

Revenue Composition and Financial Health of Nonprofit Humanitarian and Emergency Health Services

Syed Tariq

Suleman Dawood School of Business, Lahore University of Management Sciences,
Lahore, Pakistan and
Department of Business Studies, Namal Institute, Mianwali, Pakistan

Muhammad Adeel Zaffar

Suleman Dawood School of Business, Lahore University of Management Sciences,
Lahore, Pakistan

Yasir Riaz

Department of Business Studies, Namal Institute, Mianwali, Pakistan, and

Muhammad Naiman Jalil

College of Business and Economics, United Arab Emirates University,
Al Ain, United Arab Emirates

Abstract

Purpose: Emergency health and humanitarian nonprofits work under volatile circumstances that strain their financial resources. This study investigates the impact of revenue composition on the financial health of these nonprofits and the impact of financial health on the likelihood of financial distress.

Methodology: A sample of 11,335 emergency nonprofits from 2003 to 2020 was obtained through form 990 data and studied through a difference GMM approach for the impact of revenue composition on financial health. The impact of financial health on financial distress was studied through panel logistics regression.

Findings: Revenue diversification adversely affects the financial health of nonprofit emergency health and humanitarian organizations contrary to the implications of modern portfolio theory. The financial health of nonprofit emergency health and humanitarian organizations is persistent through the significant positive effect of lags in most cases.

Originality: The emergency health subsector of nonprofits was studied separately due to the unique nature of its operations and operating environment. The impact of revenue composition was investigated on key dimensions of financial health. Omitted variable bias, simultaneity, and dynamic endogeneity were handled through difference GMM.

1 Introduction

In 2014 the UN High Commissioner for Refugees, Antonio Guterres stated that “humanitarian financing was close to bankruptcy” due to the increasing number of crises (United Nations, 2014). He further explained the situation: “The global humanitarian community is not broken – as a whole, they are more effective than ever before. But we are financially broke.” (Grant, 2015). These comments were made in the face of a growing number of humanitarian crises all over the globe with volatile and insufficient funding to overcome them. While attaining sufficient revenue is important, financial management is the foremost factor in effective capacity building for nonprofits (Shumate et al., 2017).

Financial management is the foremost factor in effective capacity building for nonprofits (Shumate et al., 2017). Revenue composition may affect the financial health of nonprofits (Froelich, 1999; Pfeffer and Salancik, 2003). Some studies tried to investigate the impact of revenue composition on the financial health of nonprofits with mixed results. Extant literature has reported the impact of revenue diversification on financial health as positive (Hung & Hager, 2019; Despard et al., 2017; Tevel et al., 2015), negative (Lu et al., 2019; Sacristán López de Los Mozos et al., 2016) or dependent on other aspects of revenue composition (Mayer et al., 2014).

This study establishes the role of revenue composition in the financial health of nonprofit humanitarian and emergency health services in four ways. Firstly, this paper follows the suggestions of a number of papers suggesting that the financial health of the emergency health subsector of nonprofits should be studied separately due to the unique nature of its operations and operating environment (Guan, Tian, & Deng, 2021; Sacristán López de Los Mozos et al. 2016; Chikoto & Neely, 2014; Hager, 2001). Secondly, we study revenue diversification with major revenue sources as predictors of financial health to clarify the effects of revenue composition in this subsector of nonprofits as results in nonprofits are unclear (Hung & Hager, 2019; Despard et al., 2017; Lu et al., 2019; Sacristán López de Los Mozos et al., 2016; Mayer et al., 2014). Thirdly, financial health is studied as a combination of two key dimensions (Lu et al., 2019) in this paper: financial vulnerability and financial capacity to investigate the effects of revenue composition on different dimensions of the financial health of nonprofits. Fourthly, this study uses the generalized method of moments (GMM) technique for estimating the relationship between revenue

composition and financial health. GMM technique helps overcome various challenges with data including omitted variable bias (Baum, 2006), simultaneity, and dynamic endogeneity (Bond, 2002). Finally, the financial health dimensions are tested for their effect on financial distress to confirm which aspects of financial health are important for the survival of nonprofit health and humanitarian organizations.

This paper investigates the following two research questions for humanitarian and emergency health nonprofits:

- Does revenue composition impact financial health?
- Do financial health measures impact financial distress?

The findings of this paper include the detrimental impact of revenue diversification on financial health. Revenue diversification increased financial vulnerability and decreased financial capacity. Revenue sources exhibited unique impacts on financial health measures. Revenue from contributions and program revenue improved financial capacity measures of financial health while increasing financial vulnerability through increased leverage and decreasing financial vulnerability through surplus margin. Investment income, however, decreased financial vulnerability and financial capacity. The results present a nuanced view of the impact of revenue composition on the financial health of nonprofit and emergency health services. Reduction in financial health increases the likelihood of financial distress. The nuanced effects of revenue sources on financial health support hypotheses derived from the resource dependence theory (Pfeffer and Salancik, 2003) while the detrimental impact of revenue diversification on financial health calls into question the application of modern portfolio theory (Markowitz, 1968) by earlier studies.

The rest of the paper is organized into five sections. Literature related to the hypotheses of the study is reviewed in the following section. Section 3 is a discussion on the estimation methodology and econometric model. Section 4 describes the data. Section 5 presents and discusses the estimation results. Finally, the conclusion section summarizes key results and implications.

2 Literature Review

This section provides an overview of the literature relevant to the research questions. The first subsection discusses revenue composition with its impact on financial health measures in literature.

The financial health measures discussed in these sections are debt and surplus margin aspects of financial vulnerability (Tuckman and Chang, 1991) and growth in fund balance and unrestricted assets aspects of financial capacity (Chikoto and Neely, 2014). This is followed by a review of the literature on the impact of these financial health measures on financial distress.

