviation over growth	-	-
Grants	% of government grants of total revenue	0.170	0.231
Contribution %	% of contributions of total revenue	0.338	0.446
Program Revenue %	% of program revenues of total revenue	0.385	0.387
Dues %	% of membership dues of total revenue	0.034	0.125
Investment %	% of investment income of total revenue	0.053	0.139
Other Revenue %	% of other revenues of total revenue	0.020	0.077
Ln_total_rev	Natural log of total revenue	13.526	1.867
Fixed_ratio	Ratio of fixed assets to total assets	0.302	0.300
Bond_ratio	Ratio of bond to long term fixed debt	0.014	0.081
Mort_ratio	Ratio of mortgage to long term fixed debt	0.096	0.199
Liab_ratio	Ratio of total liabilities to total assets	0.360	0.528
Ln_state_inc	Natural log of state personal income	15.704	1.008
Age	Number of years since organization was founded	20.158	16.138
No Age	Dummy variable=1 if age missing	0.019	0.137
NTEE	26 major classifications of NTEE (dummy variables)	-	-
Recession	Dummy variable=1 for years 2001, 2002 and 2003	-	-
Recessionx--	Interaction of post-recession with specific variable	-	-

The focus of our analysis is on examining the average risk and growth factors among organizations (and not within an organization) over time. The between estimator, or group means estimator, is an appropriate and robust model for this purpose (see Greene, 2008, p. 189). We collapsed the annual observations by calculating the mean to produce a single observation for each organization, with its corresponding values for the average annual revenue growth and the standard deviation. The values of the continuous explanatory variables were averaged by organization over the time period, and betas were estimated through regressions on the single cross section.[3] The between estimator model captures only differences among organizations (not within organizations). Organizational differences in annual total revenues were measured through the average and standard deviation of annual growth, which were calculated when the data were collapsed.

Data Description

The financial data for nonprofit organizations were extracted from the National Center for Charitable Statistics (NCCS) Digitized Data, which provides comprehensive information from

Table 2. Nonprofit Subsectors Represented in the Sample

NTEE Code	NTEE Category	Total Organizations	% of Sample
A	Arts	9,795	9.36
B	Education	13,533	12.93
C	Environment	1,961	1.87
D	Animal	1,151	1.10
E	Health	13,713	13.10
F	Mental	4,898	4.68
G	Disease	2,735	2.61
H	Medical Research	843	0.80
I	Crime	2,379	2.27
J	Employment	2,414	2.31
K	Food	999	0.95
L	Housing	7,198	6.88
M	Public Safety	571	0.55
N	Recreation	2,965	2.83
O	Youth	2,987	2.85
P	Human Services	19,969	19.07
Q	International	1,608	1.54
R	Civil Rights and Advocacy	851	0.81
S	Community Improvement	4,781	4.57
T	Philanthropy	4,154	3.97
U	Science and Tech	737	0.70
V	Social Science Research	297	0.28
W	Public and Societal Benefit	1,029	0.98
X	Religion Related	2,881	2.75
Y	Mutual Membership	240	0.23
Total		104,691	100

Notes: NTEE=National Taxonomy of Exempt Entities. Category Z is omitted due to no observations.

the 990 forms that all nonprofit entities with $25,000 or more in gross receipts are required to file annually with the IRS. The NCCS Digitized Data includes observations for individual nonprofit organizations from 1998 to 2003. Compared with more traditional sources of information in this field, e.g., the IRS Statistics of Income Sample Files (SOI), NCCS Digitized Data offer several advantages such as the inclusion of all qualified nonprofit units and improved quality and reliability of the financial information. Although the NCCS data do have limitations, these data files (when properly cleaned) have shown to be generally reliable sources of information for nonprofit financial management studies, as discussed by Carroll (2009) and others (e.g., Froelich & Knoepfle, 1996; Froelich, Knoepfle, & Pollak, 2000). The socio-economic data depicting the macro environments in which the nonprofit organizations operate were obtained from the U.S. Bureau of Economic Analysis.

