

## **ABSTRACT**

Title of Dissertation: UNDERSTANDING NONPROFITS' USE OF  
DEBT INSTRUMENTS TO FINANCE  
CAPITAL PROJECTS: PERSPECTIVES FROM  
THE LANDSCAPE OF NONPROFIT BOND  
FINANCE, NONPROFIT CAPITAL  
STRUCTURE, AND TAX-EXEMPT BOND  
CREDIT RATINGS

Qingqing Sun, Doctor of Philosophy, 2024

Dissertation directed by: Associate Professor, Angela Bies,  
School of Public Policy

This dissertation delves into the significant challenges nonprofit organizations face in accessing tax-exempt bond markets—a vital resource for financing their capital projects and expanding services, particularly in capital-intensive sectors like hospitals and housing-related nonprofits. Although these bonds are intended to provide cost-effective capital for public service entities,

nonprofits encounter greater borrowing obstacles than governmental entities, a phenomenon insufficiently studied due to data limitations. To bridge this research gap, my study leverages a unique dataset combining IRS 990 Schedule K forms and municipal bond data, thereby enriching our comprehension of nonprofit financing in the bond market. The overarching question of this research is why nonprofits choose particular debt instruments over others for their capital funding needs and to identify the barricades that hinder more nonprofits from leveraging the municipal bond market efficiently.

The first essay examines the nonprofit bond issuance landscape, identifying disparities in interest rates, underwriter fees, and bond rating acquisition among various nonprofit sectors. Notably, charter schools and senior housing nonprofits face higher interest and issuance costs and exhibit lower tendencies to obtain bond ratings, pivotal for signaling creditworthiness and reducing interest rates. Furthermore, there's a uniformly low tendency across all subsectors to obtain credit enhancements, indicating nonprofits' difficulties in persuading credit enhancement agencies willing to take over their default. The reluctance to secure bond ratings and credit enhancements highlights a systemic issue within nonprofit financing, potentially escalating financial risks.

The second essay scrutinizes nonprofits' financial decisions concerning mortgages, tax-exempt bonds, and insider loans through the lens of static trade-off (STT) and pecking order theories (POT). Analysis via a Heckman selection model indicates that nonprofits with more diverse revenue streams and with stable source of income have increased usage of mortgages with lower issuance costs and greater repayment flexibility, aligning with STT. Conversely, these nonprofits are less inclined to use tax-exempt bonds, a finding that aligns POT. The results challenge

conventional capital structure theories and underscoring the need for novel theoretical perspectives.

The third essay explores the impacts of nonprofits' financial conditions on their bond credit ratings. Ordered probit regression with the Heckman selection correction reveal that nonprofits' tendency towards financial leanness contributes to low bond crediting ratings. Specifically, minimized profits, operating revenue, and cash flows, combined with over-dependence on donations and program revenue lead to weaker credit ratings. This scenario reveals a paradox where financial prudence, intended to foster donor confidence, inadvertently signals limited debt repayment capacity to credit rating agencies, inflating borrowing costs.

Collectively, these essays contribute significantly to understanding the financial barriers impeding nonprofits' effective use of tax-exempt bonds, underscoring a high-risk perception regarding nonprofit bonds among investors and financial agencies. The insights garnered from this dissertation also underscore critical areas for future research and policymaking, aimed at facilitating more equitable and efficient capital access for nonprofits, thereby enhancing their ability to serve marginalized communities and fulfill their mission-driven objectives.

UNDERSTANDING NONPROFITS' USE OF DEBT INSTRUMENTS TO FINANCE  
CAPITAL PROJECTS: PERSPECTIVES FROM THE LANDSCAPE OF NONPROFIT BOND  
FINANCE, NONPROFIT CAPITAL STRUCTURE, AND TAX-EXEMPT BOND CREDIT  
RATINGS

By

Qingqing Sun

Dissertation submitted to the faculty of the Graduate School of  
the University of Maryland, College Park, in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
2024

Advisory Committee:

Dr. Angela Bies, Chair (School of Public Policy, UMD)

Dr. Thomas Luke Spreen (School of Public Policy, UMD)

Dr. Joannie Tremblay-Boire (School of Public Policy, UMD)

Dr. Philip Joyce (School of Public Policy, UMD)

Dr. Thad Calabrese (Wagner Graduate School of Public Service, New York University)

Dr. Jesse Lecy (School of Community Resources and Development, Arizona State University)

Dr. Anna Alberini (Dean's Representative, Department of Agricultural and Resources  
Economics, UMD)

© Copyright by  
Qingqing Sun  
2024

## **Dedication**

To my family, professors, and friends who helped me complete the journey.

## Acknowledgement

There are many people I want to thank for helping me complete this journey. Looking back, many factors collectively led me to study the topic I chose for my dissertation on nonprofit capital finance—an unusual but fascinating subject for me.

My interest in nonprofit research began with my role as a research assistant for Dr. Mary Kay Gugerty, working on her projects related to foreign aid and nonprofit self-regulations. Thank you, Dr. Gugerty, for providing me with my first research experience. Later, I served as a Policy Analysis & Advocacy Intern for the University of Washington's alumni foundation. My main job was to engage alumni in contacting their state legislators to support budget spending on higher education, especially for capital projects on campus. This role helped me realize the importance of capital investment for asset-intensive nonprofits and ignited my curiosity about how smaller, less financially stable nonprofits might raise funds to finance capital projects.

When I moved to Maryland to pursue my PhD in public policy, I was still uncertain about my dissertation topic, but I knew I wanted to focus on nonprofits, ideally on aspects related to their finance.

During graduate school, I had the opportunity to be an editorial assistant for *Nonprofit Voluntary Sector Quarterly* with my advisor, Dr. Angela Bies, who was the editor-in-chief at the time. This experience exposed me to a wide range of research topics in nonprofit management and helped me begin to understand what constitutes good research work. I am very grateful to Dr. Bies, who shaped my understanding of scholarly writing and my academic career through several difficult yet helpful conversations during my PhD journey. She also provided me with

teaching opportunities in her classroom and offered insightful comments on my specialization exam papers, dissertation proposal, and dissertation, all of which I really appreciate.

As a second-year PhD student, I met Dr. Jesse Lecy at the ISTR conference, where he introduced methods for extracting data from e-filed Form 990s and schedules. I was fascinated by this and discussed it with him at the end of his presentation. Eventually, with his generous help and guidance, I worked with him as a summer research assistant and learned the method to web scrape XML files from Form 990 Schedule K, which became the core dataset for my dissertation.

In my third year as a PhD student, I met Dr. Thomas Luke Spreen, who helped me to grow dramatically. Dr. Spreen is kind and sincerely cares about students. He is also supportive, responsible, and always available to answer my questions and review my work. Without his consistent support, I do not think I would have finished this PhD journey and still come out thinking that I want to be a scholar. I also met Dr. Joannie Trembly-Boire when I was in my third year (or was it my second?) as a PhD student and had her join my committee. I greatly appreciated her feedback, which challenged me to sharpen my arguments and improve my writing. Her insightful comments and feedback pushed me to become a better writer and scholar. That same year, I also met Dr. Thad Calabrese through an ABFM mentor program, and he later graciously agreed to be a member of my committee. He took the time to read early drafts of my work and supported my presentations at various ABFM and ARNOVA conferences, for which I am very grateful. I wish one day I can be a scholar like him, bridging nonprofit management and public finance. In my fifth year as a PhD student, Dr. Philip Joyce joined my committee and

provided valuable feedback on my dissertation proposal and dissertation. He also gave me the opportunity to teach in his classroom, which I really appreciate.

Along with my academic journey, my life also changed. I met my husband when I was a third-year PhD student. Matt helped me through many lows and highs during my PhD program, including my specialization exams, my dissertation proposal defense, and eventually my dissertation defense. I look forward to experiencing more highs and lows together in our lifelong journey!

I also wanted to thank all of my friends and mentors along the way. I probably could not remember all of your names. I want to thank Peiyao Jia, Xingchi Shen, Jiehong Lou, Jing Liang, Menye Zhu, Ryna Cui, Sergio Pinto, Cyn Boru, Juan A. Echenique, Anjali Sharma, Simran Singh, Poorti Sapatnekar, and Matthew Regan, whom I met in the School of Public Policy. I am glad that I was once, and for some of you, continue to be part of your life. I also want to thank the friends I met through the ARNOVA conferences and the UPenn PhD fellows' program that made this journey feel less lonely and more fun, including Chen Ji, Hanjin Mao, Shuyi Deng, Jiako Hung, Ruodan Zhang, Rong Zhao, Menghan Ho, Qiaozhen Liu, Erica Ceka, Dominik Meier, Emma Lotte Willems, and Philine van Overbeeke. I also want to thank my friends from the Department of Political Science, the School of Public Health, and the Department of Psychology, Guan Wang, Kainan Gao, Xiaonan Wang, Yuruo Li, and Megan Fitter, whose support helped me through the last step of my PhD journey.

In addition, I also wanted to thank Dr. Chao Guo, Dr. Juan Pablo Martínez Guzmán, Dr. Jason Coupet, Dr. Jiahuan Lu, Dr. Peter Frumkin, and Dr. Linda Macri from the Graduate School

Writing Center, who helped in many ways—professionally and emotionally—on this long journey.

Finally, I also want to thank my parents. Although you may not always agree with my decisions, you eventually supported me in the end. I hope that when I read this acknowledgment ten years from now, I will be happier, more confident, and still remember why I like research. 😊

## Table of Contents

Dedication .....	ii
Acknowledgement .....	iii
Table of Contents .....	vii
Chapter 1: Introduction .....	1
1.1 Background .....	1
1.2 Overview of the Three Essays .....	8
Chapter 2: The Landscape of Nonprofit Bond Borrowers and Bond Issuance Process .....	17
Abstract .....	17
2.1 Introduction .....	18
2.2. Literature Review: Conceptual Underpinnings and Definitions .....	24
2.2.1 Nonprofit Bond Issuance Process and Issuance costs .....	24
2.2.2 Who are Nonprofit Bond Borrowers? .....	30
2.3 Data and Method .....	36
2.4 Findings .....	38
2.4.1 The trend of nonprofit bond usage by Subsector and Year .....	38
2.4.2 The Attributes of Nonprofit Bonds .....	41
2.4.3 The Bond Borrowers’ Financial Characteristics .....	59
2.5 Conclusion and Discussion .....	70
Chapter 3: Financing Nonprofit Growth: Exploring the Strategic Use of Mortgages, Bonds, and Private Loans .....	77
Abstract .....	77
3.1. Introduction .....	78
3.2. Literature Review .....	83
3.2.1 Theories of Capital Structure in the Nonprofit Context .....	83
3.2.2 Repayment Flexibility, Default Risk, Interest, and Issuance Costs of Debt Instruments .....	87
3.3 Testing the Pecking Order (POT) and Static Trade-off (STT) Theories .....	89
3.3.1 Profitability .....	89
3.3.2 the Cost of Financial Distress: Revenue Diversification & Reliance on Sources of Income .....	91
3.3.3 Endowments .....	94
3.3.4 Fixed Assets .....	95
3.4. Data & Variables .....	96
3.5. Methods .....	99

3.6	Results .....	103
3.7	Conclusion and Discussion.....	107
	Notes .....	112
Chapter 4: Is Financial Leanness Punished by Credit Rating Agencies: The Impacts of Financial Conditions on Nonprofit Tax-Exempt Bond Ratings.....		
	Abstract.....	113
4.1	Introduction.....	114
4.2	Literature Review.....	116
4.2.1	Why do Bond Ratings Matter for Nonprofit Borrowers? .....	116
4.2.2	Does Nonprofit Financial Condition affect Credit Ratings?.....	118
4.3	Hypotheses.....	120
4.3.1	Operating Revenue and Operating Margin .....	120
4.3.2	Profitability .....	121
4.3.3	Debt Load.....	121
4.3.4	Revenue Diversification.....	122
4.3.5	Reliance on program service revenue and donations .....	122
4.3.6	Liquidity.....	123
4.3.7	Fixed Assets and Endowment .....	124
4.4	Data & Methods .....	124
4.4.1	Sample Selection.....	124
4.4.2	Dependent Variable.....	126
4.4.3	Independent Variable .....	126
4.4.4	Control Variables .....	128
4.4.5	Methods.....	129
4.5	Results.....	132
4.6	Discussion and Conclusion .....	137
Chapter 5: Conclusions and Discussions .....		
List of Tables .....		
	Table 2.1 Sample Construction.....	151
	Table 2.2 The Number of Nonprofit Bonds issued by Subsector, 2009 and 2016.....	152
	Table 2.3 The Aggregated Principal Amount of Nonprofit Tax-Exempt Bonds by Subsector, 2009 and 2016 (Inflation-Adjusted, 2016 US\$). .....	152
	Table 2.4 Descriptive Statistics for Bond Attributes by Borrower Type, 2009-2016.....	153
	Table 2.5 Descriptive Statistics for Financial Characteristics of Bond vs. Non-Bond Borrowers, 2009- 2016 .....	155

Table 2.6 Descriptive Statistics for Financial Characteristics by Borrower Type, 2009-2016.....	156
Table 3.1 Summarizing Hypothesized Signs and the Corresponding Underlying Theories.....	158
Hypothesized Signs & Underlying Theories .....	158
Table 3.2 Sample Construction .....	159
Table 3.3 Descriptive Statistics .....	160
Table 3.4 Heckman Selection Model Estimation Results .....	163
Table 4.1 Sample Construction.....	166
Table 4.2 Descriptive Statistics.....	167
Table 4.3 Ordered Probit Model with/without Heckman Sample Selection.....	169
Table 4.4 Marginal Effects Calculated Based on the Weighted Order Probit Model.....	171
and the Probability of Receiving a Credit Rating between Below AAA to A .....	171
Table 4.5 Marginal Effects Calculated Based on the Weighted Order Probit Model.....	173
and the Probability of Receiving a Credit Rating between Below A- to below BBB- .....	173
Table 4.6 Ordered Probit Models by Credit Rating Agency.....	175
List of Figures .....	177
Figure 2.1 Nonprofits' Municipal Bond Issuance Process.....	177
Figure 2.2 The Percentage of Bonds Issued by Subsector 2009-2016 (N= 843).....	178
Figure 2.3 Number of Bonds and Aggregated Principal Amount of Bonds by Year .....	179
Appendices.....	180
Appendix A.....	180
Table A-1. Summary Statistics of Characteristics used to Match Nonprofits with Similar Likelihoods of Using Tax-exempt Bonds .....	180
Table A-2. Summary Statistics of Characteristics used to Match Nonprofits with Similar Likelihoods of Using Mortgages.....	180
Table A-3. Summary Statistics of Characteristics used to Match Nonprofits with Similar Likelihoods of Using Loans From Insiders.....	181
Table A-4. Weighted Regressions using Coarsen Exact Matching (CEM) Weights (updated format 3.30.2024).....	182
Appendix B. ....	184
Table B-1. Rating Criteria of Operating Performance (Operating Performance) <sup>1</sup> .....	184
Table B-2. Rating Criteria of Debt Load .....	186
Table B-3. Rating Criteria of Scale.....	189
Table B-4. Rating Criteria of Liquidity .....	191
Notes .....	194
References.....	196

# Chapter 1: Introduction

## 1.1 Background

Raising capital to develop and expand infrastructure and facilities is important for capital intensive nonprofits - such as hospitals and housing-related nonprofits – to support programmatic expansion and growth, maximize organizational mission accomplishments, and fulfill the increasing needs of services provided by nonprofits (Calabrese, 2020, 2012; Searcy, 2011; Woronkowitz et al., 2012). For instance, housing-related and community development nonprofits need land to build housing projects. Universities need buildings and equipment (i.e., lab facilities) to provide quality education to students. Nonprofit museums and theaters need land and buildings to host performances and exhibitions.

Nevertheless, many nonprofits face equity constraints, meaning they do not have enough internal funds—equivalent to retained earnings or accumulated unrestricted net assets— to completely finance capital projects (Jegers, 2018; Jegers & Verschueren, 2006). Furthermore, many nonprofits prefer not to use up all internal funds to finance capital projects, since some nonprofits need to save some retained earnings as a rainy-day fund to cover common fiscal shortfalls or save funds for future growth (Bowman, 2002; Calabrese, 2011; Yetman, 2007). Recent literature also indicates that using debt for capital projects can be a relatively cheap and quick way to raise the necessary capital, considering the significant commitment of time, human capital, and uneven returns related to capital campaigns (Calabrese 2019; Lam et al., 2020; Yetman 2006). In addition, not all nonprofits have deep pools of wealthy donors or a very broad pool of average donors that can be targeted to raise funds through a capital campaign (Lam et al., 2020; Yetman, 2007; Young, 2017). Therefore, borrowing becomes an important path for nonprofits to overcome equity constraints and raise borrowed capital to “better match the costs of

the assets with its benefits over longer time periods” to support nonprofits’ programmatic growth in the long run (Calabrese 2019, p.89).

On a broader scale, the growing need for nonprofit services has likely led many nonprofits to develop and enhance their infrastructure to meet this rising demand. As a result, an increasing number of nonprofits are turning to mortgages and tax-exempt bonds to secure the capital needed for facility expansion. For example, Bridgeland and Reed (2009) observed that 70% of Michigan nonprofits reported a surge in service demand, with Arizona seeing a 100% increase in social service seekers between 2007 and 2008. While no study has directly examined the link between social service demand and nonprofit financing through mortgages and bonds, the spike in service demand might explain the 258.8% increase in outstanding tax-exempt bonds for human service nonprofits from 1997 to 2010 (Calabrese & Ely, 2016). Furthermore, research has shown a positive correlation between a city's median household income, the educational attainment of its population, and the number of museums built by art nonprofits (Woronkowitz et al., 2012). With a 563.1% rise in tax-exempt bond liabilities for art nonprofits from 1997 to 2010, it's plausible that higher median incomes and education levels in urban areas might also drive the expansion of tax-exempt bond liabilities for art nonprofits by boosting demand for cultural infrastructure among educated, financially secure residents (Calabrese & Ely, 2016).

As a consequence, over recent decades, beyond traditional frequent borrowers like hospitals and universities, more nonprofits in sectors not typically associated with tax-exempt bond usage—such as those in the arts, human services, and housing—have increasingly accessed the bond market to fund capital projects in response to growing demand of service and goods (Ely & Calabrese, 2016; Smith, 2010; Woronkowitz et al., 2012). For instance, tax-exempt bond issuance by arts and culture nonprofits saw a remarkable 563% increase from 1997 to 2010, in

contrast to a 144% increase for hospitals (Calabrese & Ely, 2016). According to Calabrese and Ely (2016), the inflation-adjusted amount of mortgages and other notes payable for the entire nonprofit sector also rose from 1997 to 2010, albeit at a slower rate compared to tax-exempt bonds. My dissertation will build on the work of Calabrese and Ely (2016), analyzing more recent data (2009 to 2016) to explore current trends in nonprofit use of tax-exempt bonds. This study will assess how bond usage varies across different subsectors and how these trends have evolved since 2010.

However, there are complications to borrowing, as nonprofits face high default risk and financial distress associated with debt. Nonprofits are more likely to face revenue shortfalls and then default on debt, especially in contrast to for-profit and government borrowers that can respectively raise funds in the stock market or have the stable tax revenue to back up repayment (Bowman, 2011; Gaver et al., 2016; Tuckman, 1993). These sectoral differences are due to 1) nonprofits lacking owners and being subject to a non-distribution constraint; 2) their inability to levy taxes, dependence on external funders, and reliance on unstable revenue streams. Because nonprofits have no owners and are bound by the non-distribution constraint, they cannot issue equity to raise funds in the stock market (Bowman, 2002; Yetman, 2006). This limitation stems from the absence of owners or shareholders to receive profits. Furthermore, unlike government entities, nonprofits lack the authority to impose taxes for debt repayment. As a result, they often rely on less predictable revenue streams to service their debt.

Specifically, nonprofits by their nature sometimes experience an inverse relationship between the needs their clients have for mission-driven services and their clients' ability to pay fees for such services. As a result, nonprofits often depend on external, donative revenue sources like foundations, individual donors, and government grants. These sources, however, are less

stable than tax revenue and may not consistently match the mission or service demands. Such revenues are vulnerable to financial instabilities, including government budget cuts or economic downturns that can diminish donations and foundation payouts, jeopardizing debt repayment (Bowman, 2011; Calabrese & Ely, 2022; Gaver et al., 2016; Tuckman, 1993).

Furthermore, although nonprofits cannot be liquidated involuntarily by law, default still sullies nonprofits' reputations, causing nonprofits to lose control of managerial decisions. This then allows lenders, such as banks, to take a claim to the nonprofit's revenues (Bowman, 2002; Calabrese, 2011a; Yetman, 2006). In addition, using financial debt may also create financial distress for nonprofits due to the fixed payment schedule, which requires nonprofits to make debt payments regardless of their financial status (Calabrese, 2011a; Calabrese & Ely, 2016; Yetman, 2006, 2010). Therefore, debt obligations may incur many costs associated with financial distress, such as the disruption of the nonprofits' operation, service provisions, and operating budget deficits, especially when nonprofits face revenue shortfalls (Calabrese, 2011a; Smith, 2010, 2012; Yetman, 2006).

Using financial debt, such as tax-exempt bonds and mortgages, also incurs many financial costs, such as interest and issuance costs. Since nonprofits have volatile revenue that may not withstand fiscal shocks well, nonprofits need to minimize their interest and issuance costs to minimize default risks and avoid financial distress that may interrupt nonprofits' daily operations and service provisions (Bowman, 2011; Calabrese, 2011a; Gaver et al., 2016; Tuckman, 1993).

Further research is needed to understand how variations in interest and issuance costs, as well as the characteristics of bond issues and nonprofit borrowers, impact these costs across different nonprofit subsectors. Literature suggests nonprofits incur higher interest costs than

government entities due to unstable revenue streams and a higher vulnerability to financial shocks, leading to increased risk premiums from investors (Peng & Brucato, 2004; Robins & Simonsen, 2013, 2014; West, 1967). In addition, transaction costs, which form part of the issuance costs, are determined by the complexity of the tasks undertaken by financial agencies, including underwriters, financial advisors, and Credit Rating Agencies (CRAs). These tasks involve analyzing and determining the certainty of repayment and the viability of the financing plan (Denison, 2001; Nanda & Singh, 2004; Robbins & Simonsen, 2013). Issuance costs also include a risk premium designed to offset the risks of default and the difficulties faced by underwriters and credit enhancement agencies to find investors for bonds or incur potential losses upon sale.

Studies have highlighted various attributes of bond issues and nonprofit borrowers that affect both interest and issuance costs by impacting repayment uncertainty and the complexity of tasks performed by financial agencies to ascertain and mitigate the credit risks of bonds (Ely et al., 2013; Robbins et al., 2012; Vogt, 2004). The attributes that affect these costs include longer years to maturity and unstable non-tax revenue streams, with nonprofit borrowers more likely to exhibit these characteristics than government borrowers (Ely & Calabrese, 2017; Ely et al., 2013; Robbins & Simonsen, 2013). Given the high uncertainty towards nonprofits' ability to pay off debt on time, nonprofits often have longer bond maturities to avoid default. This attribute increases transaction costs, due to the complicated tasks performed by financial agencies to assess nonprofits' ability to pay off debt over a long time period and to promote risky bonds to investors (Ely et al., 2013; Robbins & Simonsen, 2013). These long maturities also lead credit enhancement agencies and underwriters to charge higher risk premiums, due to high underlying repayment uncertainty associated with it (Daniels et al., 2010; Denison, 2001; Robbins &

Simonsen, 2013). In addition, unlike government bonds that are supported by stable tax revenues or consistent fees from toll roads and utilities, nonprofit bonds are funded by variable non-tax revenues, like museum admissions or entrance and monthly fees from senior housing facilities. This variability makes guaranteeing debt repayments a greater challenge during times of financial instability (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Peng et al., 2008; Peng & Brucato, 2004). This uncertainty in revenue streams results in increased issuance and interest costs, as investors and financial agencies demand higher compensation for the elevated risk of default and the additional work needed to market the bonds, create financing plans, or assess the creditworthiness of nonprofits. Despite these insights, there is still a gap in research on how the attributes of bond issues and borrowers vary among nonprofit subsectors and which subsectors contribute most to nonprofit sector's higher borrowing costs compared to government entities.

By examining differences in bond attributes and borrowers among nonprofit subsectors, we can uncover insights into several key areas: 1) which nonprofit subsectors encounter greater challenges in accessing bond markets compared to government entities and nonprofits from other subsectors, 2) why nonprofits face higher interest and issuance costs than government borrowers, and 3) what prevents certain nonprofit subsectors from issuing bonds as easily as sectors such as hospitals and universities.

Further research is also needed to understand why nonprofits prefer certain debt instruments over others for capital projects, as these choices impact borrowing costs. Specifically, the interest rates of tax-exempt bonds are lower than mortgages, but why there are not more nonprofits using tax-exempt bonds? The interest costs, issuance costs, and other attributes of these two debt instruments may be associated with varying degrees of default risks

and financial costs. Consequently, these factors complicate the decision-making process for nonprofits aiming to minimize expenses and risk. Mortgages typically carry higher interest rates compared to tax-exempt bonds (Tuckman, 1993; Yetman, 2006). Yet, banks offer more flexibility in repayment terms than tax-exempt bond investors, accommodating financial distress with borrowers that have potential for growth by adjusting loan maturities and renegotiating payment terms (Bolton & Freixas, 2000; Busuioc & Lodge, 2017; Calabrese & Ely, 2016).

Moreover, while tax-exempt bonds have lower interest rates, they incur substantial fixed issuance costs absent in mortgage financing—such as fees to conduit issuers, underwriters, and financial advisors (Ely & Calabrese, 2017; Joffe, 2015; Robbins & Simonsen, 2012, 2013). These issuance costs can negate the benefits of lower interest rates, particularly for medium-sized nonprofits requiring modest funding, leading to a preference for alternatives (Robins & Simonsen, 2012, 2013, 2014). The cost disparity is significant, with issuance costs for nonprofit tax-exempt bonds being 25% higher than those for state and local governments, which may be attributed to the reliance on volatile non-tax revenue for debt repayment (Butler, 2008; Ely & Calabrese, 2017; Robins & Simonsen, 2013).

Insider loans, an underexplored financing option, are provided by individuals closely connected to the nonprofit, such as founders, board members, and employees. These lenders provide loans to support a nonprofit's mission and may care less about the financial returns of their investment (Smith, 2010; Yetman, 2006). Insider loans might offer the lowest borrowing costs but are limited by the financial resources of the insiders involved. In sum, more research about the factors that affect nonprofits' usage of bonds, mortgages, and insider loans are needed to optimize nonprofits' financing strategies for capital projects.

Research is essential to understand how financial conditions affect bond ratings, particularly since bond credit ratings can reduce interest costs for tax-exempt bonds by signaling the credit quality of borrowers to investors (Johnson & Kriz, 2005; Liu & Thakor, 1984). Notably, a smaller proportion of nonprofit borrowers achieve desirable credit ratings compared to government borrowers, which affects their ability to reduce interest costs. Ely and Calabrese (2017) report that only 61% of nonprofit bonds were rated AA or AAA, compared to 88% of government municipal bonds. Additionally, only 54% of nonprofit tax-exempt bond borrowers opted to purchase bond ratings, in contrast to 67% of government borrowers. Investigating the determinants of bond ratings for nonprofits could shed light on why nonprofits are less likely to purchase ratings and obtain investment-grade ratings than government entities.

In sum, in this dissertation, I aim to explore several key questions that I discuss above in three essays. The first essay offers a comprehensive look at nonprofit bonds, analyzing the variations in bond attributes and the characteristics of borrowers across nonprofit subsectors to understand the obstacles they encounter in the bond market. The second essay investigates the strategies nonprofits employ to choose between internal funds, mortgages, tax-exempt bonds, and insider loans for financing capital projects, with a focus on how they balance program expansion with minimizing debt-related risks and financial distress. The third essay addresses the impact of nonprofits' financial conditions on their bond credit ratings, a critical tool used to communicate the creditworthiness of bonds to potential investors and reduce interest costs.

## **1.2 Overview of the Three Essays**

In this dissertation, I want to understand how nonprofits can minimize the costs associated with the debt usage. This includes the costs of financial distress, issuance costs, interest costs and default risks nonprofits face when financing capital projects (Calabrese, 2020).

In this dissertation, I do not focus on the costs of equity, equivalent to internal funds, since for nonprofits, the costs of equity should be zero or much lower than the cost of debt (Jegers, 2018; Jegers & Verschueren, 2006). The reason is that, unlike shareholders of a firm, funders for a nonprofit (i.e., donors and governments) do not demand a rate of financial return for their investments (Young, 2017).

Furthermore, while I acknowledge the significance of fundraising costs, particularly in capital campaigns, my dissertation will not discuss fundraising costs or compare fundraising with borrowing options. The reason is that estimating whether fundraising costs will be higher or lower than debt costs is challenging due to variations across organizations. These costs depend on the target fundraising amount, access to affluent donors or a broader donor base, the human and financial resources reallocated towards fundraising efforts, and the opportunity costs associated with time—raising funds through capital campaigns typically takes longer than acquiring debt (Young 2017; Yetman, 2006). My dissertation aims to address an overarching question of why nonprofits prefer specific debt instruments over others for financing capital projects and what barriers prevent more nonprofits with capital needs from accessing the municipal bond market more effectively. It is structured around three focused essays that examine: the landscape of bond usage, optimizing capital structure, and improving bond ratings.

The first essay is a descriptive analysis that explores recent trends in nonprofit bond usage, profiles of nonprofit bond borrowers, and attributes of their bonds, such as years to maturity and annual interest payment. There is a notable gap in understanding the landscape of nonprofit bond borrowers and bonds in the US, limiting researchers' ability to pose in-depth questions about nonprofits' bond activities. Key unknowns include the total number of bonds nonprofits have issued over any period, the financial profiles of these borrowers, which

subsectors they belong to, typical interest rates and issuance costs, and whether these borrowing costs differ by subsector. To date, research on nonprofit bond usage has been limited, partly because comprehensive data on nonprofit bonds are scarce. Early studies only focused on hospital bonds' outstanding bond liabilities (Gentry, 2002; Hassan et al., 2000; Wedig et al., 1998). More recent inquiries (Calabrese Ely, 2016; Ely & Calabrese, 2017; Smith, 2010; Denison, 2009) have expanded the scope to analyze determinants influencing the likelihood of using nonprofit bonds and the total outstanding bond liabilities across all nonprofits, leveraging data of outstanding bond liabilities reported on the IRS Form 990, which is mandatory for tax-exempt organizations with significant gross receipts. However, these aggregated data on outstanding bond liabilities, which consist of liabilities from multiple bond issuances, do not allow for detailed investigation into specific bond attributes like issuance costs, interest rates, or credit ratings. Ely and Calabrese's (2017) work is the only attempt to assess the issuance costs of nonprofit bonds, constrained to California's regional data due to these data limitations.

In the first essay, I utilize descriptive statistical analysis and a newly compiled dataset on nonprofit bond issuance. This dataset is compiled by merging data from the IRS Form 990 database, including tax-exempt bond information from IRS Form 990 Schedule K, with data from the Securities Data Company (SDC) Platinum, Bloomberg Professional Terminal, and the American Community Survey (ACS). The Form 990 is a disclosure form required by the IRS for tax-exempt organizations with gross receipts of \$200,000 or more. Schedule K is a supplemental tax-return form that nonprofits must file along with their Form 990 to report information regarding bond issues if they have outstanding liabilities associated with tax-exempt bond issues. I web scraped all 86,000 Schedule K forms of nonprofit tax-exempt bond usage filed between 2009 to 2016 via Amazon Web Services. SDC Platinum and Bloomberg datasets offer data on the

characteristics of each issued municipal bond in the U.S., such as principal amount, bond credit ratings, methods of sale, and bond insurance status. Demographic information at the county level is obtained from ACS data.

This essay first contributes to scholarship by creating and introducing a unique dataset linking the financial characteristics of nonprofit borrowers with bond-level attributes for the first time, enabling scholars to answer existing and new questions related to bond finance. For instance, previous research indicates that nonprofits incur higher issuance costs and receive lower bond ratings than government entities (Ely & Calabrese, 2017). However, scholars could not further explain the cause, due to the lack of data. This novel dataset opens doors for further analysis of how the financial conditions of nonprofits affect their bond issuance costs and interest payments. This data set also allows scholars to further examine questions related to borrowing costs, bond attributes of nonprofit bonds, such as bond ratings, and bond usage's short-term and long-term effects on nonprofit financial health.

This essay also contributes an overview of the interest and borrowing costs associated with nonprofit bond issuance across different sectors of activity or mission area, and also details the financial characteristics of these bond borrowers. It highlights significant aspects of nonprofit bond finance that warrant further exploration. For example, although universities and hospitals account for 66% of nonprofit bond issuances, there has been a notable rise in bond market activity among traditionally less active subsectors, including housing, charter schools, non-charter private nonprofit K-12 schools, human service nonprofits, and art nonprofits. This increase is evident in both the number of issuances and the total principal amounts. However, housing bonds, predominantly issued by senior housing nonprofits (86%), along with charter school bonds experience the highest credit risks among all nonprofit bond borrowers. Housing

and charter school bonds represent the largest share of nonprofit bonds outside of universities and hospitals. However, their bonds have the highest averages of coupon rates and underwriters' discounts, longest average years to maturities, and the second and third lowest likelihood of purchasing ratings, only surpassing non-charter private nonprofit K-12 schools. However, the factors contributing to the high credit risks associated with charter schools and housing bonds need to be further examined. Additionally, it observes variations in the likelihood to seek bond ratings and achieve investment-grade ratings across nonprofit subsectors, indicating a need to explore what drives or hinders nonprofits from obtaining favorable bond ratings. Finally, compared to government borrowers, fewer nonprofits utilize credit enhancements, such as bond insurance, which could otherwise lower their interest costs by transferring the risk of default (Denison, 2001; 2003). This raises questions about the factors, possibly including high fees for risky bonds, that deter nonprofits from seeking credit enhancements.

In the second essay, I analyze the capital structure of nonprofits, focusing on how they use retained earnings and various forms of external debt—including mortgages, insider loans, and tax-exempt bonds—to finance capital projects. This analysis utilizes e-filed IRS 990 form data from 2009 to 2016 and employs a Heckman selection model to control for selection bias in the choice of debt instruments. The central questions are: when nonprofits possess more stable financial resources that can be used to finance capital projects directly or guarantee debt repayment, how will their usage of different debt instruments change? Essentially, I want to understand what trade-offs nonprofits face between the benefits and costs of these debt instruments and internal funds to support their programmatic growth, while simultaneously aiming to alleviate future financial strain?

This paper makes theoretical contributions by presenting a more nuanced and complicated picture of nonprofits' use of debt instruments. First, it investigates whether the applicability of two prominent capital structure theories - the static trade-off theory (STT) and the pecking order theory (POT) - differs by debt instrument, a relatively unexplored area. STT suggests that nonprofits favor debt when its benefits, such as tax-arbitrage and keeping internal funds as reserves, exceed default risks (Bowman, 2002; Elmagrhi et al., 2018). In contrast, POT highlights the costs of financial distress and default risks from debt and posits that nonprofits always prefer internal funding over external debt (Calabrese, 2011a; Smith, 2010, 2012; Yan et al., 2009). Borrowing may lead to financial distress and default due to the inflexible repayment schedules of debts, which require consistent payments of principal and interest regardless of the market conditions or the financial status of nonprofits (Jegers, 2018; Yetman, 2010).

Calabrese's (2011) modified pecking-order approach argues that, while nonprofits generally exhibit risk aversion towards debt, they still maintain some leverage to preserve some internal funds for contingencies or future investments. I build on this approach, and further contend that, when nonprofits use debt, they show varying degrees of risk aversion towards different debt instruments to minimize borrowing costs and ensure future financial sustainability (Calabrese, 2020; Charles et al., 2021). For instance, nonprofits with stable revenue sources and diversified revenue streams are more likely to opt for mortgages, which typically have lower default rates and issuance costs, than tax-exempt bonds (Bolton & Freixas, 2000; de Haan & Hinloopen, 2003; Denison, 2001; Nanda & Singh, 2004; Raineri et al., 2012). Conversely, they tend to reduce their usage of bonds with higher default rates and costs. However, nonprofits' financial conditions seem to have little impact on loans from insiders, likely because such loans

are driven by support for the nonprofits' missions rather than financial return expectations (Smith, 2010; Young, 2017).

Second, this paper draws scholarly attention to the often-overlooked factors of repayment flexibility and upfront issuance costs when analyzing capital structure. These factors, potentially more influential than interest costs, may significantly impact nonprofits' use of debt instruments (Calabrese, 2020; Ely & Calabrese, 2017; Tuckman, 1993). This explains the preference for mortgages with higher interest rates over bonds. However, further research is required to understand how the average issuance costs and limited payment flexibility of bonds influence nonprofits' use of tax-exempt bonds. Third, this study is the first to examine factors influencing the use of insider loans within nonprofits and assess the applicability of capital structure theories to this context. Although insider borrowing is recognized as vital for small nonprofits lacking access to traditional financial debt (Smith, 2010; Yetman, 2006), its determinants have not been previously explored. My analysis reveals that neither POT nor STT can explain the use of insider loans for financing capital projects. This finding, along with the limited impact of financial factors on the extent of insider loans, prompts a need for alternative theories to better explain these borrowing decisions.

My third essay examines how organizational financial condition influences nonprofit bond credit ratings, using a two-step Heckman selection model to address the selection bias related to the decision to purchase bond ratings. By answering this question, I further our understanding of why nonprofits often receive low bond ratings as evidenced by Ely & Calabrese (2017). Data were again obtained from the e-file Form 990 database, the Form 990 Schedule K, Securities Data Company (SDC) platinum, the Bloomberg terminal, and the American Community Survey (ACS).

This essay expands the literature on municipal bonds and nonprofit borrowing by examining the organizational financial determinants of nonprofit bond ratings to answer why nonprofits receive low bond ratings. In the nonprofit sector, the practice of maintaining financial leanness—minimizing profits, revenue, and cash reserves—is widely touted. This is purported to demonstrate nonprofits’ trustworthiness to funders, including donors and government agencies, who cannot typically observe the nonprofit’s output. These funders seek to ensure that financial resources are immediately allocated to programs instead of being hoarded as excess funds (Calabrese, 2013; Mitchell, 2017). However, the analysis presented in this paper demonstrates the positive relationships between profitability, days cash on hand, and operating revenue with high bond ratings. This suggests that credit rating agencies (CRAs) value these financial characteristics that reflect a nonprofit’s ability to generate and accumulate financial surplus. Therefore, the emphasis on financial leanness among nonprofits lead CRAs to question their creditworthiness. This results in lower credit ratings and increased borrowing costs for nonprofits compared to governments.

The results of my third essay uncover a unique dilemma confronting nonprofits wishing to access the bond market: how to simultaneously demonstrate their trustworthiness to donors and creditworthiness to the market. While maintaining financial leanness may impede financial surplus accumulation necessary for timely debt servicing, leading to lower bond ratings (Liu & Thakor, 1984), they are favorably viewed by funders as an indicator of trustworthiness (Hansmann,1988). Therefore, nonprofits with larger financial reserves may receive fewer contributions due to funders’ concern about resource diversion from mission objectives. Nonprofits wishing to access the bond market need to carefully navigate the unintended consequence of maintaining financial leanness and communicate with funders regarding the

benefits of financial reserves. In an environment where many funders prefer to fund current programs and operations rather than capital projects, they should also acknowledge the necessity for nonprofits to access market capital.

Finally, in the conclusion chapter of my dissertation, I discuss the individual and collective contributions of my three essays to the literature on nonprofit borrowing and municipal bonds and outline the future research directions. This dissertation explores the barriers that impede nonprofits from raising cheap capital in the tax-exempt bond markets, which should ideally offer affordable capital to public organizations. My analysis reveals that nonprofits often opt for high-interest mortgages over tax-exempt bonds due to concerns that the substantial issuance costs of bonds could negate the benefits of lower interest rates. The dissertation also highlights factors that deter efficient bond market access for nonprofits, such as their preference for financial leanness, reliance on external funding, and lack of credit history in bond issuance. These factors lead bond buyers and financial agencies, such as bond credit rating agencies, to perceive nonprofits as high-risk, resulting in lower bond ratings and high interest rates, thus increasing borrowing costs (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Peng & Brucato, 2004; Robins & Simonsen, 2012, 2023). Finally, I also propose future research utilizing IRS Schedule K form data to explore questions, such as the impacts of bond issuance on nonprofits' programmatic and financial performance.

## **Chapter 2: The Landscape of Nonprofit Bond Borrowers and Bond Issuance**

### **Process**

#### **Abstract**

The recent increase in nonprofits seeking funding for capital projects through bond markets highlights a gap in understanding the scope of nonprofit borrowers and bond issuances in the US, including the number of bond issuances, borrowers' financial health, and borrowing costs (Ely & Calabrese, 2017; Calabrese & Ely, 2016). This study addresses these gaps by analyzing trends in nonprofit bond issuance, financial characteristics of bond borrowers, attributes of bond issues (e.g., annual interest payments, bond ratings, and principal amounts), and the obstacles nonprofits encounter in the municipal bond market. It reveals significant variations in interest payments, underwriters' fees, and the likelihood to purchase bond ratings among different nonprofit subsectors. Charter schools and senior housing nonprofits are shown to incur the highest borrowing costs and demonstrate the lowest likelihood of purchasing bond ratings. Additionally, there is a low tendency among all nonprofit subsectors to secure credit enhancements, suggesting nonprofits may struggle to find credit enhancement agencies willing to assume their default risks.

By creating and utilizing a novel dataset of nonprofit bonds that combines IRS Form 990 Schedule K data of nonprofit bond usage with other municipal bond datasets for the first time, this research contributes new insights into the nonprofit bond market. It also highlights critical areas for future research, including the factors influencing borrowing cost disparities across subsectors and the long-term effects of bond financing on nonprofits' financial health.

## 2.1 Introduction

Raising funds to develop and enhance capital assets, like infrastructure and facilities, is crucial for capital-intensive nonprofits, such as hospitals, museums, charter schools, and housing-related organizations. These efforts are vital to meet growing service demands, expand programs, and increase mission impact (Calabrese, 2020, 2012; Searcy, 2011; Searing & Lecy, 2022; Woronkowicz et al., 2012). Capital assets, such as land, buildings, and property, are essential for these nonprofits to deliver services and goods effectively to the community (Calabrese & Ely, 2016; Grønbjerg & Nagle, 1994). For example, assisted living communities require adequate facilities for elderly care, while universities depend on buildings and property to offer quality education.

On a macro level, the growing need for capital to fund capital projects and the low costs of issuing tax-exempt bonds have led more first-time nonprofit borrowers, including those in human services, charter schools, and the arts, to enter the bond market in the last decade (Calabrese & Ely, 2016b). Nonprofits have various options to gather capital for infrastructure, such as capital campaigns, insider loans, mortgages, and municipal bonds (Calabrese, 2011; Smith, 2010; Yetman, 2010). Yet, many nonprofits struggle to gather enough capital through campaigns and savings alone. Often, they face equity constraints, lacking the necessary internal funds, equivalent to retained earnings, to self-finance capital assets (Jegers, 2018; Jegers & Verschueren, 2006). Additionally, not every nonprofit has access to a significant number of wealthy donors or a wide pool of average donors for capital campaign fundraising (Yetman, 2006). Fundraising efforts can also divert crucial human and financial resources from daily operations while yielding uneven and uncertain returns (Lam et al., 2020; Young, 2017).