2.1 Revenue Composition

Calabrese (2020) stated that revenue from contributions, program service revenue, and investment income is the most significant revenue sources for nonprofits. The following literature review focuses on the impact of these three revenue sources and revenue diversification on the financial health of nonprofit humanitarian and emergency health organizations.

2.1.1 Revenue diversification

Revenue diversification is an approach to balance the dependency between multiple funding sources (White, 1983). The impact of revenue diversification or concentration on financial health can be explained through two theories of finance: modern portfolio theory and resource dependency theory. Markowitz (1968) presented the modern portfolio theory which explains the process of investment portfolio selection. The investment portfolio is formed by selecting investment options that have different risk and return, where risk is undesired (Markowitz, 1968). The portfolio is selected in a manner that maximizes expected returns and minimizes risk. Modern portfolio theory implies that there is a trade-off between risk and reward where the higher return comes with a higher risk in returns (Williams, 1997).

A nonprofit revenue mix can be thought of as a portfolio of options with varying risks and returns. Revenue diversification would indicate an attempt at managing the revenue mix to minimize risks associated with each revenue source. This is similar to for-profit corporate diversification of products and geographic regions of operation which has been supported empirically (Mehmood, Hunjra & Chani, 2019).

A number of attempts to test the impact of revenue diversification of nonprofits on financial health have concluded mixed results. While some found a positive influence of revenue diversification on financial health (Lu et al., 2020; Qu, 2019; Berrett and Holliday, 2018), others contradicted this view (von Schnurbein and Fritz, 2017). Extant literature has called for investigating the impact of nonprofit revenue composition on financial capacity (Chikoto and Neely, 2014) and financial vulnerability (Hager, 2001) in nonprofit subsectors.

Revenue diversification may be a costly approach for nonprofits (Frumkin and Keating, 2011). Banks that pursue diversification expose themselves to greater credit risk (Hunjra et al. 2020). Many revenue sources put cost pressures on the nonprofit leading to a higher likelihood of debt issuance for nonprofits with more diversified revenue (Yan et al., 2009). This leads us to the first part of the first hypothesis:

Hypothesis 1(a): Higher revenue diversification leads to more debt resulting in increased financial vulnerability.

The resource dependence theory proposes that the resource acquisition and maintenance approach affects an organization's survival (Pfeffer and Salancik, 2003). The pursuit of multiple revenue sources may be a costly endeavor (Frumkin and Keating, 2011). Sacristán López de Los Mozos et al. (2016) found support for this proposition as revenue diversification increases fund-raising and administrative costs. Revenue diversification can also allow flexibility in nonprofit expenses (Shon et al., 2019). However, Guan, Tian, and Deng (2021) found that revenue diversification may reduce the surplus margin in social enterprises, but the effect was offset after the introduction of proxies for organizational size. Humanitarian and health nonprofits that actively acquire new revenue sources are likely to have lower surplus margins due to higher fundraising and administrative costs. This leads us to the second part of our first hypothesis:

Hypothesis 1(b): Higher revenue diversification leads to a lower surplus margin resulting in increased financial vulnerability.

Modern portfolio theory (Markowitz, 1968) implies that a portfolio of revenues may be less volatile and grow quicker than dependency on a single source. Hung and Hager (2019) found some support for revenue diversification's positive impact on the financial capacity of nonprofits in their meta-analysis. However, Frumkin and Keating (2011) discovered that revenue concentration leads to higher growth in nonprofits. Chikoto and Neely (2014) and Frumkin and Keating (2011) supported this. Lu et al. (2019) also concluded a detrimental impact of revenue diversification on the financial capacity of all nonprofits. Whereas Grizzle et al. (2015) found a mixed relationship between revenue diversification and operating reserves. We argue in line with Hung and Hager (2019) for humanitarian and emergency health nonprofits where we expect the behavior of revenue diversification to reflect the implications of modern portfolio theory. This leads us to the third part of our first hypothesis:

Hypothesis 1(c): Higher revenue diversification results in a greater financial capacity.

2.1.2 Revenue from Contributions

Humanitarian and emergency health nonprofits are likely to solicit contributions in times of emergency needs like large-scale emergencies or disasters. Emergency appeals for contributions arrive in the volatile context of emergencies like natural disasters making the appeal revenue less likely to improve the nonprofit's financial health (Carroll and Stater, 2009). The volatility of contributions may be a reason extant research found an increase in debt associated with increased reliance on contributions (Yan et al., 2009). The operational context of humanitarian and emergency health nonprofits makes this phenomenon more likely. This leads us to the first part of the second hypothesis:

Hypothesis 2(a): More contributions lead to more debt resulting in decreased financial vulnerability.

Revenue volatility associated with contributions is also more likely to result in greater savings (Duquette, 2017). Contributions to humanitarian causes continue after the occurrence of an emergency event (Waters and Tindall, 2011). This makes a direct relationship between contributions and expenses difficult to determine (Frumkin and Kim, 2001). However, humanitarian nonprofits use rising operational costs in emergency events as appeals to solicit contributions (Turrini et al., 2020). This leads us to the second part of the second hypothesis:

Hypothesis 2(b): More contributions lead to a higher surplus margin resulting in decreased financial vulnerability.

Contributions are a traditionally unrestricted source of revenue (Kovács and Spens, 2007; Toyasaki and Wakolbinger, 2011). Donors may penalize excessive accumulation (Calabrese, 2011). However, it is likely that humanitarian and emergency health nonprofits would be seen as financially vulnerable by contributors who may tolerate a greater accumulation of funds by them. This combined with earlier findings on savings through the volatility of contributions (Duquette, 2017) and continued contributions after the end of emergency events (Waters and Tindall, 2011) imply growth in a financial capacity. This leads us to the third part of the second hypothesis:

Hypothesis 2(c): More contributions result in a greater financial capacity.