Total revenue is a key variable because it provides the basis for the dependent variables: *annual average operating revenue growth* and *standard deviation*. The total revenue reported on the 990 form is based on more revenues than included in the analysis. Therefore, an alternative measure of total revenue was constructed that summed the six major revenue sources of interest: contributions, grants, program revenues, dues, interest income, and other miscellaneous revenues (which includes unrelated business income).

A significant amount of data cleanup was necessary before the data could be used.[4] The dollar amounts were adjusted to real dollars (year 2000) using the consumer price index before the average revenue growth rates and standard deviations were calculated for the dependent variables. The time-series was collapsed into a single measure by organization. If a nonprofit, as identified by its Employer Identification Number (EIN), was missing data for any year, the

organization was dropped from the sample.[5] In this way, we ensured that there were six observations per organization prior to collapsing.

After collapsing the data into a single cross-section by organization, several extreme values were identified. Using extreme values produces regressions with large measurement errors and large standard errors driven by a small percentage of the observations. Outlier bias was removed by trimming the data on both tails of the distribution. Trimming is preferred to arbitrarily omitting outliers (Andrews, et al., 1972; Stuart & Ord, 1987, pp. 49-50). Therefore, the data were trimmed by 1% to remove unusually high and low values for the dependent variables, which could have created bias in the regression estimates.[6] Following the advice of Bowman, Tuckman, and Young (2012), the observations were also filtered to remove organizations that did not report on the 990 form that they used the accrual basis of accounting.

Approximately 2% of the observations were missing age data. Therefore, we created a variable called *no age*, i.e., a dummy variable that is equal to one if an organization's date of establishment is missing from the 990. We observed that organizations with missing establishment dates were more likely to be older. Coding in this way allowed us to keep more than 6,500 observations in the sample that did not report age but met other data requirements.

Empirical Test

The regression results for the group means are shown in Table 3. Model 1 shows the coefficients for the dependent variable *average annual revenue growth*. Model 1 is based on the mean values of the variables for organizations with six years of data available to calculate the average revenue growth. Similarly, model 2 reports the coefficients for the dependent variable *standard deviation* for organizations with six years of data available to calculate the standard deviations and means of the explanatory variables.

The two models have *F*-statistics that are statistically significant and coefficients on explanatory variables that are mostly statistically significant. The coefficient on the revenue variables should be interpreted in relation to government grants, the omitted revenue category. Program revenues and dues have a negative impact on total revenue growth. Contributions, investment income, and other revenue sources all have a positive impact on total revenue growth. Program revenues and dues also have a negative impact on the standard deviation. This means that the revenue sources that are most stable are the same revenue sources that decrease the potential for revenue growth. Similarly, organizations with a higher percentage of revenues from contributions, investment income, and other revenue sources see greater volatility in total revenue (i.e., larger standard deviation). The findings, therefore, provide consistent evidence in support of the mean-variance theory or the risk and return trade-off.

The control variables for the leverage ratios provide interesting insight into revenue growth and volatility. Firms with higher proportions of fixed assets relative to total assets tend to experience slower revenue growth but are also less volatile. The leverage ratios indicate that nonprofit organizations that issue bonds experience greater revenue growth and higher revenue volatility. Organizations with mortgages are also associated with slight revenue growth and statistically significant impacts on revenue volatility.

The 24 NTEE code variables capture the subsectors in which nonprofit organizations operate. The arts category (A) is the omitted category. Therefore, arts organizations serve as the reference point for interpreting the coefficients of the NTEE dummy variables. Nonprofit organizations providing services in the areas of education (category B), environment (category

Table 3. Regression Results and Coefficient Estimates (Including Marginal Coefficient of Variation)