Debt financing, in contrast, particularly through low-interest tax-exempt bonds, offers a relatively quick and cost-effective capitalization method for nonprofits (Mitchell & Calabrese, 2019; Calabrese & Ely, 2016). First, nonprofits may prefer borrowing to quickly secure funds for capital projects and accelerate the construction and completion phases, unlike capital campaigns which require more time to gather the necessary capital. Second, organizations that finance capital projects via borrowing, such as charter schools, human service nonprofits, and museums, also anticipate that their facilities financed through debt will produce adequate program revenue and government grants to assist with debt repayment. Essentially, utilizing debt allows these nonprofits to align the costs of acquiring assets with the benefits of having these assets, such as expanding their services and generating more revenue, over longer periods more efficiently (Calabrese, 2019).

Admittedly, debt can bring financial stress to the organizations, such as borrowing costs and diversion of financial resources from programs if nonprofits fail to generate sufficient income to pay off debt (Smith, 2010, 2012; Mitchell & Calabrese, 2019). In reality, many nonprofits use a mix of debt, capital campaigns, and their own accumulated net assets together to finance capital projects in order to minimize the costs and default risks associated with debt and fundraising, while enjoying the benefits of having capital assets that can support nonprofits' program expansion (Calabrese, 2020; Yetman, 2006).

On a micro level, investors are willing to accept lower interest rates from tax-exempt bonds that only governments and nonprofits have access to, compared to other debt options like bank loans and corporate bonds, thereby reducing the interest costs for tax-exempt bond borrowers. The reason is that, unlike interest income from bank loans and corporate bonds that are subject to federal and state income tax, the interest income from tax-exempt bonds is exempt

from both taxes for the tax-exempt bondholders (Calabrese, 2016; Spreen & Gerrish, 2022). Nonprofits with 501(c)(3) status are permitted to issue tax-exempt bonds to fund infrastructure projects, as they serve public goods (Ely & Calabrese, 2017). Additionally, bond borrowers are not required to provide collateral for bond payments, in contrast to banks that typically require collateral for mortgage payments. For instance, some nonprofits, such as art museums, are reluctant to use mission-critical assets, like their art collections, as collateral.

Despite the advantages, the costs of issuing bonds, including fees for financial advisors, underwriters, conduit issuers, insurance companies, and credit rating agencies (CRAs), can exceed those of obtaining bank loans. Because of the complicated bond issuance process, nonprofits have to hire financial advisors, bond counsels, and underwriters for guidance and support in creating and selling the bond (Robbins & Simonsen, 2012; Vijayakumar & Daniels, 2006). Nonprofits are also unable to issue tax-exempt municipal bonds independently and must depend on conduit issuers, which are public agencies that issue bonds on their behalf (Ely & Calabrese, 2017; Yetman, 2007). However, many components of issuance costs, including fees for financial advisors and underwriters, are determined by the risk level perceived by financial agencies and the complexity of their tasks, and these costs do not significantly fluctuate with bond size (Butler, 2008; Ely et al., 2013; Robins & Simonsen, 2014). Therefore, issuing tax-exempt bonds in sufficiently large amounts can lead to economies of scale, where the savings on interest costs surpass the issuance expenses (Robins & Simonsen, 2013, 2014). The median principal amount of nonprofit bonds in my dataset consisting of all nonprofit bond issues between 2009 to 2016 is \$53 million, indicating that primarily borrowers with substantial capital requirements—those in the multi-million-dollar range—can achieve interest cost savings through economies of scale and are thus more inclined to utilize bonds.

In sum, the increasing demands for capital, the desire to facilitate project completion, the importance of protecting valuable assets, and the lower interest costs linked to using tax-exempt bonds are driving more nonprofits towards bond financing. Utilizing the e-filed IRS Form 990 database for all nonprofits with gross receipts of \$200,000 or more that submitted their forms electronically, I found that in 2016, nonprofits had \$150 billion in outstanding municipal bond liabilities. This figure represented 72.4% of their total long-term financial liabilities, which encompass mortgages, tax-exempt bonds, and insider loans. Due to nonprofits' increasing use of municipal bonds, some scholars have started to pay attention to this phenomenon and explored what organizational factors affect their decision to utilize municipal bonds and the usage of bonds. Some research investigated the financial determinants of nonprofit hospital and nonprofits' use of tax-exempt bonds, finding that program revenue reliance, larger asset sizes, significant fixed assets and larger endowment size contribute to a higher likelihood of choosing tax-exempt bonds and the use of debt to finance assets (Calabrese & Ely, 2016; Denison, 2009; Gentry, 2002). In addition, Ely and Calabrese (2017) found that private borrowers through conduit issuers, which predominantly are nonprofits, pay higher issuance costs than government borrowers.

Nevertheless, research examining nonprofits' bond usage remains very limited (Calabrese Ely, 2016; Ely & Calabrese, 2017; Smith, 2010; Denison, 2009). Scholars even lack a fundamental understanding of the landscape of both nonprofit borrowers and nonprofit bond issues in the US. For instance, how many nonprofits issue bonds? What are their financial characteristics? In which subsectors are nonprofit bond borrowers concentrated? What are the average interest payments and issuance costs for a nonprofit bond issue? Do the borrowing costs vary by subsector? In this paper, I seek to answer these questions by examining the current trends

in nonprofit bond usage, the characteristics of nonprofit bond borrowers, and the attributes of nonprofit bonds, such as annual interest payments, bond ratings, and principal amounts, as well as the challenges nonprofits face in the bond market.

The limited understanding of nonprofit bond usage is partially due to the absence of data on the attributes of nonprofit bond issues. I addressed this issue by web-scraping 86,000 Internal Revenue Service Form 990 schedule K forms that report nonprofit tax-exempt bond usage from 2009 to 2016. Subsequently, I created a dataset that links the financial characteristics of nonprofit tax-exempt bond borrowers with the attributes of the bonds themselves. This was achieved by merging data from the e-file 990 form database, the supplemental information on tax-exempt bonds from Schedule K, Securities Data Company (SDC) platinum data, and Bloomberg professional terminal data. I am the first researcher to compile and utilize this comprehensive dataset.

This paper first makes contributions by introducing a novel dataset of nonprofit bond usage for the first time. This data set allows researchers to address longstanding questions in bond finance, such as why nonprofits face higher issuance costs and lower bond ratings compared to government entities, a gap previously unexplored due to data limitations (Ely & Calabrese, 2017). The availability of this dataset facilitates further investigation into how the financial conditions of nonprofits influence their bond issuance costs and ratings. In addition, this data set also opens doors for researchers to study the long-term impacts of financial debt on the programmatic and financial outcomes of nonprofits. With this dataset, scholars can investigate the effects of municipal bonds issued decades ago on nonprofits' program outputs and financial growth. Nonprofits use debt to finance capital projects, aiming to extend their services and generate funds for new programs to meet the increasing needs of beneficiaries. Future

research is needed to determine whether financing capital projects with debt assists nonprofits in reaching these goals or instead leads to budget reductions and program cutbacks due to the financial burdens of debt repayment.

This study also sheds light on areas within nonprofit bond finance that merit further investigation. For example, it reveals that, compared to other nonprofit bonds, bonds issued by charter schools and housing nonprofits are often viewed as having the highest credit risks by the bond market. As a result, these entities face higher coupon rates and underwriter fees as compensation for the perceived risk of default and the challenge of attracting investors (Nanda & Singh, 2004; Robbins et al., 2012; West, 1967). Additionally, this paper examines the effectiveness of commonly used financial metrics, such as the revenue diversification index and dependence on program revenue and donations, in capturing nonprofits' ability to ensure debt repayment amidst financial shocks. It highlights that most nonprofits in the dataset primarily rely on program revenue and government grants, often resulting in concentrated revenue streams. Yet, significant variations in credit risk across subsectors were observed, as evidenced by differences in borrowing and issuance costs, bond maturity periods, and the propensity to obtain bond ratings.

These findings above highlight the need for further research to uncover why certain nonprofits enjoy better access to the municipal bond market, benefiting from higher credit ratings and lower interest and borrowing costs. The study calls for identifying the financial barriers that prevent a broader range of nonprofits from entering the bond market to secure cost-effective capital, addressing growing beneficiary needs, and enhancing mission impact. Additionally, it also calls for more accurate financial measures to assess the varying levels of debt repayment capacity and default risk among nonprofit borrowers.

In the subsequent sections, drawn from the existing literature, I will begin by outlining the bond issuance process and the financial agencies involved. Following this, I will summarize and discuss the financial characteristics of nonprofit bond borrowers based on existing literature. Next, I will describe the data and methods employed for my descriptive analysis and present the findings. The paper will conclude with a discussion of these results.

## **2.2. Literature Review: Conceptual Underpinnings and Definitions**

### **2.2.1 Nonprofit Bond Issuance Process and Issuance costs**

In Figure 2.2.1, the bond issuance process is illustrated. Due to the complexity of the bond issuance process, nonprofit bond borrowers need to work closely with financial agencies—including financial advisors, bond counsels, bond credit rating agencies (CRAs), credit enhancement agencies, and underwriters—to efficiently navigate the issuance process, with the aim to reduce borrowing costs and default risks. This section will detail the bond issuance process and the roles these financial agencies play at each stage.

-----  
Insert Figure 2.2.1 about here  
-----

First, as seen in (1) in Figure 2.2.1, nonprofits must hire financial advisors at the start of the bond issuance process to provide guidance and support in both origination and sale of their bonds (Robbins & Simonsen, 2012; Vijayakumar & Daniels, 2006). These advisors are instrumental in helping nonprofits through the process, including the design of bond attributes and coordination with other financial agencies such as underwriters, CRAs, and credit enhancement agencies to minimize default risks and borrowing costs (Joffe, 2015; Robbins & Simonsen, 2013; Yetman, 2007). Key bond attributes that financial advisors and nonprofits need

to decide on include principal amount (the face value of the bond), years to maturity, coupon rates (annual interest payments as a percentage of the principal), the methods of sale, callable options, and bond option (serial vs. term). Methods of sale refer to the methods used to sell bonds to underwriters. These include competitive bidding, where several underwriters compete to purchase the bond issue, and negotiated underwriting, which involves selecting a single underwriter to collaborate with. These methods of sale will be discussed in detail later. Callable options are employed to reduce default risks and interest payments by allowing early bond repayment, which is particularly advantageous when market interest rates are low. A serial bond is a bond issue that is structured so that only a portion of the outstanding bond issue (face value) matures at a certain time until all portions of the bond have matured. A serial bond structure helps reduce a borrower's default risk by enabling the repayment of principal amounts in portions at regular intervals before full maturity, thereby decreasing the total outstanding bond amount over time.

Second, financial advisors assist nonprofits in choosing other financial entities to collaborate with during the bond issuance preparation, such as bond counsels, credit rating agencies (CRAs). For instance, as seen in (2) in Figure 2.2.1, financial advisors help nonprofits to hire bond counsels, which are attorneys that ensure bonds are valid, and the bond issuance process complies with federal and state law and regulations (Ely & Calabrese, 2017b; Joffe, 2015).

In addition, nonprofit borrowers and financial advisors also work with nonprofits to determine the necessity of purchasing bond ratings and credit enhancements to reduce interest costs and aid in selecting appropriate CRAs and credit enhancement agencies (Booth & Smith, 1986; Ely & Calabrese, 2017; Vijayakumar & Daniels, 2006). As seen in (3) in Figure 2.2.1,

nonprofits purchased bond credit ratings because they mitigate information asymmetry between investors and bond issuers by certifying and signaling the nonprofit's credit quality to potential investors, thus securing more favorable interest rates (Ely et al., 2013; Gaver et al., 2016; Robbins & Simonsen, 2013). Investors trust bond credit ratings because bond credit ratings are certified by independent third-party CRAs, which analyze the borrowers' underlying financial health and their effectiveness of managing performance, and then indicate the default risk for investors (Gaver et al., 2016; Park et al., 2020; Serna, 2013).

Why does information asymmetry exist between bond borrowers, including nonprofits, and investors, and how can this asymmetry be addressed? Bond investors are external to the borrowing organization and have less insight into the organization's default risks compared to the insiders. Moreover, investors typically do not possess the resources or time to gather detailed financial information to analyze a borrower's ability to repay debt. In addition, unlike municipal governments, which rely on stable tax revenues and the government's full faith and credit to guarantee for debt repayment, nonprofits depend on more volatile sources of income like donations, government grants and program revenues, which are susceptible to financial crises and budget cuts (Bowman, 2011; Chang & Tuckman, 1994; Peng & Brucato, 2004). This uncertainty about nonprofits' revenue stability to service debt during financial downturns exacerbates the information asymmetry for investors (Guzman & Moldogaziev, 2012; Yan et al., 2009; Vijayakumar & Daniels, 2006). To reduce this asymmetry, nonprofits can hire CRAs to serve as third-party intermediaries to assess nonprofits' creditworthiness and then provide a trustworthy signal of their credit quality to investors (Peng & Brucato, 2004; Smith, 2010).

Besides acquiring bond ratings, nonprofits can also opt for credit enhancements, as seen in (4) in Figure 2.2.1, to lower interest costs by mitigating potential losses for investors in case of

default. Generally, investors demand higher interest rates—or risk premiums—from borrowers perceived to have high default risks and unpredictable revenue streams as compensation for the increased risk (Denison, 2003; Nanda & Singh, 2004; Robbins et al., 2012). Common methods of credit enhancement include securing letters of credit from banks, and purchasing bond insurance (Joffe, 2015; Robbins & Simonsen, 2013). When bond insurers provide insurance and banks provide letters of credit, this offers the assurance of bond repayments in the event of a nonprofit default, thereby minimizing the perceived risk for investors. Additionally, some state governments may even offer guarantees on bond payments for charter schools, safeguarding against default (Griffin et al., 2020).

Third, after determining the bond's attributes, acquiring bond ratings, and securing credit enhancements, nonprofits and their financial advisors must select a conduit issuer, as seen in (5) in Figure 2.2.1, to issue bonds on behalf of the nonprofits. Unlike state and municipal governments, nonprofit organizations are not able to issue tax-exempt bonds by themselves. Consequently, they depend on conduit issuers, which are public agencies authorized to issue tax-exempt bonds for nonprofits (Ely & Calabrese, 2017; Yetman, 2007). These issuers include both general-purpose governments, such as states, cities, or counties, and special-purpose authorities that issue bonds to support specific public activities (Calabrese & Ely, 2016b). An example is the California Statewide Communities Development Authority, a conduit authority that issues bonds for 501(c)(3) nonprofits for financing land, buildings, and equipment.

Fourth, following the bond issuance, nonprofits and their financial advisors need to choose and collaborate with underwriters to market their bonds and attract investors. Financial advisors also negotiate the financial terms of bond sales with underwriters, who are usually investment banks, on behalf of the nonprofits (Booth & Smith, 1986; Vijayakumar & Daniels,

2006). These underwriters purchase the tax-exempt bonds from nonprofits at a price below market value and subsequently sell them to investors, overseeing the process of gathering proceeds for the nonprofits (Joffe, 2015; Yetman, 2007). The commission paid to the underwriter is known as the underwriter's discount, which is the difference between the price at which investment banks buy the tax-exempt bonds from nonprofits and the price at which they sell these bonds to public investors. There are two main sale methods of sale (i.e., debt underwriting): Competitive bidding requires nonprofits and their financial advisors to take on the responsibility of originating and marketing the bonds, fostering competition among underwriters (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Robbins & Simonsen, 2013). In contrast, the negotiated sale method increases the underwriter's fee by granting them monopoly power, leading to an increase in the time and resources they invest in the bond issue (Robbins et al., 2012). Nonprofits typically opt for the negotiated sale due to their lack of financial knowledge for bond issuance preparation and the need for underwriter assistance in bond marketing (Simonsen & Robbins, 1996). Additionally, compared to government entities, nonprofit borrowers often have lower credit ratings, more unpredictable revenue, and higher perceived default risks. Therefore, they cannot attract multiple underwriter bids for their issues and need to choose a single underwriter (Peng & Brucato, 2004).

Last, nonprofit borrowers need to appoint bond trustees, usually banks or financial institutions, to manage the transactions among underwriters, investors, and nonprofits. Once underwriters secure investors for the bonds, they collect the proceeds from the sale, retain a portion as their fees—known as the underwriter's discount—and pass the remaining funds to the bond trustees. Bond trustees will then distribute proceeds from underwriters to nonprofits. Additionally, they are also responsible for continuously collecting and disbursing interest and

principal payments from nonprofits to bond buyers, ensuring timely and accurate transactions (Joffe, 2015; Robbins & Simonsen, 2013).

Finally, in addition to discussing the nonprofit bond issuance process, it is important to consider issuance costs. All the financial agencies mentioned earlier charge fees for their services, contributing to the total bond issuance costs. Previous research reveals that nonprofits incur higher issuance costs than government entities, as outlined in existing research, which identifies two main components of these costs: transaction costs and risk premiums (Denison, 2001; Ely & Calabrese, 2017; Nanda & Singh, 2004; Robbins & Simonsen, 2013). First, nonprofits often exhibit bond attributes that elevate transaction costs due to increased repayment uncertainty and the complexity of assessing credit risk by financial agencies. As a return, financial agencies, such as underwriters, financial advisors, and CRAs, charge high fees to compensate for the time and effort they spend to analyze and ascertain the borrower's default risk, repayment certainty, and feasibility of financing plan (Ely et al., 2013; Robbins & Simonsen, 2013; Vijayakumar & Daniels, 2006). Such attributes include purposes deemed risky, longer years to maturity, and reliance on less stable non-tax revenue sources. For example, nonprofit bonds typically have longer years to maturity than government bonds to reduce default risk. These extended maturities contribute to complex assessments of fluctuating non-tax revenues over long time (Ely et al., 2013; Ely & Calabrese, 2017; Robbins & Simonsen, 2013; Vogt, 2004). Additionally, the nature of the bond's purpose, like projects in the art or housing sectors, often incurs higher issuance costs than those for universities due to the perceived higher risk and less predictable revenue streams, such as museums' admission revenue or rental income (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Peng et al., 2008; Peng & Brucato, 2004).

Secondly, issuance costs must also cover the risk of default and of being unable to find investors that financial agencies assume, including underwriters, bond insurers, and banks. Therefore, these entities charge higher fees (risk premiums) to organizations with greater default risks and more volatile revenue streams as compensation for the increased risk (Robbins et al., 2012; Denison, 2003; Nanda & Singh, 2004). Moreover, certain bond features associated with nonprofits, such as long maturity periods and bonds financed by uncertain non-tax revenues, heighten risk premiums by signaling higher overall credit risk and lower repayment capacity (Denison, 2003; Guzman & Moldogaziev, 2012; Nanda & Singh, 2004).

### **2.2.2 Who are Nonprofit Bond Borrowers?**

Previous research often groups different kinds of nonprofit long-term financial debt, such as mortgages and bonds, when examining the characteristics of long-term debt issuers within the sector. Given that tax-exempt bond liabilities represent approximately 88% of the nonprofit sector's annual aggregate long-term debt, the characteristics of long-term debt borrowers are expected to closely align with those of nonprofit bond issuers.

An organization's size significantly influences its debt usage, including bonds. Larger nonprofits face lower risks of insolvency and default, leading to an increased use of debt as they grow (Denison et al., 2014; Jegers & Verschueren, 2006; Smith, 2010; Yan et al., 2009). Scholars argue that larger nonprofits are more capable of absorbing financial risk, sustaining long-term debt and thus have lower default risks (Calabrese, 2011; Denison et al., 2014; Jegers & Verschueren, 2006). Furthermore, as a nonprofit grows, its financial transparency tends to improve, facilitating better access to capital markets (Smith, 2010). Past studies have found a positive correlation between a nonprofit's size (measured through revenue and assets), its

financial leverage ratio, and the likelihood of using tax-exempt bonds and mortgages (Denison, 2009; Gentry, 2002; McCue & Ozcan, 1992; Turner et al., 2015; Yan et al., 2009).

Liability is a key indicator of an organization's ability to acquire new debt and ensure timely, full debt repayments. Some researchers, like Grizzle (2010) and Krueger and Walker (2008), suggest that an increase in existing debt reduces an organization's capacity to repay new obligations, including bonds. Conversely, Bayoumi et al. (1995), Guo & Zhao (2011), and Poterba & Rueben (1997) propose that an organization's current debt level has an inverse U-shaped relationship with its future debt capacity. Initially, to reduce information asymmetry, investors and CRAs favor borrowers with moderate debt levels and a credit history that demonstrates repayment ability through repeated entries into the bond market, signaling low default risk (Zhao & Guo, 2011). Yet, when debt surpasses a certain threshold, concerns arise about its impact on the organization's capacity to service additional debt on new bonds. Evidence supporting both viewpoints exist in the literature (Greer, 2016; Guo & Zhao, 2011; Jimenez, 2011; Park et al., 2020). The debt burden ratio is a measure used by CRAs and scholars to determine if nonprofits can use their revenue to sufficiently cover debt service payments (Greer, 2016; Keith, 2013; Moody's Investor Services, 2016, 2018, 2021; S&P Global Ratings, 2021; Su & Hildreth, 2018). Public finance studies reveal a negative relationship between debt burden and the probability of securing a high government bond rating, which shows that CRAs consider debt burden as a measure of a borrower's default risk (Capeci, 1991; Denison et al., 2007; Greer, 2016; Jimenez, 2011; Zhao & Guo, 2011)

Profitability, operating margin, and liquidity are key metrics reflecting nonprofits' accumulation of retained earnings, financial surplus, and cash reserves (Guo & Zhao, 2011; Park et al., 2020; Smith, 2010, 2012). Scholars suggest that profitability, operating margin, and

liquidity influence nonprofits' leverage by either using accumulated earnings to finance capital projects, or by accumulating financial surplus and liquid assets for debt repayment (Bowman, 2002; Calabrese, 2011a; Smith, 2010, 2012; Szymańska et al., 2015). Additionally, the operating margin, indicative of financial vulnerability, signals an organization's ability to withstand financial shocks (Greenlee and Trussel 2000). Given that the average maturity of nonprofit bonds is 25 years, nonprofits issuing bonds must maintain a robust operating margin to ensure debt service payments during financial shocks. Consequently, I anticipate that nonprofit bond borrowers will exhibit high liquidity, operating margins, and profitability to adequately support their bond repayment.

Income sources significantly influence a nonprofit's likelihood of issuing bonds. Nonprofits dependent on government grants and donations tend to avoid bond issuance, while those with program revenue are more inclined towards it (Calabrese & Ely, 2016; Denison, 2009). This is because donors and governments prefer funding current services rather than repaying past debts, which suggests long-term debt may crowd out future donations and government support (Jegers, 2018; Yan et al., 2009; Yetman, 2006; Young, 2007). Conversely, program service revenue, facing less scrutiny from donors and governments and being more predictable, facilitates bond repayments, thereby encouraging the use of bonds (Froelich, 1999; Gronbjerg, 1991; Rosen & Sappington, 2016). Unrelated business income is also thought to encourage tax-exempt borrowing to lower taxable income, though empirical evidence does not consistently back this theory (Calabrese, 2011a; Denison, 2009; Yan et al., 2009).

Diversifying revenue streams may lead to an increased use of long-term debt, including municipal bonds. Some researchers posit that diversification lowers financial volatility and default risk (Carroll & Stater, 2009; Yan et al., 2009), and studies show a positive correlation

between revenue diversification and financial leverage (Yan, Denison & Butler, 2009). However, others argue that a focus on revenue concentration can strengthen a nonprofit's borrowing capacity. This is achieved by cultivating strong relationships with key funders to ensure stable funding, which can then drive revenue growth (Chikoto & Neely, 2014; Foster & Fine, 2007; Gronbjerg, 1992), ultimately improving capacity to pay off debt. Studies from Calabrese (2011) and Calabrese and Ely (2016) confirm this hypothesis and find negative relationships between revenue diversification index and leverage ratios.

Endowments and fixed assets can incentivize nonprofits to utilize long-term financial debt, including municipal bonds. Fixed assets and quasi-endowments (those not permanently restricted) are suggested to act as collateral for debt, thereby reducing associated default risks (Bowman, 2002; Smith, 2010). Even though true endowments cannot directly serve as collateral for debt, the investment income they generate can help free up other assets to be used as collateral (Calabrese, 2011; Calabrese & Ely, 2016). Consequently, nonprofits with substantial endowments and fixed assets are more inclined to incur additional debt. Some empirical studies support this argument, showing positive correlations between the ratios of endowment and fixed assets to total assets, leverage, and the proportion of tax-exempt bonds in total liabilities (Bowman, 2002; Calabrese, 2011; Calabrese & Ely, 2016; Denison, 2009).

Different nonprofit subsectors may vary in their use of financial debt due to their specific service nature, their financial distress costs, and the proportion of fixed assets they hold (Jegers, 2011; Smith, 2012; Young, 2017). For example, Smith (2012) contends that nonprofits focused on foreign aid and poverty relief incur the least financial debt, including bonds and mortgages, due to the high costs associated with financial distress. The risk of disrupting services to vulnerable groups because of stringent debt repayment schedules could potentially result in a

human rights crisis (Smith, 2012). Young (2017) observes that nonprofits that provide services with private benefits, like schools, hospitals, and museums, are more likely to finance capital assets with debt due to stable program revenues. Nonprofits that offer public benefit services, such as environmental or homelessness programs, face challenges in generating sufficient income for debt repayment and often rely on capital campaigns, government, and donor funding (Young, 2007, 2017). Finally, Jegers (2011) highlights that the ratio of fixed assets to total assets varies by sector, which influences access to financial debt as fixed assets can act as collateral.

Researchers are also interested in whether managerial aspects, like professionalism, influence the adoption of financial debt, including municipal bonds. Professionalism is often measured by the compensation-to-total-revenue ratio and the count of paid staff and officers, reflecting the nonprofit's professional level (Calabrese, 2011a; Jegers, 2011; Smith, 2010, 2012; Szymańska et al., 2015). For example, executives and employees with professional training in financial management tend to favor taking on financial debt, since they have the financial knowledge and experience to evaluate and manage the risks and benefits of using debt (Calabrese, 2011a; Calabrese & Ely, 2016; Denison, 2009; Jegers & Verschueren, 2006; Smith, 2010; Yan et al., 2009). Yet, there's a possibility that entrenched professional executives might opt for less debt to mitigate the impact of risky decisions on their reputations (Berger et al., 1997; Jegers, 2011; Jegers & Verschueren, 2006; Wedig et al., 1996; Yan et al., 2009). The evidence on how agency costs affect leverage is mixed. Some findings indicate a positive correlation between both the compensation ratio and the number of paid employees with the likelihood of using financial debt and overall leverage, while others suggest a negative relationship between compensation and financial leverage (Calabrese, 2011a; Calabrese & Ely, 2016; Jegers, 2011; Jegers & Verschueren, 2006; Smith, 2010; Yan et al., 2009). Additionally,

some studies report no significant link between compensation levels and financial debt issuance or leverage (Calabrese, 2011a; Yan et al., 2009).

In summary, existing research has mainly explored the financial, managerial, and sectoral factors that affect nonprofits' use of financial debt, often overlooking distinctions within financial debt types, such as mortgages and tax-exempt bonds. Though both are utilized for capital projects, their associated costs and risks vary, potentially appealing to nonprofits with differing profiles. For example, tax-exempt bonds typically have higher issuance costs but lower average interest rates than bank loans, because issuing bonds involve fixed costs do not present with mortgages, including fees to conduit issuers and financial advisors (Ely & Calabrese, 2017; Joffe, 2015; Robbins & Simonsen, 2012, 2013). The necessity for a large bond par value to achieve economies of scale and offset issuance costs implies that nonprofits without significant reserves or endowments may find bonds less attractive due to higher default risks.

In addition, tax-exempt bonds have other distinct advantages over bank loans, such as no requirement for down payments or collateral and streamlined reporting requirements. These features make bonds a preferable financing option for nonprofits, particularly for those with insufficient equity for down payments, a deficiency in tangible assets for collateral, an aversion to risking their assets, or a need to borrow capital on a recurring basis.

Previous studies also have not explored how the financial characteristics of bondholders differ across nonprofit subsectors, where the nature of a nonprofit's services could influence its financial stability and long-term capacity to handle financial uncertainty. Hence, this paper seeks to explore trends in the use of bonds by nonprofits over recent years, analyze the characteristics of nonprofit bond borrowers both overall and within specific subsectors, and assess how differences in issuance costs and bond attributes correspond to general and sector-specific

perceptions of nonprofit credit risk. In the following section, I will outline the data and the descriptive analysis method I employ to investigate the financial characteristics of nonprofit bond borrowers and the attributes of their bonds.

### **2.3 Data and Method**

To examine nonprofit bond usage in the US, I compiled a comprehensive dataset linking the financial characteristics of nonprofit borrowers to the attributes of tax-exempt bonds from 2009 to 2016. This dataset was constructed from the e-filed Form 990 database, Form 990 Schedule K, Securities Data Company (SDC) Platinum, and the Bloomberg terminal. Form 990, mandated by the IRS for tax-exempt organizations with annual gross receipts over \$200,000, includes Schedule K as a supplementary form for nonprofits with outstanding bond liabilities to report tax-exempt bond issues.

I extract data from 86,000 Schedule K forms filed during this period using Amazon Web Services. The SDC Platinum and Bloomberg provide detailed municipal bond data, including principal amounts, bond credit ratings, and sales methods. Table 2.1 outlines the sample selection and data cleaning methodology. The initial dataset contained 28,719 bonds listed in Schedule K forms. Since the dataset includes all bonds outstanding during this period, many were issued before 2009. I remove these earlier bonds since financial information from e-filed 990 and Schedule K forms is only available from 2009. Bonds with missing or incorrect CUSIPs (bond identification numbers) are also excluded. For serial bonds, which are issued with multiple CUSIPs but mature at different times, I retain only one CUSIP per bond. The dataset includes 28 pooled bonds from 50 nonprofits, representing 3.3% of all issues. I include all borrowers associated with each pooled bond in the sample. The final dataset encompasses 879 observations across 836 unique bonds issued by 524 nonprofits from 2009 to 2016. The classification system

of nonprofit subsectors I used in this data set is primarily based on National Taxonomy of Exempt Entities (NTEE) Codes and the research of other scholars (Calabrese & Ely, 2016; Gaver et al., 2016; Denison, 2009), but I have separately categorized charter schools and non-charter private nonprofit K-12 schools to reflect the increasing attention on charter school finance (Clark-Herrera et al., 2019; Ely, 2019).

-----

Insert Table 2.1 about here

-----

In the findings section below, I will employ descriptive statistics, such as means and counts, to first illustrate the changes in nonprofit bond usage by year and subsector from 2009 to 2016. Figure 2.2 depicts the distribution of bonds issued by each subsector as a proportion of total nonprofit bonds, while Figure 2.3 will show the evolution in the total number of bonds and their aggregated principal amounts from 2009 to 2016. Tables 2 and 3 will highlight the percentage changes in the number and total principal amounts of bonds across various subsectors over the same period.

And then I will compare the average bond attributes, such as coupon rates, underwriters' discounts, and bond ratings, as well as the average financial characteristics, like total assets and the ratio of program revenue to total revenue. This comparison will be conducted across various nonprofit subsectors and between organizations that have issued bonds and those that have not. Moreover, I will also conduct F-tests for overall significance to ascertain if the differences in mean values of bond attributes and borrower characteristics are statistically significant across nonprofit subsectors and between bond borrowers and non-borrowers. The average bond attributes are presented in Table 2.4 and the average financial characteristics of nonprofit bond

borrowers are reported in Tables 2.5 and 2.6. The analysis of bond attributes will include details on the principal amount, interest and issuance costs, bond structure, credit history, bond ratings, and bond rating agencies. The financial characteristics will cover aspects such as organizational size, liabilities, financial surplus, revenue structure, endowments, fixed assets, and the degree of professionalism. Finally, before calculating mean values, all data on continuous variables of bond attributes and financial characteristics of nonprofit borrowers are minorized at 1 percent and 99 percent to minimize the impact of extreme outliers.

## **2.4 Findings**

### **2.4.1 The trend of nonprofit bond usage by Subsector and Year**

From 2009 to 2016, nonprofits issued a total of 836 municipal bonds, with an aggregated value of \$60.1 billion in 2016 dollars adjusted for inflation. The primary purpose of these bonds is to finance and refinance construction, renovation, and equipment costs for capital projects. Based on Figure 2.2, 66% of these bonds (N=554) are issued by universities (32%) and their affiliated foundations, along with nonprofit hospitals (34%), reflecting the trend that these entities are the largest issuers of bonds, a finding supported by previous research (Calabrese & Ely, 2016; Gentry, 2002; Rosen & Sappington, 2016; Wedig et al., 1996). The remaining 35% of bonds (N=289) are issued by various other nonprofit sub-sectors, including charter schools (10%), non-charter private nonprofit K-12 schools (3%), housing nonprofits (13%), health nonprofits (2%), human service nonprofits (3%), and other nonprofits (4%). Housing nonprofits encompass both affordable and senior housing organizations, with senior housing entities such as retirement communities and assisted living facilities making up 86% of this category. Health nonprofit bond issuers mainly consist of community clinics and mental health facilities. Human service bond issuers include organizations focused on family and youth services and centers for

the developmentally disabled. Other nonprofit categories cover a range of subsectors, such as arts and culture and community improvement organizations. Figure 2.3 shows the evolution in the total number of nonprofit bonds, which rose from 87 in 2009 to 160 in 2016. Figure 2.3 also shows the aggregated total principal amounts of these bonds grew from \$5.1 billion to \$14.9 billion, adjusted to 2016 dollars.

-----  
Insert Figure 2.2 and Figure 2.3 about here  
-----

Table 2.2 presents the total number of bonds issued by each subsector, their respective shares of the total bonds in 2009 and 2016, and the percentage change in the number of bonds issued by each subsector between 2009 and 2016. While hospitals and universities historically issued the majority of bonds, the proportion of bonds they have issued decreased slightly from 2010 to 2016, from 33% and 36% to 31% each, respectively. Meanwhile, the share of bonds issued by charter schools, housing nonprofits, and other nonprofit sectors increased from 3%, 10%, and 3% in 2009 to 13%, 15%, and 4% in 2016, respectively. The percentage changes in number of bonds issued by these groups are 600%, 167%, and 100%, respectively, far surpassing the growth rates observed for hospitals (72%) and universities (58%).

-----  
Insert Table 2.2 about here  
-----

Table 2.3 shows the aggregated principal amounts of nonprofit bonds by each subsector, their respective shares of the aggregated principal amount of all nonprofit bonds, and the percentage change in the aggregated principal amount of bonds each subsector issued from

2009 to 2016. It reveals that the share of hospital bonds' principal amount to the total principal amount of nonprofit bonds decreased from 53% in 2010 to 47% in 2016, while the share of university bonds' principal amount slightly increased from 32% to 38%. These trends are consistent with observations made by Calabrese & Ely (2016), who report a decline in the proportion of outstanding bond liabilities for hospitals and a marginal rise in bond liabilities for universities between 1993 and 2010. The decline in the share of hospital bonds' principal amount relative to the total principal amount of nonprofit bonds might be attributed to the Taxpayer Relief Act of 1997 (Ely & Calabrese, 2016). This Act eliminated the \$150 million cap on tax-exempt bonds for all nonprofits, leading nonprofits from other subsectors to issue more bonds with higher principal amounts. This shift contributed to a relative decrease in the proportion of the aggregated principal amount represented by nonprofit hospital bonds.

Furthermore, the share of bonds from charter schools, non-charter private nonprofit K-12 schools, and housing in the total principal amount of nonprofit bonds rose from 2%, 0%, and 2% in 2009 to 4%, 1%, and 7% in 2016, respectively. During this period, the number of bonds issued by charter schools, non-charter private nonprofit K-12 schools, and housing nonprofits also increased, with growth rates of 510%, 1565%, and 699%, respectively, exceeding those of hospitals (157%) and universities (248%).

-----  
Insert Table 2.3 about here  
-----

In summary, my analysis of the trend of nonprofit bond usage suggests that charter schools, non-charter private nonprofit K-12 schools, and housing nonprofits issue a significant portion of bonds in terms of both total principal amounts and total bond issues. However, studies

focused on these subsectors are lacking. Recent studies have explored nonprofit sub-sectors' overall debt usage (Charles et al., 2021; Sonola, 2018; Woronkowitz et al., 2012; Woronkowitz, 2016), however, they focused on other subsectors, such as arts nonprofits and nonprofit utility services. Future research should delve into the factors that encourage charter schools, non-charter private nonprofit K-12 schools, and housing nonprofits to issue bonds, and identify obstacles that prevent other nonprofits from accessing the bond market.

**2.4.2 The Attributes of Nonprofit Bonds**

In this section, I categorize bond attributes, such as principal amount, bond ratings, and coupon rates (annual interest payments as percentage of the principal of the bond), into subgroups based on their common themes. These subgroups include the principal and years to maturity, interest and issuance costs, bond structure, credit enhancements, credit history, and bond credit ratings. Table 2.4 reports the average values of bond attributes within each subgroup for all bond issuances and across nonprofit subsectors. I also perform F-tests for overall significance to assess whether the differences in mean values of bond attributes across nonprofit subsectors are jointly statistically significant, with results reported in Table 2.4. Except for the binary variable indicating bond insurance usage, the disparities in average bond attributes across subsectors are statistically significant.

-----  
Insert Table 2.4 about here  
-----

**2.4.2.1 Principal of the Bond & Years to Maturity**

As shown in Table 2.4, the average principal amount, equivalent to the face value of a bond, for all nonprofit bonds are \$72 million. However, there is significant variation in average

principal amounts across different sectors. Hospitals and universities issue bonds with the highest average principal amount, at \$113 million and \$68 million respectively. In contrast, housing nonprofits, charter schools, and non-charter private nonprofit K-12 schools issue bonds with the lowest principal amounts, averaging \$34 million, \$29 million, and \$18 million. The larger average principal amount of university and hospital bonds compared to housing nonprofits, charter schools, and non-charter private nonprofit K-12 schools may reflect their greater need for capital to finance facilities.

In Table 2.4, average years to maturity across subsectors are also presented. The findings show that human service nonprofits and non-charter private nonprofit K-12 schools issue bonds with the shortest maturities (20 and 21 years, respectively), while charter schools and housing-related nonprofits choose the longest (27 years). This longer maturity for charter schools and housing nonprofits is likely a strategy to lower their default risk due to their uncertain financial stability (Grossman et al., 1993; Ragland, 2017). The shorter maturity for human service nonprofits could be due to their reliance on stable and predictable government grants, leading to higher debt payment certainty (Gronbjerg, 1991; Smith, 2010, 2012). In contrast, non-charter private nonprofit K-12 schools, unlike charter schools, do not rely on frequently assessed and then fluctuating government funds that depend on enrollment and students' performance. Their stable tuition revenue, akin to universities, reduces default risks, diminishing the need for longer maturity periods to ensure debt repayment.

#### **2.4.2.2 Interest and Issuance Costs**

Coupon rates are annual bond interest payments as a percentage of the principal of the bond. As shown in Table 2.4, universities and hospitals have much lower coupon rates (both at around 4.5%) of bonds than charter schools (5.11%) and housing nonprofits (4.96 %). The results

show that universities and hospitals, on average, pay lower interest rates relative to the principal amount of their bonds compared to charter schools and housing nonprofits. Charter school bonds and housing bonds, predominantly issued by senior housing nonprofits, have the lowest coupon rates among all nonprofit bond borrowers. The reason could be that both universities and hospitals are frequent borrowers in the bond market (Ely & Calabrese, 2017). Through entering the bond markets repeatedly, they implicitly signal their credit quality and low default risk to investors (Peng & Brucato, 2004; Yetman, 2010). Investors are willing to accept low interest rates of bonds from universities and hospitals, since they believe both will make debt payments on time and in full (Calabrese & Ely, 2016; Yetman, 2007). Because of the relatively low coupon rate, universities and hospitals may be more likely to issue bonds with larger principal amounts than charter schools and housing nonprofits to cover capital expenditure. This argument appears to be supported by my finding that universities and hospitals did typically issue bonds with larger principals compared to charter schools and housing nonprofits. Nonetheless, additional research is required to explore the relationship between bond coupon rates and the principal amounts of nonprofit bonds.

In addition, charter schools have the highest average coupon rates among all non-profit subsectors. This may be attributed to their government contract payments, which are contingent on the annual number of student enrollment and are subject to periodic oversight regarding students' performance and renewal, typically every three to five years (Clark-Herrera et al., 2019; National School Boards Association, 2021). Investors likely perceive charter schools' revenue streams as less certain and consequently demand higher coupon rates to mitigate the increased uncertainty of repayment they face. This perception stems from the fact that charter schools' revenues are contingent on regular government renewal and oversight, unlike the more

stable revenue streams of universities from tuition or hospitals from medical services, which are not frequently subjected to government scrutiny.

Moreover, as most charter schools are relatively new, operating for less than ten years, they face challenges in demonstrating a consistent history of government contract renewals to investors (Clark-Herrera et al., 2019; Stitzer, 2012). Furthermore, charter school closures are prevalent, particularly among those operational for less than 10 years, significantly elevating default risks for bond investors (Burriss & Pflieger, 2020; Green, 2022; Stein, 2019). Charter schools are nonprofits which cannot be forced into involuntary bankruptcy, leaving investors unable to claim assets for debt repayment upon closure (Bowman, 2002; Calabrese, 2011). Burriss and Pflieger (2020) found that 18% of charter school groups established between 1998 and 2014 closed within three years, and 40% shut down by the ten-year mark. The predominant reasons for these closures include declining student enrollment, poor academic performance, financial constraints, and mismanagement (Green, 2022; Stein, 2019). In summary, investors view charter schools as high-risk due to their less certain revenue streams, which are frequently subjected to government oversight and uncertainty of renewal, combined with their short operational history and significant closure rates (Ely, 2019; Burriss & Pflieger, 2020). This perceived risk leads investors to demand higher coupon rates as a risk premium, reflecting their challenges in assessing charter schools' debt repayment capacity (Peng & Brucato, 2004; Robins & Simonsen, 2013,2014).

As shown in Table 2.4, housing-related nonprofits, of which 86% are senior housing organizations, have the second highest average coupon rate. This can be also due to the uncertainty associated with admission fees and monthly fees from senior housing facilities, which is used to back up the bond payments. Research on senior housing finance is scarce, but

one study focusing on the perceived returns and risks of senior living facilities suggests that investments in senior housing are considered riskier than traditional real estate due to the greater variability in revenue. This variability in revenue results from facilities being limited to elderly tenants and dependent on the number of residents and the types of assistance services being offered to residents (Worzala et al., 2009). Additionally, investors' unfamiliarity with senior housing facilities and their financial returns, compared to traditional real estate, adds to the perceived risk (Worzala et al., 2009). In addition, a substantial portion of senior housing facilities' revenues comes from Medicaid programs, which are also utilized for bond repayment. However, state governments, the principal contributors to Medicaid payments, are not obligated to finance long-term services based on costs and have significant discretion in setting payments for long-term care providers (Brumberg, 2023; Rowland, 2023). This discretion can negatively impact the revenue streams of senior housing facilities, particularly during periods of government budget reductions. As a result, investors require higher coupon rates from these facilities to offset the uncertainty associated with debt repayment. Based on previous research, senior housing bonds are deemed among the riskiest, with the highest default rates reaching \$1.6 billion in 2021, partly due to challenges in attracting and protecting residents during pandemic lockdowns and high operating costs related to labor and maintenance (Andrew, 2022; Mullaney, 2021). Further research is essential to understand the factors contributing to the high financial risks associated with senior housing bonds.