2.1.3 Program service revenue

Humanitarian and emergency health organizations may engage in providing services for fees. Non-profit revenues from program services may be similar in nature to revenues of for-profit enterprises. Greater exposure to business cycles and seasonality may increase reliance on debt to acquire working capital which is in line with Yan et al. (2009) finding that a higher proportion of program service revenue leads to increased reliance on debt. However, nonprofits engaging in commercial activity are less likely to default on their debt obligations than other nonprofits (Lu et al., 2020). This leads us to the first part of the third hypothesis:

Hypothesis 3(a): More program service revenue leads to more debt resulting in increased financial vulnerability.

Volatility in program service revenue is lower than contributions (Froelich, 1999). Nonprofits can reduce costs and improve their efficiency to increase the possible surplus retained through program service revenue. The expectation from a nonprofit increasing program service revenue is that they are competitive and would command better surplus margins. This leads us to the second part of the third hypothesis:

Hypothesis 3(b): More program service revenue leads to a higher surplus margin resulting in decreased financial vulnerability.

Program service revenue is more likely to be in the form of unrestricted funds. Retaining these funds as surplus may help tackle seasonal variations in revenue. This surplus would be important as working capital in seasonal highs and might be utilized for external shocks during seasonal lows. The use of this surplus as working capital might be one reason unrestricted assets are thought of as a substitute for debt in many nonprofits Calabrese (2012). This leads us to the third part of the third hypothesis:

Hypothesis 3(c): More program service revenue results in a greater financial capacity.

2.1.4 Investment Income

A humanitarian nonprofit seeking investment income must obtain sufficient financial endowment. Organizations may perceive debt as a risk against their endowment in cases of a market downturn which may be why nonprofits with greater reliance on investment income are less likely to rely on debt (Denison, 2009). We argue that humanitarian and emergency health organizations with higher

investment income proportion of total revenue would be averse to borrowing. This gives us the first part of the fourth hypothesis:

Hypothesis 4(a): More investment income leads to less debt resulting in decreased financial vulnerability. Investment income might also be temporarily or permanently restricted to program expenditure specified by donors (Chang et al., 2018) leading to higher spending in the specified avenues and reduced financial slack (Calabrese, 2012). This gives us the second part of the fourth hypothesis:

Hypothesis 4(b): More investment income leads to a lower surplus margin resulting in increased financial vulnerability.

Investment income requires tying up funds into investment instruments for some time which may be why Calabrese (2012) found that the net unrestricted assets of nonprofit organizations do not increase significantly with increases in investment income. However, Bowman et al. (2005) found a positive impact of nonprofit investment income on financial slack. We argue that greater financial investment and/or endowments would decrease the financial capacity of humanitarian nonprofits due to the restricted nature of such funds. This gives us the second part of our fourth hypothesis:

Hypothesis 4(c): More investment income results in a lower financial capacity.

2.2 Financial Health

Financial vulnerability and financial capacity are important determinants of financial health (Lu et al., 2019). The following review hypothesizes the impact of financial vulnerability and financial capacity on financial distress.

2.2.1 Financial Vulnerability

Financial vulnerability is described as the operational inefficiency and reliance on debt that may lead to cutbacks in program offerings when facing an external shock (Tuckman and Chang, 1991). Tuckman and Chang (1991) presented measures for the prediction of the financial vulnerability of nonprofit organizations. Tevel et al. (2015) compared Tuckman and Chang (1991)'s measures with two nonprofit rating agencies and found them better predictors of financial vulnerability.

Tevel et al. (2015) and Park et al. (2021) found that surplus margins reduced financial distress.

However, Tevel et al. (2015) did not find a significant impact of debt liabilities, while Park et al. (2021) found a significant impact. We argue that humanitarian nonprofits would be more likely to face financial distress if they are more financially vulnerable. Lower surplus margins would lead

to less flexibility in the cost structure to overcome distress. Nonprofits with higher debt obligations would have less to spare for dealing with external shocks. The fifth hypothesis is given below:

Hypothesis 5: Higher financial vulnerability results in an increased likelihood of financial distress.

2.2.2 Financial Capacity

Financial capacity is described as the financial resources that enable an organization to seize opportunities and respond to threats (Bowman, 2011; Chikoto and Neely, 2014). Nonprofit unrestricted assets have similar statistical correlations with variables of interest as operating reserves defined by nonprofit managers (Kim and Mason, 2021). Extant literature contains mixed results on the impact of financial capacity on financial distress. Tevel et al. (2015) found net assets to be a significant predictor of solvency, while Park et al. (2021) did not find liquidity to be a significant predictor of financial distress.

We argue that humanitarian nonprofits would be more likely to face financial distress if they have a lower financial capacity. Nonprofits target profits to accumulate assets over time Calabrese (2012). These assets may be used to offset financial shocks. Studies in humanitarian operations highlight the importance of unrestricted funds on the performance of humanitarian aid delivery (Aflaki and Pedraza-Martinez, 2016; Besiou et al., 2014). The sixth hypothesis is given below:

Hypothesis 6: Lower financial capacity would result in an increased likelihood of financial distress.

Figure 1 represents the conceptual framework of this study.

Figure 1 here

3 Methodology

This section describes the methodology used to estimate the relationships in this paper. First, the methodology used to estimate the relationship of revenue composition with financial health is presented. This is followed by the methodology to estimate relationships between financial health and financial distress.

3.1 Financial Health - Generalized Method of Moments

Dynamic panel estimation was employed for estimating the relationship between revenue composition and financial health. The dynamic panel estimation method addresses the issue of the dependent variable's endogeneity and deals with its autoregressive characteristics as well as unaccounted-for firm-specific characteristics (Gonzalez, 2013). This selection is motivated by the suggestions and implementation of Calabrese (2012), Mayer et al. (2014), and Sacristán López de Los Mozos et al. (2016).