Variables	(1) Average Annual Growth		(2) Standard Deviation		(3) Marginal CV
Contribution %	0.058**	(0.001)	0.292**	(0.011)	5.04
Program Revenue %	-0.127**	(0.001)	-0.112**	(0.010)	0.88
Dues %	-0.154**	(0.012)	-0.100**	(0.022)	0.65
Investment %	0.164**	(0.014)	0.581**	(0.018)	3.54
Other Revenue %	0.185**	(0.026)	0.514**	(0.033)	2.78
Ln_total rev	-0.021**	(0.001)	-0.036**	(0.001)	1.70
Fixed_ratio	-0.145**	(0.008)	-0.157**	(0.010)	1.08
Bond_ratio	0.233**	(0.027)	0.187**	(0.033)	0.80
Mort_ratio	0.061**	(0.013)	0.062**	(0.016)	1.01
Liab_ratio	-0.012**	(0.004)	-0.026**	(0.005)	2.16
Ln_state_inc	0.008**	(0.002)	0.002	(0.002)	NA
NTEE B	0.024**	(0.008)	-0.014	(0.010)	NA
NTEE C	0.061**	(0.016)	0.086**	(0.019)	1.42
NTEE D	0.023	(0.019)	-0.012	(0.024)	NA
NTEE E	0.025**	(0.009)	-0.006	(0.011)	NA
NTEE F	-0.058**	(0.011)	-0.145**	(0.014)	2.50
NTEE G	-0.044**	(0.012)	-0.081**	(0.017)	1.87
NTEE H	0.044+	(0.023)	0.007	(0.029)	NA
NTEE I	-0.121**	(0.015)	-0.173**	(0.018)	1.43
NTEE J	-0.052**	(0.015)	-0.105**	(0.018)	2.04
NTEE K	-0.057**	(0.021)	-0.151**	(0.026)	2.66
NTEE L	-0.001	(0.010)	-0.020	(0.013)	NA
NTEE M	-0.103**	(0.026)	-0.147**	(0.033)	1.43
NTEE N	-0.047**	(0.013)	-0.069**	(0.016)	1.46
NTEE O	-0.044**	(0.013)	-0.112**	(0.017)	2.55
NTEE P	-0.050**	(0.008)	-0.119**	(0.001)	2.38
NTEE Q	0.010	(0.017)	-0.017	(0.021)	NA
NTEE R	-0.054*	(0.023)	-0.109**	(0.028)	2.03
NTEE S	-0.027	(0.0111)	0.002	(0.014)	NA
NTEE T	0.008	(0.012)	-0.019	(0.015)	NA
NTEE U	0.022	(0.025)	0.029	(0.030)	NA
NTEE V	-0.007	(0.037)	-0.054	(0.046)	NA
NTEE W	-0.051*	(0.021)	-0.074**	(0.026)	1.47
NTEE X	-0.081**	(0.013)	-0.164**	(0.016)	2.01
NTEE Y	0.055	(0.041)	0.012	(0.051)	NA
No_age	0.091**	(0.015)	-0.043*	(0.021)	(0.47)
Age	-0.003**	(0.000)	-0.004**	(0.000)	1.17
Constant	0.525**	(0.035)	0.960**	(0.045)	1.83
Observations	104,691		102,684		
R^2	0.044		0.089		

**$p<0.01$, *$p<0.05$, +$p<0.1$

Notes: Robust standard errors in parentheses. The Coefficient of Variation (CV) is the standard deviation divided by average return. The Marginal CVs are the coefficients from model 2 divided by the coefficients from model 1. NA means not applicable because one or more coefficients are not statistically significant.

C), healthcare (category E), and medical research (category H) exhibit higher average revenue growth and greater revenue volatility than those in the arts subsector. On the other hand, nonprofit organizations providing services in the areas of mental health (category F), crime and law (category I), employment (category J), food (category K), housing (category L), public

safety (category M), recreation (category N), youth (category O), human services (category P), civil rights and advocacy (category R), public and societal benefits (category W), and religion (category X) exhibit slower revenue growth and less revenue volatility relative to those in the arts subsector.

In terms of total revenue, larger organizations experience slower average growth and smaller standard deviations in annual revenues. The age of an organization is statistically significant, but the magnitude of the age coefficient is not substantial. This implies that, everything being equal, as an organization gets older its revenue growth diminishes but the organization also experiences less revenue volatility.