The final intriguing finding regarding coupon rates shows that non-charter private nonprofit K-12 schools, health nonprofits, and human service organizations have the three lowest coupon rates (4.35%, 4.19%, and 4.08%, respectively). This suggests that, despite being infrequent bond issuers similar to charter schools and housing nonprofits, these organizations

likely possess more stable revenue streams, which investors trust to ensure reliable debt repayment even in the face of financial uncertainties. Firstly, unlike senior housing nonprofits that are overly reliant on fluctuating Medicaid payments, social service and health nonprofits—primarily community health centers—benefit from a more diversified revenue stream and more stable government funding. This stability enhances their ability to fulfill multimillion-dollar bond payments spanning 20 to 30 years, even in the face of financial turbulence. Specifically, these organizations have diversified revenue sources, including government grants, earned revenue beyond Medicaid, and donations, which mitigate revenue volatility and ensure reliable debt servicing (Allard & Smith, 2014; Carroll & Stater, 2009). Furthermore, community health centers receive Medicaid payments based on the cost of medical services provided, resulting in higher reimbursements compared to senior housing facilities that offer long-term care (Han et al., 2017; Shin et al., 2014). Lastly, in contrast to charter schools, which have an average operational history of 11 years in my sample and may struggle to demonstrate a consistent track record of government contract renewals for long-term bond payments, non-charter private nonprofit K-12 schools demonstrate a greater capacity. These schools, with an average history of 79 years, are more capable of securing stable tuition revenues for bond repayment over extended periods. This advantage is largely due to their prolonged operational history and well-documented financial records.

Now, I will move to discuss issuance costs, which are also reported in Table 2.4. The underwriter's discount, a type of issuance cost, represents the commission paid to underwriters. It is calculated as the difference between the price at which investment banks purchase tax-exempt bonds from nonprofits and the price at which they sell these bonds to public investors. Due to the limitation of my data set, this is the only type of issuance cost that I will be able to examine in

this essay. However, unlike fees for bond ratings and credit enhancements that nonprofit bond borrowers can avoid by not using them, the underwriter's discount is an important issuance cost that all nonprofit bond borrowers incur to compensate underwriters for marketing their bonds and finding investors. Consequently, the average underwriter's discounts calculated for each nonprofit subsector and across all nonprofit bonds also accurately reflect their respective samples. As shown in Table 2.4, this discount is expressed as a percentage of the bond's principal. Underwriters typically charge higher fees to borrowers with higher default risks, such as nonprofit bonds backed up by less certain revenue streams (e.g., charter schools' government funds) or with low bond credit ratings. This is because selling riskier bonds demands more marketing effort from underwriters and carries a higher risk of either not finding buyers or having to sell the bonds at a loss (Booth & Smith, 1986; Joffe, 2015).

Research indicates that nonprofits face higher underwriter's discounts than governmental borrowers due to their volatile non-tax revenue, such as charter school's government grants and museums' admission revenue, and associated high repayment uncertainty, but it is unclear which nonprofit subsectors contribute most to these higher discounts (Ely & Calabrese, 2017; Ely et al., 2013; Peng & Brucato, 2004; Robbins & Simonsen, 2013).

In Table 2.4, the average underwriters' discount across nonprofit subsectors are shown. I found that, among all nonprofit subsectors, charter schools and housing related nonprofits again face the highest average underwriter's discounts, at 1.38% and 1.26% of the bond's principal amount, respectively. This indicates that underwriters perceive these types of nonprofits as having greater default risks than other nonprofits. This increased risk perception may stem from the greater difficulty in marketing and selling bonds from charter schools and housing projects due to their high payment uncertainties (Raineri et al., 2012; West, 1967). Compared to

universities and hospitals' stable tuition and medical care revenue, charter schools and housing nonprofits rely on riskier and less predictable revenue streams for bond repayment. These include the government grants for charter schools and the fluctuating fee income from housing projects (Peng et al., 2008; Peng & Brucato, 2004). Interestingly, non-charter private nonprofit K-12 schools, despite offering educational services similar to charter schools, face much lower underwriter's discounts, second only to universities and hospitals. This may suggest that the different funding patterns of non-charter private nonprofit K-12 schools and charter schools significantly affect both their interest and issuance costs. Table 2.6 reveals a contrast in revenue sources between charter schools and non-charter private nonprofit K-12 schools: while the former relies on government grants for 62% of its revenue, the latter relies on program revenue for 73% of its revenue. Non-charter private nonprofit K-12 schools, characterized by a long operational history averaging 79 years in my sample, demonstrate superior long term debt repayment capacity through consistent tuition revenue. This historical financial stability of non-charter private nonprofit K-12 schools translates into lower default risks for underwriters compared to charter schools, which have a significantly shorter and less stable operational history, averaging 11 years. Consequently, underwriters offer more favorable terms to non-charter private nonprofit K-12 schools, reflected in lower underwriter discounts. This preference is attributed to the reduced marketing efforts required for the low-risk bonds of non-charter private nonprofit K-12 schools and the lower risk of failing to secure buyers for these bonds compared to those of charter schools (Booth & Smith, 1986; Joffe, 2015; Robbins et al., 2012; Simonsen & Robbins, 1996; West, 1967). Future studies are needed to examine what factors may lead to the variation of underwriters' discount in nonprofit subsectors.

### 2.4.2.3 Bond Structure

Previous studies suggest that bond borrowers' choices in bond structure, such as methods of sale, serial bond structure, and callable options, reflect their self-assessment of credit quality and default risk. Methods of sale describe the methods employed to sell bonds to underwriters and encompass two major methods: competitive bidding and negotiated sale. These two methods have been defined in the literature review section. Callable bonds and serial bonds are bond options designed to lower interest costs and decrease default risks. Callable bonds allow the early repayment of bonds before the maturity date, which is especially beneficial when market interest rates are low. A serial bond allows portions of the total face value to mature incrementally until the entire bond is redeemed. This structure reduces the borrower's default risk by allowing principal repayments in stages before full maturity, thus progressively lowering the total outstanding debt. Findings on refunding bonds are also reported in Table 2.4, which is issued to redeem previous outstanding bonds with callable options. Borrowers may opt to refund bonds when current market rates fall below the interest rates of the outstanding bonds. By issuing new bonds at a lower interest rate, borrowers can retire the previous outstanding bonds and achieve interest savings. Findings on binary variables for the negotiated method of sale, the serial bond, the callable bond, and the refunding bond are reported in Table 2.4. These variables are used to determine the proportion of nonprofit bonds associated with each of these structures across different subsectors.

The percentage of nonprofit bonds associated with the negotiated method of sale, broken down by subsector are presented in Table 2.4. The choice of method of sale is closely associated with the underwriter's discount paid by nonprofit bond borrowers. Under the negotiated sale method, the borrower chooses to work with one underwriter and asks the underwriter's

assistance in originating and marketing the bond issue (Robbins et al., 2012; Simonsen & Robbins, 1996; West, 1967). Therefore, underwriters charge higher underwriter's discount to borrowers due to the lack of competition and the increased time and effort that underwriters spend on preparing and marketing the bond issue. By contrast, another major method of sale, the competitive bidding method reduces underwriters' fees by introducing competition and reducing the workload for underwriters (Guzman & Moldogaziev, 2012; M. Robbins et al., 2012). The competitive bidding method places the burden of originating and marketing bond issues on tax-exempt bond borrowers and their financial advisors, and introduces competition among potential underwriters (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Robbins & Simonsen, 2013).

As shown in Table 2.4, 86.8% of nonprofits choose the negotiated method of sale, with limited variation across different nonprofit sectors. Scholars contend that borrowers that lack financial expertise to prepare bond issuances by themselves are more likely to use negotiated method of sale, since they need assistance from the underwriter to originate and market the bond (Simonsen & Robbins, 1996). Furthermore, not all borrowers can attract multiple borrowers to bid for bond issues. If a bond issuer has low credit quality, volatile revenue streams, and seemingly high default risk, it cannot attract multiple underwriters to bid for the bond issue and must choose one underwriter to work with (Peng & Brucato, 2004). Previous research supports the finding that nonprofits prefer the negotiated sale method for bond issuance (Ely & Calabrese, 2017). This preference stems from the volatility of their revenue sources, such as senior housing nonprofits' fee revenue and charter schools' government grants, which are less predictable than government borrowers' stable tax or project revenues, such as fees for toll roads (Peng & Brucato, 2004; Robbins et al., 2012). Consequently, amid financial uncertainties, nonprofits

struggle to prove their debt repayment capacity to underwriters responsible for buying and reselling their bonds. This difficulty hampers their ability to attract multiple underwriters for competitive bidding. Consequently, nonprofits tend to incur a higher underwriter's discount compared to government borrowers (Peng & Brucato, 2004; Robbins et al., 2012;).

As shown in Table 2.4, the smallest proportion (72.6%) of charter school bonds are issued through negotiated sales, the remaining charter school bonds use private placements and limited offerings. These sale methods are suited for bonds with the highest credit risk and are typically only sold to banks and sophisticated investors capable of handling such risks. Again, the use of private placements and limited offerings may be attributed to charter schools' short operating history and the unpredictability of their government contract funding, which is subject to periodic renewals and is contingent on student enrollment and their academic performance (Clark-Herrera et al., 2019; National School Boards Association, 2021).

As shown in Table 2.4, 87.2% and 83.5% of nonprofit bonds utilize serial bond structures and callable options, with minor variations among subsectors. A serial bond structure helps reduce a borrower's default risk by enabling the repayment of principal amounts in portions at regular intervals before full maturity, thereby decreasing the total outstanding bond amount over time. Research shows that serial bonds can lower both issuance and interest costs due to this reduced risk (Ely & Calabrese, 2017). This structure is particularly suitable for projects with steady income streams, a category into which most nonprofit bond borrowers fall. Callable options are also employed to reduce default risks and interest payments by allowing early bond repayment, particularly advantageous when market interest rates are low. However, bonds with callable options typically carry higher initial coupon rates compared to non-callable bonds,

offsetting investors' potential loss of future interest income (Joffe, 2015; Robbins & Simonsen, 2013).

Refunded bonds represent 55.4% of all bonds, illustrating their widespread use among nonprofits to refinance existing callable bonds and lower interest payments. The variation across subsectors is minimal, with only charter schools (27.4%) and health nonprofits (47.4%) notable for having less than half of their bonds classified as refunding bonds.

#### **2.4.2.4 Credit Enhancements**

In table 2.4, findings on binary variables that indicate the association of nonprofit bonds with three types of credit enhancements are reported: bond insurance, letters of credit, and other guarantors. These findings detail the percentage of nonprofit bonds utilizing each of these credit enhancements across all bonds and within specific nonprofit subsectors. Credit enhancements, a financial tool that can help a bond borrower to elevate bond credit ratings and subsequently lower interest rates through guaranteed payments to investors in case of a borrower defaults, are rarely used by nonprofits (Denison, 2001, 2003). Aside from bond insurance and letters of credit provided by insurance companies and banks to guarantee bond payments, other guarantors include other credit enhancements targeting certain nonprofit bonds. For example, state governments offer credit enhancement programs exclusively for charter schools (Griffin et al., 2020; Temkin et al., 2008).

As shown in Table 2.4, only 1.6% use bond insurance and 5.5% use letters of credit. The proportion of nonprofits using credit enhancements in my dataset is even lower than the figures Ely and Calabrese (2017) report using bond data from California (Bond insurance: 8% of nonprofit bonds vs. 39% of government bonds; Letters of Credit: 22% of nonprofit bonds vs. 2% of government bonds). The relatively low usage of credit enhancements, especially bond

insurances, among nonprofits may stem from banks and insurance companies' reluctance to cover nonprofit bonds. This hesitation is often due to the typically low credit quality of nonprofits, making them a riskier proposition for entities that would need to assume debt payments in case of a borrower's default (Denison, 2003; Nanda & Singh, 2004; Thakor, 1982). Nonprofit bonds, typically funded by less stable nontax revenue, such as government grants for charter schools and rental income from housing projects, present more volatility and uncertainty in creditworthiness compared to tax or project revenue, such as toll road fees, from government revenue bonds (Butler, 2008; Rainer et al., 2012; Peng et al., 2008). Therefore, banks and insurers often charge high-risk premiums to offset the elevated default risk they assume, making commercial credit enhancements less appealing to nonprofits due to the increased costs (Nanda & Singh, 2004; Robbins et al., 2012; West, 1967).

To reduce difficulty for charter schools to obtain credit enhancements, Arizona, Arkansas, Colorado, Idaho, Michigan, Texas, and Utah offer government-initiated credit enhancement programs to assist charter schools to achieve better credit ratings and reduce interest costs (Griffin et al., 2020; Temkin et al., 2008). I contend that this kind of credit enhancement program can expand to other nonprofits that also provide vital public services.

#### 2.4.2.5. Credit History

In line with prior research, hospitals and universities are identified as more frequent bond issuers, with averages of eight and five bonds issued, respectively. In comparison, less frequent issuers include health nonprofits and non-charter private nonprofit K-12 schools with two bonds, followed by housing, human service nonprofits, and other nonprofits with three bonds, and charter schools with four bonds. Surprisingly, charter schools rank as the most frequent bond issuers among nonprofits, excluding universities and hospitals. However, their established credit

history has not effectively signaled their creditworthiness to investors and financial agencies to lower their interest costs (Peng & Brucato, 2004; Yetman, 2010). Again, further research is needed to examine factors affecting the coupon rates of nonprofit bonds.

#### **2.4.2.5 Credit Ratings**

Bond credit ratings serve as a financial instrument enabling nonprofits to obtain favorable interest rates. These ratings are determined by independent third-party credit rating agencies (CRAs) that evaluate the financial health of nonprofits, thereby signaling the credit quality to potential investors (Ely et al., 2013; Gaver et al., 2016; Robbins & Simonsen, 2013). There are three major CRAs (Fitch's, Moody's, and Standard & Poor's) in the U.S. that provide municipal bond ratings. Moody's and Standard & Poor's together provide more than 80% of credit ratings in municipal bond markets (Ely et al., 2013).

As indicated by the binary variable of whether the bond is rated in Table 2.4, 71.3% of nonprofit bonds are rated by at least one CRA, suggesting many nonprofit bond borrowers use these bond ratings to demonstrate their creditworthiness to investors. However, the proportion of rated bonds is significantly lower for non-charter private nonprofit K-12 schools (37.5%), charter schools (50%), housing-related nonprofits (50%), and other nonprofits (53.3%). Research indicates that borrowers are likely to seek ratings only if they expect to achieve an investment-grade rating, defined as BBB and above (Gaver et al., 2016; Hsueh & Liu, 1993). The lower percentage of rated bonds in these subsectors may reflect their recognition that CRAs perceive them as higher risk due to their limited history of bond issuance and uncertain revenue streams, which leads them to withhold this unfavorable information. It is also possible that, compared to universities and hospitals, many charter schools, housing nonprofits, non-charter private nonprofit K-12 schools, and other nonprofits, such as those in the arts and culture sector, are

either infrequent or first-time bond issuers (Calabrese & Ely, 2016). This situation may result in a limited understanding of the role bond ratings play in reducing interest expenses. The prevalence of unrated bonds in these subsectors might contribute to the higher coupon rates, notably in charter schools and housing-related nonprofits, as unrated bonds typically carry higher interest rates. However, non-charter private nonprofit K-12 schools, despite being least likely to obtain ratings, do not have the highest average coupon rates.

As showed in Table 2.4, A (38.1%) and AA (37.7%) as the most frequent ratings for nonprofit bonds, surpassing Gaver, Harris, and Im's (2016) discovery of A (23.6%) and AA (29.2%) among Moody's and S&P's nonprofit bond ratings from 1997 to 2010. Conversely, Gaver, Harris, and Im (2016) observed a higher prevalence of AAA (17.8%) and BBB (21.7%) ratings compared to my findings of only 1.6% for AAA and 19.1% for BBB. These findings might suggest an increase in A and AA ratings, and a decrease in BBB and AAA ratings, for nonprofits after 2010. However, these findings should be interpreted with caution. Unlike the dataset from Gaver, Harris, and Im (2016), which includes only Moody's and S&P ratings, my dataset also incorporates ratings from Fitch's. However, government bond literature also consistently shows that more than half of government bond ratings are AA and AAA, with percentages ranging from 52% (Plumbo & Zaporowski, 2012), to 83% (Ely & Calabrese, 2017), and even as high as 93% and 94% (Chen et al., 2016; John & Kriz., 2015), across various types of bonds, states, and time periods.

This indicates a tendency for CRAs to be more cautious with nonprofits, assigning lower ratings and thus contributing to higher interest rates. Possible reasons include 1) infrequent nonprofit bond issuers, like human service nonprofits and charter schools, often lack credit histories that prove creditworthiness through market transactions (Greer & Denison, 2014; Peng

& Brucato, 2004); 2) nonprofits' reliance on unstable external funding sources like donations and charter schools' government contracts, which may not withstand fiscal shocks for debt repayment (Bowman, 2011; Chang & Tuckman, 1994); and 3) CRAs' unfamiliarity with and difficulty in assessing the stability of some nonprofits' program revenues, such as senior housing nonprofits' fee income, over long periods (Guzman & Moldogaziev, 2012; Robbins et al., 2012). Further research is necessary to understand why nonprofits are more likely to receive lower bond ratings.

Table 2.4 also illustrates disparities in bond ratings within different nonprofit subsectors. Specifically, the largest portion of rated bonds from charter schools (47.7%) and housing nonprofits (30%) received BBB ratings, surpassing all other subsectors in the proportion of BBB bonds. Furthermore, the smallest proportion of rated charter school bonds is associated with A (4.5%) and AA ratings (6.8%). Therefore, the prevalence of BBB ratings and the absence of A and AA among charter schools and housing nonprofits may indicate that rating agencies accurately assess the overall high credit risk of rated bonds in these subsectors, as discussed previously, and then signal the low ratings to reflect their uncertainty regarding these nonprofits' long-term debt repayment capacity.

However, charter schools also have the largest proportion of rated bonds that received AAA ratings (15.9%), significantly surpassing all subsectors. Universities, which have the second-largest proportion of rated bonds associated with AAA ratings, have only 1.4% of AAA bonds. In addition, 45% of rated housing bonds are associated with A ratings, ranking just below health nonprofits and non-charter private nonprofit K-12 schools. However, charter schools (50%) and housing nonprofits (50%) exhibit a lower percentage of rated bonds compared to universities (75%), health nonprofits (70%), and hospitals (87.8%). This suggests charter schools and housing nonprofits might avoid seeking ratings due to doubts about securing an investment-

grade rating (BBB or higher), as suggested by Gaver et al. (2016) and Hsueh & Liu (1993). Therefore, the prevalence of AAA ratings among charter schools or A ratings among housing nonprofits may not fully reflect the overall credit risk in these subsectors.

#### **2.4.2.6 Summary of Findings on Bond Attributes**

Discussion in this subsection reveals that certain nonprofit subsectors face greater challenges in accessing bond markets than others. Notably, housing nonprofits, mainly those focused on senior housing, and charter schools incur the highest coupon rates and underwriter's discounts across the nonprofit sector. These elevated costs reflect the perceived financial uncertainties of their revenue streams. Charter schools depend on volatile government contracts tied to student numbers and periodic evaluations, often also lacking a long operating history (less than ten years in most cases), which complicates their ability to demonstrate consistent government contract funding, essential for securing long-term bond investment (Clark-Herrera et al., 2019; National School Boards Association, 2021; Stitzer, 2012). This uncertainty leads investors and underwriters to perceive higher default risks of nonprofit bonds (Ely, 2019). Similarly, the revenue of senior housing nonprofits is susceptible to changes in demographics, health crises, and service demands, as evidenced by their significant default rates during the COVID-19 pandemic (Andrew, 2022; Mullaney, 2021).

High coupon rates and underwriter's discount suggest difficulties in proving charter schools and housing nonprofits' revenue sustainability, prompting investors and underwriters to apply higher risk premiums (Peng & Brucato, 2004; Robins & Simonsen, 2013, 2014). Investors face the prospect of losing their principal and interest if a default occurs, while underwriters risk being unable to sell the risky bonds (Booth & Smith, 1986; Joffe, 2015). Moreover, borrowers from these subsectors are also the least likely to obtain bond credit ratings than borrowers from

other sectors, fearing unfavorable assessments that could expose their financial vulnerabilities and elevate their borrowing costs (Gaver et al., 2016; Hsueh & Liu, 1993).

In comparison with earlier studies on government bonds, my dataset reveals that nonprofit bonds are significantly less likely to receive top-tier ratings (AA and AAA) or obtain credit enhancements. This trend reflects broader apprehensions about the creditworthiness of nonprofits and their potential risks in the bond market. Specifically, the occurrence of top-tier ratings for nonprofit bonds is two to four times lower, depending on the referenced study (Chen et al., 2016; Denison, 2001, 2003; Ely & Calabrese, 2017; John & Kriz, 2015; Plumbo & Zaporowski, 2012). This disparity highlights growing concerns about the ability of nonprofits to fulfill their debt obligations and the difficulties rating agencies encounter in assessing the long-term financial stability of these entities.

Furthermore, only 7.1% of nonprofit bonds in my sample are linked to credit enhancements, such as bond insurance or letters of credit, in contrast to the 40% usage rate for government bonds reported in other studies (Ely & Calabrese, 2017). This disparity suggests financial institutions' hesitancy to back nonprofit bonds, perceiving them as riskier due to their lower credit quality and heightened likelihood of default (Denison, 2003; Nanda & Singh, 2004; Thakor, 1982).

Finally, there is also a downward trend in the acquisition of credit enhancements and AA and AAA ratings for nonprofit bonds, even when compared to nonprofit bonds issued in earlier periods (Ely & Calabrese, 2017; Gaver et al., 2016). This pattern may signal a growing concern among bond insurers and rating agencies about the high credit risk associated with nonprofit bonds.

In sum, the challenges nonprofits face in securing credit enhancements and high bond ratings likely contribute to their higher interest and issuance costs compared to government bond issuers (Ely & Calabrese, 2017). Since credit enhancements and high bond ratings are indicators of lower default risk, their absence in nonprofit bonds signals higher default risk to investors and bond insurance companies. Consequently, investors and bond insurance companies charge high interest costs and fees for bond insurance to compensate for the increased uncertainty.

### **2.4.3 The Bond Borrowers' Financial Characteristics**

This section examines the financial characteristics of nonprofit bond borrowers and their differences across subsectors. Using scholarly research and criteria from CRAs this study analyzes financial conditions reflecting a nonprofit's size, debt level, repayment capacity, financial surplus, revenue structure, endowment, fixed assets, and professionalism.

These financial characteristics can assess a nonprofit's ability to generate income for debt repayment, its long-term debt default risk, and its level of professionalism.

A descriptive analysis that compares the financial characteristics of nonprofit bond borrowers with those of non-bond borrowers to identify any differences in financial traits between these groups is presented in Table 2.5. It also reports F-tests to determine if the differences in mean financial attributes between the groups are statistically significant.

-----  
Insert Table 2.5 about here  
-----

Similarly, a descriptive analysis of the financial characteristics of nonprofit bond borrowers by subsector to detect any variations across these categories is reported in Table 6. F-

tests are utilized here as well to verify the statistical significance of differences in average financial attributes across the subsectors.

-----  
Insert Table 2.6 about here  
-----

**2.4.3.1. Size**

Total assets and total revenue are measures used by scholars and CRAs to assess a nonprofit's size. Larger nonprofits are more capable of absorbing financial risk, sustaining long-term debt, and therefore have lower default risks (Calabrese, 2011; Denison et al., 2014; Jegers & Verschueren, 2006). As shown in Table 2.5, nonprofit bond borrowers on average have over \$216 million in assets and \$113 million in revenue, significantly larger than other nonprofits in the e-file 990 form database, which typically have \$7 million in assets and \$4 million in revenue. These nonprofits in the e-file 990 database are already mid to large-sized, with gross receipts over \$200,000 or assets exceeding \$500,000. There is also sectoral variation in the size of nonprofit bond borrowers. For example, the average charter school bond borrower has \$88 million in assets and \$39 million in revenue, which is just 30% and 23% of the average assets and revenue of hospital borrowers, respectively. Human service nonprofits, charter schools, and health nonprofits are generally moderate in revenue and assets, whereas universities and hospitals exhibit the largest assets and revenue.

**2.4.3.2 Debt Level & Repayment Capacity**

Liability is a key indicator of an organization's ability to acquire new debt and ensure timely, full debt repayments. As seen in Table 2.5, nonprofit bond borrowers typically have liabilities exceeding their assets. On average, these borrowers possess liabilities of 667 million

dollars, significantly surpassing their average asset value of 216 million dollars. Notably, outstanding bond liabilities constitute about half of the total liabilities for these borrowers. However, based on Table 6, this trend of higher liabilities than assets are predominantly driven by universities, their affiliated foundations, and hospitals. For example, hospitals, on average, hold 1.3 billion dollars in liabilities against 292 million dollars in assets. In addition, universities have average liabilities of 580 million dollars against 251 million dollars in assets. However, other nonprofit subsectors, such as non-charter private nonprofit K-12 schools, human service nonprofits, housing nonprofits, and art and other nonprofits, generally maintain a positive fund balance (i.e., the difference between assets and liabilities), while charter schools and health nonprofits only exhibit a much smaller negative fund balance.

Despite higher liabilities than assets, hospitals and universities continue to access capital markets, often have lower coupon rates from investors compared to housing nonprofits and charter schools that have the highest coupon rates. The reason could be that, instead of maintaining positive fund balance, hospitals and universities, as frequent bond issuers, can self-certify their capacity and commitment to timely debt repayment by entering the market repeatedly (Bayoumi et al., 1995; Greer & Denison, 2014; Guo & Zhao, 2011). This practice lowers the perceived default risk for investors, resulting in reduced coupon rates. Investors understand that frequent bond issuers who default will be punished when they go to the market next time (Capeci, 1991; Jimenez, 2011; Peng & Brucato, 2004; Poterba & Rueben, 1997).

The debt burden ratio, a measure used by CRAs and scholars to determine if nonprofits can sufficiently cover debt payments, is defined as the ratio of annual debt service to total operating revenue (Greer, 2016; Keith, 2013; Su & Hildreth, 2018; Zhao & Guo, 2011). This annual debt service is estimated by the difference between the liabilities of the prior and current

years. Across all nonprofits in my sample, both non-bond borrowers and those bond borrowers in various subsectors have a negative average debt burden ratio, indicating an increase in liabilities rather than a decrease in existing debt. However, as shown in Table 2.5, on average, bond borrowers have a significantly higher debt burden ratio (37.7%) compared to non-bond borrowers (1.8%). As shown in Table 6, the share of annual added liability in operating revenue significantly differs across nonprofit subsectors, ranging from 11.3% in human service nonprofits to a striking 119.1% in charter schools, with other sectors like health nonprofits at 12.3%, universities at 14.1%, hospitals at 23.7%, art and other nonprofits at 54.3%, and housing nonprofits at 78.4%. With charter schools and housing nonprofits showing annual added liabilities close to or exceeding their total operating revenues, these entities may face higher default risks compared to other borrowers. This seemingly explains why many charter schools and housing nonprofits are reluctant to obtain bond ratings, as it would reveal their high default risk to CRAs.

#### **2.4.3.3 Financial Surplus and Cash Flows**

Operating margin is an indicator of an organization's ability to accumulate financial surplus, which is essential for debt repayment (Guo & Zhao, 2011, Park et al., 2020). As shown in Table 2.5, the average operating margin of nonprofit bond borrowers, measured as net operating income to operating revenue, is 0.047, notably higher than -609.29 for nonprofits that have never issued bonds. This may suggest that the requirement for debt service payments prompts bond borrowers to amass more financial surplus than non-issuers. Similarly, bond borrowers exhibit a positive profitability of 0.001, in contrast to the -0.01 profitability of non-issuing nonprofits.

However, the F-statistic indicates no statistically significant difference in the means of profitability between nonprofit bond borrowers and nonprofits that have never borrowed through bonds. The finding is unexpected, given that profitability is a financial indicator that scholars frequently use in the literature to predict nonprofits' use of financial debt to finance assets (Bowman, 2002; Calabrese, 2011; Smith, 2010; Szymańska et al., 2015). Given that operating margin is an indicator that CRAs consider when assessing borrowers' creditworthiness, the relatively modest average operating margin might lead to CRAs questioning nonprofits' capacity for timely, full bond repayment, potentially resulting in lower credit ratings than government borrowers (Ely & Calabrese, 2017). Further research is required to understand why nonprofit borrowers receive lower bond ratings compared to government borrowers. While average profitability and operating margin vary across nonprofit subfields, an F-test shows no statistically significant differences in these metrics across different nonprofit sub-sectors.

Days cash on hand, a liquidity measure used by scholars to determine the number of days a nonprofit can cover its operating expenses with its current cash and cash equivalents (Prentice, 2016), is also a critical indicator for CRAs assessing nonprofits' capacity to accumulate liquid assets for debt payments. As seen in Table 2.5, bond-issuing nonprofits average lower days cash on hand (624 days) compared to those that have never issued bonds (1395 days), aligning with existing literature. However, this lower liquidity in bond-issuing nonprofits may stem from using their cash flows for debt service (Bowman, 2002; Jegers, 2018; Jensen, 1986; Myers, 2001). Additionally, Table 2.6 shows the average liquidities also vary across subfields: housing and other nonprofits, including art nonprofits, have the highest averages (1248 days and 1649 days, respectively), while human service and health nonprofits

show the lowest (251 days and 228 days, respectively). Further research is needed to understand the causes of these variations in cash flow across different nonprofit sectors.

#### **2.4.3.4 Revenue Structure**

In this subsection, the revenue diversification of nonprofit borrowers and their reliance on specific income sources such as donations, government grants, program revenue, and fundraising revenue are discussed.

The extent of revenue diversification is a key indicator of default risk in nonprofit finance, as noted in the literature (Calabrese & Ely, 2016; Yan et al., 2009b). As seen in Table 2.5, nonprofit bond borrowers tend to have more concentrated revenue streams (average 0.29) compared to those that never issue bonds (average 0.387). This may imply that revenue concentration might improve their financial ability for debt repayment and then encourage borrowing (Chiko & Neely, 2014; Frumkin & Keating, 2011). However, the level of revenue diversification varies across subfields, with hospitals, and housing nonprofits at lower levels (0.188 and 0.231, respectively) and universities and non-charter private nonprofit K-12 schools at higher levels (0.397 and 0.441, respectively). Notably, universities and hospitals, both major bond issuers, exhibit different levels of revenue diversification, possibly reflecting their distinct service nature and funding sources (Young, 2017). Universities, for instance, depend on a combination of government grants, donations, and endowment income for research and education, whereas hospitals rely mainly on income from healthcare services. Scholars also argue that several factors, primarily vary at the sectoral level, such as whether the nonprofits provide a public or private benefit, the costs of financial distress, and the proportion of fixed assets relative to total assets, influence nonprofits' decisions to use debt for financing capital projects (Jegers, 2011; Smith, 2012; Young, 2007, 2017). Therefore, further research is needed to

further explore how sector affiliations might indirectly affect nonprofits use of bonds or debt in financing capital projects, potentially through factors like revenue diversification.

As shown in Table 2.5, nonprofit bond borrowers predominantly depend on program revenue (77.8%), with a smaller contribution from donations (6.6%) and government grants (8.8%). In contrast, non-bond-issuing nonprofits see a more varied revenue structure: 32.2% from program revenue, 40.9% from donations, and 14.9% from government grants. This pattern suggests that nonprofits with stable program revenue, facing a need to finance capital projects due to increasing service demand, find bond borrowing a viable capital-raising strategy. This aligns with previous research indicating a positive correlation between reliance on program revenue and debt usage (Bowman, 2002; Denison, 2009; Yan et al., 2009).

Program revenues, being predictable and stable, ensure debt repayment and lower default risk (Froelich, 1999; Gronbjerg, 1991; Rosen & Sappington, 2016). For example, stable revenue sources include tuition and fees in universities and non-charter private nonprofit K-12 schools, and medical service fees in hospitals. Additionally, bond borrowers typically have a lower proportion of government grants in their total revenue (8.8%) compared to non-bond issuers (14.9%). This may be because governments are hesitant to fund nonprofits with existing debt, preferring to allocate funds to current and future services rather than debt repayment (Young, 2017). As shown in Table 6, while variation in reliance on government grants and program revenue among bond-issuing nonprofit subfields is limited, charter schools stand out with the highest average government grant reliance (61.9%) and the lowest program revenue (26.9%). This is largely attributed to their funding structure, which primarily relies on government per-pupil contract payments based on enrollments. Future research should

investigate whether this reliance on volatile government contract payment results in higher issuance costs and coupon rates for charter schools compared to other nonprofit bond borrowers.

Among nonprofit bond borrowers, donations constitute the smallest revenue source, accounting for only 6.6%—significantly less than the 40.9% for nonprofits that have never issued bonds. Even within the category of other nonprofits, such as those focused on art and community improvement, which have the highest average reliance on donations relative to total revenue, the proportion of donations peaks at only 24%. The likely reason is that donations are a volatile revenue source, and do not fare well against fiscal shocks. This results in unstable income streams for repayment and increased default risk (Bacon, 1992; Bowman, 2002; Wedig et al., 1989). Given that municipal bonds typically involve multi-million-dollar principals and average 20-year maturities, investors tend to favor nonprofits with less volatile revenue sources. Consequently, nonprofits heavily reliant on donations might be less inclined to use bonds for capital project financing. However, capital campaigns are a common tool for museums to raise funds to finance capital projects. Some nonprofits utilize capital campaigns to reduce their need for bond market capital, others to establish cash reserves that improve bond ratings and interest rates, and still others to generate funds for repaying bond interest and principal (Denison et al., 2014; Lam et al., 2020). Future research should distinguish between donations for daily operations and those sourced from capital campaigns, to understand their distinct effects on bond utilization and borrowing costs.

Some researchers suggest a substitution effect exists between revenue from fund-raising events and debt, implying nonprofits that generate funds through such events may reduce their use of debt (Calabrese, 2011; Denison, 2009). Denison (2009) found that revenue from special fundraising events is inversely related to the use of tax-exempt bonds. In Table 2.5,

nonprofit bond borrowers show a lower percentage of fundraising revenue to total revenue (3.7%) compared to nonprofits that have never issued bonds (0.1%), which seems to support Denison (2009)'s finding. Notably, non-charter private nonprofit K-12 schools and human service nonprofits, with the highest average fundraising revenue share (0.6%), still fall below the fundraising revenue share of nonprofits that do not issue bonds. Capital campaigns, specialized fundraising events for capital finance, are used by nonprofits either to directly fund capital projects or to cover bond principal and interest payments (Lam et al., 2020; Yetman, 2006; Young, 2017). Again, future studies should explore whether revenue from capital campaigns can either replace bonds or result in higher bond issuance and reduced borrowing costs by improving nonprofits' debt repayment capabilities.

#### **2.4.3.5 Endowments and Fixed Assets**

Endowments and fixed assets are two financial factors that scholars believe influence nonprofit leverage (Bowman, 2002; Calabrese, 2011; Garcia-Rodriguez & Jegers, 2017). However, the F-statistic in Table 2.5 reveals no statistically significant difference in average endowment size between nonprofit bond borrowers and non-issuers, suggesting that endowment size may not be crucial in nonprofit bond financing decisions. However, this finding aligns with research indicating that endowments do not significantly impact debt usage. This is because endowments and their investment income may be earmarked for specific purposes unrelated to debt repayment (Calabrese, 2011a; Calabrese & Ely, 2016; Lam et al., 2020). In addition, nonprofit bond borrowers have a significantly higher percentage of fixed assets to total assets (39%) compared to non-borrowers (14%). This is expected, as many bond borrowers like hospitals, universities, charter schools, and housing-related nonprofits heavily rely on fixed assets such as land and buildings for service delivery. Their need to raise capital to develop and

expand these assets to meet growing service demands and achieve mission goals further explains this trend (Calabrese, 2020, 2011; Searcy, 2011; Woronkiewicz et al., 2012)

#### **2.4.3.6 Professionalism**

The compensation-to-total-revenue ratio and the number of paid employees and officers serve as indicators of a nonprofit's level of professionalism (Calabrese, 2011; Jegers, 2011). In table 2.5, I find a statistically significant large difference in the average number of paid employees across nonprofit bond borrowers (N=4380) and nonprofits that never issue bonds (N=53). Even for nonprofits with smallest number of employees, such as non-charter private nonprofit K-12 schools (N=311) and housing nonprofits (N=504), their size of employees are still much larger than nonprofits that never issue bonds. Similarly, the average compensation ratio for nonprofit bond borrowers (46%) is higher than the average compensation ratio for nonprofits that never issue bonds (36%). The difference is also statistically significant. All these results seem to support the argument that professionalized nonprofits are more likely to use debt (Smith, 2010, 2012; Szymańska et al., 2015).

#### **2.4.3.7 Summary of Findings on Financial Characteristics of Nonprofit Bond Borrowers**

In summary, this sub-section's findings align closely with prior research on nonprofit borrowing. indicating that nonprofit bond issuers typically possess greater assets and revenue, a larger ratio of fixed to total assets, increased liabilities, superior operating margins, and lesser liquidity compared to their non-bond issuing counterparts (Calabrese, 2011a; Denison, 2009; Jegers, 2018; Jensen, 1986). They also show a stronger dependency on program revenues and government grants rather than on donations and employ more professional staff than their counterparts who do not issue bonds (Smith, 2010, 2012; Szymańska et al., 2015).

These observations may suggest that: 1) only sizable nonprofits, as indicated by their revenue, assets, and fixed assets, are likely to undertake extensive capital projects that require substantial financing; 2) only those nonprofits with considerable financial surpluses (reflected in higher operating margins) are inclined to issue bonds; 3) program revenues and government funding, being stable revenue sources, are deemed more reliable to ensure bond repayment, especially against financial volatilities over two to three decades; and 4) effective management of bond issuance may mean that nonprofits need to employ executives and staff with specialized financial management skills.

However, it is questionable whether the moderate operating margin (4.7%) and the number of days of cash on hand (624 days) observed for nonprofit bond borrowers can sufficiently indicate their capacity to withstand financial vulnerability and ensure the repayment of substantial bond debts in the long run. Consequently, the potential perceived limitation in generating cash flow and financial surplus could prompt investors and underwriters to question the nonprofits' bond repayment abilities, potentially resulting in higher issuance and interest costs compared to government borrowers (Ely & Calabrese, 2017). Further research is needed to examine this argument.

Finally, charter schools and housing nonprofits exhibit highly concentrated revenue streams and the highest average debt burden ratios. This high debt burden ratio indicates a reduced capacity for these entities to service new debt. The dependence of charter schools on per-student government funding and of senior housing on fee income may underpin the observed fragility in their debt servicing capability (Grizzle, 2010; Krueger and Walker, 2008).

## 2.5 Conclusion and Discussion

In recent decades, more nonprofits have used tax-exempt bonds to finance their capital projects (Calabrese & Ely, 2016). Based on the e-filed form 990 database, Nonprofits now have \$150 billion in outstanding tax-exempt bond liabilities, which represent 72% of their total long-term financial obligations. Nonprofits utilize funds from tax-exempt bonds to enhance and expand their programs and services, meeting the growing demands of their beneficiaries and thereby enhancing their mission impact (Anderson, 2022; Searing & Lecy, 2022). Despite nonprofits' increasing use of bonds, there is still a significant gap in understanding the landscape of the nonprofit bond market, including the volume of nonprofit bond issues, borrowing costs, typical credit ratings, and sector-specific variations. This lack of comprehensive insight hinders further research into the determinants of issuance costs and interest rates for nonprofits and the impacts of bond financing on nonprofits' financial and programmatic performance.

Using panel data with 879 observations from 836 unique bonds issued by 524 nonprofits between 2009 and 2016, this paper aims to address the knowledge gap concerning nonprofit bond usage. It provides a descriptive analysis of the characteristics of bond issues, the costs of issuance and borrowing for bonds, and the profiles of nonprofit borrowers both overall and within different subsectors.

Echoing findings by Calabrese & Ely (2016), while universities and hospitals still represent 66% of the nonprofit bonds, there has been a significant increase in activities from subsectors traditionally less engaged in bond market, both in terms of the number of issues and the total principal amount. This includes subsectors such as housing, charter schools, non-charter private nonprofit K-12 schools, human service nonprofits, health nonprofits, and other nonprofits (included art and community improvement nonprofits).

This study also identifies some challenges that nonprofits face to access the municipal bond market. For instance, I observe that some nonprofit subsectors experience higher borrowing and issuance costs even compared to other newcomers. Housing bonds, predominantly issued by senior housing nonprofits (86%), along with charter school bonds, represent the largest share of nonprofit bonds outside of universities and hospitals, yet they are also seen as carrying the highest credit risks. Their bonds have the highest averages of coupon rates and underwriters' discounts, longest average years to maturities, and the second and third lowest likelihood of purchasing ratings, only surpassing non-charter private nonprofit K-12 schools. These characteristics signal the perceived high risk of default and payment uncertainty from both investors and the borrowers themselves. As a result, higher coupon rates and underwriters' discounts are demanded by investors and underwriters to compensate for the high default risks and the additional effort required to structure and market these riskier bonds (Daniels et al., 2010; Peng & Brucato, 2004).

In line with existing literature on nonprofit organizations' use of financial debt, my research shows that nonprofits opting for bond borrowing generally have larger assets and revenues, more liabilities, a greater debt load, a higher operating margin, less liquidity, and a stronger dependence on program revenues and government grants over donations (Calabrese, 2011a; Denison, 2009; Jegers, 2018; Jensen, 1986). It is also notable that only universities, their affiliated foundations, and hospitals will have much higher liabilities than assets. For example, hospitals, on average, hold 1.3 billion dollars in liabilities against 292 million dollars in assets. However, I acknowledge that the higher liabilities compared to assets for hospitals and universities might result from their service nature and payment structures. Specifically, hospitals account for uncompensated medical care and universities for scholarships as liabilities. Aside

from hospitals and universities, other nonprofit subsectors generally maintain a positive fund balance (i.e., the difference between assets and liabilities) and a much smaller negative fund balance. Despite the much higher liabilities than assets, hospitals and universities continue to access capital markets and often have lower coupon rates from investors than other nonprofits.

Nonprofit borrowers also tend to allocate a larger portion of their assets to fixed assets, derive a smaller fraction of their income from fundraising, spend more on salaries, and hire more professional staff (Lam et al., 2020; Myers, 2001; Smith, 2010, 2012; Yan et al., 2009). Despite previous findings that suggest profitability encourages borrowing, my study found no statistically significant difference in average profitability between nonprofits that have and have not borrowed through bonds (Bowman, 2002; Calabrese, 2011; Smith, 2010; Szymańska et al., 2015). Similarly, the operating margin, a measure that scholars and CRAs believe can capture an organization's ability to accumulate financial surplus for debt repayment and readiness to absorb financial vulnerability—did not significantly differ across sectors (Guo & Zhao, 2011; Park et al., 2020; Greenlee and Trussel 2000).