The model used for this set of relationships is the Dynamic Panel Data technique (Arellano–Bond 1-step difference estimator). This type of estimation is appropriate for models with lagged endogenous variables and cross-section fixed effects. The estimation equation for financial health estimates is presented in equation 1.

$$Y_{it} = \alpha + \beta_1 Y_{it-1} + \beta_2 X_{it} + \beta_3 Z_{it} + \epsilon_{it} \quad (1)$$

Where Y_{it} are financial health measures, X_{it} are the independent variables, Z_{it} are control variables, α is a constant, and ϵ_{it} is the error term where i represents firm and t represents a year.

Four measures for financial health (Y_{it}) were used. Two measures each for financial vulnerability and financial capacity dimensions of financial health. Financial vulnerability is measured by surplus margin SM_{it} and debt ratio DR_{it} (Tuckman and Chang, 1991; Greenlee and Trussel, 2000). The surplus margin represents the excess of revenue over costs as a percentage of revenue and the debt ratio is total debt over total assets. Financial capacity is measured as growth in funds balance $FBGROW_{it}$ and log growth in unrestricted assets $UAGROW_{it}$ (Chikoto and Neely, 2014). Two measures for each financial health dimension also act as a test for the robustness of results on financial health.

X_{it} comprises the independent variables in this model. The independent variables include the Revenue diversification index (RD_{it}), Revenue from contributions ($CONTRIB_{it}$), program revenue ($PROGREV_{it}$), and investment income ($INVINC_{it}$).

Control variables (Z_{it}) used in the model are total assets ($TAST_{it}$), executive compensation ($EXEC_{it}$), total functional expenditures ($TFEXP_{it}$), fund-raising expenses ($FUNDEXP_{it}$), and year fixed effects.

Dynamic panel data technique controls for the impact of past observations of the dependent variable on current realizations leading to consistent estimation of parameters (Bond, 2002). The difference GMM

technique used in this paper overcomes Nickell bias (Arellano and Bond, 1991), removes organizational effects, and omitted variable bias (Baum, 2006).

Bond (2002)'s test was employed for determining the difference or system GMM. All financial health equations in our paper satisfy conditions for difference GMM. Independent variables were treated as endogenous and instrumented with their lags following Arellano and Bond (1991). This choice was assisted by diagnostic tests. Breusch and Pagan tests exhibit the presence of heteroskedasticity for which we employed robust estimation of standard errors. Since the dataset for this paper forms an unbalanced panel, forward orthogonal deviation estimates were employed as suggested by Roodman (2009).

3.2 Financial Distress - Panel logistics regression

Panel logistics regression was used to estimate the relationship between financial health and financial distress. Past studies have used t-tests (Frumkin and Keating, 2011), correlations (Never, 2013), and logistic regressions (Tevel et al., 2015). The panel logistics regression model of this paper was inspired by the suggestions of Koh et al. (2015). Fixed effect logistic panel regression used to estimate the relationships in this paper is presented in equation 2.

$$FD_{it} = \alpha + \beta_1 SM_{it} + \beta_2 DR_{it} + \beta_3 FBGROW_{it} + \beta_4 UAGROW_{it} + \beta_5 TAST_{it} + \beta_6 EXEC_{it} + \beta_7 TFEXP_{it} + \beta_8 FUNDEXP_{it} + \epsilon_{it} \quad (2)$$

Where FD_{it} is the financial distress measure, SM_{it} is surplus margin, DR_{it} is debt ratio, $FBGROW_{it}$ is growth in funds balance, $UAGROW_{it}$ is growth in unrestricted assets, $TAST_{it}$ is total assets, $EXEC_{it}$ is executive compensation, $TFEXP_{it}$ is total functional expenditures, $FUNDEXP_{it}$ is fund-raising expenses, α is a constant and ϵ_{it} is the error term where i represents firm and t represents year.

The Hausman test confirmed the suitability of fixed effects for our model and data. Breusch and Pagan tests exhibit the presence of heteroskedasticity for which we employed robust estimation of standard errors. Robustness checks on this model included an instrumental variable probit implementation following suggestions and implementation of Cardillo et al. (2021).

4 Data and Variable Selection

The data utilized in this study were obtained from the Internal Revenue Service (IRS) of the United

States of America form 990 filings. Several studies have found form 990 to be a reliable and adequate source of data for nonprofit financial information (Froelich and Knoepfle, 1996; Froelich et al., 2000; Hager, 2003; Trussel, 2002).

The definition of the humanitarian and emergency health sector was shaped by the National Taxonomy of Exempt Entities (NTEE) code for the filers of form 990. The broad categories searched were types E health care, M public safety, disaster preparedness and relief, and P human services. These categories were further filtered for organizations most closely related to humanitarian rescue, relief, and emergency health services. The final organization types selected for this study are listed in Table 1 with their NTEE code.

Table 1: List of organization types with NTEE code

Table 1 here

Hirschmann-Herfindahl index for nonprofit revenue diversification is widely employed in literature (Sacristán López de Los Mozos et al., 2016; Calabrese, 2012; Chikoto et al., 2016). This measure considered the relative position of revenue diversification of a nonprofit with the highest possible diversification level. We employed the Hirschman-Herfindahl index as follows:

$$RD_{it} = \frac{n (1 - \sum_{j=1}^n R_{jit}^2)}{(1 - n)} \quad (3)$$

Where RD_{it} represents the revenue diversification index for an organization i at time t , R_{jit} is the proportion of revenue generated through each j th revenue source and n is the total number of revenue sources considered. We considered five sources of nonprofit revenue: contributions, program revenue, investment income, fund-raising income, and rental income. It is not uncommon to find negative revenue values for some revenue fields in the form 990 data Tinkelman and Neely (2011). These values were removed to avoid their influence on the index.

We calculated financial distress (FDit) as a binary variable that is equal to 1 for a reduction in net assets for 3 consecutive years and 0 otherwise (Trussel, 2002). This paper controlled for firm size using total assets (TASTit) Chikoto and Neely (2014) and total functional expenses (TFEXPit) (Chikoto et al., 2016). This paper also controlled for executive compensation (EXECit) (Yan et al., 2009; Chikoto et al., 2016), fundraising expenses (Tinkelman and Neely, 2011), and year-fixed effects (Sacristán López de Los Mozos et al., 2016).