The economic climate of the state in which a nonprofit is located has an interesting impact on revenue growth and volatility. Specifically, nonprofit organizations in states with higher aggregate personal income exhibit modest increases in revenue growth and revenue volatility. The short-term effect of the economy is examined in a later model.

The literature on financial risk and return frequently employs the coefficient of variation as a convenient method to compare risk and return (Markowitz, 1952). The coefficient of variation is the ratio found by dividing the standard deviation by the average return. The right-hand column of Table 3 provides a ratio of risk to return that we call the marginal coefficient of variance (CV). This is calculated by dividing the coefficients from the standard deviation model (model 2, Table 3) by the coefficients from the average revenue growth model (model 1, Table 3). Thus, the ratio provides a quick way to compare the risk per unit of return (i.e., growth) for each explanatory variable. For example, a 1 percentage point increase (0.01) in the average proportion of revenue from contributions increases the annual growth by 0.000574 percentage points and the standard deviation by 0.00292 percentage points. The standard deviation increases five times more than the growth in annual revenue.

The marginal CV ratio quantifies the increase in revenue growth in relation to the increase in the standard deviation (i.e., risk) to facilitate comparisons across variables. Every unit of annual growth arising from an increased reliance on contributions is associated with an increase of 5.04 units in the standard deviation. A high value for this ratio indicates that increasing the proportion of revenues from contributions will increase revenue volatility more than annual revenue growth. The lower the marginal CV ratio, the more growth is generated relative to changes in revenue volatility. Consider, for example, investment revenue. A 1 percentage point increase in the proportion of investment revenue increases growth by 0.00164 percentage points and standard deviation by 0.00581 percentage points. The marginal CV ratio is 3.54, indicating that the growth from interest revenues comes at the cost of substantially more revenue volatility. Investment revenues increase total revenue volatility more per unit of growth when compared with the other revenue sources. The program revenues variable has the lowest marginal CV meaning that, on average, program revenues offer the best opportunity to reduce volatility relative to growth. Note that the marginal CV ratio is not meaningful where the regression coefficient is not statistically significant.

The coefficients in Table 3 provide an industry-wide average that may be used to predict how alterations in an organization's revenue mix might better balance risk and revenue growth. For example, an organization that is predominately reliant on program fees might increase growth opportunities by decreasing this reliance and pursuing other revenue sources, such as contributions and investment revenues—assuming these revenue sources are viable options. The dilemma here is that contributions and investments are, on average, more volatile. The information in Table 3 provides some insight into the relative growth potential and risk. It is important to note that the actual growth and risk potential of a nonprofit organization may differ from the sector averages derived through the regression model. For example, an education-oriented nonprofit organization may be able to adjust its program fees (i.e., tuition) to build revenue growth, while a human services nonprofit organization that provides services

principally on behalf of governments might have little room to negotiate fee increases. Investment management strategies, therefore, can vary widely in terms of risk tolerance, meaning that organization-specific investment risk and returns may deviate from market-wide findings. This concept will be discussed further in the next section.

Bowman (2011) argues that a short-term aspect of the nonprofit revenue goal is to be able to absorb external economic shocks. There is no reason to assume that revenue growth will remain constant over time as the prevailing industry-wide environment changes. Rather, the coefficients in Table 3 are expected to be different when viewed in the short-term compared with the long-term. To explore this scenario, we next look at whether the growth and risk coefficients changed in the periods during and following the economic recession. The binary variable *recession* is created with a value equal to zero for the years 1998 through 2000 and a value equal to one for the years 2001 through 2003. Experts vary in opinion as to the end of the recession period, but the unemployment rate was still as high as 6% in 2003 (Maxfield, 2006). By 2004, gross domestic product was growing and the unemployment rate was falling. Thus, we define the recession period as 2001 through 2003. The average revenue growth, the standard deviation, and the average values of the explanatory variables are calculated prior to, and during, the recession period for each organization. The pre-recession and recession panels are analyzed together, with the dichotomous recession variable interacting with the revenue percentage variables and other key explanatory variables except NTEE variables. The results are shown in Table 4.