Charter schools and housing nonprofits also showed the highest average debt burdens, defined as the share of added liability relative to operating revenue, and highly concentrated revenue streams. This high debt burden suggests a decreased ability to repay new debt (Grizzle, 2010; Krueger and Walker 2008). Given the variability of government payments per student to charter schools and rental income for senior housing, which depend on student enrollment, student performance, or the number and type of senior residents, mainly relying on these revenues may not improve their debt repayment capacity, especially in financial downturns (Chikoto & Neely, 2014).

Contrary to previous studies, I wonder whether certain measures, such as income sources and the revenue diversification index, may not effectively reflect a nonprofit's ability to generate revenue and ensure debt repayment amid financial uncertainties. While some researchers consider program revenue and government grants as stable and predictable, ensuring long-term debt repayment and minimizing default risk (Bowman, 2002; Calabrese, 2011; Froelich, 1999; Gronbjerg, 1991), my descriptive analysis of bond borrowers reveals a different picture. All bond borrowers in all subsectors in my study heavily depend on either program revenue or government grants yet exhibit significant variation in bond terms. For example, except for charter schools and other nonprofits, all infrequent nonprofit borrowers in other subsectors heavily rely on program revenue, with indices ranging from 73% (non-charter private nonprofit K-12 schools) to 88.7% (charter schools). However, among all infrequent bond borrowers that rely on program revenue, housing nonprofits have the highest average coupon rates, underwriters' discounts, and shorter maturities compared. In addition, charter schools, despite their reliance on what are presumed to be stable government grants, encounter the highest average coupon rates and underwriters' discounts among bond borrowers in all subsectors (Jegers, 2018; Yetman, 2007; Young, 2007). However, it's important to note that my observations on the relationship between income sources and coupon rates, underwriters' discounts, and years to maturity are derived from descriptive analysis. A regression analysis that controls for other confounding variables, such as age, would more accurately isolate the impact of revenue sources on nonprofits' borrowing costs and their choice of bond structure.

My data also shows that nonprofit borrowers in all subsectors have relatively concentrated revenue streams, with indices ranging from 0.188 to 0.450, suggesting that significant revenue concentration probably is necessary for substantial growth and bond

repayment capacity (Chikoto & Neely, 2014; Frumkin & Keating, 2011). Housing nonprofits and charter schools, with indices of 0.231 and 0.246 respectively, rank just behind hospitals (0.188) in revenue concentration. Despite the high degree of revenue concentration, charter schools and housing nonprofits face the highest average coupon rates and underwriters' discounts, in contrast to hospitals, which benefit from some of the lowest average coupon rates and underwriters' discounts. Again, given the study's descriptive approach, it is necessary to conduct regression analysis to further investigate the impact of revenue diversification index on nonprofits' coupon rates and underwriters' discounts.

Thus, I propose that the volatility of primary revenue streams for charter schools and housing nonprofits—such as the variability of government funds based on enrollment and student performance for charter schools, and the dependency on resident numbers and service types for housing nonprofits— more accurately reflects their ability to make debt payments. This measure helps explain why these nonprofits encounter high interest and issuance expenses. The results we discuss above may suggest that traditional indicators like income source and revenue diversification may not adequately capture a nonprofit's financial stability and debt repayment capability in the face of external shocks (Carroll & Stater, 2009; Yan et al., 2009).

This paper first contributes by introducing a unique dataset linking financial characteristics of nonprofit borrowers with bond-level attributes, enabling scholars to examine the reasons behind observed phenomena related to bond finance. For instance, previous research indicates that nonprofits incur higher issuance costs and receive lower bond ratings than government entities (Ely & Calabrese, 2017). However, scholars could not examine the reason, due to the lack of data. This dataset opens doors for further analysis of how financial conditions of nonprofits affect their issuance costs and interest payments.

The paper's descriptive analysis also sheds light on phenomena and questions within nonprofit bond finance that require further exploration. It highlights the low creditworthiness of charter schools and housing nonprofits, signaling the need for a closer examination of the organizational factors contributing to this risk. Additionally, it observes variations in the likelihood to seek bond ratings and achieve investment-grade ratings across subsectors, indicating a need to explore what drives or hinders nonprofits from obtaining favorable bond ratings. Finally, few nonprofits utilize credit enhancements, such as bond insurance or letters of credit, which could otherwise lower their interest costs by transferring default risk (Denison, 2001, 2003). This raises questions about the factors, possibly including high fees for risky bonds, that deter nonprofits from seeking credit enhancements. Another interesting topic could be the impact of government-funded credit enhancement programs on nonprofits' coupon rates. Ten state governments provide credit enhancement programs to charter schools by guaranteeing bond payments in case charter schools default. However, further studies are needed to examine the effectiveness of these government programs.

Through answering all these questions above, scholars can address why some nonprofit subsectors access the bond market more cost-effectively than others and what factors influence these disparities. Additionally, scholars should also answer why within the same subsector, some organizations opt to issue bonds while others do not, aiming to identify the factors influencing organizations' individual decisions. Why do answers to these questions matter? Better access to the tax-exempt municipal bond market, which provides lower interest rates than taxable loans, can help nonprofits to secure the capital needed to enhance and expand their programs and services in a cost-efficient way. This, in turn, allows them to support more beneficiaries and

maximize their mission impact (Anderson, 2022; Searing & Lecy, 2022). (Ely & Calabrese, 2017).

In addition, this dataset enables scholars to explore both the short-term and long-term effects of bond usage on nonprofit financial health. Research indicates that nonprofits are reluctant to incur debt because of worries from donors and government sponsors that debt repayments could divert resources from essential programs and missions (Mitchell, 2017; Mitchell & Calabrese, 2019). Funders want their contributions to fund ongoing programs rather than repay previous debts, leading nonprofits to fear that using debt could crowd out future funding (Denison, 2009; Yan et al., 2009; Young, 2017). Yet, there is a lack of empirical research on whether debt usage actually decreases program expenses, donations, and government support. This dataset offers researchers the opportunity to investigate these impacts. Additionally, while nonprofits often issue bonds to finance capital projects with the aim of expanding their programs and generating revenue to fund new programs to meet the increasing needs of beneficiaries, it is unclear whether debt usage effectively promotes organizational growth and mission advancement. The presence of this data allows for an analysis of the long-term consequences of bond issuance on program outputs and financial growth.

Finally, this paper has limitations. This paper is a descriptive study that warrants further regression analysis. Although this study observes interesting patterns regarding the variations of nonprofits' bond attributes and financial conditions across subsectors, regression analysis is needed to further examine the relationship between the effects of subsectors and organizational financial conditions on nonprofits' bond attributes, such as coupon rates and bond ratings

## **Chapter 3: Financing Nonprofit Growth: Exploring the Strategic Use of Mortgages, Bonds, and Private Loans**

### **Abstract**

To finance growth, nonprofits adopt a capital structure - a mix of retained earnings and debt - to raise sufficient funds to finance capital projects while minimizing borrowing costs and default risks. This study examines the financial determinants of using mortgages, tax-exempt bonds, and loans from insiders by nonprofits. It investigates the applicability of two competing capital structure theories - the static trade-off theory (STT) and the pecking order theory (POT) - in relation to the use of these debt instruments. Using e-filed IRS 990 form data from 2009 to 2016, a Heckman selection model controlling for selection bias show that nonprofits with diverse revenue streams and relying on donations, government grants, and program revenue increase the use of mortgages that offer lower issuance costs and greater repayment flexibility, aligning with STT. Conversely, these nonprofits are less inclined to use tax-exempt bonds a finding that aligns POT. Finally, neither STT nor POT, which both focus on the cost-benefit tradeoff of using debt, can effectively explain nonprofits' use of insider loans for asset financing. This may be because insider loans are provided based on the lender's support for the nonprofit's mission, with less concern for the nonprofit's financial ability to repay. This paper makes theoretical contributions by delineating the applicability of POT and STT by debt instruments.

Keywords: nonprofits, capital structure, mortgages, tax-exempt bonds, debt

### **3.1. Introduction**

Capital-intensive nonprofits, which encompass a diverse range of entities such as universities, museums, charter schools, housing organizations, and nursing homes, require significant capital assets like land, equipment, and buildings to deliver their services and goods. For example, housing related nonprofits need land for housing projects, while museums require land and buildings for hosting exhibitions and performances. Therefore, securing funding for these capital assets is crucial for nonprofits to expand their programs, meet the growing demand for their services, and maximize their organizational achievements (Calabrese, 2020, 2012; Woronkowicz et al., 2012).

When a nonprofit decides to expand its infrastructure and facilities, it's essential to carefully balance its capital structure, which is the combination of internal funds and external debt used to finance assets. This balance is key to maximizing programmatic growth and minimizing borrowing costs (Bowman, 2002; Denison, 2009; Gronbjerg, 1991). Unlike governments, which have stable tax revenue to support debt payments for infrastructure projects, nonprofits depend on less predictable external funding sources and have more variable revenue streams (Calabrese, 2020; Gaver et al., 2016; Searcy, 2011). Consequently, nonprofits face a higher risk of revenue shortfalls and potential debt default compared to governments (Smith, 2010, 2012; Yetman, 2007).

In this paper, I explore the financial factors influencing the capital structure of nonprofits, focusing on the balance between retained earnings and various external debt options such as mortgages, insider loans, and tax-exempt bonds. The central questions are: when nonprofits possess more stable financial resources that can be used for direct capital project financing or debt repayment guarantees, how does this influence their usage among different

debt instruments? Essentially, what are the trade-offs nonprofits face between the benefits and costs of these debt instruments and internal funds in supporting their programmatic growth, while simultaneously aiming to alleviate future financial strain?

Recent scholarship increasingly focuses on evaluating the applicability of two capital structure theories - the static trade-off theory (STT) and the pecking order theory (POT) - in the nonprofit sector. This research primarily investigates how nonprofits' financial conditions affect leverage, which essentially captures the share of total assets financed by debt (Charles et al., 2020; Garcia-Rodriguez et al., 2021; Jegers & Verschueren, 2006). STT suggests that nonprofits favor debt over accumulated savings when its benefits, such as tax-arbitrage and keeping internal funds as reserves, outweigh default risks (Bowman, 2002; Elmagrhi et al., 2018). In contrast, POT highlights the costs of financial distress and default risks from debt and posits that nonprofits always prefer internal funding over external debt (Calabrese, 2011a; Smith, 2010, 2012; Yan et al., 2009). Borrowing may lead to financial distress and default due to the inflexible repayment schedules of debts, which require consistent payments of principal and interest regardless of market conditions or the financial status of nonprofits (Jegers, 2018; Yetman, 2010).

As POT and STT offer conflicting views on the relationship between nonprofits' internal funds and their debt usage for financing assets, researchers have been examining how various financial attributes of nonprofits – such as profitability, revenue diversification, and reliance on government grants – correlate with leverage. Specifically, they investigate whether higher internal funds or stable income sources, which can either directly fund infrastructure or secure debt repayments, lead nonprofits to reduce (supportive of POT) or increase (supportive of STT) their debt to finance capital projects. However, findings so far have been inconclusive in

supporting either theory consistently (Calabrese, 2011; Charles et al., 2020; Smith, 2010). The relationship between financial attributes and leverage appears to vary based on whether the focus is on a specific debt instrument, like tax-exempt bonds, or overall debt use. For example, Calabrese (2012) and Smith (2010) discovered a negative association between profitability and financial leverage, suggesting, in line with POT, a preference for using retained earnings over external debt when more earnings are available. In contrast, Calabrese and Ely (2016) found no significant link between profitability and tax-exempt bond amounts, thus neither supporting POT nor STT.

The mixed results in testing POT and STT make me wonder if the applicability of these theories vary by debt instrument available to finance capital projects. These debt instruments include mortgages, tax- exempt bonds and insider loans from board members and employees. This study considers whether nonprofits, with more financial resources like retained earnings, opt for debt instruments with lower default risks and costs, while reducing reliance on higher-risk options. Existing research on nonprofit capital structure has not specifically examined how the costs and benefits associated with different debt instruments influence their use. In contrast, studies in both corporate and nonprofit finance have shown that bank loans generally have lower default rates and issuance costs compared to tax-exempt bonds (Bolton & Freixas, 2000; Busuioc & Lodge, 2017; Morellec et al., 2015). Although tax-exempt bonds offer lower interest rates due to tax exemptions for investors, the potential savings can be offset by issuance costs (Calabrese & Ely, 2016; Ely & Calabrese, 2017a; Yan et al., 2009). As a result, the cost savings from tax-exempt bonds may not significantly impact nonprofits' choices in financing capital projects. Additionally, loans from insiders, an alternative for nonprofits with wealthy insiders who can

provide low or zero-interest funding, remain underexplored in terms of their role in nonprofit capital structure (Smith, 2010; Yetman, 2007).

Due to the varying default risk and financial distress associated with debt instruments, in this paper, I test if the applicability of both POT and STT vary by the debt instrument. To test the applicability of both theories, I examine the relationship between nonprofits' financial attributes and the share of assets financed by either tax-exempt bonds, mortgages, or loans from insiders using IRS e-filer 990 database consisting of 367,932 observations between 2009 and 2016 (Lecy & Grasse, 2016). I use two-step Heckman selection models to conduct my analysis and address the potential selection bias.

My analysis yields several key findings. First, there are negative correlations between profitability and liquidity and the proportion of total operating assets financed through mortgages and tax-exempt bonds. This aligns with the pecking order theory (POT), which suggests nonprofits reduce debt usage when they have ample retained earnings and cash for capital projects. Second, financial conditions reflecting dependency on specific income sources (like government grants, donations, and program revenue) and revenue diversification show a positive association with the use of mortgages (supporting STT) but a negative one with tax-exempt bonds (supporting POT). Essentially, nonprofits with stable and diversified income streams for debt repayment generally prefer mortgages, given their lower default rates and issuance costs, over direct financing of capital projects with these income sources. Conversely, nonprofits with stable and diversified income sources are inclined to utilize these funds rather than opting for tax-exempt bonds. The enhanced debt repayment capacity, achieved through reliance on stable income sources and a diversified revenue stream, along with the benefits of debt utilization such as maintaining a rainy-day fund, may outweigh the moderate default risks and issuance costs

associated with mortgages. However, this does not compensate for the greater financial risks and costs associated with tax-exempt bonds. Therefore, a hierarchy of preference for debt instruments and financial reserves is established as follows: mortgages > equity > tax-exempt bonds.

Finally, apart from revenue diversification, no other financial condition examined shows a significant link to the usage of insider loans, diverging from the expectations of both STT and POT. A plausible explanation is that insiders, such as founders and board members, offer loans to a nonprofit driven by commitment to its missions rather than the financial returns from debt repayment. Hence, the amount of loans that the nonprofit can access is not influenced by the financial costs associated with using debt significantly.

This paper makes theoretical contributions by presenting a more nuanced and complicated picture of nonprofits' use of debt instruments. Firstly, it investigates whether the applicability of POT and STT differs by debt instrument, a relatively unexplored area. Building on Calabrese's (2011) modified pecking order approach that argue, while nonprofits generally exhibit risk aversion towards debt, they still maintain some leverage to preserve internal funds for contingencies or future investments. I further contend that nonprofits show varying degrees of risk aversion towards different debt instruments to minimize borrowing costs and ensure future financial sustainability (Calabrese, 2020; Charles et al., 2021). For instance, nonprofits with stable revenue sources are more likely to opt for mortgages, which typically have lower default rates and issuance costs, than tax-exempt bonds. Conversely, they tend to reduce their usage of bonds with higher default rates and costs. However, nonprofits' financial conditions seem to have little impact on loans from insiders, likely because such loans are driven by support for the nonprofits' missions rather than financial return expectations (Smith, 2010; Young, 2017).

Second, this paper draws scholarly attention to the often-overlooked factors of repayment flexibility and upfront issuance costs when analyzing capital structure. These factors, potentially more influential than interest costs, may significantly impact nonprofits' use of debt instruments (Calabrese, 2020; Ely & Calabrese, 2017; Tuckman, 1993). This explains the preference for mortgages with higher interest rates over bonds. However, further research is required to understand how the average issuance costs and limited payment flexibility of bonds influence nonprofits' use of tax-exempt bonds. Third, this study is the first to examine factors influencing the use of insider loans within nonprofits and assessing the applicability of capital structure theories to this context. Although insider borrowing is recognized as vital for small nonprofits lacking access to traditional financial debt (Smith, 2010; Yetman, 2006), its determinants have not been previously explored. My analysis reveals that neither POT nor STT can explain the use of insider loans for financing capital projects. This finding, along with the limited impact of financial factors on the extent of insider loans, prompts a need for alternative theories to better explain these borrowing decisions.

## **3.2. Literature Review**

### **3.2.1 Theories of Capital Structure in the Nonprofit Context**

In corporate finance literature, capital structure refers to the combination of retained earnings, equity, and debt utilized to finance capital projects, expand services, and stabilize cash flows (DeAngelo & Masulis, 1980; Eger III, 2011; Jegers, 2018; Lam et al., 2020; Myers, 1984). Four major corporate capital structure theories explain firms' preferences between equity issuance and debt use: the pecking order theory (POT), the static trade-off theory (STT), the Modigliani and Miller (MM) theory, and the signaling theory.

However, the MM theory and signaling theory are not applicable to nonprofit capital structures. These theories focus on the impact of a firm's equity market value on its capital structure, but nonprofits cannot issue equity (Bowman, 2002; Jegers & Verschueren, 2006; Yetman, 2010). Therefore, POT and STT are primarily used to explain nonprofit capital structures, focusing on tax benefits, default risks, and borrowing costs associated with debt. Nonprofits have access to debt instruments like mortgages and tax-exempt bonds, making POT and STT relevant for their capital structure analysis.

In corporate finance, the static trade-off theory posits that capital structure results from balancing the tax advantages of debt against its financial costs (Castanias, 1983; Graham, 2000; Stiglitz, 1972). Companies issue debt only when its benefits, primarily tax-deductible interest expenses, outweigh the risks of bankruptcy and financial distress caused by fixed debt repayments, like operating budget deficits (Frank & Goyal, 2007; Smith, 2010). The objective is to find an optimal balance between equity and debt (Bradley et al., 1984; DeAngelo & Masulis, 1980; Modigliani, 1982). Conversely, the pecking order theory suggests that firms always prefer internal financing, such as retained earnings, over external sources like debt and equity (Myers, 1984; Myers, 2001; Myers & Majuf, 1984). This preference is due to information asymmetry, where corporate managers have more insights into the firm's value and profit potential than shareholders and lenders. To offset the risks associated with this asymmetry, investors and lenders demand higher returns, making external financing costlier (Myers & Majuf, 1984; Smith, 2010). Therefore, firms favor using retained earnings to finance capital projects to minimize financing costs.

However, nonprofits' unique financial characteristics affect the adaptations of POT and STT. Firstly, due to the lack of owners in nonprofits, and then their inability to issue equity,

nonprofits rely on only retained earnings and external debt for capital financing (Bowman, 2002; Calabrese, 2011, 2020). Secondly, federal laws protect nonprofits from liquidation by creditors, yet defaulting on debt can damage their reputation and future credit access (Bowman, 2002; Calabrese, 2011a; Denison, 2009; Rosen & Sappington, 2016). Thirdly, unlike firms, nonprofits can access tax-exempt bonds, reducing borrowing costs of financing capital projects (Ely & Calabrese, 2017). Fourthly, excessive debt use can deter future donations and government grants, a unique consideration for nonprofits (Denison, 2009; Yan et al., 2009; Yetman, 2007; Young, 2007). Lastly, due to volatile revenue streams, nonprofits must maintain sufficient internal funds as a buffer against financial shocks, presenting a potential advantage of using debt (Bowman, 2011; Calabrese, 2011, 2013).

In recent research, scholars have suggested that both the POT and STT can shed light on the factors influencing nonprofit capital structure, aiming to address the mixed empirical findings that support both frameworks (Calabrese, 2011; Charles et al., 2021). For example, findings of endowments positively correlating with nonprofit leverage align with STT, whereas the negative association of profitability with leverage supports POT (Bowman, 2002; Calabrese, 2011; Charles et al., 2021; Smith, 2010, 2012). Therefore, Calabrese (2011) proposed a modified POT claiming that, although nonprofits prefer internal funds to external debt, nonprofits also maintain a target for financial leverage. The reason is that contrary to traditional POT, nonprofits aim to preserve some reserves for emergencies or for future growth without depleting all internal funds on financial projects due to their unstable revenue streams and the high risks of financial shocks, like government budget cuts (Calabrese, 2011, 2013; Bowman, 2011). Charles et al. (2021) further argue that neither POT nor STT exclusively dictates nonprofit behavior regarding capital structure. They emphasize that the share of debt financing in an art nonprofit's capital projects

“must reflect the balance between current and future revenue needs and the complexity of other revenue decisions like pricing structures, programming, and solicitation forecasts” (Charles et al., 2021, p.778)

In summary, Calabrese (2011) and Charles et al. (2021) attempt to bridge two capital structure theories to address why research often yields conflicting empirical results that seemingly support both theories within a single study. However, neither study explains why certain financial factors favor debt usage for capital projects while others discourage it, nor do they explore the variability in empirical relationships between identical financial factors and leverage across different studies. For example, the inconsistency in how reliance on government funding correlates with financial leverage—positively in some research, aligning with STT, and negatively in others, aligning with POT (Calabrese, 2011a; Denison, 2009; Denison et al., 2014; Yan et al., 2009). Given that scholars use different combinations of debt instruments to construct leverage measures, I ask whether aggregating debt from different debt instruments ignores the heterogeneity of each type of debt, leading to divergent findings across studies. Furthermore, what adjustments to capital structure theories are necessary to reconcile these varying empirical outcomes across diverse research.

Thus, to further understand these questions, I extend the arguments of Calabrese (2011) and Charles et al. (2021) that both POT and STT are valuable for understanding nonprofit capital structure. However, my approach differs in suggesting that the relevance of each theory may depend on the type of debt instrument. In the following subsection, I will discuss how the unique characteristics of each debt instrument influence which capital structure theory better explains the proportion of assets financed by that debt.

### **3.2.2 Repayment Flexibility, Default Risk, Interest, and Issuance Costs of Debt**

#### **Instruments**

In this section, I discuss the impacts on four key characteristics of debt instruments - repayment flexibility, default risks, issuance costs, and interest costs - on the applicability of capital structure theories to different debt types (Bolton & Freixas, 2000; Busuioc & Lodge, 2017; Calabrese, 2020; Ely & Calabrese, 2017; Morellec et al., 2015; Tuckman, 1993).

Firstly, bank loans offer more repayment flexibility than tax-exempt bonds, leading to lower default risks associated with loans (Bolton & Freixas, 2000; Emery & Cantor, 2005; Morellec et al., 2015). Unlike bonds with fixed payment schedules, bank loan terms are renegotiable. While there is limited research on nonprofit defaults, evidence from corporate finance suggests that banks' ability to assess and price firms' bankruptcy risks results in lower loan default rates compared to bonds (Busuioc & Lodge, 2017; Morellec et al., 2015). Banks, having better risk-tolerance and resource capabilities, are also often more willing to renegotiate loan terms for financially distressed but potentially growing firms to prevent inefficient liquidation losses (Bolton & Freixas, 2000; Morellec et al., 2015). In contrast, restructuring bond payments is more challenging due to the larger number of bondholders, often leading to rigid payment schedules regardless of the borrower's financial situation (Bolton & Freixas, 2000; Morellec et al., 2015). Therefore, firms facing high financial distress risks are more likely to prefer bank loans to minimize default risks (Busuioc & Lodge, 2017; Emery & Cantor, 2005).

In this paper, I argue that nonprofits with sufficient retained earnings and stable revenues, capable of directly financing capital projects or securing debt repayments, tend to increase assets financed by low-default-rate mortgages, aligning with STT. Conversely, they reduce reliance on high-default-rate tax-exempt bonds, in line with POT. Although specific data

on nonprofits' loan and tax-exempt bond default rates are scarce, Calabrese and Ely (2016) and Tuckman (1993) acknowledge low repayment flexibility issues with tax-exempt bonds. Most nonprofits, often under financial stress due to unpredictable revenues and dependence on external funding, are at a higher risk of default (Bowman, 2011; Yan et al., 2009). Thus, similar to financially distressed for-profit firms, nonprofits with more internal funds or stable revenue sources increase their use of mortgages and decrease their reliance on tax-exempt bonds (Busuioc & Lodge, 2017; Emery & Cantor, 2005).

Moreover, the interest and issuance costs associated with tax-exempt bonds and mortgages can influence how nonprofits allocate these debt instruments in their capital structure. With sufficient retained earnings and stable revenue, nonprofits may favor mortgages due to their lower initial issuance costs for financing projects, while reducing reliance on tax-exempt bonds, which incur higher issuance costs. Despite lower interest rates on tax-exempt bonds, they involve substantial fixed issuance costs absent in mortgages, such as fees to conduit issuers, underwriters, and financial advisors (Ely & Calabrese, 2017; Joffe, 2015; Robbins & Simonsen, 2012, 2013).

Consequently, nonprofits using tax-exempt bonds must ensure that the interest savings outweigh the associated issuance costs (Robbins & Simonsen, 2013; Robbins et al., 2014). Research indicates that nonprofits face higher issuance costs in the municipal bond market compared to entities like municipal governments (Ely & Calabrese, 2017). These high costs can deter especially medium-sized nonprofits, which require only modest funding, from using tax-exempt bonds (Calabrese and Ely 2016; Ely and Calabrese 2017a; Smith, 2010). The reason is that, to make tax-exempt bonds cost-effective, nonprofits need to issue bonds in large volumes to

achieve economies of scale and ensure interest savings exceed the issuance costs (Calabrese and Ely 2016; Ely and Calabrese 2017a).

### **3.3 Testing the Pecking Order (POT) and Static Trade-off (STT) Theories**

Leverage refers to the proportion of debt used to finance assets, is the capital structure (the mix of accumulated savings and external debt to finance assets) (Bowman, 2002; Calabrese, 2011; Jegers & Verschueren, 2006; Smith, 2010, 2012; Su et al.2022)<sup>1</sup>. Seven financial characteristics of nonprofits - profitability, liquidity, revenue diversification, dependence on program revenue, dependence on donations, dependence on government grants, endowment size, and fixed assets size – are commonly used in the literature as determinants of nonprofit leverage to test the applicability of POT or STT. Essentially, scholars examined how these financial conditions affect the share of total assets financed by debt (Bacon, 1992; Bowman, 2002; Charles et al., 2020; Garcia-Rodriguez & Jegers, 2017; Garcia-Rodriguez et al., 2021; Jegers, 2011).

This section reviews and analyzes previous research on these variables, leading to the formulation of my hypotheses. Table 3.1 presents a summary of the expected directional effects (positive or negative) of these financial factors on debt instrument usage, along with the associated theories they are presumed to support.

#### **3.3.1 Profitability**

Profitability, indicating nonprofits' retained earnings, is a key metric for testing capital structure theories. POT suggests a negative relationship between profitability and leverage, indicating nonprofits prefer using internal funds over external debt for financing capital projects as they generate more income (Bowman, 2002; Smith, 2010; Szymańska et al., 2015). In contrast, STT posits a positive relationship, arguing that with more internal funds, nonprofits are likely to increase debt usage for capital projects, viewing the benefits of debt—like preserving

earnings for emergencies—as outweighing default risks (Bowman, 2002; Calabrese, 2011a; Rosen & Sappington, 2016).

However, research on the relationship between profitability and nonprofit leverage has yielded inconsistent findings (Bowman, 2002; Calabrese, 2012; Smith, 2010; Szymańska et al., 2015), with variations observed across different types of debt. Some studies report a negative association with financial leverage, defined as the ratio of long-term debt (mortgages and tax-exempt bonds) to total assets, while others find a positive relationship with total leverage, which includes both long-term and short-term debt (Calabrese, 2011; Smith, 2012; Szymańska et al., 2015; Bowman, 2002). Additionally, Calabrese & Ely (2016) found no significant link between profitability and the ratio of tax-exempt bonds to total liabilities.

These mixed results lead me to question how financial characteristics might differently influence the use of specific debt instruments and then challenging the traditional capital structure theories. I propose that profitability negatively correlates with tax-exempt bond financing (supporting POT) but positively with mortgage financing (supporting STT), due to higher default risks and issuance costs of bonds compared to mortgages (Bolton & Freixas, 2000; de Haan & Hinloopen, 2003; Emery & Cantor, 2005). In other words, when nonprofits have more accumulated savings that can either finance capital projects directly or guarantee debt repayments, they increase the use of mortgages with moderate default risk and issuance costs while reducing the use of bonds. This hypothesis aligns with corporate finance findings that financially distressed firms prefer mortgages over bonds (Busuioc & Lodge, 2017; Emery & Cantor, 2005), a preference likely mirrored by nonprofits facing financial uncertainties and dependency on external funding (Bowman, 2011; Yan et al., 2009).

Regarding loans from insiders, profitability's impact appears negligible since insiders, familiar with the nonprofit's financial status, do not rely solely on profitability to gauge the organization's funding capacity or debt repayment ability (Frank & Goyal, 2007; Myers, 1984; Smith, 2010). Insiders' support is often mission-driven, not financially motivated, limiting profitability's influence on internal loan decisions (Smith, 2010; Young, 2017).

H1: Profitability is negatively associated with the use of tax-exempt bonds (supporting POT) and positively associated with the use of mortgages (supporting STT). Profitability has no impact on the use of loans from insiders.

### **3.3.2 the Cost of Financial Distress: Revenue Diversification & Reliance on Sources of Income**

Research indicates that the costs of financial distress influence nonprofit leverage, with debt obligations potentially leading to financial distress during revenue shortfalls, affecting service provision and causing budget deficits (Bowman, 2002; Castanias, 1983; Calabrese, 2011; Garcia-Rodriguez, 2021; Stiglitz, 1972). Although nonprofits cannot be liquidated involuntarily, debt default can harm a nonprofit's reputation and future credit access (Bowman, 2011; Calabrese, 2011; Smith, 2012). Nonprofits rely on external funding sources like donations and government grants that vary with economic cycles and budget decisions, making their revenue streams fluctuating and increasing the risk of financial distress (Carroll & Stater, 2009; Denison et al., 2014; Rosen & Sappington, 2016; Gronbjerg, 1991; Yan et al., 2009).

Revenue diversification is closely linked to financial distress, with both theories suggesting that diversified revenue streams positively affect nonprofit leverage by reducing financial volatility and enhancing debt repayment capacity (Carroll & Stater, 2009; Yan et al.,

2009). However, the relationship between revenue diversification and leverage is not consistent across studies, varying with the types of debt instrument included in leverage calculations (Calabrese, 2011a; Calabrese & Ely, 2016; Yan et al., 2009).

I argue that the mixed evidence on the correlation between revenue diversification and leverage questions the uniform applicability of capital structure theories across different debt types. Specifically, I suggest that STT predicts a positive correlation with diversified revenues encouraging the use of mortgages due to their lower default risks and issuance costs. Diversified revenues enable nonprofits to effectively manage the lower risks and costs associated with mortgages, making them a viable option for financing capital projects. In contrast, despite diversified revenues, POT suggests a cautious approach towards high-cost tax-exempt bonds and prefers using diversified revenue streams rather than tax-exempt bonds to finance capital projects." (Bolton & Freixas, 2000; Calabrese & Ely, 2017; Emery & Cantor, 2005). Thus, the financial benefits of using bonds, such as to keep internal funds as a reserve, may not outweigh the high default risk and issuance costs associated with tax-exempt bonds.

Regarding revenue sources, there's a debate on how reliance on donations and government funding influences borrowing. Some argue that such reliance discourages borrowing due to the risk of crowding out future donations (POT perspective) (Calabrese, 2011; Jegers, 2018; Yetman, 2007; Young, 2017), while others believe stable government and program revenues can secure debt repayments, encouraging borrowing for capital projects (STT perspective) (Bowman, 2002; Denison, 2009; Gronbjerg, 1991). The evidence is mixed, showing that the relationship between these revenue sources and leverage varies with the debt type included in leverage calculations (Bowman, 2002; Denison et al., 2014; Rosen & Sappington, 2016).

Therefore, I propose that nonprofits' capital structure choices are influenced by the type of debt instrument. Nonprofits tend to use mortgages, which have lower default risks and issuance costs, as they rely more on government grants, donations, and program revenue, consistent with STT. Conversely, they prefer to use government grants, donations, and program revenue rather than higher-risk tax-exempt bonds, aligning with POT. Tax-exempt bonds might deter future grants and donations more than mortgages due to the perceived higher default risk. Governments and major donors also recognize that nonprofits holding tax-exempt bonds are more prone to default than mortgages, potentially redirecting their contributions towards debt repayment instead of the designated services or projects. Consequently, they may be less willing to fund nonprofits that choose tax-exempt bonds as a financing option (Bolton & Freixas, 2000; de Haan & Hinloopen, 2003; Emery & Cantor, 2005).

Lastly, the impact of these revenue sources on the use of insider loans remains unexplored. I hypothesize that insider lending is less influenced by the nonprofit's revenue sources, as insiders are motivated by the organization's mission and values, rather than its financial stability or income source reliability (Smith, 2010; Young, 2017).

H2: Higher revenue diversification correlates negatively with the use of tax-exempt bonds (supporting POT) and positively with the use of mortgages (supporting STT). Revenue diversification does not affect the use of insider loans.

H3: Greater dependence on government funding is negatively related to the use of tax-exempt bonds but positively related to mortgage usage. Dependence on government funding does not affect the use of insider loans.

H4: Greater dependence on donations is negatively related to the use of tax-exempt bonds but positively related to mortgage usage. Dependence on donations does not affect the use of insider loans.

H5: Greater dependence on program service revenue is negatively related to the use of tax-exempt bonds and positively related to the use of mortgages. Dependence on program revenue does not affect the use of insider loans.

### **3.3.3 Endowments**

Endowments are another financial indicator widely used to test whether nonprofit borrowing aligns with POT or STT. STT posits a positive link between endowment size and leverage, indicating that larger endowments can lower default risk and encourage borrowing by offering collateral or generating investment income, which can then free up other assets to serve as collateral (Bowman, 2002; Calabrese, 2011; Calabrese & Ely, 2016). In contrast, POT expects a negative relationship, since the increased investment income from endowments reduces reliance on external debt by allowing organizations to use this income for capital projects (Denison et al., 2014; Rosen & Sappington, 2016). However, empirical results have been mixed, with the relationship between endowment size and leverage varying according to the type of debt analyzed (Bowman, 2002; Calabrese, 2011; Gentry, 2002b; Rosen & Sappington, 2016; Smith, 2012).

I argue that the impact of endowment size on debt usage depends on the specific debt instrument. Endowment shares should negatively correlate with the use of tax-exempt bonds with high default risk and issuance costs, in line with POT (Bolton & Freixas, 2000; Busuioc & Lodge, 2017). Conversely, with additional collateral from endowments, nonprofits tend to favor mortgages, as endowments offering collateral can further diminish the moderate default risk

associated with bank loans (Calabrese, 2011; Morellec et al., 2015). Additionally, I propose that endowment size may not significantly influence the use of insider loans, as insiders lending to support the nonprofit's mission may not prioritize endowment size as a guarantee for debt repayment (Smith, 2010; Young, 2017).

H6: The endowment size is negatively related to the use of tax-exempt bonds but positively related to mortgage usage. The endowment size does not affect the use of insider loans.

### **3.3.4 Fixed Assets**

Asset tangibility is another factor related to nonprofit capital structure. STT predicts fixed assets should have a positive relationship with the use of debt. The reason is that fixed assets can be used as collateral for debt and reduce the risk of default faced by both bond investors and nonprofits (Bowman, 2002; Smith, 2010). This hypothesis is widely supported by empirical research in the field (Calabrese, 2011a; Calabrese & Ely, 2016; Jegers & Verschueren, 2006; Smith, 2010, 2012). Therefore, I hypothesize a positive relationship between fixed assets and the use of mortgages and tax-exempt bonds for financing capital projects, in line with STT. Conversely, I propose that asset tangibility does not significantly impact the use of insider loans for capital projects. Insiders who lend loans to support nonprofits' missions and social values do not expect financial returns from nonprofits and may not care if the nonprofit has a sufficient amount of fixed assets to back debt repayment (Smith, 2010; Young, 2017).

H7: Fixed assets as a share of total assets are positively associated with the use of mortgages and tax-exempt bonds, while they do not have a statistically significant relationship with the use of loans from insiders.

In summary, this study posits that nonprofits' capacity to repay debt and mitigate default risks—facilitated by retained earnings accumulation, stable income streams, revenue diversification, and endowments—along with the benefits of debt utilization, such as maintaining financial reserves, may be higher than the moderate default risks and issuance costs associated with mortgages. However, this does not offset the greater financial risks and costs associated with tax-exempt bonds. Consequently, there is a preference hierarchy in debt instrument and accumulated savings use: mortgages > accumulated savings > tax-exempt bonds.

### 3.4. Data & Variables

To test my hypotheses, I utilized the e-filer 990 database, which includes electronically filed 990 forms by nonprofits from fiscal years 2009 to 2016 (Lecy & Grasse, 2016). I chose this database over the National Center for Charitable Statistics (NCCS)'s core files because it provides data on loans to nonprofit insiders from 2010 onwards. Although the e-filer database encompasses only 70-85% of all 990 form submissions, it captures the majority of large nonprofits by assets and total revenue, which are more inclined to utilize long-term debt for financing capital assets (Daniels & Olsen-Phillips, 2018; Ely et al., 2021).

Table 3.2 outlines the sample selection and data cleaning procedures in detail. Following data cleaning, the final sample consists of 367,932 observations representing 79,441 nonprofits. Approximately 50% of nonprofits were excluded from the final dataset due to inaccurate reporting, a rate of removal that aligns with that found in prior research (Calabrese, 2011a; Lu et al., 2019).

-----

Insert Table 3.2 about here

-----

In the existing literature, nonprofit capital structure theories are tested through financial determinants of leverage. Various leverage measures are used in the literature, including the financial leverage ratio (financial debt to total debt), total leverage ratio (total debt to total assets), long-term debt leverage ratio (long-term debt to total assets), and the proportion of total debt comprised of tax-exempt bonds (Bacon, 1992; Bowman, 2002; Calabrese, 2011a; Smith, 2010; G. J. Wedig et al., 1989).

In order to test if the applicability of POT and STT varies by debt instrument, nonprofit leverage ratios in this paper are measured by the share of total assets financed by three debt instruments, including the sum of mortgages and secured bank notes (*Mortgage Ratio*), individual loans from insiders of nonprofits (*Loans from Insiders Ratio*), and tax-exempt bonds (*Tax-exempt Bonds Ratio*) (Bowman, 2002; Denison, 2009; Smith, 2010, 2012). The leverage ratios use total operating assets—total assets minus true endowments—as the denominator, in line with Bowman (2002) and Calabrese (2011).

Profitability (*profitability*) is defined as the return on unrestricted net assets, since only unrestricted net assets can be used to finance capital projects easily (Calabrese, 2011). Liquidity (*liquidity*) is measured by the current assets to short-term liabilities ratio, assessing the ability of nonprofits to use liquid assets to meet short-term obligations (Charles et al., 2021; Garcia-Rodriguez et al., 2021; Smith, 2010)<sup>2</sup>.

Furthermore, the study employs the Hirschman-Herfindahl Index (HHI) (*revenue diversification*), as shown in Equation (1), to quantify revenue diversification, incorporating four revenue streams: contributions, program service revenue, investment income, and other revenue, where  $R_i$  denotes the share of total revenue from source  $i$  (Calabrese & Ely, 2016; Yan et al., 2009).

$$RD = \frac{1 - \sum_{i=1}^4 R_i^2}{0.75} \quad (1)$$

I use the proportions of total revenue from government grants, program service revenue, and private contributions to capture the impacts of reliance on each source of income on debt instrument ratios (Rosen & Sappington, 2016; Yan et al., 2009). Endowments (*endowment*) are defined as the ratio of true endowments (permanently restricted net assets) to total assets, in accordance with Calabrese (2011) and Lam et al. (2020), while fixed assets (*fixed assets*) are represented by the ratio of land, buildings, and equipment to total assets (Bowman, 2002; Garcia-Rodriguez & Jegers, 2017).

For control variables, I employ the logarithm of total operating assets (*ln(total operating assets)*), the organization's age (*age*), and its squared term (*age\_sqr*) to account for the effects of size and age in the analysis (Charles et al., 2021; Yan et al., 2009)<sup>3</sup>. Additionally, I include dummies for the year and nonprofit subfields, specifically the National Taxonomy of Exempt Entities (NTEE) codes, to control the effects of nonprofit subfields and time-specific factors<sup>4</sup>. To mitigate the effect of outliers, all variables are winsorized at the 1% and 99% levels.

Table 3.3 presents the descriptive statistics for the variables in my models, including their definitions. Approximately 19% of the nonprofits in the dataset have utilized mortgages, insider loans, or tax-exempt bonds to finance their operations, aligning with findings from previous research (Calabrese, 2020). Mortgages emerge as the preferred financial instrument, with 16.1% of nonprofits opting for them, followed by 3.6% using tax-exempt bonds and 1.7% choosing insider loans. The average ratios of these financing methods to total assets are relatively low (mortgages at 3.3%, tax-exempt bonds at 0.8%, and insider loans at 0.1%), indicating that the majority of nonprofits have limited need for debt financing of capital assets.

-----  
Insert Table 3.3 about here  
-----

### 3.5 Methods

Building on previous research, the two-step Heckman selection model are employed to model the two-step decision-making process regarding the share of each debt instrument for financing capital projects. Nonprofits need to decide whether they use the debt instrument before determining the amount of debt they will use to finance assets (Yan et al., 2009). The Heckman selection estimator also aims to mitigate potential self-selection bias and examine the financial factors affecting the proportion of each debt instrument in financing assets—specifically, the capital structure (Charles et al., 2020; Garcia-Rodriguez et al., 2021; Yan et al., 2009)<sup>5</sup>.

With only 19% of nonprofits in the dataset reporting the use of mortgages, tax-exempt bonds, or insider loans, there's a concern for selection bias. This bias arises because nonprofits that use a debt instrument may systematically differ in unobserved ways from those that do not, affecting both their choice to use a debt instrument and the amount they borrow from the debt instrument (Wooldridge, 2010). Consequently, the selection bias contributes to inconsistent estimates of coefficients on variables in the OLS outcome equation (Charles et al., 2020; Greene, 2012; Wooldridge, 2010).

The Heckman selection model effectively addresses selection bias by incorporating the conditional probability of receiving the treatment (i.e., inverse mills ratio) into the outcome equation, thus controlling for selection bias (Greene, 2012; Guo & Fraser, 2014). The equations for Heckman selection models are detailed in Equation (2) and Equation (3). In the first stage of

the Heckman model, binary variables are used to indicate whether a nonprofit utilizes mortgages and secured banknotes (*the Existence of Mortgages*), loans from insiders (*the Existence of Loans from insiders*), or tax-exempt bonds (*the Existence of Tax-exempt bonds*) in year t, serving as dependent variables. In the second stage of the Heckman selection model, *Mortgage Ratio*, *Loans from Insiders Ratio*, *Tax-exempt Bonds Ratio* are used to capture the share of assets financed by three debt instruments, including the sum of mortgages and secured bank notes, individual loans from insiders of nonprofits, and tax-exempt bonds.