Tinkelman and Neely (2011) cautioned about heteroskedasticity and data errors when using form 990 data. This paper treats them by winsorizing all variables at 1% and 99% and employing the “robust” option of STATA for heteroskedasticity correction. The final dataset is an unbalanced panel that contains data from 11,335 nonprofits from 2003 to 2020 with gaps. Descriptive statistics for the full sample are provided in Table 2.

Table 2: Descriptive Statistics of all variables

Table 2 here

5 Estimation Results

The estimation results for the impact of revenue sources and diversification on the financial health of nonprofit emergency health and humanitarian organizations are presented in three parts. The first estimation results are presented for the two measures of financial vulnerability: debt ratio and surplus margin. Followed by estimation results for the two measures of financial capacity: growth in fund balance and growth in unrestricted assets. Estimation results for the impact of financial health measures on financial distress are presented after this. Finally, results are compared with extant literature highlighting contributions and providing implications for theory and practice.

In addition to full sample estimates, sensitivity analysis is performed by creating subsamples of the pre-2011 financial crisis, post-2011 financial crisis, small nonprofit organizations with total assets below the median, and large nonprofit organizations with total assets above the median. Instrumental variable probit regression is used as a further robustness check for the impact of financial health measures on financial distress.

5.1 Impact of revenue composition on financial vulnerability

The estimated results for the debt ratio are presented in Table 3. The lag of the debt ratio is significant at 1% for all samples showing that the debt ratio persists. The impact of revenue diversification on the debt ratio is not statistically significant for the full sample and most subsamples. So support was not found for hypothesis 1(a) except in a post-financial crisis. The impact of revenue from contributions on the debt ratio is positive and significant for the full sample, post-crisis, and large nonprofit subsamples. This finding supports Hypothesis 2(a) that increases in revenue from contributions are likely to increase the debt ratio resulting in an increase in financial

vulnerability. Similar support was found for Hypothesis 3(a) that increases in program revenue are likely to increase the debt ratio resulting in an increase in financial vulnerability. Hypothesis 4(a) was also supported, that increases in investment income are likely to reduce the debt ratio resulting in a decrease in financial vulnerability.

Table 3: Difference GMM results for Debt Ratio

Table 3 here

The estimated results for surplus margin are presented in Table 4. The lags of surplus margin are significant at 1% for all samples implying that the surplus margin is very persistent. The impact of revenue diversification on surplus margin is negative and statistically significant for the full sample and most subsamples. So significant support was found for hypothesis 1(b). The impact of revenue from contributions and program revenue on the surplus margin is positive and significant for all samples. This implies strong support for Hypotheses 2(b) and 3(b) that increases in revenue from contributions and program revenue increase the surplus margin reducing financial vulnerability. Hypothesis 4(b) was not supported by full sample estimates. Contrary to hypothesis 4(b) investment income exhibited a significant positive impact in some subsamples.

Table 4: Difference GMM results for Surplus Margin

Table 4 here

Tables 3 and 4 show that Hansen's J statistic is not significant for the full sample and most robustness scenarios establishing instrument validity of estimates (Roodman, 2009). AR2 stats are insignificant for all samples establishing the validity of difference GMM (Arellano and Bond, 1991). Windmeijer's robust standard errors were employed to overcome any cross-correlation and heteroskedasticity.

5.2 Impact of revenue composition on financial capacity

The estimated results for growth in fund balance are presented in Table 5. The lags of the dependent variable are negative and significant at 1% for all samples. This implies conditional convergence. When the fund balance was reduced in the past, there was a higher likelihood of growth in the subsequent period and vice versa. The impact of revenue diversification on growth in fund balance is not statistically significant for any sample showing no support for hypothesis 1(c). The impact of contributions and program revenue on the growth in fund balance is positive and significant for

all samples. This implies strong support for hypotheses 2(c) and 3(c) that increases in revenue from contributions and program revenue increase financial capacity. Hypothesis 4(c) was also supported by all sample estimates. Investment income exhibited a significant negative impact on growth in fund balance. Data availability issues led to no estimation for the pre-financial crisis subsample.

Table 5: Difference GMM results for growth in Fund Balance

Table 5 here

The estimated results for log growth in unrestricted assets are presented in Table 6. The lags of the dependent variable are positive and significant at 1% for all samples. This implies persistence in growth in unrestricted assets. The impact of revenue diversification on growth in unrestricted assets is negative and statistically significant for the full sample and all subsamples contrary to hypothesis 1(c) that higher revenue diversification leads to greater capacity. The impact of revenue from contributions is positive and significant for all samples supporting hypothesis 2(c) that increases in contributions increase financial capacity. Results in Table 6 do not show significant support for hypotheses 3(c) and 4(c) for full sample estimates.

Table 6: Difference GMM results for growth in Unrestricted Assets

Table 6 here

Tables 5 and 6 show that Hansen's J statistic is not significant for all samples establishing instrument validity of estimates (Roodman, 2009). AR2 stats are insignificant for all samples establishing the validity of difference GMM (Arellano and Bond, 1991). Windmeijer's robust standard errors were employed to overcome any cross-correlation and heteroskedasticity.

5.3 Impact of financial health on financial distress

Increases in financial capacity, growth in fund balance, and growth in unrestricted assets reduce the likelihood of financial distress in all scenarios. This supports hypothesis 6 that nonprofits with lower financial capacity would be more likely to face financial distress. Data availability issues led to no estimation for the pre-financial crisis subsample.

Table 7: Panel logistics regression and instrumental variable probit results for Financial Distress

Table 7 here

5.4 Discussion

Results from Tables 3, 4, 5, and 6 give a detailed view of the impact of revenue composition on financial health measures. These tests are summarized in Table 8. Most of these results are in the hypothesized direction except for the negative influence of revenue diversification on growth in unrestricted assets.