The coefficients on the explanatory variables are based on information in both panels. The coefficients used in the interaction variables indicate the adjustment of the coefficients in the recession panel. For example, the coefficient on investment revenue is 0.32 for the average growth model. The coefficient on investment interaction is -0.40, meaning that the combined coefficient in the recession panel is approximately -0.08 (0.32-0.40=-0.08). Thus, following 2000, investment revenues were associated with a negative growth rate and less risk (i.e., smaller standard deviation). Of particular interest is the fact that the magnitude of the coefficient on investment revenues is substantially less than that on the aggregate coefficient. The combined coefficient on investment revenues in the standard deviation model dropped to 0.11 (1.00-0.89=0.11) during the economic decline. Thus, for an average organization, an increase of 1 percentage point on the proportion of revenues from investments decreased the average growth of revenues by eight percentage points and increased the standard deviation by eleven percentage points during and after the recession. This suggests that many managers of nonprofit organizations became much more risk-averse in their investment policies following the market decline. Note that the dummy variable *recession* indicates that both average growth and standard deviation were lower in the 2001 to 2003 panel, suggesting a shift to low-risk, low-yield investments, such as U.S. treasuries.

Template for Decision-Making

The models presented in Table 3 may be used by managers of individual organizations to assess strategic opportunities and evaluate performance in relation to revenue management. Financial officers may be able to alter an organization's revenue mix in the long run to accomplish financial goals of revenue growth and stability. Average revenue growth may be enhanced by increasing the proportions of total revenues derived from contributions, investment revenues, and other miscellaneous revenues. Revenue volatility may be reduced by increasing the proportions of total revenues derived from program revenues and membership dues.

Some critics of the nonprofit revenue diversification literature argue that nonprofit managers may have minimal opportunities to dramatically alter their organization's revenue mixes. Fortunately, the regression models in Table 3 can be employed to find adjusted performance

Table 4. Regression Results and Coefficient Estimates (Pre-Recession and Recession Panels)

	(1)		(2)	
Variables	Annual Growth		Standard Deviation	
Constant	0.769**	(0.043)	1.461**	(0.068)
Contribution %	0.021	(0.019)	0.130**	(0.036)
Program Revenue %	-0.214**	(0.014)	-0.253**	(0.024)
Dues %	-0.275**	(0.019)	-0.302**	(0.033)
Investment %	0.319**	(0.024)	1.001**	(0.046)
Other Revenue %	0.150**	(0.034)	0.380**	(0.055)
Ln_total_rev	-0.033**	(0.002)	-0.062**	(0.003)
Fixed_ratio	-0.135**	(0.008)	-0.171**	(0.012)
Bond_ratio	0.297**	(0.035)	0.282**	(0.036)
Mort_ratio	0.044**	(0.013)	0.045**	(0.018)
Liab_ratio	0.010*	(0.005)	-0.020**	(0.006)
Ln_state_inc	0.006**	(0.002)	-0.002	(0.003)
Age	-0.003**	(0.000)	-0.002**	(0.000)
No Age	0.061**	(0.013)	-0.046**	(0.017)
Recession	-0.586**	(0.052)	-0.561**	(0.091)
Recessionx Contribution %	0.006	(0.024)	-0.038	(0.055)
Recessionx Program Revenue %	0.089**	(0.017)	-0.005	(0.038)
Recessionx Dues %	0.183**	(0.023)	0.097*	(0.048)
Recessionx Investment %	-0.398**	(0.028)	-0.894**	(0.058)
Recessionx Other Revenue %	0.049	(0.044)	0.029	(0.078)
Recessionx Ln_total_rev	0.028**	(0.002)	0.023**	(0.003)
Recessionx Fixed_ratio	0.104**	(0.010)	0.115**	(0.015)
Recessionx Bond_ratio	-0.217**	(0.040)	-0.134**	(0.049)
Recessionx Mort_ratio	-0.016	(0.016)	-0.036	(0.023)
Recessionx Liab_ratio	-0.016**	(0.006)	0.016*	(0.008)
Recessionx Ln_state_inc	0.002	(0.003)	0.016**	(0.004)
Observations	327,485		295,745	
R^2	0.043		0.058	

**$p<0.01$, *$p<0.05$, +$p<0.1$

Notes: Robust standard errors in parentheses. NTEE variables included in models, but not interacted or reported.

benchmarks conditional upon an organization's revenue mix—even if this revenue mix is considered to be beyond the nonprofit manager's control. Regression-adjusted performance measures have been applied in many settings, including education (Stiefel, Rubinstein, & Schwartz, 1999) and job training (Schochet & Fortson, 2014).