#### Stage 1 (Selection Equation: Probit Model)

The existence of Tax-exempt bonds  $i,t$  or Mortgages  $i,t$  (or Loans from insiders  $i,t$ ) =  $a_i + \beta_1$  profitability  $i,t$  +  $\beta_2$  liquidity  $i,t$  +  $\beta_3$  unrelated business income  $i,t$  (or conflict of interest policies  $i,t$ ) +  $\beta_4$  revenue diversification  $i,t$  +  $\beta_5$  government grant  $i,t$  +  $\beta_6$  donations  $i,t$  +  $\beta_7$  program service revenue  $i,t$  +  $\beta_8$  endowment  $i,t$  +  $\beta_9$  fixed assets  $i,t$  +  $\beta_{10}$  ln (total operating assets)  $i,t$  +  $\beta_{11}$  age  $i,t$  +  $\beta_{12}$  age squared  $i,t$  +  $\beta_{13}$  year dummies +  $\beta_{14}$  nonprofit subfields dummies +  $\epsilon_i$ , (2)

#### Stage 2 (Outcome Equation)

Tax-exempt bonds ratio  $i,t$  or Mortgages ratio  $i,t$  or Loans from insiders ratio  $i,t$  =  $a_i + \beta_1$  profitability  $i,t$  +  $\beta_2$  liquidity  $i,t$  +  $\beta_3$  revenue diversification  $i,t$  +  $\beta_4$  government grant  $i,t$  +  $\beta_5$  donations  $i,t$  +  $\beta_6$  program service revenue  $i,t$  +  $\beta_7$  endowment  $i,t$  +  $\beta_8$  fixed assets  $i,t$  +  $\beta_9$  ln (total operating assets)  $i,t$  +  $\beta_{10}$  age  $i,t$  +  $\beta_{11}$  age squared  $i,t$  +  $\beta_{12}$  year dummies +  $\beta_{13}$  nonprofit subfields dummies +  $\beta_{14}$  Inverse mills ratio  $i,t$  +  $\epsilon_{i,t}$ (3)

To obtain precise estimations of coefficients in the second stage of the Heckman

selection model, researchers must identify a variable Z in the first stage that fulfills the exclusion restriction requirement. The exclusion restriction requirement requires at least one variable that affects the probability of choosing a debt instrument, but not the share of total operating assets financed by the debt instrument (Greene, 2012; Sartori, 2003; Wooldridge, 2010). Variable Z is utilized to compute the inverse mills ratio in the Heckman selection model and is not an instrumental variable aimed at capturing exogenous variation in the variable of interest. As such, it is not subject to the typical assumptions required of instrumental variables, such as instrument strength (Guo & Fraser, 2014; Wolfolds & Siegel, 2009).

Age and the ratio of salaries to total expenses are commonly used in literature to satisfy the Heckman selection model's exclusion restriction, which necessitates a variable that influences the decision to use debt but not the amount of leverage directly (Charles et al., 2021; Yan et al., 2009). However, these variables are also frequently identified as direct predictors of nonprofit leverage, potentially influencing leverage themselves (Calabrese & Ely, 2016; Smith, 2010, 2012).

This paper proposes alternative variables to fulfill Heckman selection models' exclusion restriction requirements. For models focusing on mortgage and tax-exempt bond ratios, I utilize the ratio of unrelated business income (UBI) to total revenue (*Total Unrelated Businesses Income*).

The IRS defines UBI as income from activities unrelated to a nonprofit's primary mission (Yetman & Yetman, 2008; IRS, 2022). UBI affects the likelihood of using debt, because nonprofits with UBI may incur debt to absorb tax obligations related to UBI, indicating a propensity to use financial debt across different nonprofit subfields (Calabrese & Ely, 2016; Rosen & Sappington, 2016). Institutionalized nonprofits with significant assets, extensive

program expenses, and lower donation reliance are more likely to generate UBI and engage in financial debt (Denison, 2009; Hines Jr, 1999; Yetman & Yetman, 2008). However, UBI is unlikely to directly impact the debt amount for capital financing, as it typically represents a minimal portion of a nonprofit's revenue (around 1%), insufficient to significantly affect debt repayment capacity (Child, 2010; Cordes & Weisbrod, 1998). Nonprofits are disincentivized from accumulating substantial UBI, risking their tax-exempt status with excessive unrelated business activities (IRS, n.d.). Additionally, the IRS requires tax payments on UBI exceeding \$500, potentially encouraging underreporting to minimize taxes. Nevertheless, research suggests that UBI figures reported on 990 forms are reliable indicators of actual UBI earned by nonprofits (Yetman et al., 2009).

Since the UBI ratio does not significantly influence the use of insider loans, it fails to meet the Heckman selection model's exclusion restriction for models analyzing insider loan ratios. To address this, I introduce three binary variables related to the presence, disclosure, and enforcement of a conflict-of-interest (COI) policy (*Coipolicy*, *Coidisclose*, *Coimonitor*), detailed in table 3. Implementing and adhering to a COI policy can diminish the propensity to use insider loans by outlining clear procedures for loan review and approval, safeguarding the nonprofit's interests (National Council of Nonprofits, n.d.). The use of insider loans poses a risk to a nonprofit's tax-exempt status due to potential conflicts of interest, where insiders might gain financially from the loan terms (Stanley, 2019; Lawyers Alliance for New York, 2019). The IRS can impose financial penalties on both lenders and nonprofits involved in transactions where insiders receive returns exceeding the market value of benefits for the nonprofit, known as excess benefit transactions (IRS, 2021b). However, the presence of a COI policy is unlikely to

influence the loan amounts from insiders, as conflicts of interest are more about the lender's identity, such as board members, rather than the loan size (IRS, 2021a).

### **3.6 Results**

Table 3.4 presents the outcomes of the two-step Heckman selection models. The rho coefficients in the Heckman selection model, representing the correlation between the error terms of the selection and outcome equations, are nonzero, confirming the presence of selection bias. Additionally, the inverse mills ratio is statistically significant, further validating the detection of selection bias. Hence, the Heckman selection model is validated as a suitable method for this analysis. Given the mathematical nature of the Heckman selection model, the magnitudes of coefficients of financial variables on debt instrument ratios are not as straightforwardly interpretable as in OLS models. Consequently, the discussion in the results section will concentrate on the direction and statistical significance of the relationships between financial variables and debt instrument ratios and the standardized coefficients of these financial variables.

Partially contrary to my hypotheses in part, profitability and liquidity show negative correlations with the proportion of total operating assets financed through mortgages and tax-exempt bonds. Both results align with the POT expectations. This indicates that nonprofits with higher retained earnings and liquid assets tend to decrease their reliance on bonds and mortgages for financing capital assets. However, the impact of liquidity on the use of mortgages and bonds is statistically insignificant or negligible, suggesting that liquid assets do not significantly influence the choice between bonds and mortgages. Nonetheless, this contradicts my initial hypotheses since profitability also negatively affects the mortgage ratio. Still, these findings agree with previous research indicating that nonprofits might prefer utilizing retained earnings

and liquid assets over debt for capital project financing, supporting POT (Garcia-Rodriguez et al., 2021; Smith, 2010; Szymańska et al., 2015).

In the Heckman selection model, the revenue diversification index, reliance on government grants, donations, and program revenue are all positively linked to the mortgage-to-total operating assets ratio, aligning with the expected direction from STT (significant at 0.01 level). The results suggest that when nonprofits have more diversified and less volatile revenue streams, a reliable source of income, or an endowment that can be pledged as collateral, nonprofits increase the use of mortgages with moderate default risk (Ely & Calabrese, 2017; Smith, 2010; Tuckman, 1993). This is since the reduced default risk brought by having more collateral, the increased capacity to pay off debt on time brought by relying on a source of income and diversifying revenue streams, as well as the benefit of using debt can sufficiently offset the relatively low default risk and low issuance costs associated with mortgages (Bolton & Freixas, 2000; Morellec et al., 2015; Yan et al., 2009). Interestingly, reliance on donations, despite its volatility, appears to strengthen a nonprofit's financial capacity by contributing to revenue growth, thus expanding debt capacity (Calabrese, 2011a; Chikoto & Neely, 2014; Frumkin & Keating, 2011). The Heckman selection model shows a positive association between donation reliance and mortgage ratio (significant at 0.01 level) with a coefficient of 0.078. Standardizing the coefficients of these four financial conditions on the mortgage ratio reveals that reliance on government grants and program revenue have the most significant effects, with increases of one standard deviation in these factors leading to 9.8 and 7.8 percentage points increases in the share of operating assets financed by mortgages, respectively.

Contrary to tax-exempt bonds, the second-stage Heckman selection model shows that the revenue diversification index, reliance on government grants, donations, and program revenue

are all negatively correlated with the tax-exempt bonds to total operating assets ratio, significant at the 0.001 level. This outcome aligns with POT, indicating that nonprofits prefer more stable and less volatile revenue sources over the high default risks and issuance costs of tax-exempt bonds for financing capital projects. The drawbacks of tax-exempt bonds, including low payment flexibility and the potential to crowding out future donations and government grants, are likely not compensated for by the advantages of diversified and stable sources of income (Calabrese & Ely, 2016; Jegers, 2018; Tuckman, 1993; Yetman, 2006). For instance, the negative impact of reliance on donations on the tax-exempt bond ratio is evidenced by a coefficient of -0.093 ( $p = 0.00$ ). Standardizing the coefficients of these four financial conditions reveals that reliance on donations most significantly affects the tax-exempt bond ratio, with an increase in reliance on donations by one standard deviation leading to a 3.5 percentage point decrease in the proportion of assets financed by tax-exempt bonds.

Partially contrary to my initial hypotheses, both endowment size and fixed asset size are positively related to the tax-exempt bond and mortgage ratios in the Heckman selection model, with significant findings at the 0.001 level. This alignment with STT suggests that nonprofits increase their use of both bonds and mortgages to finance assets as the size of their fixed assets and endowments grows, despite the higher issuance costs and default risks associated with bonds. Unlike income sources like program revenue and government grants, which are vulnerable to external financial shocks, fixed assets and endowments provide a stable guarantee for debt repayment by serving as collateral (Bowman, 2002; Gaver et al., 2016; Tuckman, 1993).

Given that tax-exempt bonds carry significantly higher principal and default risks compared to mortgages, it is possible that the debt repayment assurance provided by fixed assets and endowments can more effectively mitigate these risks than income sources, thus promoting

greater use of bonds. After standardizing the coefficients, it is evident that, among all eight financial conditions I test in this paper, the fixed assets to total assets ratio exerts the most substantial impact on both mortgage and bond ratios. A one standard deviation increase in the fixed assets ratio leads to 5.5 and 15.1 percentage point increases in the shares of operating assets financed by bonds and mortgages, respectively.

The Heckman selection model, with the insider loan ratio as the dependent variable, shows that neither the POT nor the static trade-off theory STT definitively accounts for nonprofits' use of insider loans. In this model, most variables, ranging from profitability to endowments, do not significantly relate to the insider loan ratio, aligning with my initial hypotheses. Most financial conditions I test do not have statistically significant impacts on the usage of insider loans, as lenders offer these loans based on their commitment to the nonprofit's mission rather than the financial return. Consequently, the default risks and financial distress costs associated with insider loans are considered negligible. Hence, POT and STT, which emphasize the tradeoff between the costs and benefits of debt usage, do not adequately explain the use of insider loans by nonprofits. The only two exceptions are the revenue diversification index and the fixed assets ratio, where increased revenue diversification and a higher fixed assets ratio led to decreased reliance on insider loans for capital financing, aligning with POT. This result may suggest that insider loans may serve as a last resort for nonprofits lacking access to financial markets but need capital to finance assets, often due to insufficient collateral and the financial instability from less diversified revenues. Consequently, nonprofits that improve their debt repayment capacity, either through collateral provision or by diversifying their revenue streams, reduce their dependence on insider loans (Carroll & Stater, 2009; Smith, 2010; Yan et al., 2009; Young, 2017). Further research is necessary to determine if nonprofits, given the

negligible default risks and financial distress costs of insider loans, might favor these loans over using their own accumulated earnings for capital projects, aiming to preserve retained earnings for a contingency fund or for future development.

-----  
Insert Table 3.4 about here  
-----

### **3.7 Conclusion and Discussion**

Over the past 30 years, many scholars have used capital structure theories to explain nonprofits' use of external debt to finance assets but failed to find consistent empirical evidence to support either POT or STT (Bacon, 1992; Bowman, 2002; Calabrese, 2011a; Charles et al., 2020; Garcia-Rodriguez & Jegers, 2017; Garcia-Rodriguez et al., 2021; Jegers, 2011; Jegers & Verschueren, 2006; Smith, 2010, 2012; Su et al., 2022; Szymańska et al., 2015; G.J. Wedig et al., 1996; Yan et al., 2009). I argue that scholars' failure to reach a consensus on nonprofits' use of debt overall could be they ignore the heterogeneities of debt instruments in terms of default risks and issuance costs, and pool different debt instruments together to test capital structure theories. Hence, in this paper I test the applicability of POT and STT by debt instrument to reconcile conflicting empirical results found in previous research.

The findings of my analysis largely support my overarching hypothesis that the applicability of POT and STT vary by debt instrument, possibly due to the lower default risks and issuance costs associated with mortgages than tax-exempt bonds. Using Heckman selection models, I find that when nonprofits have diversified revenue streams or reliable major income sources that can generate income sufficient to pay off debt regardless of financial shocks, they

increase the use of mortgages with low default risks and issuance costs (supportive of STT), but decrease the use of tax-exempt bonds (supportive of POT)

This work makes three theoretical and empirical contributions to literature. First, this paper is the first to explore whether the applicability of the pecking order theory (POT) and static trade-off theory (STT) differs across debt instruments. It enhances scholarly understanding of the POT and STT by suggesting that the differing default risks and upfront issuance costs of each debt instrument can influence the relevance of capital structure theories based on the type of debt. Specifically, when nonprofits possess stable financial resources that either improve their capacity to repay debt or finance capital projects directly, they tend to increase their use of mortgages, which offer greater repayment flexibility and lower default and issuance costs, and reduce their reliance on bonds that carry higher default risks and insurance costs.

My finding in this paper first validates Calabrese (2011)'s modified pecking order theory that nonprofits exhibit risk aversion towards using debt instruments for capital projects, as evidenced by the negative correlations between profitability and both mortgage and bond ratios in my study. However, nonprofits still use debt to finance capital projects. Nonprofits do not want to deplete their internal funds to finance capital projects before turning to external debt, which contradicts the traditional pecking order theory (Calabrese, 2011). The reason is that the cost of using up all internal funds to finance capital projects is too high, and nonprofits need to keep some reserves either as a rainy-day fund or for future programming and investment (Calabrese, 2011; Charles et al, 2021, Myers, 1984).

Extending Calabrese (2011)'s argument, I further contend that nonprofits prefer to use mortgages rather than tax-exempt bonds when they seek external debt to finance capital projects, due to the higher default risks and issuance costs associated with tax-exempt bonds than

mortgages (Bolton & Freixas, 2000; de Haan & Hinloopen, 2003; Emery & Cantor, 2005). That explains why the positive associations between financial conditions like revenue diversification and sources of income with the mortgage ratio, and their negative association with the bond ratio. The reason could be that the enhanced debt payment capacity brought by diversified revenue and reliable sources of income may not sufficiently enough to offset the high issuance costs and default risks associated with bonds. In practice, many capital projects are financed through a combination of internal funds and external debt instruments (Calabrese, 2011; Yetman, 2007). This approach supports the argument that nonprofits aim for a specific leverage target to minimize financial distress and default risk without exhausting all internal funds on capital projects.

Second, this study is among the first to investigate what drives the use of insider loans in the nonprofit sector. While previous research acknowledges insider borrowing as a vital funding avenue for small nonprofits without access to traditional financial debt (Smith, 2010; Yetman, 2007), the factors influencing this choice remain unexplored. However, my findings also do not conclusively support either POT or STT in the context of nonprofits' insider loans. This may be because such loans are provided based on the lender's support for the nonprofit's mission, with less concern for the nonprofit's financial ability to repay. As such, the default risk and costs of financial distress for insider loans could be negligible compared to other debt instruments. Thus, POT and STT, which focus on the cost-benefit tradeoff of using debt, may not effectively explain nonprofits' use of insider loans for asset financing. This reasoning might explain why most financial conditions examined in this study do not show statistically significant correlations with the use of insider loans.

Moreover, insider loans might serve as a last resort for nonprofits who do not have access to financial markets but are in need of capital (Smith, 2010, Yetman, 2006; Young, 2017). As nonprofits enhance their debt repayment abilities, through means such as offering collateral or diversifying revenue sources, their reliance on insider loans decreases. This trend is evidenced by the negative correlation between revenue diversification, fixed assets ratio, and insider loan usage for capital funding. Nonetheless, further research is required to identify what other factors, possibly non-financial factors, that may influence the use of insider loans by nonprofits.

Additionally, this paper provides insights to nonprofit managers and policymakers. First, nonprofits should not overemphasize the default risks and financial costs associated with debt and miss the chance of achieving programmatic growth. Medium-sized nonprofits with a stable source of income and a sufficient amount of fixed assets and endowments can manage the risks of using mortgages and then enjoy the benefit of supporting the organization's programmatic growth to meet the increasing needs of their beneficiaries.

Second, the significant default risks and high issuance costs associated with tax-exempt bonds may deter nonprofits from utilizing this attractive low-interest option, thereby limiting their ability to expand services in a cost-effective manner. States like Texas and Colorado have introduced credit enhancement programs for nonprofit charter schools' bond issues, which alleviate interest and issuance costs by guaranteeing payments to bondholders in case of default (Griffin et al., 2020; Temkin et al., 2008). Risk premiums constitute a major portion of issuance costs, as financial agencies need to compensate for risks undertaken, such as covering defaults for insurance companies and ensuring bonds attract sufficient investors for underwriters (Denison, 2001; Nanda & Singh, 2004; Raineri et al., 2012). Therefore, extending such programs

to a broader range of public-serving nonprofits could reduce tax-exempt bond borrowing costs by decreasing default risk, thus encouraging their use.

Finally, this paper has limitations. This paper primarily concentrates on the impact of nonprofits' financial conditions on their usage of funding sources, such as retained earnings, mortgages, and bonds, for capital projects. Yet, the availability of these funding sources is also influenced by lenders' willingness to provide loans. For example, the not-for-profit status of these organizations may make banks and bond investors hesitant to offer capital (Yetman, 2006; Young, 2017). Future research should further examine the factors that affect the supply and availability of debt instruments to nonprofits and, consequently, their capital structure.

## Notes

1. A nonprofit's capital structure and financing decision can be described using the equation as shown below:

$$\text{Assets} = \text{Liabilities} + \text{Net Assets}$$

Assets—such as land, property, and working capital—need to be financed either through borrowing (liabilities) or through accumulated savings (net assets).

2. Finally, 23% of observations (87,125 observations) report zero short-term liability. Short-term liability serves as a denominator for the liquidity measure; therefore, it will lead to undefined values of liquidity. Thus, I replace the zero-dollar amount of short-term liability as one dollar when calculating the liquidity.
3. Considering there are 4% of nonprofits do not report their age, I use the multiple imputation technique and all dependent and independent variables from my analysis model (see equation 2) to impute age values for these nonprofits (Schwartz-Soicher, 2017).
4. I recognize that state-level policy of municipal bond issuance may also affect nonprofits' likelihood of using bonds and the amount of bond used. However, the two-step Heckman selection models fail to converge after adding state-fixed effects.
5. I conducted robustness checks using the Coarsened Exact Matching method to mitigate selection bias and analyze the financial factors influencing the usage of insider loans, mortgages, and tax-exempt bonds. The findings largely support my hypotheses but with less statistically significant results, due to the much smaller size of matched samples. Detailed results are provided as part of my appendix.

## **Chapter 4: Is Financial Leanness Punished by Credit Rating Agencies: The Impacts of Financial Conditions on Nonprofit Tax-Exempt Bond Ratings**

### **Abstract**

The number of nonprofits, including charter schools and museums, seeking funding for capital projects through bond markets has surged in recent decades. Despite this, nonprofit borrowers experience difficulty in securing strong credit ratings compared to municipal borrowers, resulting in higher borrowing costs (Calabrese & Ely, 2016). This study investigates the impact of nonprofit financial condition on bond credit ratings. This is accomplished by constructing a novel dataset of nonprofit credit ratings linked to bond issuance data reported in the IRS Form 990 schedule K. Ordered probit regression with the Heckman selection correction reveal that nonprofits' tendency towards financial leanness contributes to low bond crediting ratings. Specifically, minimized profits, operating revenue, and cash flows, combined with over-dependence on donations and program revenue lead to weaker credit ratings. This result challenges the conventional wisdom of maintaining financially lean nonprofits by demonstrating that it has a negative impact on credit ratings which increases borrowing costs, thereby inhibiting the ability of nonprofits to expand programs and scale up their mission impact.

*Keywords:* bond ratings, information asymmetry, default risk

## 4.1 Introduction

Nonprofits with significant capital requirements, such as human service providers, housing organizations, charter schools, and museums, increasingly turn to the tax-exempt bond market (Calabrese & Ely, 2016). This approach supports their capital funding needs for program expansion to meet the increasing need for their services. Currently, outstanding tax-exempt bond liabilities surpass \$150 billion, representing about 44 percent of the total liabilities in the nonprofit sector.

However, this trend of leveraging debt, particularly tax-exempt bonds, for capital projects challenges the conventional wisdom that nonprofits should avoid debt (Mitchell, 2017; Mitchell & Calabrese, 2019). Conventional norms suggest that maintaining a debt-free position signals trustworthiness to donors, government agencies, and other funders (Hansmann, 1980; Young, 2017). These funders usually prefer their contributions to support current programs instead of settling past liabilities. Nevertheless, recent literature proposes that using municipal bonds for capital projects can be an efficient, quick way to raise the necessary capital (Calabrese, 2020; Yetman, 2007; Smith, 2010). Many nonprofits choose to fund capital projects through debt, considering the considerable commitment of time and human capital and uneven returns related to capital campaigns (Lam et al., 2020; Yetman, 2006). Furthermore, numerous nonprofits lack a sufficient pool of donors to finance capital projects.

Access to low-interest tax-exempt bonds can also help nonprofits ease financial burdens and default risks associated with borrowing (Ely & Calabrese, 2017; Yetman, 2006). Nonprofits can further reduce interest costs by obtaining favorable bond credit ratings (Johnson & Kriz, 2005; Liu & Thakor, 1984). Therefore, using debt is not inherently advantageous or detrimental for nonprofits (Mitchell & Calabrese, 2019, p.655).

For bond borrowers, particularly infrequent borrowers, bond ratings can significantly reduce interest costs (Spreen & Gerrish, 2022). These ratings act as informational signals about the credit quality of unknown borrowers to investors (Guzman & Moldogaziev, 2012; Park et al., 2020). Trusted by investors, these ratings are awarded by independent credit rating agencies (CRAs) and reflect the borrower's financial conditions, performance, and potential default risks (Serna, 2013).

Nonprofits, however, may face difficulties in securing favorable credit ratings compared to government borrowers. Ely and Calabrese (2017) reported that merely 61 percent of rated nonprofit bonds attained AA or AAA ratings, contrasting with 88 percent of rated government municipal bonds. This disparity underscores perceived inadequacies in financial health among many nonprofit borrowers for future debt repayments. Previous studies have not explored why nonprofits are more likely to receive lower credit ratings than other tax-exempt borrowers. Earlier studies on nonprofit bonds have primarily focused on the impact of bond attributes on bond issuance costs and the decision to use bond ratings due to the lack of data linking nonprofit borrowers to bond issues (Gaver et al., 2016; Ely & Calabrese, 2017). I addressed this gap by web-scraping 86,000 Internal Revenue Service Form 990 Schedule K forms, which report nonprofit tax-exempt bond usage from 2009 to 2016, providing a link between the financial conditions of nonprofit bond borrowers and bond attributes for the first time.

I use these data to investigate how organizational financial condition influences bond credit ratings with the goal of understanding why nonprofits often receive low bond ratings. Based on the nonprofit borrowing literature, I define several financial condition variables, including profitability, liquidity, operating revenue, sources of income, diversified revenue

streams, and fixed assets. These variables reflect nonprofits' default risk and revenue accumulation capacity for debt repayments (Bowman, 2002; Calabrese, 2011; Calabrese & Ely, 2016; Smith, 2012). I hypothesize these characteristics significantly impact a nonprofit's chances of receiving a higher bond rating. To evaluate my hypotheses, I use an ordered probit regression with Heckman sample selection correction to address potential self-selection bias associated with purchasing bond ratings. My findings suggest that while financial leanness, achieved by minimizing profits, revenue, and cash flows, is a common finance practice for nonprofits to gain funders' trustworthiness (Mitchell, 2017; Mitchell & Calabrese, 2022), it negatively affects nonprofits' creditworthiness, contributing to low bond credit ratings. This paper challenges the conventional wisdom of maintaining financially lean nonprofits by illustrating its unintended consequence for nonprofit bond borrowers. Specifically, that it restricts nonprofits' access to low-interest capital by negatively affecting their bond credit ratings. This subsequently impedes their capacity to expand programs efficiently to meet the growing needs of beneficiaries.

## **4.2 Literature Review**

### **4.2.1 Why do Bond Ratings Matter for Nonprofit Borrowers?**

Information asymmetry is a well-recognized challenge in tax-exempt bond markets. Borrowers and investors do not equally share information, leading to doubts about borrowers' true creditworthiness (Daniels et al., 2010; Peng & Brucato, 2004; Connelly et al., 2011). This discrepancy in information can be more pronounced between nonprofit borrowers and investors than their government counterparts, largely due to specific characteristics of nonprofit organizations.

First, aside from universities and hospitals, other nonprofits, such as human service organizations, charter schools, and museums, which constitute 40 percent of the nonprofit bond

issues, do not borrow frequently. Consequently, they are unable to self-validate their creditworthiness via repeated market transactions (Greer & Denison, 2014; Peng & Brucato, 2004). Borrowers, including nonprofits, might withhold unfavorable information that could deter investors, a fact well acknowledged by investors (Stiglitz, 2002). Therefore, investors prefer bonds issued by frequent borrowers, as their creditworthiness has been established over time (Capeci, 1991; Peng & Brucato, 2004).

Second, many investors are unfamiliar with the nonprofits' revenue sources and find it harder to ascertain the payment certainty of these revenues. First, compared to government obligation bonds backed up by tax revenue, nonprofit bonds are financed by non-tax revenue which can be volatile (Butler, 2008; Ely et al., 2013). Furthermore, even compared to governments' revenue bonds backed up by fees – such as bonds for utilities and toll roads - nonprofit bonds are more likely to be backed up by volatile project revenue that is also novel to investors, such as a social service nonprofit's program revenue and a museum's admission revenue (Guzman & Moldogaziev, 2012; Zhao & Guo, 2011). Furthermore, individual investors often lack the necessary expertise, time, and resources to thoroughly evaluate borrowers' financial data for accurate credit assessment (Greer & Denison, 2014; Peng & Brucato, 2004). Consequently, they demand higher risk premiums, usually reflected as high-interest rates, to offset the potential unknown credit risks of nonprofit bonds (Park et al., 2017).

Third, nonprofits, unlike governments, depend on external funders and may seek multiple external income sources for debt repayment, such as donations from capital campaigns, government funding, and program revenue (Denison, 2009; Rosen & Sappington, 2016; Yan et al., 2009). This leads to potentially fluctuating and volatile revenue streams and increases financial uncertainty. Consequently, assessing a nonprofit's ability to fulfill multi-million

financial commitments spanning 20 to 30 years can be challenging for investors. Compared to government tax revenue, nonprofits' revenue streams may not adequately buffer financial shocks to guarantee debt repayment (Bowman, 2011; Chang & Tuckman, 1994). For example, donations and government grants are affected by many external factors, such as the economic cycle and government budget cuts (Tuckman & Chang, 1991).

Therefore, bond borrowers that lack credit records and well-known stable revenue streams that are favored by investors need another channel to signal their creditworthiness to differentiate themselves from borrowers with unknown credit risk. Otherwise, they face high interest rates regardless of their actual default risk (Peng & Brucato, 2004; Serna, 2013). Here, bond credit ratings come into play as they incorporate complex financial information about a bond issue and its borrower into a simplified rating scale to signal a borrower's creditworthiness to investors (Chen et al., 2016; Liu et al., 1999). Unlike investors, CRAs are third-party information intermediaries who have the capacity to analyze complex information to assess a borrower's default risk effectively before issuing bond ratings.

#### **4.2.2 Does Nonprofit Financial Condition affect Credit Ratings?**

CRAs assign bond rating grades based on their assessments of the organization's default risk and the ability to produce income sufficient to pay back debt on time and in full (Capeci, 1991; Johnson & Kriz, 2005). Consequently, in the government bond literature, most factors scholars contend will affect bond ratings are factors related to the tax base, fiscal institution & management, and government finance, since these factors can reflect governments' ability to raise, accumulate and spend tax revenue on debt payment (Chen et al., 2016).

First, research indicates that economic factors like tax burden, total tax rate, unemployment rate, population, and median household income, which relate to a local

government's capacity to raise tax revenue, influence bond ratings (Greer, 2016; Palumbo & Zaporowski, 2012). However, these factors do not apply to nonprofit bond ratings. Unlike governmental borrowers, nonprofits lack the authority to levy taxes and cannot utilize tax revenue for debt repayment. Similarly, fiscal institution and management factors, such as debt and spending limits in the budget and balance budget requirements, which capture a government's spending and debt capacity, do not apply to nonprofits (Greer & Denison, 2014; Johnson & Kriz, 2005).

Research also suggests that governmental financial condition, such as outstanding debt, general fund balance, surplus fund balance, the percentage of revenue from local sources, and total operating revenue, impact government bond ratings (Denison et al., 2007; Grizzle 2010; Zhao & Guo 2011). These factors represent governments' capacity to assume additional debt or accumulate revenue for debt payments, influencing bond ratings. In this paper, I extend this analysis to nonprofits to test whether organizational financial condition affects bond ratings by similarly indicating default risks and repayment capabilities.

Nonprofit finance literature identifies various organizational financial conditions, including profitability, revenue diversification, income sources, liquidity, operating margin, fixed assets, and endowment size, which represent low default risk through collateral pledging or signal stable revenue-generating capacity for debt repayment (Calabrese, 2011; Smith, 2012). For instance, research indicates that increased fixed asset size leads to higher debt usage, as these assets can serve as collateral, reducing default risk (Garcia-Rodriguez & Jegers, 2017; Jegers & Verschueren, 2006; McCue & Ozcan, 1992). Nonprofits' income sources can also affect debt payment abilities. For instance, reliance on donations negatively correlates with debt usage due to the volatility of donations, which cannot guarantee debt repayment in fiscal shocks (Jegers,

2018; Yetman, 2006; Young, 2007). Additionally, diversified revenue streams can facilitate debt usage by reducing revenue volatility, enhancing debt payment capabilities despite external shocks (Carroll & Stater, 2009; Yan et al., 2009).

Given that nonprofit financial condition can reflect debt payment capacity and indicate default risks, credit rating agencies (CRAs) should evaluate these factors before assigning ratings. CRAs' methodologies confirm their consideration of organizational financial conditions when assessing nonprofit creditworthiness (Fitch Ratings, 2021; Moody's Investor Services, 2016, 2018a, 2018b, 2021; S&P Global Ratings, 2021a, 2021b, 2021c). This paper's analysis also considers whether bond ratings issued by CRAs reflect the organizational financial condition outlined in their rating methodologies, and if these conditions' correlation with bond ratings aligns with expectations from nonprofit literature.

### **4.3 Hypotheses**

In this section, I propose seven financial factors that affect nonprofit credit ratings.

#### **4.3.1 Operating Revenue and Operating Margin**

Operating revenue and operating margin are indicators of an organization's ability to accumulate revenue and financial surplus (Guo & Zhao, 2011, Park et al., 2020). Both are expected to increase the likelihood of obtaining high bond credit ratings. First, scholars posit that CRAs consider a government bond borrower's revenue-generating capacity when assigning bond ratings (Caplan, 2016; Wagner, 2004). The argument holds for nonprofit borrowers as CRAs also examine their revenue-generating abilities for debt repayment. Second, operating margin, a measure of financial vulnerability, can indicate an organization's readiness to absorb financial shocks (Greenlee and Trussel 2000). Based on my analysis, the average years to maturity for nonprofit bonds is 25 years, CRAs need to ensure nonprofits can pay off debt regardless of

financial shocks. High operating margin means more surplus for debt service payments even during financial shocks. Finally, these two factors are used by CRAs in assessing nonprofit borrowers' financial health.

H1: As operating margin increases, a nonprofit's likelihood of a high credit rating increases.

H2: As operating revenue increases, a nonprofit's likelihood of a high credit rating increases.

### **4.3.2 Profitability**

Profitability, or return on assets, captures a nonprofit's ability to accumulate retained earnings and influences nonprofit leverage (Bacon, 1992; Szymańska et al., 2015; Wedig et al., 1996). A profitable nonprofit is more capable of repaying debts, reducing default risk (Calabrese, 2011a; Rosen & Sappington, 2016; Smith, 2010, 2012). Since the default risk is a major factor that determines bond ratings, higher profitability should lead to higher ratings (Akins, 2018; Nanda & Singh, 2004; Peng & Brucato, 2004).

H3: As profitability increases, a nonprofit's likelihood of a high credit rating increases.

### **4.3.3 Debt Load**

The public finance literature suggests a negative correlation between debt load and the likelihood of a high government bond rating (Capeci, 1991; Greer, 2016; Jimenez, 2011). CRAs perceive that high debt loads lead to a decreased ability to repay new bonds, leading to a lower credit rating (Grizzle, 2010; Krueger and Walker 2008). This hypothesis is empirically supported in several prior studies (Jimenez, 2011; Park et al., 2020; Zhao & Guo, 2011). I posit that a high debt load also negatively impacts a nonprofit's chances of earning a high bond rating. Mirroring CRA rating methodology and the prior literature, I use debt burden to capture debt load in my paper (Denison et al., 2007; Zhao & Guo, 2011).

H4: As debt burden increases, a nonprofit's likelihood of a high credit rating decreases.

#### **4.3.4 Revenue Diversification**

The degree of revenue diversification is also commonly used to measure nonprofits' default risk in the nonprofit finance literature (Calabrese & Ely, 2016; Yan et al., 2009b). Although no study examines the relationship between revenue diversification and nonprofit bond ratings, many studies test the relationship between revenue diversification and nonprofit leverage (Calabrese, 2011). On the one hand, a diversified revenue stream may reduce the financial volatility that nonprofits face and enhance nonprofits' ability to make debt payments, leading nonprofits to borrow more (Carroll & Stater, 2009). On the other hand, revenue concentration may strengthen a nonprofit's financial capacity by generating strong growth in total revenue, which also reduces default risk and encourages additional borrowing (Chikoto & Neely, 2014; Frumkin & Keating, 2011). Prior empirical studies support both arguments (Calabrese, 2011; Calabrese & Ely, 2016; Yan et al., 2009).

Because of the mixed evidence, I argue that either diversified or concentrated revenue streams may improve bond ratings. Consequently, I do not hypothesize a specific direction for the relationship between revenue diversification and ratings. The direction of the relationship between revenue diversification and bond ratings depends on whether revenue diversification or concentration is perceived as reducing default risk.

#### **4.3.5 Reliance on program service revenue and donations**

Previous studies argue that program revenue is a predictable and stable source of revenue, which can guarantee debt repayments from nonprofits and then reduce the default risk associated with debt usage (Froelich, 1999; Gronbjerg, 1991; Rosen & Sappington, 2016). Consequently, reliance on program service revenue should positively affect the bond rating, due to the low default risk brought by program revenue.

By contrast, reliance on donations should be negatively associated with the likelihood of receiving a high bond rating, due to the high revenue volatility and low ability to guarantee debt repayment (Denison et al., 2014; Yan et al., 2009; Tuckman & Chang, 1991). Specifically, donations are a volatile revenue source that cannot withstand fiscal shocks well, since donors reduce donations during an economic downturn (Gronbjerg, 1991; Green et al., 2021; Mayer et al., 2014). In addition, donors can restrict the use of donations, preventing nonprofits from using donations to pay off debt (Bowman, 2002; Calabrese, 2011a; Rosen & Sappington, 2016).

H5: As reliance on program revenue increases, a nonprofit's likelihood of a high credit rating increases.

H6: As reliance on donation increases, a nonprofit's likelihood of a high credit rating decreases.

#### **4.3.6 Liquidity**

Liquidity captures whether nonprofits have sufficient cash and other liquid assets to cover their current liability. Again, no studies have directly examined the relationship between liquidity and bond ratings. However, based on the literature on nonprofit borrowing, nonprofits increase the use of debt to finance capital projects once they have more liquid assets that can guarantee debt repayments (Smith, 2010, 2012). Similarly, if liquidity is a valid proxy for nonprofits' ability to generate cash sufficient to pay off debt, liquidity should also affect bond ratings positively by indicating nonprofits' capacity to pay off debt. Liquidity is also one of the dimensions that rating agencies consider when assigning ratings.

H7: As liquidity increases, a nonprofit's likelihood of a high credit rating increases.

### **4.3.7 Fixed Assets and Endowment**

A nonprofit with either fixed assets or an endowment can reduce default risk, as they can serve as collateral for debt (Bowman, 2011; Smith, 2010). Even in the case of permanently restricted endowments that cannot be used as collateral, investment income from these endowments can help release other assets to serve as collateral that otherwise would not be available (Garcia-Rodriguez & Jegers, 2017; Wedig et al., 1988).

Due to the reduced default risk brought by fixed assets and an endowment, I also propose nonprofits are more likely to receive high bond ratings as the percentage of fixed assets or the endowment relative to total assets increases. The reason is, again, that default risk is the primary factor determining whether a CRA assigns high bond ratings to nonprofits (Akins, 2018; Nanda & Singh, 2004; Peng & Brucato, 2004).

H8: As fixed assets increase, a nonprofit's likelihood of a high credit rating increases.

H9: As endowment increases, a nonprofit's likelihood of a high credit rating increases.

## **4.4. Data & Methods**

### **4.4.1 Sample Selection**

To the hypotheses above, I assembled a unique data set, linking financial attributes of nonprofit borrowers, bond-level attributes, and demographic characteristics of the county where each nonprofit is located. Data was obtained from the e-file Form 990 database, the Form 990 Schedule K, Securities Data Company (SDC) platinum, the Bloomberg terminal, and the American Community Survey (ACS). The Form 990 is required by the IRS for tax-exempt organizations with gross receipts of \$200,000 or more. The Schedule K is a supplemental tax-return form that nonprofits have to file along with their Form 990 to report information regarding bond issues if they have outstanding liabilities associated with tax-exempt bond issues. I scraped

all 86,000 Schedule K forms of nonprofit tax-exempt bond usage filed between 2009 to 2016 via Amazon Web Services. SDC Platinum and Bloomberg datasets offer data on characteristics of each issued municipal bond in the U.S., such as principal amount, bond credit ratings, methods of sale, and bond insurance status. Demographic information at the county level is obtained from ACS data.

The initial data set comprised 28,719 outstanding bonds reported in Schedule K forms from 2009 to 2016. Since nonprofits report all outstanding bonds in their forms, most of the bonds were issued before 2009. Given that financial information from e-filed 990 and Schedule K forms is available from 2009 onwards, bonds issued before 2009 and after 2016 were removed. Other exclusions included bonds with blank or incorrect CUSIP numbers (unique bond identification numbers), bonds reporting only short-term ratings from CRAs, and bonds lacking the lagged organizational financial characteristics necessary to generate independent variables. Finally, I only keep one CUSIP for each serial bond. A serial bond is a bond issue that is structured so that only a portion of the outstanding bond issue matures at a certain time until all portions of the bond have matured. Although a serial bond includes multiple CUSIPs, these CUSIPs belong to one bond issue and only have one rating.

Approximately 34 percent of the bonds in the final data set have more than one credit rating. Given that bond credit ratings are dependent variables, the data set retains all ratings for each bond issue. I test for potential bias introduced by redundant observations by running robustness checks using sub-samples of bonds from the same rating agency. The final dataset consists of 1,127 observations from 752 unique bond issues issued by 494 nonprofits between 2009 and 2016. Table 4.1 provides a summary of the sample selection strategies and data cleaning process.

#### **4.4.2 Dependent Variable**

The dependent variable used is an ordinal rating ranging from 1 (highest rating) to 11 (lowest rating), representative of credit ratings such as AAA, AA+, ..., BBB-, and below BBB- if S&P or Fitch long-term ratings are used by nonprofits, as stated in previous studies (Guo & Zhao, 2011; Johnson & Kriz, 2005). For Moody's long-term ratings, the scale represents ratings from Aaa, Aa1, ..., Baa3, and below Baa3. A separate binary variable indicates whether the nonprofit purchased a bond rating as the dependent variable for the first stage of the Heckman selection model.

#### **4.4.3 Independent Variable**

From existing literature and CRAs' rating methodology, nine financial conditions impacting bond credit ratings are identified: operating margin, operating revenue, profitability, revenue diversification index, revenue structure, fixed assets, endowments, debt load, and liquidity. CRAs reported their formulas to assess many of these financial conditions in their rating methodologies. I adopt CRAs' formulas when available. If measurements for a financial condition differ among CRAs, I select the most frequent measure that can be calculated using my data. I summarize common financial dimensions (i.e., operating performance, liquidity, scale, and debt load) that CRAs examine across nonprofit sectors and my method for preparing these measures for this study in the appendix.

Profitability is typically calculated as return on assets (change in unrestricted net assets/total assets) in the literature, which reflects nonprofits' accumulation of retained earnings (Calabrese, 2011; Wedig et al., 1996; Yan et al., 2009). Despite it not being used in CRA rating methodologies, profitability is included in this model as it is commonly used as an indicator for debt capacity in nonprofit borrowing literature.

Liquidity is captured by log-transformed days of cash on hand, a measure widely adopted by rating agencies. This variable reflects the number of days a nonprofit can cover its operating expenses with its current cash and cash equivalents (Prentice, 2016). The formula for preparing this variable is reported in Table 2.

According to CRA rating methodologies, operating margin is constructed as the proportion of net operating income to total operating revenue. Debt burden is constructed as the ratio of annual debt service to total revenue, measuring whether nonprofits have sufficient revenue to cover debt payments. The annual debt service is imputed by calculating the difference between the current and prior year's liabilities. Total operating revenue is log-transformed to reduce skewness.

I employ a Hirschman-Herfindahl Index (HHI), defined below in Equation 1, to capture revenue diversification (Calabrese & Ely, 2016; Yan et al., 2009). The formula incorporates four major types of revenue sources: contribution, program service revenue, investment income, and other revenue - with higher values indicating greater revenue diversification.

$$RD = \frac{1 - \sum_{i=1}^4 R_i^2}{0.75} \quad (1)$$

To understand the effect of revenue structure on debt instrument ratios, the proportions of total revenues from program revenue and private contributions are used. Due to high correlation between program service revenue and government grants in my dataset, reliance on government grants is not included in my regression.

Endowments are quantified as the ratio of true endowments (permanently restricted net assets) to total assets, as per Calabrese (2011) and Lam et al. (2020). Fixed assets are captured as

the ratio of assets of land, buildings, and equipment to total assets (Bowman, 2002; Garcia-Rodriguez & Jegers, 2017).