Table 8: Summary of results for the impact of Revenue Composition on Financial Health measures

Table 8 here

The results are also illustrated in Figure 2 with effect sizes for all significant effects.

Figure 2 here

The findings of this paper are in line with the resource dependence theory that revenue composition impacts the financial health of humanitarian and emergency health nonprofits (Froelich, 1999; Pfeffer and Salancik, 2003). Financial managers of these nonprofits should pay more attention to the type of funding their organization is attracting and its implications.

Contrary to the modern portfolio theory (Markowitz, 1968), we found that increased diversification of revenue streams increases financial vulnerability and reduces the financial capacity of humanitarian and emergency health nonprofits. Humanitarian and emergency health organizations may find it challenging to seek revenue through multiple sources due to fund-raising costs associated with pursuing multiple revenue streams (Sacristán López de Los Mozos et al., 2016). These findings are similar to Lu et al. (2019), Sacristán López de Los Mozos et al. (2016), and Mayer et al. (2014) while differing from Hung and Hager (2019), Despard et al. (2017) and Tevel et al. (2015). Nonprofit humanitarian and emergency health organizations are recommended to exercise caution when pursuing revenue diversification. While our findings confirm the conclusions of Lu et al. (2019)'s meta-analysis, we recommend industry-specific analysis for consistent results (Hager, 2001; Chikoto and Neely, 2014; Sacristán López de Los Mozos et al., 2016).

The impact of revenue from contributions on financial health found strong support in this study. Nonprofit humanitarian and emergency health organizations are also more likely to benefit from contributions that continue after the occurrence of emergency events (Waters and Tindall, 2011). Organizations in this subsector are also more likely to solicit contributions by appealing to operational costs (Turrini et al., 2020). However, we confirm that reliance on contributions increases reliance on debt (Yan et al., 2009) for the humanitarian subsector.

Program revenue impacts financial health in mostly the same way as revenue from contributions. While the findings are similar to Yan et al. (2009) in that program revenue increases dependency on debt, it is possible that the surplus accumulated through program revenue makes these debt obligations less risky (Lu et al., 2020). Higher investment income is likely to reduce reliance on debt in line with Denison (2009). While investment income helps build financial capacity (Bowman et al., 2005) through fund accumulation, this study could not conclude a significant increase in net unrestricted assets.

A methodological contribution of this study to nonprofit financial health literature is the treatment of endogeneity through difference GMM. Most of the financial health measures were found to have a persistent relationship with their lags. While this is a consolation for nonprofit humanitarian and emergency health organizations that are in good financial health, it spells trouble for organizations facing challenging financial situations.

This study verified the impact of financial health measures, financial capacity, and financial vulnerability, on the financial distress of nonprofit humanitarian and emergency health entities. Helms et al. (2013)'s recommendation of increasing spending restrictions runs contrary as it increases the likelihood of financial distress.

6 Conclusion

This study explored the impact of revenue sources and revenue diversity on financial health, and the impact of financial health on the financial distress of emergency nonprofits. A sample of 11,335 emergency nonprofits from 2003 to 2020 was studied through the difference GMM approach for the impact of revenue composition on financial health. Increased diversification of revenue streams was found detrimental to the financial health of emergency nonprofits. Program revenue and contributions affect financial health in similar ways. Findings suggest that the financial health of

nonprofit emergency health and humanitarian organizations is persistent. Financial health indicators impact the likelihood of financial distress in hypothesized manner. This study recommends caution when nonprofit emergency health and humanitarian organizations pursue revenue diversification contrary to the implications of modern portfolio theory.

This study has several implications for policymakers. Firstly, policymakers should consider the impact their support creates on the debt portfolio of nonprofit emergency health and humanitarian nonprofits. Dranove, Garthwaite, and Ody (2015) recommended a floor-and-trade system for nonprofit hospitals in the USA. Similar solutions can be adopted for emergency health and humanitarian services. Secondly, policymakers can use the financial health measures studied in this paper to evaluate the possibility of financial distress in nonprofit emergency health and humanitarian service of interest. This could help support organizations that perform well but are struggling on the financial front.

The managerial implications of this study include caution for emergency health and humanitarian nonprofits when pursuing revenue diversification. Revenue concentration might be better for emergency health and humanitarian nonprofits. Revenue sources that improve financial health generally include both public support and private contributions, however, managers must stay cautious about increased debt associated with pursuing these revenue sources. While investment endowments can decrease the debt burden, their impact on other financial health indicators is not very heartening. Finally, the financial health indicators employed in this study may serve managers as useful measures to avoid financial distress.

The foremost limitation of this study is that it utilizes data from emergency health and humanitarian nonprofits in the USA. Future studies are encouraged to look into similar nonprofits in other developed and developing nations. This study opens other avenues for future research as well. The impact of investment income on unrestricted assets could not be verified by Calabrese (2012) and this study. The persistence of financial health measures opens questions about how to break the cycle for struggling nonprofits. One interesting avenue is to explore whether financial health and financial distress may explain fundraising choices Tao (2019).