A manager of a nonprofit organization may find the regression-adjusted performance measures by using the following steps:

- Calculate the organization's actual change in revenue growth and standard deviation using equations [1], [2], and [3]
- Calculate the organization's average values for the continuous explanatory variables for both models in Table 3.
- Use the mean values of the exploratory variables in models 1 and 2 in Table 3 to find the predicted values of growth and standard deviation.
- Compare actual and predicted growth and standard deviation.

To illustrate, Table 5 provides individual data on five of the nonprofit organizations included in the sample. The organizations are similar in that they are classified in NTEE category "A" and have missions associated with musical performance in metropolitan centers.

The regression models in Table 3 can be employed to calculate adjusted performance measures, while holding the revenue mix constant. The basic premise of regression-adjusted measures is that the actual performance is compared with predicted performance, which is estimated through a regression model that incorporates the key factors beyond management control. In this application, the organization's performance measures are the average annual revenue growth and standard deviation between 1998 and 2003. The actual revenue growth and standard deviations for the five organizations are listed in Table 5 in the columns labeled Org_1 through Org_5. The predicted values are derived from regression models 1 and 2 in Table 3.

The predicted values of average revenue growth and standard deviation provide points of comparison that account for an organization's revenue mixes and for the values of other control variables in the model. Organization 1 performed at the expected average return and more commendable is that the actual standard deviation is nearly half of the predicted standard deviation. Organization 2 was also near the benchmark for revenue growth; however, it is disconcerting that the actual standard deviation was more than double the predicted value, indicating much higher revenue volatility than that of organizations with a similar revenue mix. Organization 3 generated revenue growth 18 percentage points above the predicted value with an actual standard deviation equal to the predicted standard deviation. Organization 4 experienced a standard deviation greater than expected, but generated revenue growth an impressive 25 percentage points above the predicted value. Finally, Organization 5 had average volatility and growth in revenues.

Coefficients of variation were calculated for the actual and predicted values. Organizations 1, 3 and 4 are relatively low risk for their average growth and are beating their benchmarks. Organization 2 is experiencing excessive revenue volatility compared with the other organizations in the sample. These findings suggest that management should investigate what makes their revenues so volatile or consider less-volatile revenue options.

Regression-adjusted performance measures may be tailored to individual nonprofit organizations by building models on adequate samples of similar organizations rather than on all subsectors of the nonprofit sector, as we do in our application. In sum, Table 5 provides an example of an application of our model to five specific nonprofit organizations. Perhaps managers of nonprofit organizations may be able to use the model's results to change the factors within their control to influence the organization's revenue growth and volatility.

Conclusion

The academic research on the revenue sources of nonprofit organizations has focused primarily on financial insolvency and revenue volatility. This study adds a mean-variance perspective to the evaluation of revenue management that explicitly incorporates revenue growth. The findings from our study indicate that organizations that rely heavily on program revenues and dues experience less revenue volatility. However, this revenue stability comes at the cost of slower total revenue growth. By contrast, organizations that rely to a greater degree on contributions, investments, and other revenue sources, such as unrelated business income, experience both a higher degree of revenue volatility and a higher average revenue growth. In addition, we find that between 2001 and 2003, nonprofit managers generally became more risk-averse and conservative in their investments in balancing financial risk and yield. We also illustrated how our models may be used to determine risk-adjusted performance measures of total revenue growth and volatility.