#### **4.4.4 Control Variables**

Demographic characteristics of the county could affect demand for nonprofit services. For instance, employed people with disposable income attend theaters and museums more, which increases these nonprofits' admission revenue for debt payment (Woronkowicz et al., 2012). I therefore include the county unemployment rate and population size as covariates in the regression model (Park et al., 2020; Woronkowicz et al., 2012; Zhao & Guo, 2011).

Bond attributes and the borrower's credit history, like the par value of the bond, years to maturity, number of previously issued bonds, indicators of rating agencies, and indicators of credit enhancement, are included in the regression model mirroring the prior research (Denison et al., 2007; Ely et al., 2013; Greer, 2016; Morgan, 2002).

Whether CRAs are familiar with certain types of nonprofits and their credit history and revenue streams may also affect the ratings nonprofits receive. Therefore, nonprofits are categorized into seven major subfields according to bond usage frequency: 1) hospitals, 2) other health nonprofits, 3) universities, 4) charter schools, 5) other education nonprofits, 6) housing-related nonprofits, 7) other nonprofits.

A nonprofit's board effectiveness, internal controls, financial reporting, and transparency are qualitatively assessed by CRAs when assigning ratings. Hence, the model incorporates control variables such as the number of independent voting board members, accounting methods, and whistleblowing and conflict of interest policies. However, the lack of variation in accounting methods and conflict of interest policy lead the Heckman selection model to fail to converge. Therefore, only the number of independent board members and the binary indicator of

whistleblower policy are included in my model. All continuous variables are winsorized at 1 percent and 99 percent to minimize impact of extreme outliers.

#### **4.4.5 Methods**

I use an ordered probit model to test how financial factors determine nonprofit bond rating scales (Greer, 2016; Guo & Zhao, 2011; Park et al., 2020) since the bond rating is an ordinal dependent variable consisting of ordered categories, ranging from AAA (highest) to below BBB (lowest).

Since nonprofit bond borrowers may optionally purchase bond credit ratings, those that do may systematically differ from nonprofits do not. If this is the case, bond ratings will differ along unobservable dimensions that affect both nonprofit bond borrowers' probability to purchase bond ratings (the selection equation) and the bond ratings that nonprofits obtain (the outcome equation), leading to selection bias (Cameron & Trivedi, 2010; Charles et al., 2020; Greene, 2012). Selection bias leads to inconsistent estimates of coefficients on variables in the outcome equation, since the error term in the outcome equation will not have a mean of zero and is correlated with explanatory variables in the outcome equation (Charles et al., 2020; Greene, 2012; Wooldridge, 2010).

Although the prior literature acknowledges this selection bias, few studies directly address it (Ely et al., 2013; Greer, 2016). To my knowledge, only Gaver et al. (2016) uses a two-step Heckman selection model to address the selection bias related to the decision to purchase bond ratings when examining the effect of bond ratings on donations.

Following Gaver et al. (2016), I use the order probit model with Heckman correction to address the potential self-selection bias and to examine financial determinants of nonprofit bond borrowers' probability of getting each rating. The Heckman selection model allows unmeasured

variables to impact both the selection and outcome equations. The Heckman selection equations are presented in Equation (2) and Equation (3). The  $i$  in the equations represents a bond issue  $i$ , the  $s$  in the equations represents a subfield  $s$ , and the  $b$  in the equations represents the bond borrower  $b$  that issues the bond in the sample.

$$p_i = \alpha + \overline{R}_b' \beta + \overline{C}_i' \gamma + \mu_s + b_i + \varepsilon_i \quad (2)$$

$$y_i = \alpha + \overline{R}_b' \beta + \overline{X}_b' \gamma + \mu_s + \gamma_i + l_b + imr_i + \varepsilon_i \quad (3)$$

Using a probit model (Equation 2), the first stage of the Heckman model estimates factors that influence nonprofits' self-selection into purchasing bonds.  $p_i$  is a binary variable of whether the bond issue  $i$  has a credit rating. Gaver et al. (2016) and Hsueh & Liu (1993) argue that a borrower only buys a bond rating when it believes it can meet and exceed the rating criteria for an investment grade rating (above BB/Ba). If this argument holds for nonprofits, all of the financial condition variables that affect bond ratings will also affect a nonprofit's decision to purchase ratings.  $\overline{R}_b$  is the vector of the average explanatory variables over the year  $t-1$ ,  $t-2$ , and  $t-3$ . My explanatory variables comprise operating margin, log-transformed operating revenue, debt burden ratio, log-transformed days cash on hand, profitability, revenue diversification index, the degree of reliance on donations, the degree of reliance on program revenue, fixed assets, and endowment as a share of total assets. I average each explanatory variable over the past three years because a CRA may assess the nonprofit's financial conditions over the past few years before granting a rating.  $\overline{C}_i$  is the vector of the mean control variables over the year  $t-1$ ,  $t-2$  and  $t-3$ . Control variables include log-transformed par value of the bond,

years to maturity, and the number of bonds issued before the current issue.  $\mu_s$  is the vector of variables of the nonprofit subfields.  $b_i$  is a vector of three binary indicators. The first captures whether a credit enhancement backs up the bond, the second indicates whether the bond is issued by multiple nonprofits (i.e., pooled bonds), and the last captures whether the bond is issued for the refunding purpose.  $\varepsilon_i$  is the model's error term.

To ensure accurate coefficient estimates in the second-stage Heckman model, the model uses the bond buyer index for revenue bonds to satisfy the exclusion restriction requirement (Sartori, 2003; Wooldridge, 2010). The exclusion restriction requires at least one variable in the Heckman model to affect only the probability of purchasing a bond rating, but not the bond rating itself (Greene, 2012; Sartori, 2003). This variable is used to calculate the inverse mills ratio (imr) and not as an instrumental variable to capture exogenous variation in the explanatory variable. Thus, it needs not to satisfy other instrumental variable assumptions (e.g., instrument strength) (Guo & Fraser, 2014; Wolfolds & Siegel, 2009). I chose the bond buyer index for revenue bonds to meet the exclusion restriction. The bond buyer index captures the weekly average of market interest rates using revenue bonds with a maturity of 30 years. When the market interest rates increase, nonprofit bond borrowers may be more likely to purchase bond ratings to reduce interest costs by signaling the credit quality to investors. By contrast, according to CRA rating methodologies, the bond buyer index is not a criterion they consider when rating bonds. Therefore, the bond buyer index does not directly affect the bond credit rating. I calculate the measure of the bond buyer index as the mean of the bond buyer index over the past six months prior to the bond issue date. The reason is that I do not have information about when a nonprofit decides to purchase a bond rating or the exact bond buyer index that the nonprofit checks prior to the bond issue date.

The second stage of the Heckman model (Equation 3) estimates the financial determinants of bond credit ratings.  $y_i$  is the S&P, Fitch, or Moody's long-term bond credit ratings for a bond issue  $i$  that is issued in year  $t$ .  $\overline{R}_b$  is the same average explanatory variables as discussed above.  $\overline{X}_b$  is the vector of the mean control variables over the year  $t-1$ ,  $t-2$  and  $t-3$ . I control for the log-transformed number of independent voting board members in the nonprofit, the number of bonds that the nonprofit has previously issued, the unemployment rate, and the population of the county that the nonprofit locates in.  $\mu_s$  is the vector of variables indicating each nonprofit's subfield.  $\gamma_i$  is a vector of three categorical variables, including a categorical variable indicating which CRA granted the rating, a binary indicator of whether a credit enhancement backs up the bond, and a binary indicator of the bond's refunding status.  $l_b$  is a binary indicator of the presence of a whistleblower policy within the nonprofit.  $imr_i$  is the Inverse mills ratio, which controls for the conditional probability of purchasing a bond rating in the outcome equation.  $\varepsilon_i$  is an error term. For bonds issued by multiple nonprofits together, I calculate the weighted average of explanatory and control variables for each nonprofit bond borrower. The weight is based on the size of total assets each bond borrower owns as a share of total assets of all bond borrowers issuing the pooled bond together. Pooled bonds account for only 3 percent of total bond issues in my data set. As a robustness check, I also run the models using three subsamples of bonds that contain only ratings from each of the three CRAs.

#### 4.5 Results

Table 4.3 presents two models: the ordered probit model with the Heckman correction and a baseline ordered probit model. Notable differences are seen between these two in terms of the significance levels and magnitudes of variable coefficients. In addition, the rho coefficients that measure the correlation between the error terms of selection equations and outcome

equations is not 0, indicating selection bias. Thus, the Heckman selection model is the appropriate choice for this analysis. In addition, the average bond buyer index for revenue bonds in the previous six months has a statistically significant association with the propensity to purchase bond ratings. This indicates that the index fulfills the exclusion restriction requirement. Finally, for clarification, because my dependent variable is an ordinal dependent variable with values ranging from 1 (highest rating) to 11 (lowest rating), a negative relationship between any of my independent variables and the outcome variable in Table 4.3 indicates the independent variable can lead to a better rating. By contrast, a positive relationship between the independent and outcome variables suggests the independent variable leads to a lower rating.

Table 4.3 reveals positive associations between variables, such as log-transformed operating revenue, log-transformed days cash on hand, profitability, and revenue diversification index, and the probability of a higher rating. All of these are statistically significant at 95 or 99 percent confidence level. These variables, which indicate the nonprofit's financial capacity to generate cash and earnings sufficient to pay off debt on time, and consequently lower default risk, lead to higher ratings. Although credit rating agencies (CRAs) value high profits, revenues, and cash reserves when assessing a bond borrower's creditworthiness, nonprofits frequently act to minimize these indicators to demonstrate trustworthiness to donors and other funders, who prefer funds spent directly on programs rather than accumulated as excess reserves (Irvin & Furneaux, 2021). The results in Table 4.3 suggest that the prevailing goal of financial leanness in nonprofits leads to lower bond ratings compared to governments.

Revenue diversification also contributes to higher ratings as it can reduce revenue volatility and then enhances a nonprofit's capacity to pay off debt regardless of fiscal shocks. Conversely, reliance on donations negatively affects the likelihood of higher ratings. Donations

are a volatile revenue source that cannot withstand fiscal shocks well, which should also negatively affect nonprofits' ability to guarantee debt payment, leading to low bond ratings (Gronbjerg, 1991; Green et al., 2021; Mayer et al., 2014).

Contrary to my hypotheses, no significant relationship is found between variables - such as debt burden ratio, operating margin, and the percentage of total assets from endowments – and the probability of getting a rating. The insignificant relationship between endowments and the bond rating may be explained by the fact that the usage of endowments is restricted to donor-restricted purposes, which may not include financing bond payments (Lam et al., 2020). The results also suggest that CRAs prioritize factors related to the income growth and the overall potential to meet debt service payments, such as profitability, cash on hand, and operating revenue, over those that reflect current financial uncertainty, such as debt load.

Surprisingly, the percentage of total assets from fixed assets and reliance on program revenue are negatively related to the likelihood of a higher rating. The results contradict the mainstream arguments in the nonprofit borrowing literature that reliance on program revenue and fixed assets are two factors that can help nonprofits to reduce default risk, as a stable income that can guarantee debt repayment or serve as collateral (Bowman, 2011; Denison, 2009; Froelich, 1999; Gronbjerg, 1991). However, program revenue accounts for an average of 74 percent of total revenue in the sample of nonprofit bond borrowers. Consequently, the high degree of revenue concentration brought by relying on program revenue may negatively affect nonprofits' ability to pay off debt, especially during external shocks that can affect program revenue. Therefore, CRAs may assign low ratings to reflect their concern about overly relying on program revenue. The negative relationship between fixed assets and the likelihood of a higher rating may relate to the fact that fixed assets cannot be liquidated easily to generate cash to pay off the debt.

Thus, CRAs may assign low ratings to nonprofit borrowers with high fixed assets to reflect their concerns over the nonprofits' capacity to generate cash to pay off debt.

Managerial factors and demographic characteristics demonstrate no statistically significant relationship with the possibility of a higher credit rating. CRAs' claimed emphasis on management effectiveness and good governance is not supported given the lack of association between variables like board independence, whistleblower policy and bond ratings. Similarly, demographic characteristics, such as population size and unemployment rate in the primary service area, said to be factored into CRAs' assessments, show no significant relationship with bond ratings.

The maximum likelihood estimation of ordered probit models makes it less convenient to interpret the coefficients of independent variables because the coefficients do not directly reveal the magnitude of the effects. Hence, Tables 4 and 5 report the average marginal effects of all variables on the predicted probability of receiving each rating from AAA to below BBB-/Baa3, calculated with all other independent variables held constant at mean values. The coefficient reports the average difference between the predicted probability of getting the same rating while the explanatory variable increases by one unit. To compare the magnitudes of coefficients, I also standardize the coefficients of marginal effects in my below discussion. The standardized coefficient equals the point estimates of the marginal effects regarding the variable (from Tables 4.4 and 4.5) multiplied by its standard deviation (from Table 4.1).

The findings remain consistent with results presented in Table 3. As log-transformed operating revenue, log-transformed days cash on hand, profitability, and diversified revenue streams increase by one standard deviation, the likelihood of getting a rating that is above A- increases while the likelihood of getting a rating that is at or below A- decreases. For example,

increasing log-transformed operating revenue by one standard deviation (2.051) increases the probability of receiving an A+ rating by 4.7 percentage point and reduces the probability of receiving a BBB+ rating by 6.6 percentage point. Similarly, as profitability increases by one standard deviation (0.096), the probability of earning an A+ rating increases by 1.1 percentage points and the probability of receiving a BBB+ rating decreases by 1.5 percentage points. As the revenue diversification index increases by one standard deviation (0.227), the probability of getting an A+ rating increases by 1.3 percentage points while the probability of earning a BBB+ rating decreases by 1.8 percentage point. All of these results are significant at 99% confidence level. A comparison of the magnitudes and signs of standardized coefficients of marginal effects shows that total operating revenue is the factor that has the largest positive impact on the probability of receiving an A+ or above rating, followed by the degree of revenue diversification and profitability.

On the contrary, a higher percentage of total assets from fixed assets, a greater reliance on program revenue, and a higher degree of reliance on donations decrease the likelihood of a rating above A- while increasing the likelihood of a rating below A-. For instance, as the degree of reliance on program revenue increases by one standard deviation, the probability of earning a A+ rating decreases by 2.1 percentage point while the probability of receiving a BBB + rating increases by 2.9 percentage point. Both results are significant at 99% level. Reliance on program revenue and fixed assets both have substantial effects compared to other factors on the probability of receiving any rating. Thus, increasing operating revenue, and decreasing reliance on program revenue and fixed assets are the most effective strategies to minimize the risk of receiving a credit rating below A.

I conduct one robustness check using the ordered probit models. I divide the full sample of nonprofit bonds into three subsamples, representing only ratings from S&P, Fitch, and Moody's. The check ensures the dataset's redundant observations do not skew the baseline estimation results. As reported in Table 4.6, most coefficient signs are consistent across three ordered probit models and the Heckman model in Table 4.3, including variables like operating revenue, days cash on hand, profitability, reliance on program revenue, and fixed assets. However, few statistically significant coefficients are found in models using Fitch and Moody's ratings due to the small sample size. Notably, only Fitch demonstrates a concern for borrowers' current debt burden. The operating margin is positively associated with the probability of earning a better rating when the sample is restricted to only bonds with S&P or Moody's ratings.

#### **4.6 Discussion and Conclusion**

In recent decades, more first-time nonprofit borrowers, including charter schools and art nonprofits, have turned to the bond market to fund their capital projects (Calabrese & Ely, 2016). Utilizing municipal bonds to finance these projects allows nonprofits to expand their programs/services, serving a greater number of beneficiaries, and generating revenue to fund new programs, thereby maximizing their mission impacts (Anderson, 2022; Searing & Lecy, 2022). However, research indicates that nonprofit bonds often receive lower ratings than government municipal bonds, leading to increased interest costs and limiting nonprofits' ability to efficiently maximize service provision (Ely & Calabrese, 2017; Liu & Thakor, 1984). This paper seeks to answer why nonprofits, on average, receive low bond ratings by exploring the financial determinants of nonprofit bond credit ratings.

Using a novel dataset consisting of 1,127 tax-exempt bonds issued by nonprofits between 2009 and 2016, I find that some financial dimensions cited in the CRAs' official rating

methodologies and the nonprofit borrowing literature matter more than others. CRAs appear to place greater weight on nonprofits' capacity to generate and accumulate sufficient earnings to pay off future debt than on nonprofits' current degree of indebtedness (Chang & Tuckman 1991; Greenlee and Trussel 2000; Guo & Zhao, 2011). As long as nonprofits can continue to grow and accumulate revenue to cover the current and future debt service, CRAs do not view debt burden as an important indicator of nonprofits' high default risks.

Consequently, indicators that capture nonprofits' ability to generate and accumulate earnings - such as profitability, days cash on hand, and operating revenue - are all positively associated with a nonprofit's likelihood of getting a higher bond rating. In addition, a diverse revenue stream can also enhance the chance of obtaining a high rating, as it alleviates the financial volatility nonprofits experience and enhance their capacity to repay debt, even amidst external fiscal shocks (Carroll & Stater, 2009; Yan et al., 2009). By contrast, CRAs do not appear to account for how a nonprofit's existing liabilities may negatively impact its ability to service debt from a new bond issue (Greer, 2016; Jimenez, 2011; Park et al., 2020). Thus, the ratio of debt burden does not have statistically significant relationships with the probability of a lower rating.

Many findings in this paper also cannot be reconciled with mainstream arguments in the nonprofit borrowing literature. For instance, the degree of reliance on program revenue and the size of fixed assets are negatively associated with a nonprofit's likelihood of obtaining a rating that is above A. The results contradict mainstream arguments in the nonprofit borrowing literature that these factors can help nonprofits to reduce default risk by either being a stable income that can guarantee debt repayment or serve as collateral (Denison, 2009; Rosen & Sappington, 2016; Smith, 2010).

Finally, CRAs also do not seem to prioritize managerial and economic/demographic factors when assigning bond ratings based on this sample. CRAs claim that they qualitatively assess managerial factors related to the effectiveness of management and governance before assigning ratings, including financial oversight, board independence, financial transparency, and internal control. However, none of the indicators on board independence and financial oversight has a statistically significant relationship with bond rating in this study. Future studies should further examine the impact of the nonprofits' management effectiveness on bond ratings.

This paper contributes to the literature on nonprofit borrowing and municipal bonds in several ways. First, this paper expands the literature on municipal bonds by examining the organizational financial determinants of nonprofit bond ratings to answer why nonprofits receive lower bond ratings than governments. In the nonprofit sector, the practice of maintaining financial leanness—minimizing profits, revenue, and cash reserves—is widely touted. This is purported to demonstrate nonprofits' trustworthiness to funders, including donors and government agencies, who cannot typically observe the nonprofit's output. These funders seek to ensure that financial resources are immediately allocated to programs instead of being hoarded as excess funds (Calabrese, 2013; Mitchell, 2017). However, the analysis presented in this paper demonstrates the positive relationships between profitability, days cash on hand, and operating revenue with high bond ratings. This suggests that credit rating agencies (CRAs) value these financial characteristics that reflect a nonprofit's ability to generate and accumulate financial surplus. Therefore, the emphasis on financial leanness among nonprofits lead CRAs to question their creditworthiness. This results in lower credit ratings and increased borrowing costs for nonprofits compared to governments. This paper is also the first study to test if widely used financial conditions in nonprofit literature to assess default risks and financial capacities

accurately reflect the creditworthiness of nonprofits to third-party rating agencies (Calabrese & Ely, 2016; Garcia-Rodriguez & Jegers, 2017; Jegers & Verschueren, 2006; Smith, 2010, 2012).

My results challenge the conventional wisdom of maintaining financial leanness by illustrating its unintended consequence: it increases borrowing costs for nonprofits, impeding their capacity to expand programs to meet their beneficiaries' needs (Mitchell & Calabrese, 2019). The study uncovers a unique dilemma confronting nonprofits wishing to access the bond market: how to simultaneously demonstrate their trustworthiness to donors and creditworthiness to the market. While maintaining financial leanness may impede financial surplus accumulation necessary for timely debt servicing, leading to lower bond ratings (Liu & Thakor, 1984), they are favorably viewed by funders as an indicator of trustworthiness (Hansmann, 1988). Therefore, nonprofits with larger financial reserves may receive fewer contributions due to funders' concern about resource diversion from mission objectives. Nonprofits wishing to access the bond market need to carefully navigate the unintended consequence of maintaining financial leanness and communicate with funders regarding the benefits of financial reserves. In an environment where many funders prefer to fund current programs and operations rather than capital projects, they should also acknowledge the necessity for nonprofits to access market capital.

Third, this paper introduces the first dataset linking municipal bond borrowers' financial characteristics, bond-level attributes, and bond ratings. By web-scraping Form 990 Schedule K data and combining it with the IRS Form 990 database and other bond datasets, I created a new dataset to examine the impact of borrowers' financial condition on bond ratings. This dataset also opens many new research opportunities on nonprofit tax-exempt bonds, including the potential impact of bond finance on long-term financial health and program outcomes.

Finally, this paper provides insights for nonprofit managers considering municipal bond usage. The conventional wisdom discourages nonprofits from using debt, including municipal bonds, to preserve donors' trust (Mitchell & Calabrese, 2019; Young, 2017). Debt service payment can lead to the diversion of resources from current programs, while funders prefer to fund current programs rather than paying previous debt (Yetman, 2007). High debt levels also increase financial stress, risks of insolvency and dissolution arising from debt payment, contradicting the conventional risk-averse managerial practice for nonprofits (Yetman, 2006, 2010; Mitchell & Calabrese, 2020). However, I argue that avoiding using debt is shortsighted and could potentially hinder programmatic growth and social impact scaling (Andersson, 2020; Foster & Fine, 2007; Lam et al., 2020). Financial stress and debt-related risks can be managed through careful financial planning and acquiring a favorable bond rating to reduce interest rates.

For instance, this paper reveals that many financial conditions, such as operating revenue, cash on hand, fixed assets, program revenue, profitability, and revenue diversification, can influence bond credit ratings. Since nonprofits at least have some control over these conditions, they can improve ratings by increasing profits, cash flows and operating revenue, diversifying revenue streams, downsizing fixed assets, and reducing reliance on program revenue (Daniels et al., 2010; Vijayakumar & Daniels, 2006). Enhancing these financial characteristics, such as amassing a sizable cash reserve and diversifying revenue streams, takes time. Nonprofits should plan accordingly before entering the municipal bond market. Lastly, nonprofits should also proactively communicate to funders the merits of using debt to finance infrastructure and the necessity of accumulating financial reserves to enhance credit quality and lower long-term borrowing costs.

## Chapter 5: Conclusions and Discussions

In this dissertation, I sought to address the overarching question of why nonprofits choose certain debt instruments over others to finance capital projects, and what prevents more nonprofits with capital needs from having better access to the municipal bond market? Municipal bonds are tax-exempt financial instruments within a market valued at \$4 trillion, facilitating affordable capital for entities providing public goods, including state and local governments and nonprofits. These bonds enable organizations to finance infrastructure developments, expand program services, and address growing beneficiary needs. Despite these benefits, many nonprofits either show little interest in utilizing this financing option or incur higher borrowing and issuance costs compared to governmental entities. My research answered this overarching question from three angles: the landscape of bond borrowers and bond issues, the capital structure of nonprofits, and their bond credit ratings.

The first essay of my dissertation provided a descriptive analysis that offers one of the first comprehensive overviews of the financial characteristics of nonprofit bond borrowers and their attributes of bond issues, such as interest costs, issuance costs, and bond ratings. By analyzing a unique dataset comprising 836 municipal bonds issued by 524 nonprofits between 2009 and 2016, I discovered that nonprofit bond borrowers primarily consist of service providers reliant on program revenue and government grants. These entities tend to have larger operating margins, debt burden, assets, and revenue than nonprofits that never borrowed via bonds.

The key contributions of this paper are that it identifies obstacles nonprofits encounter in municipal markets, which may also differ by subsector. First, in alignment with prior research, my analysis revealed that nonprofits are generally less inclined or less capable of purchasing bond ratings and bond insurances than government entities, which affects their ability to secure

favorable interest rates (Ely & Calabrese, 2017). Nonprofits also tend to face higher interest and issuance costs, such as underwriter fees, due to the increased risk of default perceived by investors and the challenge underwriters face in finding investors. Specifically, my research revealed charter schools and senior housing nonprofits are nonprofits that experience the highest interest rates and underwriter fees, attributable to their lack of bond issuance history, dependence on fluctuating revenue sources, and low likelihood to acquire bond ratings and credit enhancements. Conversely, other less frequent bond issuers such as human service nonprofits, non-charter private nonprofit K-12 schools, health nonprofits, and art nonprofits experienced comparable or lower rates and fees than hospitals and universities. Further research is needed to understand the factors that cause differences in interest and issuance costs among various nonprofit subsectors. This study presents a unique dataset on nonprofit bond usage, which facilitates further research in this field, such as the determinants of borrowing costs for nonprofit bonds.

In the second essay, I focused on the capital structure of nonprofits—how they balance retained earnings and debt instruments—to finance capital projects while aiming to reduce borrowing costs and default risk. My objective was to comprehend how nonprofits decide among retained earnings, mortgages, insider loans, and tax-exempt bonds to fund their capital projects. What are the trade-offs nonprofits face between the benefits and costs of these debt instruments and internal funds in support of their programmatic growth, while simultaneously aiming to alleviate future financial strain?

In the study, I first validated Calabrese (2011)'s modified pecking order theory that nonprofits exhibit risk aversion towards using all debt instruments for capital projects, as evidenced by the negative correlations between profitability and both mortgage and bond ratios

in my study. However, nonprofits still use debt to finance capital projects. Nonprofits do not want to deplete their internal funds to finance capital projects before turning to external debt, which contradicts the traditional pecking order theory (Calabrese, 2011, Charles et al, 2021). The necessity to maintain financial reserves, either as a rainy-day fund or for future programming and investment, prevents nonprofits from depleting all internal funds on capital projects, as the costs associated with exhausting these reserves are very high (Calabrese, 2011; Charles et al., 2021; Myers, 1984).

Extending previous research, I found nonprofits prefer to use mortgages rather than tax-exempt bonds when they seek external debt to finance capital projects, due to the higher default risks and issuance costs associated with tax-exempt bonds than mortgages. That explains the positive associations between financial conditions like revenue diversification and reliance on certain sources of income with the mortgage ratio, and their negative association with the bond ratio. The enhanced debt payment capacity brought by diversified revenue and reliable sources of income may not be sufficient to offset the high issuance costs and default risks associated with bonds.

The paper also extends the literature by examining the financial determinants of insider loans. My findings do not conclusively support either pecking order or static trade-off theories in the context of nonprofits' insider loans, since most financial conditions do not show statistically significant correlations with the use of insider loans. Insider loans are provided based on the lender's support for the nonprofit's mission, with less concern for the nonprofit's financial ability to repay. In addition, due to less information asymmetry between insider lenders and nonprofits, lenders also will not charge higher interest to offset the financial uncertainty they face. Consequently, neither pecking order theory, which emphasizes the cost of using debt, nor static

trade-off theory, which considers the cost-benefit tradeoff of using debt, adequately accounts for nonprofits' utilization of insider loans for asset financing.

The third paper of my dissertation explored the financial determinants of bond credit ratings, an essential instrument acknowledged by both nonprofits and scholars for its ability to lower interest costs by signaling credit quality. The results revealed that CRAs place greater weight on nonprofits' capacity to generate and accumulate sufficient earnings to pay off future debt than on nonprofits' current degree of indebtedness (Chang & Tuckman 1991; Greenlee and Trussel 2000; Guo & Zhao, 2011). Indicators that capture nonprofits' ability to generate and accumulate earnings - such as profitability, days cash on hand, and operating revenue - are all positively associated with a nonprofit's likelihood of getting a higher bond rating.

The essay uncovered a unique dilemma confronting nonprofits wishing to access the bond market: how to simultaneously demonstrate their trustworthiness to donors and creditworthiness to the market. While minimizing profits, cash flows, and operating revenue to maintain financial leanness may impede the accumulation of financial surpluses necessary for timely debt servicing, leading to lower bond ratings (Liu & Thakor, 1984), such financial management practices are favorably viewed by funders as an indicator of trustworthiness (Hansmann, 1988). Financial leanness is essentially used to indicate that financial resources are immediately allocated to programs instead of hoarded as excess funds (Calabrese, 2013; Mitchell, 2017). Therefore, nonprofits wishing to access the bond market need to carefully navigate the unintended consequence of maintaining financial leanness and communicate with funders regarding the benefits of financial reserves. Considering many funders prefer to fund current programs and operations rather than capital projects, they should acknowledge the necessity for nonprofits to access market capital.

In sum, my dissertation reveals that nonprofit bond borrowers, especially borrowers that are not hospitals and universities, may not borrow in a cost-efficient way when they raise capital from the market, which impedes their capacity to maximize service provision and increases costs of financial distress, such as insolvency, budget cuts, program cut back, and staff layoffs.

This dissertation contributes to the literature on nonprofit borrowing and municipal bonds by identifying reasons that hinder nonprofit organizations' access to the tax-exempt bond market. Although this market is designed to provide affordable capital to public entities, nonprofits often adopt a risk-averse approach towards bond usage. First, this dissertation finds that nonprofits prefer to use high-interest mortgages over tax-exempt bonds, due to the high issuance costs that may erode cost-saving benefits and less flexible repayment terms that may increase default risk. Moreover, the dissertation identifies several factors that discourage nonprofits from accessing the bond market in a cost-efficient way, including their inclination towards financial leanness, reliance on volatile and less familiar revenue sources, and a lack of bond issuance credit history. These conditions cause investors and financial agencies involved in the bond issuance process to view nonprofits as high-risk borrowers. As a result, these entities often impose higher risk premiums on nonprofits or assign lower bond ratings, thereby escalating interest and issuance costs for nonprofits (Ely & Calabrese, 2017; Guzman & Moldogaziev, 2012; Peng & Brucato, 2004; Robins & Simonsen, 2012, 2023). Some nonprofits' risk premiums could be even higher than other nonprofits, such as charter schools and senior housing nonprofits. They are infrequent borrowers with the least certain revenue stream, making it difficult for financial agencies and investors to ascertain debt payment capacities.

Furthermore, the dissertation reveals that many nonprofits are hesitant to seek bond ratings or insurance, aware that their risk profile might not secure favorable evaluations.

Insurance firms and rating agencies are reluctant to endorse bonds that lack investment-grade ratings and impose substantial fees on lower-rated issuances (Denison, 2001, 2003). The lack of bond ratings and insurance, aimed at reducing information asymmetry for investors, necessitates that nonprofits offer higher coupon rates to attract investment. These elevated bond coupon rates, in turn, heighten the nonprofits' risk of default and financial instability, particularly when combined with the less flexible bond repayment terms. Ultimately, the increased issuance costs and interest rates associated with bonds may drive nonprofits to prefer mortgage financing despite its inherently higher interest rates.

This dissertation has implications for both nonprofits and governments. This dissertation argues that the avoidance of using debt to finance capital projects can be short-sighted to nonprofits and hinder programmatic growth and social impact scaling (Andersson, 2020; Foster & Fine, 2007; Lam et al., 2020). The conventional wisdom suggests that nonprofits should avoid using debt to finance capital projects to preserve the trust of funders (Mitchell, 2017; Mitchell & Calabrese, 2019). Nonprofits also emphasize the default risks and financial distress associated with debt, especially tax-exempt bonds, as evidenced by the negative relationship between profitability and the usage of bonds and mortgages to finance capital projects. Consequently, when nonprofits accumulate more retained earnings (i.e., profits) that can finance capital projects directly, they reduce the use of debt.

This dissertation contends that financial stress and debt-related risks can be mitigated through careful financial planning, which in turn can secure favorable ratings and lower interest rates. Specifically, based on this dissertation, enhancing operating revenue, improving cash flow, increasing profitability, and diversifying revenue streams can demonstrate a nonprofit's capacity to generate and accumulate sufficient earnings and service debt, even amid financial shocks.

Such financial strategies can lead to better bond ratings and then lower interest costs. Further investigation is required to identify the financial variables influencing issuance costs, including fees paid to underwriters, bond insurance companies, and financial advisors, and to explore strategies through which nonprofits can minimize these expenses.

Second, governments can play a significant role to help nonprofits reduce borrowing costs. Ten state governments have introduced credit enhancement programs for nonprofit charter schools' bond issues, which alleviate interest and issuance costs by guaranteeing payments to bondholders in case of default. This has helped nonprofit charter schools to obtain high bond ratings (Griffin et al., 2020; Temkin et al., 2008). Governments should extend such programs to a broader range of nonprofits to reduce tax-exempt bond borrowing costs by decreasing default risk and increasing bond ratings. As a result, nonprofits can gain improved access to the bond market and benefit from the savings on interest costs. Nonprofits often undertake roles similar to those of governments by delivering public services, including education, social, and health services. While governments, as major funders of service-providing nonprofits, typically prefer to finance programs rather than capital projects essential for program delivery. Implementing credit enhancement programs for nonprofits can be a practical method for governments to facilitate these organizations' access to affordable capital in the market. Such assistance allows nonprofits to maximize their program provision in a cost-efficient way and more effectively address their beneficiaries' needs.

Finally, this dissertation also opens doors for new research in nonprofit borrowing. This dissertation compiles and introduces a dataset that links nonprofit borrowers' financial characteristics with their bonds' attributes for the first time. This data set allows researchers to address longstanding questions in bond finance, such as why nonprofits face higher interest costs

and issuance costs than government borrowers (Ely & Calabrese, 2017). Moreover, this dataset enables scholars to investigate the impacts of debt on the financial health of nonprofits. Studies suggest that nonprofits hesitate to take on debt as donors and government backers are concerned that repaying debt might redirect funds away from essential programs and objectives (Mitchell, 2017; Mitchell & Calabrese, 2019). As a result, reliance on debt could potentially reduce future donations and government funding (Jegers, 2018; Yan et al., 2009; Yetman, 2007; Young, 2007). However, empirical analysis is scant on whether debt usage leads to decreased program spending, donations, and government grants. This dataset provides a valuable opportunity for scholars to examine these critical questions. Furthermore, although nonprofits utilize bonds to finance capital projects with the intention of expanding their programs and generating funds to fund new programs to address the growing needs of their beneficiaries, the effectiveness of bond usage to achieve these goals is not well-established. Consequently, this dataset provides the necessary tools to conduct research to analyze the impacts of bond issuance on program outputs and financial growth.

My dissertation also sheds light on the phenomena of nonprofit bond finance that need further exploration to find the reasons. For instance, why do few nonprofits obtain commercial credit enhancements, like letters of credit and bond insurance? In addition, why do some nonprofit subsectors access the bond market more cost-effectively than others, and what factors influence these disparities? In my dissertation, nonprofits from some subsectors, such as charter schools and senior housing nonprofits, faced the highest obstacles regarding interest rates and fees to underwriters when accessing the markets. Further analysis is needed to examine the reason for the variation across subsectors. Why do answers to these questions matter? Better access to the tax-exempt municipal bond market, which provides lower interest rates than taxable

loans, can help nonprofits cost-effectively secure the capital needed to enhance and expand their programs and services. This, in turn, allows them to support more beneficiaries and maximize their mission impact (Anderson, 2022; Searing & Lecy, 2022).

## List of Tables

**Table 2.1 Sample Construction**

Sample Restriction	Number of Observations Lost	Sample Size
Total sample of bonds reported in Schedule K forms and by 501 (c)(3) nonprofits between fiscal year 2009-2016 (including all outstanding tax-exempt bond issues that are issued before and after 2009)		28,719
Removed bond issues without valid CUSIP identification numbers and only has short-term bond ratings	-5,896	22,823
Remove bonds that are issued before 2009 and duplicated bond issues (identified by CUSIP numbers) that are reported again after the initial issue year.	-21,514	1,309
For serial bonds with multiple CUSIPs (a bond issue that is structured so that a portion of the bond mature at different time), only keep one cusip for each serial bond issue; removed duplicated bond ratings from the same rating agencies.	-430	879

Notes: The raw data consists of 28,719 observations from 2,408 nonprofits. The final sample consists of 879 observations from 836 unique bonds issued by 524 nonprofits. For pooled bonds that are issue by multiple issuers, the information of each borrower is kept.

**Table 2.2 The Number of Nonprofit Bonds issued by Subsector, 2009 and 2016**

Nonprofit Service Area	2009		2016		% change
	(Number)	% total	(Number)	% total	
Hospitals	29	33%	50	31%	72%
Health Nonprofits	5	6%	3	2%	-40%
Universities & Affiliated Foundations	31	36%	49	31%	58%
Charter School	3	3%	21	13%	600%
Non-charter Private Nonprofit K-12 Schools	4	5%	6	4%	50%
Housing Nonprofits	9	10%	24	15%	167%
Human Service Nonprofits	3	3%	1	1%	-67%
Other Nonprofits	3	3%	6	4%	100%
Total	87	100%	160	100%	84%

**Table 2.3 The Aggregated Principal Amount of Nonprofit Tax-Exempt Bonds by Subsector, 2009 and 2016 (Inflation-Adjusted, 2016 US\$).**

Nonprofit Service Area	2009		2016		% change
	(US\$ millions)	% total	(US\$ millions)	% total	
Hospitals	2723	53%	7009	47%	157%
Health Nonprofits	191	4%	257	2%	34%
Universities & Affiliated Foundations	1644	32%	5722	38%	248%
Charter School	96	2%	587	4%	510%
Non-charter Private Nonprofit K-12 Schools	9	0%	149	1%	1565%
Housing Nonprofits	124	2%	992	7%	699%
Human Service Nonprofits	153	3%	34	0%	-78%
Other Nonprofits	160	3%	196	1%	23%
Total	5101	100%	14947	100%	193%

**Table 2.4 Descriptive Statistics for Bond Attributes by Borrower Type, 2009-2016**

	All bond issues			Hospitals		Health		Universities & Foundations		Charter Schools		Non-charter Private Nonprofit K-12 Schools		Housing		Human Service		Other Nonprofits		F-statistics	
	N	Mean	SD	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	F-stat	Prob > F
<b>Principal &amp; Years to Maturity</b>																					
Principal Amount (millions)	829	72	103	285	113	19	56	263	68	84	29	24	18	107	34	24	37	30	54	13.5	0
Years to Maturity	836	25	7.88	286	26	19	24	268	23	84	28	24	22	108	28	24	20	30	22	8.12	0
<b>Interest &amp; Issuance Cost (% of principal)</b>																					
Coupon Rate	764	4.620	1.120	254	4.6	16	4.2	250	4.48	84	5.11	17	4.3	102	4.96	19	4.08	29	4.64	5.7	0
Underwriter's discount	696	0.839	0.53	229	0.6	17	###	225	0.63	82	1.38	18	0.9	88	1.26	16	1.02	26	1.08	45.5	0
<b>Bond Structure</b>																					
Negotiated (1,0)	836	0.868	0.4	286	0.9	19	0.9	268	0.9	84	0.73	24	0.8	108	0.94	24	0.79	30	0.8	2.4	0.020
Serial Structure (1,0)	836	0.872	0.33	286	0.9	19	0.8	268	0.89	84	0.92	24	0.6	108	0.82	24	0.63	30	0.77	5.51	0
Callable (1,0)	836	0.835	0.37	286	0.9	19	0.8	268	0.86	84	0.73	24	0.6	108	0.88	24	0.58	30	0.73	5.23	0
Refunding (1,0)	836	0.554	0.5	286	0.6	19	0.5	268	0.59	84	0.27	24	0.7	108	0.65	24	0.5	30	0.53	5.11	0
<b>Credit Enhancements</b>																					
Bond Insurance (1,0)	836	0.016	0.12	286	0	19	0	268	0.02	84	0	24	0	108	0.01	24	0	30	0	0.65	0.713
Letter of Credit (1,0)	836	0.055	0.23	286	0.1	19	0.2	268	0.06	84	0	24	0.1	108	0.06	24	0.13	30	0.03	2.39	0.020
Other Guarantor (1,0)	836	0.036	0.19	286	0	19	0.2	268	0	84	0.19	24	0	108	0.06	24	0.04	30	0	15.1	0.000
<b>Credit History</b>																					

Number of Prior Tax- Exempt Bonds	752	5	7	257	8	14	2	237	5	81	4	20	2	99	3	21	3	27	3	7.23	0
<b>Bond Credit Ratings</b>																					
Rated (1,0)	836	0.713	0.45	286	0.9	19	0.7	268	0.75	84	0.5	24	0.4	108	0.5	24	0.67	30	0.53	16.2	0
AAA Rating (1,0)	916	0.016	0.13	458	0	16	0	294	0.01	44	0.16	10	0	60	0	21	0	20	0	3.24	0.002
AA Rating (1,0)	916	0.377	0.49	458	0.5	16	0.3	294	0.31	44	0.07	10	0.3	60	0.15	21	0.62	20	0.6	25.31	0
A Rating (1,0)	916	0.381	0.49	458	0.4	16	0.6	294	0.42	44	0.05	10	0.5	60	0.45	21	0.24	20	0.25	16.5	0
BBB Rating (1,0)	916	0.191	0.39	458	0.1	16	0.1	294	0.25	44	0.48	10	0.2	60	0.3	21	0.14	20	0.05	3.28	0.002
Below BBB (1,0)	916	0.035	0.18	458	0	16	0	294	0.01	44	0.25	10	0	60	0.1	21	0	20	0.1	4.51	0
Number of Ratings per Bond	916	2	0.71	458	2	16	1	294	2	44	1	10	1	60	1	21	2	20	1	34.1	0

**Table 2.5 Descriptive Statistics for Financial Characteristics of Bond vs. Non-Bond Borrowers, 2009-2016**

	All Nonprofits (never issued bonds)			All bond issues			F-statistics	
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	F-stat	Prob > F
<b>Size</b>								
Total Assets (millions)	351889	7	26	762	216	122	45911.57	0
Total Revenue (millions)	351889	4	16	762	113	76	33268.43	0
<b>Debt Level &amp; Repayment Capacity</b>								
Total Liability (millions)	351889	1	8	762	667	1578	61820.10	0
Mortgage Liabilities (millions)	351889	0.259	1	762	25	98	20575.45	0
Bond Liabilities (millions)	351889	0	0	762	320	710	71713.79	0
Debt Burden	351889	-0.018	0.206	762	-0.377	0.778	2235.64	0
<b>Financial Surplus &amp; Cash Flow</b>								
Operating Margin	351889	-609.290	5131.212	762	0.047	0.211	10.75	0.001
Profitability	351889	-0.008	0.393	762	0.001	0.081	0.39	0.5337
Days Cash on Hand	351889	1395	3710	762	624	1040	32.90	0
<b>Revenue Structure</b>								
Revenue Diversification Index	351889	0.387	0.319	762	0.290	0.236	70.16	0
% Donations	351889	0.409	0.375	762	0.066	0.133	639.01	0
% Government Grants	351889	0.149	0.290	762	0.088	0.239	33.35	0
% Program Revenue	351889	0.322	0.380	762	0.778	0.285	1093.22	0
% Fundraising Revenue	351889	0.037	0.097	762	0.001	0.005	103.76	0
<b>Endowments &amp; Fixed Assets</b>								
% Endowment	351889	0.054	0.156	762	0.061	0.101	1.44	0.2295
% Fixed Assets	351889	0.137	0.216	762	0.388	0.187	1026.72	0
<b>Professionalism</b>								
% Salary Expenses	351889	0.359	0.283	762	0.463	0.155	101.60	0
Number of Total Employee	351889	53	163	762	4380	8321	80784.49	0

**Table 2.6 Descriptive Statistics for Financial Characteristics by Borrower Type, 2009-2016**

	Hospitals		Other Health		Universities & Foundations		Charter Schools		Non-charter Private Nonprofit K-12 Schools		Housing		Human Service		Other Nonprofits		F-statistics	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	F-stat	Prob > F
<b>Size</b>																		
Total Assets (millions)	255	292	23	68	241	251	77	88	22	147	97	122	21	82	26	194	80.19	0.000
Total Revenue (millions)	255	170	23	56	241	129	77	39	22	33	97	30	21	78	26	75	113.11	0.000
<b>Debt Level &amp; Repayment Capacity</b>																		
Total Liability (millions)	255	1,346	23	70	241	580	77	92	22	45	97	106	21	47	26	158	13.19	0.000
Mortgages Liabilities (millions)	255	53	23	3	241	13	77	10	22	1	97	10	21	8	26	6	4.80	0.000
Bond Liabilities (millions)	255	655	23	32	241	255	77	69	22	26	97	58	21	13	26	104	15.44	0.000
Debt Burden	255	-0.237	23	-0.123	241	-0.141	77	-1.191	22	-0.249	97	-0.784	21	-0.113	26	-0.547	26.00	0.000
<b>Financial Surplus &amp; Cash Flow</b>																		
Operating Margin	255	0.060	23	0.053	241	0.039	77	0.069	22	0.062	97	0.050	21	0.025	26	-0.083	1.78	0.088
Profitability	255	0.005	23	0.017	241	0.003	77	-0.005	22	-0.012	97	-0.014	21	0.047	26	-0.013	1.97	0.056
Days Cash on Hand	255	450	23	228	241	539	77	540	22	674	97	1248	21	251	26	1649	11.83	0.000
<b>Revenue Structure</b>																		
Revenue Diversification																		
Index	255	0.188	23	0.379	241	0.397	77	0.246	22	0.441	97	0.231	21	0.283	26	0.450	22.23	0.000
% Donations	255	0.016	23	0.117	241	0.086	77	0.080	22	0.158	97	0.037	21	0.132	26	0.244	18.66	0.000
% Government Grants	255	0.006	23	0.075	241	0.044	77	0.619	22	0.046	97	0.005	21	0.085	26	0.082	139.27	0.000
% Program Revenue	255	0.919	23	0.737	241	0.794	77	0.269	22	0.730	97	0.887	21	0.736	26	0.460	94.73	0.000
% Fundraising Rev	255	0.000	23	0.003	241	0.002	77	0.001	22	0.006	97	0.000	21	0.006	26	0.002	9.23	0.000
<b>Endowments &amp; Fixed Assets</b>																		
% Endowment	255	0.015	23	0.005	241	0.150	77	0.000	22	0.143	97	0.020	21	0.016	26	0.040	75.35	0.000
% Fixed Assets	255	0.297	23	0.329	241	0.405	77	0.615	22	0.438	97	0.458	21	0.350	26	0.227	42.27	0.000
<b>Professionalism</b>																		

% Salary Expenses	255	0.488	23	0.619	241	0.423	77	0.503	22	0.520	97	0.409	21	0.632	26	0.328	18.32	0.000
Number of Total Employee	255	7009	23	994	241	5663	77	744	22	310	97	503	21	1648	26	579	13.31	0.000

---

**Table 3.1 Summarizing Hypothesized Signs and the Corresponding Underlying Theories**

**Hypothesized Signs & Underlying Theories**

Explanatory Variables	Signs	Tax-exempt bonds ratio	Mortgages ratio	Loans from insiders ratio
Profitability	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Revenue diversification index	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Government grants	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Donations	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Program service revenue	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Endowment	-	<b>Pecking Order</b>		No Significant Relationship
	+		<b>Static Trade-Off</b>	
Fixed assets	+	<b>Static Trade-Off</b>	<b>Static Trade-Off</b>	No Significant Relationship

*Notes:* The hypothesized signs of coefficients of each financial factor and the corresponding underlying theory are highlighted in bold for tax-exempt bonds ratio, long-term bank loans ratio, and loans from insiders ratio, respectively.