References

- Aflaki, A. and Pedraza-Martinez, A. J. (2016). Humanitarian funding in a multi-donor market with donation uncertainty. *Production and Operations Management*, 25(7):1274–1291.
- Arellano, M. and Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The review of economic studies*, 58(2):277–297.
- Baum, C. F. (2006). *An introduction to modern econometrics using Stata*. Stata press.
- Berrett, J. L. and Holliday, B. S. (2018). The effect of revenue diversification on output creation in nonprofit organizations: A resource dependence perspective. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 29(6):1190–1201.
- Besiou, M., Pedraza-Martinez, A. J., and Van Wassenhove, L. N. (2014). Vehicle supply chains in humanitarian operations: Decentralization, operational mix, and earmarked funding. *Production and Operations Management*, 23(11):1950–1965.
- Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese economic journal*, 1(2):141–162.
- Bowman, H. W., Keating, E. K., and Hager, M. (2005). Organizational slack in nonprofits. In *Annual Meeting of the Academy of Management, Honolulu, HI*. Retrieved from <http://mhager.net>.
- Bowman, W. (2011). Financial capacity and sustainability of ordinary nonprofits. *Nonprofit management and leadership*, 22(1):37–51.
- Bowman, W., Keating, E., and Hager, M. A. (2007). Investment income. *Financing nonprofits: Putting theory into practice*, pages 157–182.
- Calabrese, T. D. (2011). Do donors penalize nonprofit organizations with accumulated wealth? *Public Administration Review*, 71(6):859–869.
- Calabrese, T. D. (2012). The accumulation of nonprofit profits: A dynamic analysis. *Nonprofit and Voluntary Sector Quarterly*, 41(2):300–324.

- Calabrese, T. D. (2020). Nonprofit finance: A synthetic review. *Voluntaristics Review*, 4(5):1–89.
- Cardillo, G., Onali, E., and Torluccio, G. (2021). Does gender diversity on banks' boards matter? evidence from public bailouts. *Journal of Corporate Finance*, 71:101560.
- Carroll, D. A. and Stater, K. J. (2009). Revenue diversification in nonprofit organizations: Does it lead to financial stability? *Journal of public administration research and theory*, 19(4):947–966.
- Chang, C. F., Tuckman, H. P., and Chikoto-Schultz, G. L. (2018). Income diversity and nonprofit financial health. *Handbook of research on nonprofit economics and management*.
- Chikoto, G. L., Ling, Q., and Neely, D. G. (2016). The adoption and use of the Hirschman–Herfindahl index in nonprofit research: Does revenue diversification measurement matter? *Voluntas: Inter- national Journal of Voluntary and Nonprofit Organizations*, 27(3):1425–1447.
- Chikoto, G. L. and Neely, D. G. (2014). Building nonprofit financial capacity: The impact of revenue concentration and overhead costs. *Nonprofit and Voluntary Sector Quarterly*, 43(3):570–588.
- Denison, D. V. (2009). Which nonprofit organizations borrow? *Public Budgeting & Finance*, 29(3):110–123.
- Despard, M. R., Nafziger-Mayegun, R. N., Adjabeng, B. K., and Ansong, D. (2017). Does revenue diversification predict financial vulnerability among non-governmental organizations in sub-saharan africa? *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, 28(5):2124– 2144.
- Dranove, D., Garthwaite, C., & Ody, C. (2015). *A floor-and-trade proposal to improve the delivery of charity-care services by US nonprofit hospitals*. Washington (DC): Hamilton Project.
- Duquette, N. J. (2017). Spend or save? nonprofits' use of donations and other revenues. *Nonprofit and Voluntary Sector Quarterly*, 46(6):1142–1165.
- Froelich, K. A. (1999). Diversification of revenue strategies: Evolving resource dependence in nonprofit organizations. *Nonprofit and voluntary sector quarterly*, 28(3):246–268.

- Froelich, K. A. and Knoepfle, T. W. (1996). Internal revenue service 990 data: Fact or fiction? *Nonprofit and Voluntary Sector Quarterly*, 25(1):40–52.
- Froelich, K. A., Knoepfle, T. W., and Pollak, T. H. (2000). Financial measures in nonprofit organization research: Comparing IRS 990 return and audited financial statement data. *Nonprofit and voluntary sector quarterly*, 29(2):232–254.
- Frumkin, P. and Keating, E. K. (2011). Diversification reconsidered: The risks and rewards of revenue concentration. *Journal of social entrepreneurship*, 2(2):151–164.
- Frumkin, P. and Kim, M. T. (2001). Strategic positioning and the financing of nonprofit organizations: Is efficiency rewarded in the contributions marketplace? *Public administration review*, 61(3):266–275.
- González, V. M. (2013). Leverage and corporate performance: International evidence. *International Review of Economics & Finance*, 25, 169-184.
- Grant, H. (2015, September 6). *UN agencies “broke and failing” in face of ever-growing refugee crisis*. The Guardian. Retrieved October 19, 2022, from <https://www.theguardian.com/world/2015/sep/06/refugee-crisis-un-agencies-broke-failing>
- Greenlee, J. S. and Trussel, J. M. (2000). Predicting the financial vulnerability of charitable organizations. *Nonprofit management and leadership*, 11(2):199–210.
- Grizzle, C., Sloan, M. F., and Kim, M. (2015). Financial factors that influence the size of nonprofit operating reserves. *Journal of Public Budgeting, Accounting & Financial Management*.
- Guan, S., Tian, S., & Deng, G. (2021). Revenue diversification or revenue concentration? Impact on financial health of social enterprises. *Public Management Review*, 23(5), 754-774.
- Hager, M. A. (2001). Financial vulnerability among arts organizations: A test of the Tuckman-Chang measures. *Nonprofit and Voluntary Sector Quarterly*, 30(2):376–392.
- Hager, M. A. (2003). Current practices in allocation of fundraising expenditures. *New Directions for Philanthropic Fundraising*, 2003(41):39–52.
- Helms, S., Scott, B., and Thornton, J. (2013). New experimental evidence on charitable gift restrictions and donor behaviour. *Applied Economics Letters*, 20(17):1521–1526.
- Heutel, G. and Zeckhauser, R. (2014). The investment returns of nonprofit organizations, part ii:

- The value of focused attention. *Nonprofit Management and Leadership*, 25(1):59–75.
- Hung, C. and Hager, M. A. (2019). The impact of revenue diversification on nonprofit financial health: A meta-analysis. *Nonprofit and voluntary sector quarterly*, 48(1):5–27.
- Hunjra, A. I., Hanif, M., Mehmood, R., & Nguyen, L. V. (2020). Diversification, corporate governance, regulation and bank risk-taking. *Journal of Financial Reporting and Accounting*.
- Kim, M., & Mason, D. P. (2022). Research note: Bridging the gaps between the theory and practice of nonprofit operating reserves. *Nonprofit Management and Leadership*, 32(4), 669-682.
- Koh, S., Durand, R. B., Dai, L., and Chang, M. (2015). Financial distress: Lifecycle and corporate restructuring. *Journal of Corporate Finance*, 33:19–33.
- Kovács, G. and Spens, K. M. (2007). Humanitarian logistics in disaster relief operations. *International Journal of Physical Distribution & Logistics Management*.
- Lu, J., Lin, W., and Wang, Q. (2019). Does a more diversified revenue structure lead to greater financial capacity and less vulnerability in nonprofit organizations? a bibliometric and meta-analysis. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 30(3):593–609.
- Lu, J., Shon, J., and Zhang, P. (2020). Understanding the dissolution of nonprofit organizations: A financial management perspective. *Nonprofit and Voluntary Sector Quarterly*, 49(1):29–52.
- Markowitz, H. M. (1968). *Portfolio selection*. Yale university press.
- Mayer, W. J., Wang, H.-c., Egginton, J. F., and Flint, H. S. (2014). The impact of revenue diversification on expected revenue and volatility for nonprofit organizations. *Nonprofit and Voluntary Sector Quarterly*, 43(2):374–392.
- McKeever, B. S. (2015). The nonprofit sector in brief 2015: public charities, giving, and volunteering. The Urban Institute. Retrieved from <https://www.urban.org/sites/default/files/publication/72536/2000497-The-Nonprofit-Sector-in-Brief-2015-Public-Charities-Giving-and-Volunteering.pdf>.
- Mehmood, R., Hunjra, A. I., & Chani, M. I. (2019). The impact of corporate diversification and

- financial structure on firm performance: evidence from South Asian countries. *Journal of Risk and Financial Management*, 12(1), 49.
- Never, B. (2013, October). Divergent patterns of nonprofit financial distress. In *Nonprofit Policy Forum* (Vol. 5, No. 1, pp. 67-84). De Gruyter.
- Park, Y. J., Shon, J., and Lu, J. (2021). Predicting organizational mortality: How financial management matters. *Administration & Society*, 00953997211045068.
- Pfeffer, J. and Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Qu, H. (2019). Risk and diversification of nonprofit revenue portfolios: Applying modern portfolio theory to nonprofit revenue management. *Nonprofit management and leadership*, 30(2):193–212.
- Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata journal*, 9(1):86–136.
- Sacristán López de los Mozos, I., Rodríguez Duarte, A., & Rodríguez Ruiz, Ó. (2016). Resource dependence in non-profit organizations: Is it harder to fundraise if you diversify your revenue structure? *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 27(6), 2641-2665.
- Shon, J., Hamidullah, M. F., and McDougale, L. M. (2019). Revenue structure and spending behavior in nonprofit organizations. *The American Review of Public Administration*, 49(6):662–674.
- Shumate, M., Cooper, K. R., Pilny, A., and Pena-y lillo, M. (2017). The nonprofit capacities instrument. *Nonprofit Management and Leadership*, 28(2):155–174.
- Tao, R. (2019). Fundraising under two-dimensional asymmetric information: the case of mindless donations. *Applied Economics*, 51(40):4438–4454.
- Tevel, E., Katz, H., and Brock, D. M. (2015). Nonprofit financial vulnerability: Testing competing models, recommended improvements, and implications. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, 26(6):2500–2516.

- Tinkelman, D. and Neely, D. G. (2011). Some econometric issues in studying nonprofit revenue interactions using NCCS data. *Nonprofit and Voluntary Sector Quarterly*, 40(4):751–761.
- Toyasaki, F. and Wakolbinger, T. (2011). Impacts of earmarked private donations for disaster fundraising. *Annals of Operations Research*, 221(1):427–447.
- Trussel, J. M. (2002). Revisiting the prediction of financial vulnerability. *Nonprofit Management and Leadership*, 13(1):17–31.
- Tuckman, H. P. and Chang, C. F. (1991). A methodology for measuring the financial vulnerability of charitable nonprofit organizations. *Nonprofit and voluntary sector quarterly*, 20(4):445–460.
- Turrini, L., Besiou, M., Papiés, D., and Meissner, J. (2020). The role of operational expenditures and misalignments in fundraising for international humanitarian aid. *Journal of Operations Management*, 66(4):379–417.
- United Nations. (2014, November 5). *Humanitarian Coffers Near ‘Bankruptcy’, Third Committee Hears, Top Refugee Official Calls for Complete Change of Course | UN Press*. un.org. Retrieved October 19, 2022, from <https://press.un.org/en/2014/gashc4117.doc.htm>
- von Schnurbein, G. and Fritz, T. M. (2017). Benefits and drivers of nonprofit revenue concentration. *Nonprofit and Voluntary Sector Quarterly*, 46(5):922–943.
- Waters, R. D. and Tindall, N. T. (2011). Exploring the impact of American news coverage on crisis fundraising: Using media theory to explicate a new model of fundraising communication. *Journal of Nonprofit & Public Sector Marketing*, 23(1):20–40.
- Weisbrod, B. A. (2000). The nonprofit mission and its financing: Growing links between nonprofits. *To profit or not to profit: The commercial transformation of the nonprofit sector*, Cambridge University Press.
- Williams, J. O. (1997). Maximizing the probability of achieving investment goals. *Journal of portfolio management*, 24(1), 77.
- White, F. C. (1983). Trade-off in growth and stability in state taxes. *National Tax Journal*, 36(1):103–114.
- Yan, W., Denison, D. V., and Butler, J. S. (2009). Revenue structure and nonprofit borrowing. *Public*

Finance Review, 37(1):47–67.