Table 5. Illustration of the Adjusted Performance Measures for Revenue Management

	Organization				
	Org_1	Org_2	Org_3	Org_4	Org_5
Performance Measures					
Actual Average Revenue Growth	0.22	0.17	0.41	0.40	0.25
Predicted Average Revenue Growth	0.22	0.14	0.23	0.15	0.26
Actual Standard Deviation	0.28	0.79	0.59	0.58	0.51
Predicted Standard Deviation	0.45	0.31	0.59	0.46	0.68
Actual CV[++]	1.27	4.65	1.44	1.45	2.04
Predicted CV[++]	2.05	2.21	2.57	3.07	2.62
Control Variables					
Contribution %	35.90	51.10	52.20	8.60	1.70
Program Revenue %	47.50	41.90	34.30	90.80	74.00
Investment %	1.30	2.50	13.50	0.20	7.80
Other Revenue %	3.80	0.00	0.00	0.40	16.50
Ln_total_rev	13.51	17.43	10.34	11.45	9.51
Fixed_ratio	0.02	0.03	0.32	0.00	0.00
Liab_ratio	0.40	0.27	0.00	0.00	0.00
Age	9	4	17	19	21
Ln_state_inc	6.02	6.48	5.12	5.47	5.67

Note: The illustrative organizations (Org_1 – Org_5) in Table 5 are all music-performing nonprofit organizations in metropolitan areas. The predicted values of average revenue growth and standard deviation are based on model coefficients in Table 3. The five organizations are classified in NTEE category "A" and have zero values for the following variables: Dues percent, Bond ratio, and Mortgage ratio. To illustrate Org 1 predicted mean growth: YY=0.058 x 0.359 + -0.127 x 0.475 + 0.164 x 0.013 + 0.185 x 0.038 + -0.021 x 13.51 + -0.145 x 0.02 + -0.012 x 0.40 + -0.003 x 9 + 0.008 x 6.02 + 0.525 = ~ 0.22. The Coefficient of Variation (CV) is the actual (predicted) standard deviation divided by the actual (predicted) average return.

Because the NCCS digitized data are comprised of larger organizations that will be more resilient to the financial problems that plague smaller nonprofit organizations, our findings may not be applicable to smaller organizations. Still, these findings can guide financial managers of nonprofit organizations in promoting revenue structures designed to strike a balance in the financial objectives of revenue growth and volatility. Nonprofit organizations confronted with more volatile revenue mixes may also actively consider risk mitigation strategies, such as reserve funds, lines of credit, and insurance, to minimize potential negative impacts.

Notes

1. We are not suggesting that revenue growth is the paramount objective. Revenue growth is one of several financial objectives for the manager of a nonprofit to balance (see Finkler, Smith, Calabrese, & Purtell, 2017, pg. 16.). Furthermore, the appropriate growth level will depend on the attributes of the nonprofit organization. For these reasons, it is useful to understand the typical risk and return relationships of the primary revenue sources in the nonprofit sector.
2. Managers of nonprofit organizations will have more difficulty managing a portfolio of revenues than an investment manager will have diversifying investments. Not all revenue sources will be available to a nonprofit organization and changing the mix of revenues may be a difficult and lengthy process. Nonetheless, understanding the risk and return attributes of various revenue sources can guide managers in developing financial policies appropriate for their mix of revenues.
3. These calculations are programed in the "be" (between effects) option of xtreg in STATA.

4. The steps to clean the data are adapted from Bowman et al., 2012.
5. The observations with missing data comprised 5.29% of the overall sample. To check robustness, the models in Table 3 were also estimated though extrapolations of the missing observations and included in the sample. These model results are not reported but are similar to those reported in Table 3.
6. Trimming 1% appears to sufficiently address the estimation bias. Trimming at 2% and 3% had little effect on the regression estimates, so we determined that trimming at the 1% level was sufficient. We considered Winsoring but felt like the outliers in the sample could be caused by human errorl thus, we could not be sure that the real numbers should be proxied by another large number.

Disclosure Statement

The authors declare that there are no conflicts of interest that relate to the research, authorship, or publication of this article.

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