**Table 3.2 Sample Construction**

Sample Restriction	Number of Observations lost	Sample Size
Total sample of tax-exempt organizations between 2009-2016		2,028,365
Removed nonprofits filling 990EZ (do not report liabilities by debt category and do not report restricted and unrestricted assets)	-810,351	1,218,014
Removed organizations that do not have 501 (c)(3) tax exempt status	-290,618	927,396
Dropped nonprofits with negative revenue, spending, assets, and liabilities in any financial category	-86,634	840,762
Dropped nonprofits where revenue and spending, assets, and liabilities in any single financial category is larger than total revenue, expenses, assets, and liabilities	-379,346	461,416
Dropped organizations noncompliant with FASB117 (net assets not reported by donor restriction; need the information to calculate endowments)	-86,880	374,536
Dropped nonprofits with zero total revenue, zero total expenses, zero & negative operating assets (serve as denominators for many ratio variables, generating missing values.)	-6,604	367,932

*Notes:* The raw data consists of 2,028,365 observations from 457,350 nonprofits. The final sample consists of 367,932 observations from 79,441 nonprofits

**Table 3.3 Descriptive Statistics**

Variable	Definition	Count	Mean	SD	Minimum	Maximum
Tax-exempt bonds ratio	The ratio of tax- exempt bonds to total operating assets (i.e., total assets minus endowments)	367,932	0.008	0.048	0.000	0.359
Loans from insiders ratio	The ratio of loans from insiders to total operating assets	367,932	0.001	0.009	0.000	0.083
Mortgages ratio	The sum of mortgages and secured bank notes as a share of total operating assets	367,932	0.033	0.111	0.000	0.684
Tax-exempt bonds	The likelihood of using tax-exempt bonds (0/1)	367,932	0.036	0.186	0.000	1.000
Loans from insiders	The likelihood of using loans from insiders (0/1)	367,932	0.017	0.131	0.000	1.000
Bank loans	The likelihood of using long term bank loans (0/1)	367,932	0.161	0.368	0.000	1.000

Profitability	The ratio of the change in unrestricted net assets to total operating assets	367,932	-0.007	0.385	-2.447	0.966
Liquidity	The ratio of current assets to short-term liabilities	367,932	63,477.190	214,197.620	0.102	1,505,885.000
Revenue diversification index	Revenue diversification index	367,932	0.385	0.316	0.000	1.202
Government grants	The ratio of government grants to total revenue	367,932	0.146	0.288	0.000	0.998
Donations	The ratio of private contribution to total revenue	367,932	0.397	0.374	0.000	1.000
Program service revenue	The ratio of program service revenue to total revenue	367,932	0.340	0.386	0.000	1.000
Endowment	The ratio of restricted net assets to total assets	367,932	0.055	0.155	0.000	0.847

Fixed assets	The ratio of fixed assets to total assets	367,932	0.148	0.222	0.000	0.889
ln (total assets)	The log of total operating assets	367,932	13.979	2.133	8.507	19.492
Age	The age of the organization	367,932	30.423	25.564	2.000	136.000
Age_sqr	The age squared	367,932	1,595.768	2,961.902	4.000	18,496.000
ln (total revenue)	The log of total revenue	367,932	13.861	1.895	8.851	19.053
Total Unrelated Businessse Income	The ratio of Unrelated Business Income to total revenue	367,932	0.001	0.007	0.000	0.059
Coipolicy	Conflict of Interest Policy (COI) (0/1)	367,932	0.773	0.419	0.000	1.000
Coidisclose	Were officers required to disclose interests that could cause COI (0/1)	367,856	0.716	0.451	0.000	1.000
Coimonitor	Did organization monitor and enforce compliance with COI (0/1)	367,808	0.685	0.465	0.000	1.000

---

**Table 3.4 Heckman Selection Model Estimation Results**

	(1) Tax-exempt bonds ratio	(2) Mortgages ratio	(3) Loans from insiders ratio
<i>Second stage</i>			
Profitability	-0.099*** (0.009)	-0.122*** (0.004)	0.001 (0.001)
Liquidity	-0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)
Revenue diversification index	-0.063*** (0.005)	0.078*** (0.007)	-0.005+ (0.003)
Government grants	-0.057*** (0.010)	0.272*** (0.017)	-0.010 (0.008)
Donations	-0.093*** (0.010)	0.078*** (0.011)	-0.005 (0.008)
Program service revenue	-0.033*** (0.011)	0.255*** (0.016)	-0.010 (0.011)
Endowment	0.044*** (0.010)	0.135*** (0.009)	0.004 (0.003)
Fixed assets	0.247*** (0.012)	0.684*** (0.024)	<b>-0.020**</b> <b>(0.009)</b>
ln (total operating assets)	0.028*** (0.004)	0.034*** (0.003)	-0.004*** (0.001)
Age_sqr	0.000*** (0.000)	0.000*** (0.000)	-0.000** (0.000)

Age	-0.002*** (0.000)	-0.002*** (0.000)	0.000 (0.000)
Constant	-0.092 (0.093)	-1.301*** (0.091)	0.189*** (0.022)
Year fixed effect	Yes	Yes	Yes
Subfield fixed effect	Yes	Yes	Yes

*First stage (probit models)*

Coipolicy			0.075*** (0.024)
Coidisclose			0.061** (0.025)
Coimonitor			-0.077*** (0.020)
Total unrelated business income	3.606*** (0.683)	1.782*** (0.377)	
Profitability	-0.408*** (0.038)	-0.108*** (0.010)	-0.062*** (0.011)
Liquidity	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Revenue diversification	0.014 (0.028)	0.383*** (0.011)	0.049** (0.020)
Government grants	0.556*** (0.050)	1.174*** (0.020)	0.545*** (0.044)
Donations	0.045 (0.053)	0.555*** (0.021)	0.566*** (0.044)
Program service revenue	1.040*** (0.047)	1.064*** (0.020)	0.754*** (0.043)
Endowment	0.814*** (0.055)	0.292*** (0.022)	-0.348*** (0.044)

Fixed assets	1.701*** (0.029)	1.924*** (0.012)	0.738*** (0.022)
ln (total operating assets)	0.641*** (0.005)	0.196*** (0.002)	-0.100*** (0.003)
Age_sqr	0.000 (0.000)	-0.000*** (0.000)	0.000*** (0.000)
Age	0.003*** (0.001)	0.004*** (0.000)	-0.019*** (0.001)
Inverse mills ratio	0.0572*** (0.009)	0.3627*** (0.017)	-0.0299** (0.015)
Constant	-13.205*** (0.110)	-5.258*** (0.038)	-1.281*** (0.072)
Year fixed effect	Yes	Yes	Yes
Subfields fixed effect	Yes	Yes	Yes
Rho	0.5246	1.0000	-0.7605
Sigma	0.1089	0.3627	0.0393
Observations	367,932	367,932	367,785
Censored observations	354,715	308,686	361,364
Uncensored observations	13,217	59,246	6,421
Wald Chi2(42)	3281.48	6944.61	1310.21

Standard errors in parentheses. Total operating assets equals to total assets less endowments.

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

**Table 4.1 Sample Construction**

Sample Restriction	Number of Observations lost	Sample Size
Total sample of bonds reported in Schedule K forms and by 501 (c)(3) nonprofits between fiscal year 2009-2016 (including all outstanding tax-exempt bond issues that are issued before and after 2009)		28,719
Removed bond issues without valid CUSIP identification numbers and only has short-term bond ratings	-5,896	22,823
Remove bonds that are issued before 2009 and duplicated bond issues (identified by CUSIP numbers) that are reported again after the initial issue year	-21,514	1,309
Reshape data from short to long format; so, if a bond issue have multiple ratings from CRAs, all ratings are listed as dependent variables		2,678
For serial bonds with multiple CUSIPs (a bond issue that is structured so that a portion of the bond mature at different time), only keep one CUSIP for each serial bond issue	-1,113	1,565
Remove bonds without lagged organizational financial conditions that are used as key independent variables, removed duplicated bond ratings from the same rating agencies.	-438	1,127

Notes: The raw data consists of 28,719 observations from 2,408 nonprofits. The final sample consists of 1,127 observations from 494 nonprofits

**Table 4.2 Descriptive Statistics**

Variable	Definition	Count	Mean	SD	Min	Max
Probability of purchasing bond ratings (1,0)	1: the issuer purchases bond ratings; 0: no	1,127	0.806	0.396	0.000	1.000
Bond ratings	1:AAA/Aaa; 2: AA+/Aa1;3: AA/Aa2;4: AA-/Aa3; 5: A+ /A1;6: A/A2;7: A- /A3; 8:BBB+/Baa1;9: BBB/Baa2;10: BBB-/Baa3; 11: below BBB-/ Baa3	908	5.790	2.362	1.000	11.000
ln (operating revenue)	Log-transformed total operating revenue	1,127	18.701	2.051	12.315	21.549
Operating margin	The ratio of net operating income to operating revenue	1,127	0.041	0.202	-1.617	0.607
Debt burden	The ratio of annual debt service to total revenue	1,127	-0.175	0.456	-3.244	0.621
Days cash on hand	Cash + cash equivalents / ([total operating expenses – depreciation] / 365)	1,127	514.042	920.672	0.075	7,389.850
Profitability	Change in unrestricted net assets/operating assets	1,127	0.002	0.096	-0.803	0.510
Revenue diversification index	Revenue diversification index	1,127	0.278	0.227	0.000	1.202
% Government grants	The ratio of government grants to total revenue	1,127	0.067	0.196	0.000	0.998
% Donations	The ratio of private contribution to total revenue	1,127	0.058	0.122	0.000	1.000
% Program service revenue	The ratio of program service revenue to total revenue	1,127	0.748	0.297	0.000	1.000
% Endowment	The ratio of restricted net assets to total assets	1,127	0.051	0.087	0.000	0.448
% Fixed assets	The ratio of fixed assets to total assets	1,127	0.343	0.203	0.000	0.889
ln (principal amount)	Log-transformed par value of the bond	1,127	17.719	1.249	12.044	21.155

Years to maturity	The number of years to maturity	1,127	25.092	7.471	0.921	76.058
Bond Buyer Index (percentage points)	An estimated weekly average of the market interest rates using revenue bonds with the maturity of 30 years	1,127	4.339	0.620	2.980	5.630
Number of prior bonds	The number of tax-exempt bonds that have been issued by the nonprofit before	1,127	6.242	9.571	1.000	60.000
ln (independent board members)	Log-transformed number of independent board members	1,127	2.584	0.912	-1.730	4.796
Credit enhancement (1,0)	Equals 1: has either a letter of credit, bond insurance, or a guarantee of debt payment by the government if it defaults; Equals 0: no credit enhancement	1,127	0.068	0.252	0.000	1.000
Whistleblower policy (1,0)	The presence of whistleblower policy (0,1)	1,127	0.957	0.202	0.000	1.000
Rating agency	1: Fitch; 2: Moody's; 3: S&P	908	2.244	0.751	1.000	3.000
Pooled bond	The bond is issued by multiple nonprofits (0,1)	1,127	0.100	0.300	0.000	1.000
Refunding issue	The bond is a refunding issue (0,1)	1,127	0.635	0.482	0.000	1.000
Nonprofit Subfields	1: hospitals; 2: other health nonprofits; 3: universities; 4: charter schools; 5: other education nonprofits; 6: housing related nonprofits; 7: other nonprofits.	1,127	3.232	1.953	1.000	7.000
Unemployment rate	Unemployment rate	1,127	0.084	0.032	0.001	0.177
ln (population)	Log-transformed total county population	1,127	13.237	1.295	9.005	16.110

Note: all organizational financial conditions and county-level demographic characteristics are calculated as the average of the values over the past three years. Total operating assets equals to total assets less endowment

**Table 4.3 Ordered Probit Model with/without Heckman Sample Selection**

	(1)	(2)		(3)
	Likelihood of a worse rating ( <u>with</u> Heckman Correction)	Likelihood of a worse rating ( <u>without</u> Heckman Correction)		Likelihood of a worse rating ( <u>with</u> Heckman Correction)
<b>Second Stage</b>			<b>First Stage</b>	
ln (operating revenue)	-0.388*** (0.056)	-0.365*** (0.037)	ln (operating revenue)	0.173*** (0.050)
Operating margin	-0.815 (0.529)	-0.696** (0.273)	Operating margin	0.809*** (0.279)
Debt burden	0.012 (0.109)	-0.003 (0.109)	Debt burden	-0.188 (0.116)
ln (days cash on hand)	-0.103** (0.047)	-0.104*** (0.034)	ln (Days cash on hand)	0.038 (0.049)
Profitability	-1.871*** (0.597)	-2.010*** (0.502)	Profitability	-0.514 (0.752)
HHI index	-0.943*** (0.324)	-0.963*** (0.267)	HHI index	0.827*** (0.316)
% Donations	0.967** (0.440)	0.940** (0.468)	% Donations	-0.143 (0.463)
% Program Revenue	1.188*** (0.213)	1.124*** (0.213)	% Program Revenue	-0.054 (0.261)
% Endowments	-0.860 (0.652)	-0.929 (0.662)	% Endowments	-0.126 (0.792)
% Fixed Assets	1.435*** (0.261)	1.322*** (0.257)	% Fixed Assets	-0.937*** (0.311)
Number of prior tax-exempt bonds	0.000 (0.005)	-0.001 (0.005)	Number of prior tax-exempt bonds	-0.007 (0.010)
Credit enhancement (1,0)	-1.792*** (0.187)	-1.832*** (0.161)	Credit enhancement (1,0)	0.076 (0.184)

In (independent board members)	0.098 (0.062)	0.095 (0.062)	In (principal amount)	0.386*** (0.063)
whistleblower policy (1,0)	-0.306 (0.275)	-0.333 (0.239)	Years to maturity	0.008 (0.008)
Unemployment rate	-2.366 (1.816)	-2.490 (1.723)	Pooled bond (0,1)	0.749*** (0.277)
In (population)	0.042 (0.041)	0.041 (0.038)	Refunding issue (0,1)	0.199* (0.120)
Rating agency- Moody's	0.084 (0.124)	0.086 (0.104)	Bond Buyer G.O 20 Index (percentage points)	-0.223** (0.094)
Rating agency- S&P	0.160 (0.107)	0.150 (0.101)	Subfields fixed effect	Yes
Refunding issue (0,1)	-0.118 (0.085)	-0.089 (0.076)	Rho	-0.340
			Observations	1,127
			Censored observations	219
			Uncensored observations	908

---

Standard errors in parentheses. \*p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Table 4.4 Marginal Effects Calculated Based on the Weighted Order Probit Model  
and the Probability of Receiving a Credit Rating between Below AAA to A**

	(1) Coefficient	(2) AAA/Aaa	(3) AA+/Aa1	(4) AA/Aa2	(5) AA-/Aa3	(6) A+/A1	(7) A/A2
ln (operating revenue)	-0.388*** (0.056)	0.003*** (0.001)	0.010*** (0.002)	0.050*** (0.008)	0.070*** (0.011)	0.023*** (0.005)	-0.008*** (0.003)
Operating margin	-0.815 (0.529)	0.006 (0.004)	0.020 (0.014)	0.104 (0.068)	0.147 (0.095)	0.049 (0.033)	-0.017 (0.013)
Debt burden	0.012 (0.109)	-0.000 (0.001)	-0.000 (0.003)	-0.001 (0.014)	-0.002 (0.020)	-0.001 (0.007)	0.000 (0.002)
ln (days cash on hand)	-0.103** (0.047)	0.001* (0.000)	0.003** (0.001)	0.013** (0.006)	0.019** (0.008)	0.006** (0.003)	-0.002* (0.001)
Profitability	-1.871*** (0.597)	0.013* (0.007)	0.046*** (0.018)	0.239*** (0.080)	0.336*** (0.110)	0.111*** (0.039)	-0.040** (0.019)
Revenue diversification index	-0.943*** (0.324)	0.006* (0.004)	0.023** (0.009)	0.121*** (0.043)	0.169*** (0.059)	0.056*** (0.021)	-0.020** (0.010)
% Donations	0.967** (0.440)	-0.007* (0.004)	-0.024** (0.012)	-0.124** (0.057)	-0.174** (0.080)	-0.058** (0.028)	0.021* (0.012)
% Program Revenue	1.188*** (0.213)	-0.008** (0.003)	-0.029*** (0.008)	-0.152*** (0.030)	-0.213*** (0.041)	-0.071*** (0.018)	0.025*** (0.010)
% Endowments	-0.860 (0.652)	0.006 (0.005)	0.021 (0.017)	0.110 (0.084)	0.155 (0.118)	0.051 (0.040)	-0.018 (0.016)
% Fixed Assets	1.435*** (0.261)	-0.010** (0.004)	-0.036*** (0.010)	-0.184*** (0.036)	-0.258*** (0.050)	-0.085*** (0.022)	0.031*** (0.012)
Number of prior tax-exempt bonds	0.000 (0.005)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.000)	0.000 (0.000)

Credit enhancement (0,1)	-1.792*** (0.187)	0.120*** (0.039)	0.156*** (0.037)	0.281*** (0.026)	0.061** (0.031)	-0.115*** (0.024)	-0.114*** (0.015)
ln (independent board members)	0.098 (0.062)	-0.001 (0.000)	-0.002 (0.002)	-0.013 (0.008)	-0.018 (0.011)	-0.006 (0.004)	0.002 (0.002)
Whistleblower policy (0,1)	-0.306 (0.275)	0.001 (0.001)	0.006 (0.004)	0.033 (0.024)	0.055 (0.048)	0.025 (0.029)	-0.000 (0.005)
Unemployment rate	-2.366 (1.816)	0.016 (0.014)	0.059 (0.047)	0.303 (0.233)	0.425 (0.328)	0.141 (0.111)	-0.051 (0.043)
ln (population)	0.042 (0.041)	-0.000 (0.000)	-0.001 (0.001)	-0.005 (0.005)	-0.008 (0.007)	-0.003 (0.003)	0.001 (0.001)
Rating agency-Moody's	0.084 (0.124)	-0.001 (0.001)	-0.002 (0.004)	-0.011 (0.017)	-0.015 (0.022)	-0.004 (0.006)	0.002 (0.004)
Rating agency-S&P	0.160 (0.107)	-0.001 (0.001)	-0.004 (0.003)	-0.021 (0.015)	-0.029 (0.019)	-0.009 (0.005)	0.004 (0.003)
Refunding issue (0,1)	-0.118 (0.085)	0.001 (0.001)	0.003 (0.002)	0.015 (0.010)	0.021 (0.015)	0.007 (0.006)	-0.002 (0.002)

**Table 4.5 Marginal Effects Calculated Based on the Weighted Order Probit Model  
and the Probability of Receiving a Credit Rating between Below A- to below BBB-**

	(1) Coefficients	(2) A- /A3	(3) BBB+/Ba a1	(4) BBB/Ba a2	(5) BBB- /Baa3	(6) below BBB-/ Baa3
ln (operating revenue)	-0.388*** (0.056)	-0.041*** (0.008)	-0.032*** (0.006)	-0.036*** (0.007)	-0.024*** (0.005)	-0.013*** (0.004)
Operating margin	-0.815 (0.529)	-0.087 (0.056)	-0.067 (0.044)	-0.076 (0.050)	-0.050 (0.034)	-0.027 (0.020)
Debt burden	0.012 (0.109)	0.001 (0.012)	0.001 (0.009)	0.001 (0.010)	0.001 (0.007)	0.000 (0.004)
ln (days cash on hand)	-0.103** (0.047)	-0.011** (0.005)	-0.009** (0.004)	-0.010** (0.004)	-0.006** (0.003)	-0.003** (0.002)
Profitability	-1.871*** (0.597)	-0.200*** (0.068)	-0.154*** (0.053)	-0.174*** (0.059)	-0.116*** (0.040)	-0.063** (0.026)
Revenue diversification index	-0.943*** (0.324)	-0.101*** (0.036)	-0.078*** (0.028)	-0.088*** (0.032)	-0.058*** (0.022)	-0.032** (0.014)
% Donations	0.967** (0.440)	0.103** (0.048)	0.080** (0.038)	0.090** (0.042)	0.060** (0.029)	0.032* (0.017)
% Program Revenue	1.188*** (0.213)	0.127*** (0.026)	0.098*** (0.021)	0.110*** (0.024)	0.074*** (0.018)	0.040*** (0.012)
% Endowments	-0.860 (0.652)	-0.092 (0.071)	-0.071 (0.054)	-0.080 (0.061)	-0.053 (0.041)	-0.029 (0.023)
% Fixed Assets	1.435*** (0.261)	0.153*** (0.032)	0.118*** (0.026)	0.133*** (0.029)	0.089*** (0.021)	0.048*** (0.016)

Number of prior tax-exempt bonds	0.000 (0.005)	0.000 (0.001)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Credit enhancement (0,1)	-1.792*** (0.187)	-0.174*** (0.016)	-0.085*** (0.010)	-0.074*** (0.010)	-0.039*** (0.007)	-0.017*** (0.005)
ln (independent board members)	0.098 (0.062)	0.010 (0.007)	0.008 (0.005)	0.009 (0.006)	0.006 (0.004)	0.003 (0.002)
Whistleblower policy (0,1)	-0.306 (0.275)	-0.027 (0.018)	-0.025 (0.022)	-0.031 (0.030)	-0.023 (0.025)	-0.014 (0.017)
Unemployment rate	-2.366 (1.816)	-0.252 (0.196)	-0.195 (0.151)	-0.220 (0.170)	-0.147 (0.114)	-0.079 (0.064)
ln (population)	0.042 (0.041)	0.004 (0.004)	0.003 (0.003)	0.004 (0.004)	0.003 (0.003)	0.001 (0.001)
Rating agency-Moody's	0.084 (0.124)	0.009 (0.014)	0.007 (0.010)	0.007 (0.011)	0.005 (0.007)	0.002 (0.004)
Rating agency-S&P	0.160 (0.107)	0.017 (0.012)	0.013 (0.009)	0.015 (0.010)	0.010 (0.006)	0.005 (0.003)
Refunding issue (0,1)	-0.118 (0.085)	-0.012 (0.009)	-0.010 (0.007)	-0.011 (0.008)	-0.008 (0.006)	-0.004 (0.003)

**Table 4.6 Ordered Probit Models by Credit Rating Agency**

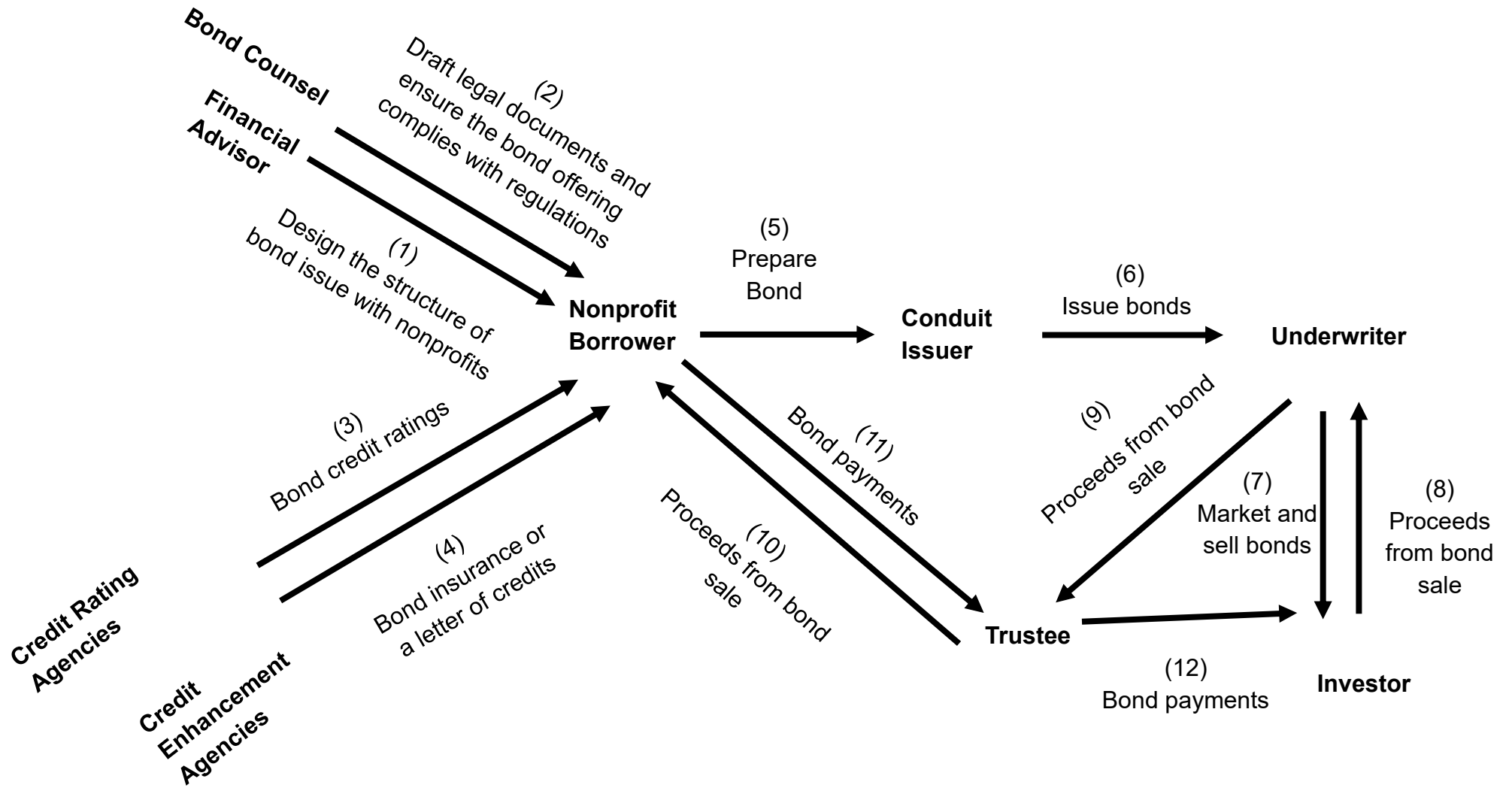
Likelihood of a worse rating	(1)	(2)	(3)
	S&P	Moody's	Fitch
ln (operating revenue)	-0.440*** (0.054)	-0.346*** (0.062)	-0.305*** (0.106)
Operating margin	-0.812* (0.433)	-1.125** (0.533)	-1.078 (0.751)
Debt burden	-0.075 (0.145)	-0.122 (0.275)	0.604** (0.289)
ln (days cash on hand)	-0.131*** (0.050)	-0.098 (0.060)	-0.007 (0.091)
Profitability	-1.414* (0.762)	-2.840*** (0.913)	-3.372*** (1.170)
Revenue diversification index	-0.895** (0.363)	-1.303** (0.513)	-1.079 (0.918)
% Donations	1.585*** (0.584)	-0.401 (0.976)	-2.273 (2.847)
% Program Revenue	1.137*** (0.294)	1.074** (0.439)	0.728 (0.618)
% Endowments	-0.360 (0.929)	-0.056 (1.117)	2.557 (2.672)
% Fixed Assets	1.212*** (0.358)	1.794*** (0.580)	1.532** (0.696)
Number of prior tax-exempt bonds	-0.000 (0.008)	0.000 (0.009)	0.014 (0.013)
Credit enhancement (1,0)	-2.160*** (0.215)	-0.882** (0.352)	-1.105*** (0.424)
ln (independent board members)	0.157 (0.097)	0.073 (0.103)	0.167 (0.159)
whistleblower policy (1,0)	-0.397 (0.296)	-1.080* (0.552)	-0.416 (1.159)

Unemployment rate	-1.759 (2.491)	-0.818 (2.970)	-12.801** (5.169)
ln (population)	0.065 (0.055)	-0.027 (0.065)	0.119 (0.104)
Rating agency- Moody's	0.228 (0.200)	0.518*** (0.193)	0.117 (0.221)
Rating agency- S&P	0.209 (0.187)	0.437** (0.208)	0.670*** (0.243)
Refunding issue (0,1)	-0.241** (0.114)	0.076 (0.129)	0.044 (0.200)
Observations	414	329	165

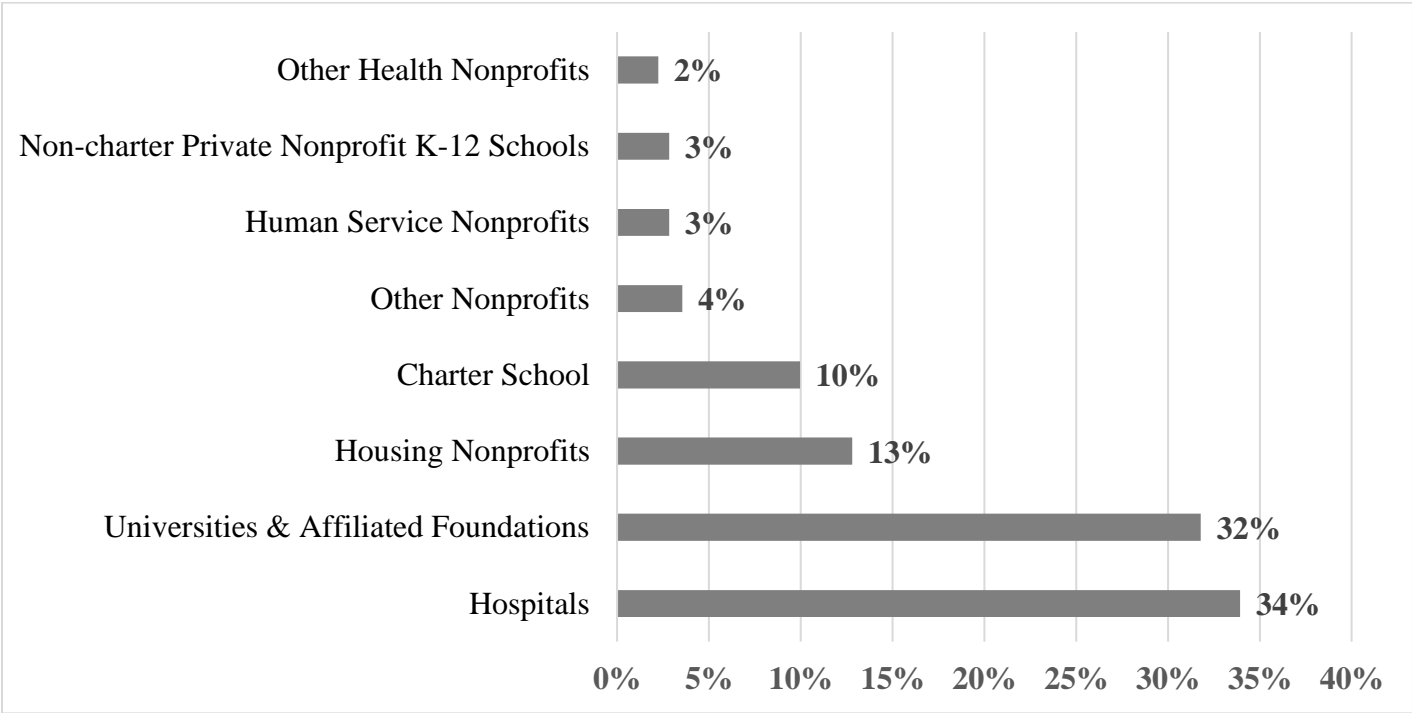
Standard errors in parentheses. \*p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

# List of Figures

## Figure 2.1 Nonprofits' Municipal Bond Issuance Process

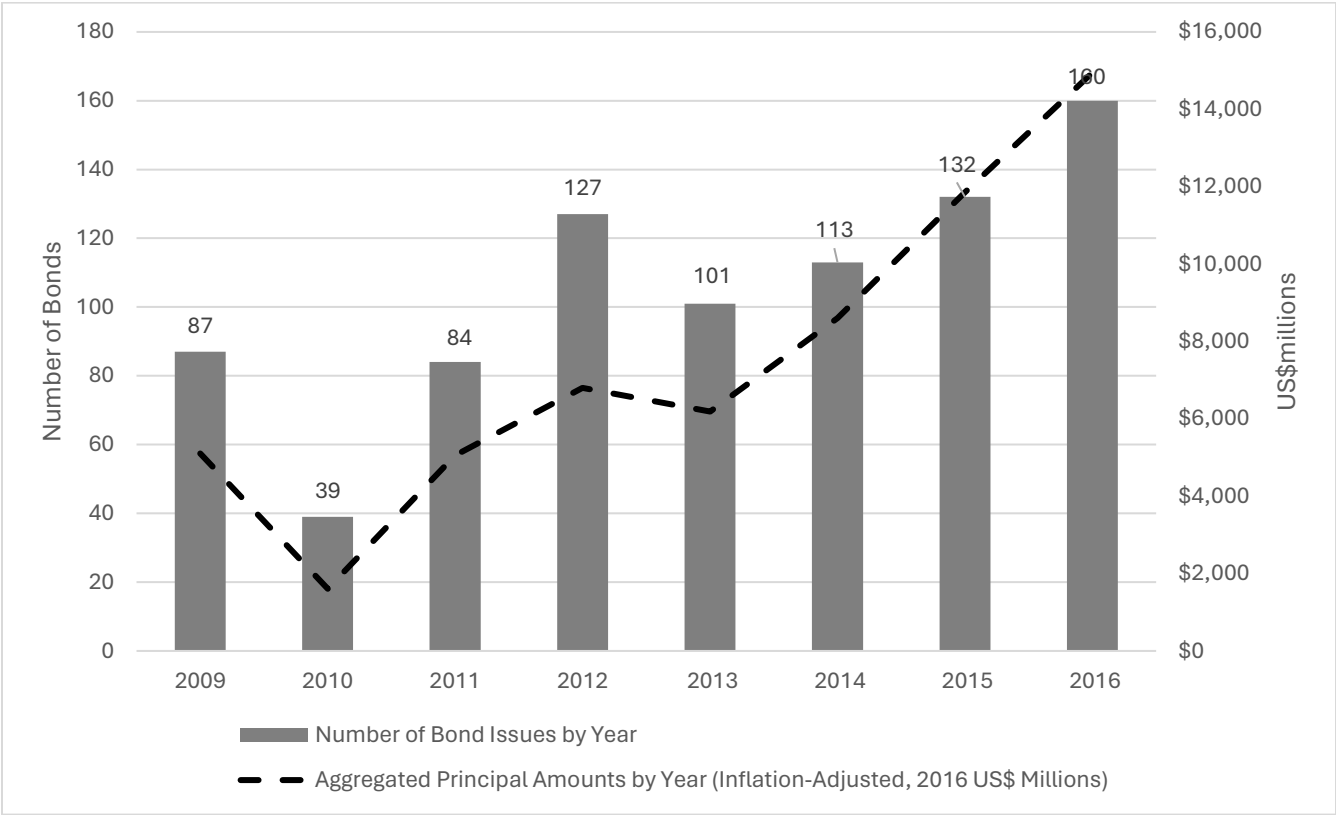


**Figure 2.2 The Percentage of Bonds Issued by Subsector 2009-2016 (N= 843)**



Notes: Pooled bonds issued by multiple nonprofits from different subsectors are counted repeatedly.

**Figure 2.3 Number of Bonds and Aggregated Principal Amount of Bonds by Year**



## Appendices

### Appendix A.

**Table A-1. Summary Statistics of Characteristics used to Match Nonprofits with Similar**

**Likelihoods of Using Tax-exempt Bonds**

	Unmatched Sample		Matched Sample	
	(1) Bonds: No	(2) Bonds: Yes	(3) Bonds: No	(4) Bonds: Yes
	mean	Mean	mean	mean
Age	29.175	63.897	41.866	53.500
ln(total revenue)	13.735	17.265	16.262	17.208
Fixed asset ratio	0.138	0.406	0.297	0.361
ln(total operating assets)	13.830	17.972	16.783	17.772
<i>N</i>	354715	13217	2530	2206

*Note:* nonprofits are also matched by year and NTEE code

**Table A-2. Summary Statistics of Characteristics used to Match Nonprofits with Similar**

**Likelihoods of Using Mortgages**

	Unmatched Sample		Matched Sample	
	(1) Mortgages : No	(2) Mortgages : Yes	(3) Mortgages : No	(4) Mortgages : Yes
	mean	mean	mean	mean
Age	28.903	38.342	25.651	32.871
ln(total revenue)	13.612	15.160	14.348	14.945
Fixed asset ratio	0.109	0.353	0.100	0.203
ln(total operating assets)	13.693	15.468	14.222	15.052
<i>N</i>	308686	59246	29201	13462

*Note:* nonprofits are also matched by year and NTEE codes

**Table A-3. Summary Statistics of Characteristics used to Match Nonprofits with Similar Likelihoods of Using Loans From Insiders**

	Unmatched Sample		Matched Sample	
	(1)	(2)	(3)	(4)
	Loans From Insiders: No	Loans From Insiders: Yes	Loans From Insiders: No	Loans From Insiders: Yes
	mean	mean	mean	mean
Age	30.618	19.420	13.678	16.054
ln(total revenue)	13.865	13.657	13.238	13.421
Fixed asset ratio	0.147	0.223	0.037	0.100
ln(total operating assets)	13.995	13.096	12.373	12.595
<i>N</i>	361499	6433	13556	3100

*Note:* nonprofits are also matched by year and NTEE codes

**Table A-4. Weighted Regressions using Coarsen Exact Matching (CEM) Weights (updated format 3.30.2024)**

	(1)	(2)	(3)
	Tax-exempt bonds ratio	Mortgages ratio	Loans from insiders ratio
Profitability	-0.128*** (0.021)	-0.043*** (0.005)	-0.002*** (0.001)
Liquidity	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Revenue diversification index	-0.018 (0.017)	0.026*** (0.005)	0.003** (0.001)
Government grants	-0.002 (0.030)	0.034*** (0.010)	0.004+ (0.002)
Donations	-0.088*** (0.030)	-0.007 (0.010)	0.007*** (0.002)
Program service revenue	-0.007 (0.027)	0.030*** (0.009)	0.010*** (0.002)
Endowment	0.010 (0.035)	0.054*** (0.012)	-0.004 (0.002)
Fixed assets	0.023 (0.024)	0.049*** (0.007)	-0.001 (0.002)
ln (total operating assets)	0.002 (0.004)	-0.007*** (0.001)	-0.001*** (0.000)

Age_sqr	0.000 <sup>+</sup>	0.000 <sup>***</sup>	-0.000
	(0.000)	(0.000)	(0.000)
Age	-0.001 <sup>***</sup>	-0.002 <sup>***</sup>	-0.000
	(0.000)	(0.000)	(0.000)
Constant	0.146 <sup>**</sup>	0.149 <sup>***</sup>	0.017 <sup>***</sup>
	(0.065)	(0.019)	(0.004)
Year & fixed effect	Yes	Yes	Yes
fixed effect	Yes	Yes	Yes
R <sup>2</sup>	0.053	0.054	0.016
Total observations	4,736	42,663	16,656

---

Standard errors in parentheses. Total operating assets equal to total assets less endowments.

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

## Appendix B.

**Table B-1. Rating Criteria of Operating Performance (Operating Performance)**

Definition <sup>1</sup>	Formula	Can you calculate it	Source	The one I choose and why
Operating margin	Operating margin (%): (Adjusted net operating income/total operating expense) x 100. Operating income: Total operating revenue minus total operating expenses.	Yes	S&P Universities	I calculate the operating margin as net operating income divided by total operating revenue. This measure is commonly used in the literature (Chang and Tuckman, 1991; Gaver et al., 2016; Greenlee and Trussel, 2000). Also, S&P and Moody's formulas for operating margin and operating cash flow margins are similar to my formula.
Operating margin	(Operating income/total operating revenue) x 100. Operating income: Total operating revenue - total operating expenses	Yes	S&P Health Orgs	
Two-year Average Operating Cash Flow Margin	For each fiscal year (or 12-month period), the numerator is Operating Cash Flow, and the denominator is Operating Revenue. The two single-year margins are summed and divided by two. Operating Cash Flow equals Operating Revenue minus operating expenses, plus the sum of interest, depreciation and amortization, and other material non-cash expenses.	Yes	Moody's Charter Schools	

Operating Cash Flow Margin	Operating income plus depreciation, amortization, and interest, divided by Operating Revenue, multiplied by 100	Yes	Moody's Health Orgs
Excess margin	[(Total revenues - total expenses) / total revenues] x 100	Yes	S&P Charter Schools; S&P Health Orgs
EBIDA Margin	The numerator is earnings before interest, depreciation, amortization, and other large non-cash expenses (EBIDA), and the denominator is adjusted operating revenue <sup>2</sup> .	No. Cannot calculate the adjusted operating revenue	Moody's Universities; Moody's Other Nonprofits

---

**Table B-2. Rating Criteria of Debt Load**

Definition	Formula	Can you calculate it	Source	The one I choose and why
MADS burden	Maximum annual debt service (MADS) as a percentage of operating expenses <sup>3</sup>	Yes. Do not have data on maximum annual debt service. But I can use current year liabilities minus previous year liabilities to approximate maximum annual debt service.	S&P Universities	I calculated debt burden as (annual debt service/total revenue) * 100. Due to the lack of data, I use current year liabilities minus previous year liabilities to approximate the maximum annual debt service. The measure of my debt burden ratio is similar to the debt burden ratio (total liability/state personal income) used in public finance literature (Greer, 2016; Jimenez, 2011; Zhao & Guo, 2011). In addition, S&P, Moody's, and Fitch's measures of debt load, such as Annual Debt Service Coverage, Debt Burden, and MADS coverage ratio, are similar to my measure of debt burden and all capture an organization's ability to pay off debt.
Lease-adjusted MADS burden	(MADS + operating lease expense) / total revenues] x 100	No. Do not have data on operating lease expenses.	S&P Charter Schools	
Debt burden (%)	(Maximum annual debt service/total revenue) x 100.	Yes	S&P Health Orgs	

Annual Debt Service Coverage	The numerator is EBIDA, and the denominator is annual debt service. EBITDA is income from operations before interest expense, tax, depreciation and amortization, and other non-cash items. Annual debt service is interest expenses and scheduled principal payments, excluding refunding.	No. Do not have data on principal payments.	Moody's Universities
Debt Service Coverage (x)	The numerator is annual Operating Cash Flow (see definition in factor 2A Two-year Average Operating Cash Flow Margin). The denominator is annual principal and interest payments on long-term debt.	No. Do not have data on annual principal and interest payments on long-term debt.	Moody's Charter Schools
Debt service coverage ratio	Adjusted net cash flow divided by maximum annual debt service (MADS).	No. Do not have information regarding the definition and formula of the adjusted net cash flow.	S&P Rental Orgs
MADS coverage ratio	EBITDA or CFADS/MADS	Yes. Do not have data on maximum annual debt service, but can approximate the annual	Fitch Nonprofits

		debt service as discussed above	
	CFAD = EBITDA + non-operating revenue available for debt service – non-operating expenditure prior to debt servicing		
Total Debt to Cash Flow (x)	Total debt divided by net income (including a 5% smoothing on unrestricted cash and investments and unrestricted contributions) plus depreciation, amortization, interest, and other large non-cash expenses	No. Do not have data on unrestricted cash and investment and unrestricted contributions	Moody's Health Orgs
Total Adjusted Debt to Operating Revenue	The numerator is total adjusted debt, and the denominator is operating revenue.	No. No definition of total adjusted debt is provided	Moody's Other Nonprofits

---

**Table B-3. Rating Criteria of Scale**

Definition	Formula	Can you calculate it	Source	The one I choose and why
Adjusted Operating Revenue	See the definition of adjusted operating revenue in the endnote <sup>4,5</sup>	Yes. I cannot calculate adjusted operating revenue but can calculate operating revenue instead.	Moody's Universities	I use total operating revenue to approximate adjusted operating revenue. All three rating agencies use operating revenue to capture the scale of the nonprofit.
Adjusted Operating Revenue	See the definition of adjusted operating revenue in the end note <sup>6</sup>	Yes. I cannot calculate adjusted operating revenue but can calculate operating revenue instead.	Moody's Other Nonprofits	
Total revenue		Yes	S&P Charter Schools	
Operating Revenue		Yes	Moody's Charter Schools	

Total operating revenues	Revenue from clinical operations, typically includes but is not limited to net patient service revenue, net assets released from restriction for operational purposes, premiums, grants, and medical education. We may also include the impact of joint ventures depending on their strategic relevance to the organization, materiality, and other financial effects on the organization. Total operating revenue excludes non-operating revenue.	Yes	S&P for Health Orgs
Operating Revenue		Yes	Moody's Health Orgs
EBITDA	Income from operations before interest expense, tax, depreciation and amortization, and other non-cash items.	Yes	Fitch Nonprofits

---

**Table B-4. Rating Criteria of Liquidity**

Definition	Formula	Can you calculate it	Source	The One I Choose and Why
Unrestricted days' cash on hand	<p>Unrestricted reserves / [(total expenses - depreciation and amortization expense) / 365].</p> <p>See the definition of unrestricted reserves in the endnote<sup>7</sup>.</p>	Yes. I do not have all data to calculate unrestricted reserves, but I can use cash and cash equivalents to approximate unrestricted reserves.	S&P Charter Schools	<p>I do not have data to calculate unrestricted reserve or unrestricted cash and investment, So I calculate days' cash on hand = (cash + cash equivalents) / ([total operating expenses – depreciation] / 365) (Prentice, 2016).</p> <p>Cash equivalents include savings, temporary cash investments, and publicly traded securities investments.</p>
Monthly Days Cash on Hand	The numerator is total cash and investments plus other unrestricted funds for operations, less restricted funds such as debt service reserve funds, then multiplied by 365. The denominator is total operating expenses minus the sum of interest, depreciation and amortization, and other material non-cash expenses.	Yes. I do not have data on debt service fund to calculate unrestricted funds, but I can use cash and cash equivalents to approximate unrestricted funds.	Moody's Charter Schools	
Days' cash on hand	Unrestricted reserves / [(operating expense -depreciation and amortization expenses)/365].	Yes. I do not have data on unrestricted reserves, but I can use cash and cash equivalents to approximate unrestricted reserves.	S&P Health Orgs	

Cash on Hand (days)	Unrestricted cash and investments, multiplied by 365, divided by operating expenses less depreciation and amortization expense;	Yes. I do not have data on unrestricted cash and investments, but I can use cash and cash equivalents to approximate cash and investment.	Moody's Health Orgs
Monthly Days Cash on Hand	Monthly days cash on hand is the number of days a nonprofit could continue to pay cash operating expenses from existing unrestricted cash and investments in the absence of additional revenue, in a scenario of equal daily expenditures. The numerator is total available cash and investments that can be accessed within 30 days and are free from external restriction. The denominator is total annual expenses (less depreciation and other material non-cash expenses) divided by 365 days.	Yes. I do not have data on total available cash and investments that can be accessed within 30 days and are free from external restriction, but I can use cash and cash equivalents to approximate total available cash and investment within 30 days.	Moody's Other Nonprofits
Days cash on hand	Unrestricted cash & investments/ (cash operating expenses/365)	Yes. I can use cash and cash equivalents to approximate unrestricted cash and investments.	Fitch Nonprofits

Liquidity cushion	(EBITDA + unrestricted cash & investments – annual debt service + available lines of credit, not yet drawn)/ cash operating expenses prior to interest expense	Yes, I can use cash and cash equivalents to approximate unrestricted cash and investments.	Fitch Nonprofits
Total Cash and Investments to Operating Expenses	The numerator is total cash and investments, and the denominator is operating expenses.	Yes	Moody University
Available resources to annual operating expenses	See the definition of available resources in the endnote <sup>8</sup> .	Yes	SP University

---

## Notes

1. For the sake of space, in appendixes, I only include financial ratios that capture similar underlying concepts across nonprofit subsectors.

2,4,5,6. For public sector higher education issuers, adjusted operating revenue is equal to unrestricted operating revenue, adjusted to

account for pass-through scholarships and fellowship expenses, plus certain items that are typically considered operating revenues but may be reported as non-operating revenue in certain jurisdictions. These could include government funding, tax revenue, philanthropic gifts, grants, and contracts. Endowment and investment income includes the normalized endowment draws to reflect the industry standard spending rates. Typically, drawdowns have been 5% of the average level of cash and investments for the three prior fiscal years.

For private sector higher education issuers, adjusted operating revenue is equal to the sum of unrestricted operating revenue and the portion of revenue from restricted sources available for current use. We adjust operating revenue to normalize endowment draws to reflect the industry standard spending rates. Typically, drawdowns have been 5% of the average level of cash and investments for the three prior fiscal years.

For other nonprofits, adjusted operating revenue is equal to equal to unrestricted operating revenue excluding net assets released from restrictions except for current-use gifts and also adjusted to normalize endowment spending to 5% of the average level of cash and investments for the prior three fiscal years.

3. Debt service: principal and interest payments on all direct debt, including long-term bonds, capital leases, mortgages, and bank debt. For variable-rate debt, assume a 3.5% interest rate. For draws on lines of credit and commercial paper, assume the actual fixed rate or a 3.5% variable interest rate with principal payments spread over 30 years. Guaranteed debt is included at 100% if the guarantor has made any payments over the past five years. Variable-rate debt swapped to fixed rate should be run at the swap rate. Contingent debt (guarantees, off-balance sheet debt transactions, etc.) may be included per the criteria. These interest rates and assumptions may be evaluated periodically depending on policy rate environment, and rates by country.

Maximum annual debt service (MADS): the greatest annual debt service. For bullet maturities, payments are smoothed out by dividing the total debt service of that issuance by no more than 30 years (which we consider to be the average length of long-term borrowing) and including the smoothed annual amount in the calculation of total annual debt service to obtain the MADS.

7. Unrestricted reserves: Unrestricted cash, unrestricted investments, unrestricted board designated. Excluded from unrestricted reserves are debt service funds, donor restricted amounts, funds designated for pension, temporarily or permanently restricted funds, receivables, and other funds that are legally restricted. Generally included in unrestricted reserves are exceptional deferrals of state funding when we determine there has been an established record of payment in full and cash balances have been artificially suppressed at year-end.

8. Private University Available Resource = Unrestricted net assets + temporarily restricted net assets – (net plant and equipment – outstanding debt on the balance sheet). Public university Available resources = Unrestricted net assets + debt service reserves + UNA of any affiliated university foundation + any restricted but available expendable net assets that are available for debt service or operations. Pension or OPEB liabilities, if recorded at the university level, are added to UNA to allow the comparability.

## References

- Allard, S. W., & Smith, S. R. (2014). Unforeseen consequences: Medicaid and the funding of nonprofit service organizations. *Journal of health politics, policy and law*, 39(6), 1135-1172.
- Allen, A. C., & Dudley, D. M. (2008). The impact of rating agency reputation on local government bond yields. *Journal of Financial Services Research*, 33(1), 57-76.
- Andrews, Nick. (2022). *Muni Bond Delinquencies Show Senior Living Industry 'Most Poorly Positioned' to Withstand Covid*. Senior Housing News. Retrieved February 13, 2024, from <https://seniorhousingnews.com/2022/04/15/muni-bond-delinquencies-show-senior-living-industry-most-poorly-positioned-to-withstand-covid/>
- Andrews, Nick. (2023). *Senior Living Industry Still Among 'Riskiest' for Muni Bonds Even As Defaults Fall*. Senior Housing News. Retrieved February 13, 2024, from <https://seniorhousingnews.com/2023/04/26/senior-living-industry-still-among-riskiest-for-muni-bonds-even-as-defaults-fall/>
- Andersson, F. O. (2020). A desire for growth? An exploratory study of growth aspirations among nascent nonprofit entrepreneurs. *Nonprofit and Voluntary Sector Quarterly*, 49(4), 890-901.
- Akins, B. (2018). Financial Reporting Quality and Uncertainty about Credit Risk among Ratings Agencies. *Accounting Review*, 93(4), 1–22. <https://doi.org/10.2308/accr-51944>
- Bacon, P. W. (1992). Do capital structure theories apply to nonprofit hospitals? *Journal of the Midwest Finance Association*, 21(1), 86–90.

- Bayoumi, T., Goldstein, M., & Woglom, G. (1995). Do Credit Markets Discipline Sovereign Borrowers? Evidence from U.S. States. *Journal of Money, Credit and Banking*, 27(4), 1046.
- Below, S. D. (1995). The existence of municipal bond insurance: Theory and evidence, 2500-2500.
- Booth, J. R., & Smith, R. L. (1986). Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics*, 15(1-2), 261-281.
- Bourgeois III, L. J. (1981). On the measurement of organizational slack. *Academy of Management review*, 6(1), 29-39.
- Bowman, W. (2002). The Uniqueness of Nonprofit Finance and the Decision to Borrow. *Nonprofit Management Leadership*, 12(3), 293-311.
- Bowman, W. (2011). Financial capacity and sustainability of ordinary nonprofits. *Nonprofit Management and Leadership*, 22(1), 37-51.
- Butler, A. W. (2008). Distance Still Matters: Evidence from Municipal Bond Underwriting. *Review of Financial Studies*, 21(2), 763-784.
- Bridgeland, J. M., McNaught, M., Reed, B., & Dunkelman, M. (2009). The Quiet Crisis: The Impact of the Economic Downturn on the Nonprofit Sector. *Civic Enterprises*.
- Brumberg, R. (2023, Nov 27). Medicaid And Assisted Living: State By State Benefits And Eligibility. *Forbes*. <https://www.forbes.com/health/senior-living/medicaid-assisted-living/>
- Burris, C., & Pflieger, R. (2020). Broken Promises: An Analysis of Charter School Closures from 1999-2017. *Network for Public Education*.

- Calabrese, T. D. (2011a). Testing Competing Capital Structure Theories of Nonprofit Organizations: Nonprofit Capital Structure. *Public Budgeting & Finance*, 31(3), 119–143.
- Calabrese, T. D. (2011b). Do Donors Penalize Nonprofit Organizations with Accumulated Wealth? *Public Administration Review*, 71(6), 859–869. <https://doi.org/10.1111/j.1540-6210.2011.02420.x>
- Calabrese, T., & Grizzle, C. (2012). Debt, Donors, and the Decision to give. *Journal of Public Budgeting, Accounting & Financial Management*, 24(2), 221.
- Calabrese, T. (2013). Running on empty: The operating reserves of US nonprofit organizations. *Nonprofit Management and Leadership*, 23(3), 281-302.
- Calabrese, T. D., & Ely, T. L. (2016). Borrowing for the Public Good: The Growing Importance of Tax-Exempt Bonds for Public Charities. *Nonprofit and Voluntary Sector Quarterly*, 45(3), 458–477. 104
- Calabrese, T. D. (2020). Nonprofit Finance: A Synthetic Review. *Voluntaristics Review*, 4(5), 1-89.
- Capeci, J. (1991). CREDIT RISK, CREDIT RATINGS, AND MUNICIPAL BOND YIELDS: A PANEL STUDY. *National Tax Journal*, 44(4), 41–56.
- Caplan, B. (2016). The Association between Provider-Sponsored Health Plans and Nonprofit Hospital Bond Ratings. *Journal of Health Care Finance*, 11.
- Carroll, D. A., & Stater, K. J. (2009). Revenue Diversification in Nonprofit Organizations: Does it Lead to Financial Stability? *Journal of Public Administration Research & Theory*, 19(4), 947–966.
- Castanias, R. (1983). Bankruptcy Risk and Optimal Capital Structure. *The Journal of Finance*,

- 38(5), 1617–1635. JSTOR.
- Chang, C. F., & Tuckman, H. P. (1991). Financial Vulnerability and Attrition as Measures of Nonprofit Performance. *Annals of Public & Cooperative Economics*, 62(4).
- Chang, C. F., & Tuckman, H. P. (1994). Revenue diversification among non-profits. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 5, 273-290.
- Charles, C., Sloan, M. F., & Butler, J. S. (2021). Capital structure determinants for arts nonprofits. *Nonprofit Management and Leadership*, 31(4), 761-782.
- Chen, C., Kriz, K. A., & Wang, Q. (2016). How Does the Health of Transportation Infrastructure Affect State Credit Ratings? An Empirical Analysis. *Public Finance Review*, 44(5), 660–680.
- Chikoto, G. L., & 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.
- Child, C. (2010). Whither the turn? The ambiguous nature of nonprofits' commercial revenue. *Social forces*, 89(1), 145-161.
- Clark-Herrera, E., Bauer, M., Brewer, Todd., Chan, Steffi., Glymph, Darrin., Garner, Kathryn., & Radecki, A. (2019). *Public Charter Schools: Borrowing With Tax-Exempt Bonds (Third Edition)*. National Alliance for Public Charter Schools.  
<https://facilitycenter.publiccharters.org/sites/default/files/2019-04/public-charter-schools-book-3rd-edition-orrick.pdf>
- Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of management*, 37(1), 39-67.
- Cordes, J. J., & Weisbrod, B. A. (1998). Differential taxation of nonprofits and the

commercialization of nonprofit revenues. *Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management*, 17(2), 195-214.

Council of Economic Advisors. (2013). Economic report of the president. Retrieved from [https://www.whitehouse.gov/sites/default/files/docs/erp2013/full\\_2013\\_economic\\_report\\_of\\_the\\_president.pdf](https://www.whitehouse.gov/sites/default/files/docs/erp2013/full_2013_economic_report_of_the_president.pdf).

Daniels, K., Ejara, D. D., & Vijayakumar, J. (2010). Debt Maturity, Credit Risk, and Information Asymmetry: The Case of Municipal Bonds. *Financial Review*, 45(3), 603–626.

Daniels, K. N., & Vijayakumar, J. (2007). Does underwriter reputation matter in the municipal bond market?. *Journal of Economics and Business*, 59(6), 500-519.

DeAngelo, H., & Masulis, R. W. (1980). \*Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*, 8(1), 3–29.

Denison, D. V. (2001). Bond Insurance Utilization and Yield Spreads in the Municipal Bond Market. *Public Finance Review*, 29(5), 394–411.

Denison, D. V. (2003). An Empirical Examination of the Determinants of Insured Municipal Bond Issues. *Public Budgeting & Finance*, 23(1), 96–114.

Denison, D. V., Yan, W., & Zhao, Z. (jerry). (2007). Is Management Performance a Factor in Municipal Bond Credit Ratings? The Case of Texas School Districts. *Public Budgeting & Finance*, 27(4), 86–98.

Denison, D. V. (2009). Which Nonprofit Organizations Borrow.pdf. *Public Budgeting & Finance*, 29(3), 110–123.

- Denison, D., Fowles, J., & Moody, M. J. (2014). Borrowing for college: A comparison of Long-Term debt financing between public and private, nonprofit institutions of higher education. *Public Budgeting & Finance*, 34(2), 84-104.
- Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The review of economic studies*, 51(3), 393-414. 105
- Eger III, R. J. (2011). Examining Financial Behavior in Special Purpose Entities. *Journal of Applied Business and Economics*, 12(6), 57–69.
- Elmagrhi, M. H., Ntim, C. G., Malagila, J., Fosu, S., & Tunyi, A. A. (2018). Trustee board diversity, governance mechanisms, capital structure and performance in UK charities. *Corporate Governance: The International Journal of Business in Society*, 18(3), 478–508.
- Ely, T. L., Martell, C. R., & Kioko, S. N. (2013). Determinants of the Credit Rating Fee in the Municipal Bond Market. *Public Budgeting & Finance*, 33(1), 25–48.
- Ely, T. L., & Calabrese, T. D. (2016). Leveling the Playing Field: The Taxpayer Relief Act of 1997 and Tax-Exempt Borrowing by Nonprofit Colleges and Universities. *National Tax Journal*, 69(2), 387-411.
- Ely, T. L., & Calabrese, T. D. (2017). Public Borrowing for Private Organizations: Costs and Structure of Tax-Exempt Debt Through Conduit Issuers: Public Borrowing for Private Organizations. *Public Budgeting & Finance*, 37(1), 3–25.
- Ely, T. L. (2019). Budget uncertainty and the quality of nonprofit charter school enrollment projections. *The Palgrave handbook of government budget forecasting*, 325-344.

- Fitch Ratings. (2021). *Public Sector, Revenue-Supported Entities Rating Criteria*.  
<https://www.fitchratings.com/research/us-public-finance/public-sector-revenue-supported-entities-rating-criteria-01-09-2021>
- Forbes, R. W., Leonard, P. A., & Johnson, C. L. (1992). The Role Of Financial Advisors In The Negotiated Sale Of Tax-Exempt Securities. *Journal of Applied Business Research (JABR)*, 8(2), 7.
- Foster, W., & Fine, G. (2007). How nonprofits get really big. *Stanford Social Innovation Review*, 5(2), 46–55.
- Frank, M. Z., & Goyal, V. K. (2007). Trade-Off and Pecking Order Theories of Debt. *SSRN Electronic Journal*.
- Froelich, K. A. (1999). Diversification of Revenue Strategies: Evolving Resource Dependence in Nonprofit Organizations. *Nonprofit and Voluntary Sector Quarterly*, 28(3), 246–268
- Gaver, J. J., Harris, E. E., & Im, S. M. (2016). Determinants and Consequences of Nonprofit Debt Ratings. *Accounting Horizons*, 30(3), 363–378.
- Garcia-Rodriguez, I., & Jegers, M. (2017). Capital Structure of Nongovernmental Development Organizations. *Nonprofit Management and Leadership*, 28(2), 175–194.
- Gentry, W. M. (2002). Debt, investment and endowment accumulation: The case of not-for-profit hospitals. *Journal of Health Economics*, 21(5), 845–872. [https://doi.org/10.1016/S0167-6296\(02\)00056-5](https://doi.org/10.1016/S0167-6296(02)00056-5)
- Greer, R. A., & Denison, D. V. (2014). Does Intrastate Competition in Segmented Municipal Bond Markets Affect Interest Costs? An Empirical Test of the Preferred Habitat Hypothesis. *Municipal Finance Journal*, 35(2), 1–15.

- Greer, R. A. (2016). Local Government Risk Assessment: The Effect of Government Type on Credit Rating Decisions in Texas. *Public Budgeting & Finance*, 36(2), 70–90.  
<https://doi.org/10.1111/pbaf.12082>
- Greene, W. H. (2012). *Econometric analysis*. 7th (International) ed. New York University. Pearson. ISBN, 13, 978-0.
- Greene, P. (2020, Aug 7). Report: Are Charter Schools A Big Risk For Families?. *Forbes*.  
<https://www.forbes.com/sites/petergreene/2020/08/07/report-are-charter-schools-a-big-risk-for-families/?sh=33dfa1954986>
- Greenlee, J. S., and J. M. Trussel. 2000. Predicting the financial vulnerability of charitable organizations. *Nonprofit Management & Leadership* (11): 199–210.
- Greer, R. A. (2016). Local Government Risk Assessment: The Effect of Government Type on Credit Rating Decisions in Texas. *Public Budgeting & Finance*, 36(2), 70–90.  
<https://doi.org/10.1111/pbaf.12082>
- Greer, R. A., & Denison, D. V. (2014). Does Intrastate Competition in Segmented Municipal Bond Markets Affect Interest Costs? An Empirical Test of the Preferred Habitat Hypothesis. *Municipal Finance Journal*, 35(2), 1–15.
- Griffin, J., Quisenberry, B., & Schlieman, G. (2020). *State Policy Snapshot: Facilities Funding for Public Charter Schools*. National Alliance for Public Charter Schools.  
[https://facilitycenter.publiccharters.org/sites/default/files/2020-08/csfc\\_facilities\\_financing\\_snapshot.pdf](https://facilitycenter.publiccharters.org/sites/default/files/2020-08/csfc_facilities_financing_snapshot.pdf)
- Grizzle, C. (2010). The impact of budget stabilization funds on state general obligation bond ratings. *Public Budgeting & Finance*, 30(2), 95-111.

- Gronbjerg, K. A. (1991). How nonprofit human service organizations manage their funding sources: Key findings and policy implications. *Nonprofit Management and Leadership*, 2(2), 159–175. <https://doi.org/10.1002/nml.4130020206>
- Grønbjerg, K. A., & Nagle, A. E. (1994). Structure and adequacy of human service facilities: Challenges for nonprofit managers. *Nonprofit Management and Leadership*, 5(2), 117-140.
- Guo, H., & Zhao, Z. (Jerry). (2011). Management Capacity and State General Obligation Bond Ratings: Evidence with the GPP Grades. *The American Review of Public Administration*, 41, 562–576.
- Guo, S., & Fraser, M. W. (2014). Propensity score analysis: Statistical methods and applications (Vol. 11). SAGE publications.
- Guzman, T., & Moldogaziev, T. (2012). Which Bonds Are More Expensive? The Cost Differentials by Debt Issue Purpose and the Method of Sale: An Empirical Analysis. *Public Budgeting & Finance*, 32(3), 79–101.
- Hansmann, H. (1980). The role of nonprofit enterprise. *The Yale Law Journal*, 89(5), 835–902.
- Hsueh, L. P., & Liu, Y. A. (1990). The effectiveness of debt insurance as a valid signal of bond quality. *Journal of Risk and Insurance*, 691-700. 106
- Han, X., Luo, Q., & Ku, L. (2017). Medicaid expansion and grant funding increases helped improve community health center capacity. *Health Affairs*, 36(1), 49-56.
- Irvin, R. A., & Furneaux, C. W. (2022). Surviving the black swan event: How much reserves should nonprofit organizations hold?. *Nonprofit and Voluntary Sector Quarterly*, 51(5), 943-966.
- Jacobson Jarvis & Co. (n.d.). *Using Gambling as a Way to Raise Money for Nonprofits*.

<https://jjco.com/2016/07/14/using-gambling-way-raise-money-nonprofits/>

- Jegers, M. (2003). The sustainable growth rate of non-profit organisations: The effect of efficiency, profitability and capital structure. *Financial Accountability & Management*, 19(4), 309-314.
- Jegers, M. (2011). On the Capital Structure of Non-Profit Organisations: A Replication and Extension with Belgian Data. *Financial Accountability & Management*, 27(1), 18–31.
- Jegers, M. (2018). Capital structure. In *Handbook of research on nonprofit economics and management* (pp. 87–95). Edward Elgar Publishing
- Jegers, M., & Verschueren, I. (2006). On the Capital Structure of Non-Profit Organisations: An Empirical Study for Californian Organisations. *Financial Accountability & Management*, 22(4), 309–329.
- Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, 76(2), 323–329. JSTOR.
- Joffe, M. (2015). DOUBLY BOUND: THE COST OF ISSUING MUNICIPAL BONDS. Haas Institute for a Fair and Inclusive Society,. University of California, Berkeley.  
[https://belonging.berkeley.edu/sites/default/files/haasinstituterefundamerica\\_doublybound\\_cost\\_of\\_issuingbonds\\_publish.pdf](https://belonging.berkeley.edu/sites/default/files/haasinstituterefundamerica_doublybound_cost_of_issuingbonds_publish.pdf)
- Jimenez, B. S. (2011). Management Quality and State Bond Ratings: Exploring the Links between Public Management and Fiscal Outcomes. *International Journal of Public Administration*, 34(12), 783–799.
- Johnson, C. L., & Kriz, K. A. (2005). Fiscal Institutions, Credit Ratings, and Borrowing Costs. *Public Budgeting & Finance*, 25(1), 84–103. <https://doi.org/10.1111/j.0275-1100.2005.00356.x>

- Keith, D. S. (2013). Financial factors and institutional characteristics that relate to the long-term debt of US four-year public colleges and universities. The University of Alabama.
- Lam, M., Searing, E., Prentice, C., & Grasse, N. (2020). Capital Structure and Financial Health. In *Financing Nonprofit Organizations* (pp. 145-158). Routledge.
- Lecy & Grasse(2016) IRS Current Exempt Organizations Database",  
<https://doi.org/10.7910/DVN/Z4PZOG>, Harvard Dataverse, V1,  
 UNF:6:Ng3tkyN2IW4X1ZLy6GjIwg== [fileUNF]
- Liu, P., Seyyed, F. J., & Smith, S. D. (1999). The Independent Impact of Credit Rating Changes – The Case of Moody’s Rating Refinement on Yield Premiums. *Journal of Business Finance & Accounting*, 26(3–4), 337–363.
- Mayer, W. J., Wang, H. C., Egginton, J. F., & 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.
- McCue, M. J., & Ozcan, Y. A. (1992). Determinants of capital structure. *Journal of Healthcare Management*, 37(3), 333.
- McLaughlin, R. M. (1990). Investment-banking contracts in tender offers: An empirical analysis. *Journal of Financial Economics*, 28(1–2), 209–232.
- Mitchell, G. E., & Calabrese, T. D. (2019). Proverbs of nonprofit financial management. *The American Review of Public Administration*, 49(6), 649-661.
- Moody’s Investor Service. (2016). *Rating Methodology US Charter Schools*.  
[https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBM\\_1039451](https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBM_1039451)
- Moody’s Investor Service. (2018a). *Rating Methodology Not-For-Profit Healthcare*.  
[https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBM\\_1154632](https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBM_1154632)

- Moody's Investor Service. (2018b). *Rating Methodology Nonprofit Organizations (Other Than Healthcare and Higher Education)*. [https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBM\\_160889](https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBM_160889)
- Moody's Investor Service. (2021). *Higher Education Methodology*. [https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBM\\_1257002](https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBM_1257002)
- Morgan, D. P. (2002). Rating Banks: Risk and Uncertainty in an Opaque Industry. *THE AMERICAN ECONOMIC REVIEW*, 92(4), 44.
- Mullaney, Tim. (2021). *Senior Living Muni Bond Defaults Reach \$1.6B in 2021, With More Pain Coming*. Senior Housing News. Retrieved February 13, 2024, from <https://seniorhousingnews.com/2021/11/22/senior-living-muni-bond-defaults-reach-1-6b-in-2021-with-more-pain-coming/>
- Myers, S. (1984). Capital Structure Puzzle (No. w1393; p. w1393). National Bureau of Economic Research. <https://doi.org/10.3386/w1393>
- Myers, S. C. (2001). Capital Structure. *The Journal of Economic Perspectives*, 15(2), 81–102. JSTOR.
- Myers, S., & Majuf, N. (1984). Corporate financing decisions when firms have investment information that investors do not. *Journal of Financial Economics*, 13(2), 187–221.
- Marudas, N. P. (2004). Effects of nonprofit organization wealth and efficiency on private donations to large nonprofit organizations. *Research in governmental and nonprofit accounting*, 11, 71-92.
- Marudas, N. P., Hahn, T., & Jacobs, F. A. (2014). An improved model of effects of accounting measures of inefficiency on donations. *Journal of Finance and Accountancy*, 15, 1

- Nanda, V., & Singh, R. (2004). Bond Insurance: What Is Special About Munis? *The Journal of Finance*, 59(5), 2253–2280.
- National Council of Nonprofits. (2013). *State law nonprofit audit requirements*.  
[www.councilofnonprofits.org/nonprofit-audit-guide/state-law-auditrequirements](http://www.councilofnonprofits.org/nonprofit-audit-guide/state-law-auditrequirements).
- National School Boards Association. (2021). *How states fund charter schools*.  
<https://www.nsba.org/-/media/NSBA/File/cpe-charter-fund-brief-september-2021.pdf>
- Nowicki, J. M. (2022). K-12 Education: Charter Schools That Received Federal Funding to Open or Expand Were Generally Less Likely to Close than Other Similar Charter Schools. Report to Congressional Committees. GAO-23-105616. US Government Accountability Office.
- Park, J., Lee, H., Butler, J. S., & Denison, D. (2020). The effects of high-quality financial reporting on municipal bond ratings: Evidence from US local governments. *Local Government Studies*. <https://doi.org/10.1080/03003930.2020.1825385>
- Park, Y. J., Matkin, D. S., & Marlowe, J. (2017). Internal control deficiencies and municipal borrowing costs. *Public Budgeting & Finance*, 37(1), 88-111.
- Palumbo, G., & Zaporowski, M. P. (2012). Determinants of municipal bond ratings for general-purpose governments: an empirical analysis. *Public Budgeting & Finance*, 32(2), 86-102.
- Peng, J., & Brucato, P. F. (2004). An empirical analysis of market and institutional mechanisms for alleviating information asymmetry in the municipal bond market. *Journal of Economics and Finance*, 28(2), 226–238.
- Peng, J., Kriz, K. A., & Neish, T. (2008). Method of Sale in the Municipal Bond Market. In S. G. Feldstein & F. J. Fabozzi (Eds.), *The Handbook of Municipal Bonds* (pp. 51–87). John Wiley & Sons, Inc.

- Poterba, J., & Rueben, K. (1997). *State Fiscal Institutions and the U.S. Municipal Bond Market* (p. w6237). National Bureau of Economic Research.
- Raineri, L., Robbins, M., Simonsen, B., & Weaver, K. (2012). Underwriting Brokerage and Risk in Municipal Bond Underwriting. *Municipal Finance Journal*, 33, 87–103.
- Rivard, R. (2014). *The lure of taxable debt*. Inside Higher Ed. Retrieved January 18, 2023, from [https:// www.insidehighered.com/news/2014/07/21/lure-research-and-avoid-regulations-someuniversities-turn-away-tax-exempt-bonds](https://www.insidehighered.com/news/2014/07/21/lure-research-and-avoid-regulations-someuniversities-turn-away-tax-exempt-bonds)
- Robbins, M. D., & Simonsen, B. (2012). Debt Issued Through Others: Conduits, Joint Powers Authorities, and Borrowing Costs in California Local Governments. *Public Budgeting & Finance*, 32(2), 69–85.
- Robbins, M. D., & Simonsen, B. (2013). Municipal Bond New Issue Transaction Costs. *Public Budgeting & Finance*, 33(1), 1–24.
- Robbins, M., & Simonsen, B. (2014). Analysis of Outliers in Municipal Bond Transaction Costs. *Municipal Finance Journal*, 35, 27–46.
- Robbins, M., Simonsen, B., Raineri, L., & Weaver, K. (2012). Underwriting Brokerage and Risk in Municipal Bond Underwriting. *Municipal Finance Journal*, 33, 87–103.
- Rosenstiel, P. (2016). *An Overlooked Financing Tool: How Nonprofits Can Issue Tax-Exempt Bonds*. California Association of Nonprofits.  
<https://calnonprofits.org/images/NonprofitsTax-ExemptBonds.June2016.pdf>
- Rosen, H. S., & Sappington, A. J. W. (2016). To borrow or not to borrow? An analysis of university leverage decisions. *Research in Economics*, 70(1), 170–185.  
<https://doi.org/10.1016/j.rie.2015.10.005>
- Rowland (2023, April 6). Assisted-living homes are rejecting Medicaid and evicting seniors. *The*

- Washington Post*. <https://www.washingtonpost.com/business/2023/04/06/seniors-assisted-living-medicaid- eviction/>
- Sartori, A. E. (2003). An estimator for some binary-outcome selection models without exclusion restrictions. *Political Analysis*, 11(2), 111-138.
- Salamon, L. M. (2012). Holding the fort: Nonprofit employment during a decade of turmoil. Johns Hopkins University Institute for Policy Studies.
- Searcy, C. (2011). A Tale of Two Cities: Charter School Resource Allocation and Facility Financing in Albany and Buffalo.
- Searing, E. A., & Lecy, J. D. (2022). Growing up nonprofit: Predictors of early-stage nonprofit formalization. *Nonprofit and Voluntary Sector Quarterly*, 51(3), 680-698.
- Serna, G. R. (2013). Employing College and University Credit Ratings as Indicators of Institutional Planning Effectiveness. *Planning for Higher Education*, 41(4), 1–11. 108
- Shin, P., Sharac, J., & Rosenbaum, S. (2015). Community health centers and Medicaid at 50: an enduring relationship essential for health system transformation. *Health Affairs*, 34(7), 1096-1104.
- Simonsen, W., & Robbins, M. D. (1996). Does It Make Any Difference Anymore? Competitive versus Negotiated Municipal Bond Issuance. *Public Administration Review*, 56(1), 57–64.
- Smith, G. P. (2010). What are the Capital Structure Determinants for Tax-Exempt Organizations? *Financial Review*, 4
- Smith, G. P. (2012). Capital Structure Determinants for Tax-Exempt Organisations: Evidence from the UK. *Financial Accountability & Management*, 28(2), 143–163.5(3), 845–872.

- Sonola, O. (2018). Determinants of the capital structure of US public finance infrastructural enterprises: evidence from not-for-profit water, power and transportation enterprises (Doctoral dissertation, Rutgers University-Graduate School-Newark).
- Spreen, T. L., & Gerrish, E. (2022). Taxes and tax-exempt bonds: A literature review. *Journal of Economic Surveys*, 36(4), 767-808.
- S&P Global Ratings. (2020). *Criteria | Governments | U.S. Public Finance: Methodology For Rating U.S. Public Finance Rental Housing Bonds*.  
<https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/11360071>
- S&P Global Ratings. (2021a). *General Criteria: Methodology: Not-For-Profit Public And Private Colleges And Universities*.  
<https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/9389754>
- S&P Global Ratings. (2021b). *Criteria | Governments | U.S. Public Finance: U.S. Public Finance er Schools: Methodology And Assumptions*.  
<https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/9807706>
- S&P Global Ratings. (2021c). *Criteria | Governments | U.S. Public Finance: U.S. And Canadian Not-For-Profit Acute Care Health Care Organizations*.  
<https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/10407192>
- St. Clair, T. (2016). How do nonprofits respond to regulatory thresholds: Evidence from New York's audit requirements. *Journal of Policy Analysis and Management*, 35(4), 772-790.
- Stein, P. (2019, Jan 23). Cesar Chavez Public Charter Schools announces it will close two campuses in D.C.. *The Washington Post*.  
<https://www.washingtonpost.com/local/education/cesar-chavez-public-charter-schools->

announces-it-will-close-two-campus-in-dc/2019/01/23/cbc4fdae-1f59-11e9-8e21-59a09ff1e2a1\_story.html

Stiglitz, J. E. (1972). Some Aspects of the Pure Theory of Corporate Finance: Bankruptcies and Take-overs. *The Bell Journal of Economics and Management Science*, 3(2), 458–482. JSTOR.

Stiglitz, J. E. (2002). Information and the Change in the Paradigm in Economics. *American economic review*, 92(3), 460-501.

Su, M., & Hildreth, W. B. (2018). Does financial slack reduce municipal short-term borrowing?. *Public Budgeting & Finance*, 38(1), 95-113.

Szymańska, A., Van Puyvelde, S., & Jegers, M. (2015). Capital structure of social purpose companies – a panel data analysis. *Journal of Sustainable Finance & Investment*, 5(4), 234–254.

Temkin, K., Hong, G., Davis, L., & Bavin, W. (2008). Implementation of the Credit Enhancement for Charter School Facilities Program. Final Report. *US Department of Education*.

Thakor, A. V. (1982). An exploration of competitive signalling equilibria with “third party” information production: The case of debt insurance. *The Journal of Finance*, 37(3), 717-739.

Tuckman, H. P. (1993). How and why nonprofit organizations obtain capital. In D. C. Hammack & D. R. Young (Eds.), *Nonprofit organizations in a market economy* (pp. 203-232). San Francisco, CA: Jossey-Bass.

- Tuckman, H. P., & Chang, C. F. (1991). A methodology for measuring the financial vulnerability of charitable nonprofit organizations. *Nonprofit and voluntary sector quarterly*, 20(4), 445-460.
- Turner, J., Broom, K., Elliott, M., & Lee, J. F. (2015). A comparison of capital structure: The use of debt in investor owned and not-for-profit hospitals. *Journal of Health Care Finance*, 41(4).
- Vijayakumar, J., & Daniels, K. N. (2006). The Role and Impact of Financial Advisors in the Market for Municipal Bonds. *Journal of Financial Services Research*, 30(1), 43–68.
- Vogt, A. J. (2004). Capital budgeting and finance: A guide for local governments. Washington, DC: International City/County Management Association. 109  
<https://doi.org/10.1007/s10693-006-8739-y>
- Wagner, G. A. (2004). The Bond Market and Fiscal Institutions: Have Budget Stabilization Funds Reduced State Borrowing Costs? *National Tax Journal*, 57(4), 785–804.
- Wedig, G., Sloan, F. A., Hassan, M., & Morrissey, M. A. (1988). Capital Structure, Ownership, and Capital Payment Policy: The Case of Hospitals. *The Journal of Finance*, 43(1), 21–40. JSTOR.
- Wedig, G. J., Hassan, M., & Morrissey, M. A. (1996). Tax-Exempt Debt and the Capital Structure of Nonprofit Organizations: An Application to Hospitals. *The Journal of Finance*, 51(4), 1247–1283.
- Weisbrod, B. A. (1988). The nonprofit economy. *Harvard University Press*.
- West, R. R. (1967). Determinants of Underwriters' Spreads on Tax Exempt Bond Issues. *The Journal of Financial and Quantitative Analysis*, 2(3), 241–263.

- Wolffolds, S. E., & Siegel, J. (2019). Misaccounting for endogeneity: The peril of relying on the Heckman two-step method without a valid instrument. *Strategic Management Journal*, 40(3), 432-462.
- Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*. MIT press.
- Woronkowicz, J., Joynes, D. C., Frumkin, P., Kolendo, A., Seaman, B., Gertner, R., & Bradburn, N. (2012). SET IN STONE : Building America's New Generation of Arts Facilities, 1994-2008. 73.
- Woronkowicz, J. (2016). Is bigger really better? The effect of nonprofit facilities projects on financial vulnerability. *Nonprofit Management and Leadership*, 27(1), 79-94.
- Worzala, E., Karofsky, J., & Davis, J. (2009). The senior living property sector: how is it perceived by the institutional investor?. *Journal of Real Estate Portfolio Management*, 15(2), 141-156.
- Yan, W., Denison, D. V., & Butler, J. S. (2009). Revenue Structure and Nonprofit Borrowing. *Public Finance Review*, 37(1), 47-67.
- Yetman, R. J. (2006). Borrowing and Debt .pdf. In *Borrowing and debt. Financing nonprofits: Putting theory into practice* (pp. 243-268).
- Yetman, R. J. (2010). Capital formation. In *Handbook of Research on Nonprofit Economics and Management* (pp. 59-68).
- Young, D. R. (2007). Toward a normative theory of nonprofit finance. In *Financing nonprofits: Putting theory into practice* (pp. 339-372).
- Young, D. R. (2017). Capital financing: A Benefits Approach. In *Financing Nonprofits and Other Social Enterprises*. Edward Elgar Publishing.
- <https://docdel.umd.edu/illiad/illiad.dll?Action=10&Form=75&Value=1403201>

Zhao, Z. (Jerry), & Guo, H. (David). (2011). Management Capacity and State Municipal Bond Ratings: Evidence With the GPP Grades. *The American Review of Public Administration*, 41(5), 562–576. <https://doi.org/10.1177/0275074010384718>